



EMC TEST REPORT

Test Report No. : KES-EM-22T0654-R1
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : XNO-8083R
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 : Jul. 08, 2022
Test date : Jul. 09, 2022 ~ Jul. 15, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong-Hyun, Won
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.



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-EM-22T0654-R1
Page (2) of (78)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 28, 2022	KES-EM-22T0654	Issued
Feb. 24, 2023	KES-EM-22T0654-R1	Change the Applicant and manufacturer at the request of the customer

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

TABLE OF CONTENTS

1.0	General Product Description	4
1.1	Test Voltage & Frequency	7
1.2	Variant Model Differences.....	7
1.3	Device Modifications	7
1.4	Equipment Under Test.....	7
1.5	Support Equipments	8
1.6	External I/O Cabling	9
1.7	EUT Operating Mode(s)	10
1.8	Configuration.....	11
1.9	Remarks when standards applied	12
1.10	Calibration Details of Equipment Used for Measurement	12
1.11	Test Facility	12
1.12	Laboratory Accreditations and Listings	13
2.0	Test Regulations.....	14
2.1	Conducted Emissions at Mains Power Ports	15
2.2	Conducted Emissions at Telecommunication Ports	16
2.3	Radiated Electric Field Emissions(Below 1 GHz)	17
2.4	Radiated Electric Field Emissions(Above 1 GHz)	18
2.5	Harmonic Current Emissions	19
2.6	Voltage Fluctuations and Flicker	20
3.0	Criteria for compliance	21
3.1	Electrostatic Discharge.....	23
3.2	Radiated Electric Field Immunity	29
3.3	Electrical Fast Transients/Bursts	32
3.4	Surge Transients	35
3.5	Conducted Disturbance	39
3.6	Voltage Dips and Short Interruptions	43
APPENDIX A – TEST DATA.....		45
Conducted Emissions at Mains Power Ports		45
Conducted Emissions at Telecommunication Ports		47
Radiated Electric Field Emissions(Below 1 GHz).....		49
Radiated Electric Field Emissions(Above 1 GHz)		51
Harmonic Current Emissions and Voltage Fluctuations and Flicker		53
Test Setup Photos and Configuration		56
Conducted Emissions at Mains Power Ports		56
Conducted Emissions at Telecommunication Ports		57
Radiated Electric Field Emissions(Below 1 GHz).....		59
Radiated Electric Field Emissions(Above 1 GHz)		61
Harmonic Current Emissions and Voltage Fluctuations and Flicker		63
Electrostatic Discharge		64
Radiated Electric Field Immunity		65
Electrical Fast Transients/Bursts		66
Surge Transients		67
Conducted Disturbance		68
Voltage Dips and Short Interruptions		69
EUT External Photographs		70
EUT Internal Photographs		71



1.0 General Product Description

Main Specifications of EUT are:

	XNO-8083R
Video	
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
Lens	
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
Pan / Tilt / Rotate	
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
Operational	
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)
Digital PTZ	Support
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	- 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) - Analytics events : Defocus detection, Motion detection, Tampering, Fog detection, Audio detection, Sound classification, Shock detection, Appear/Disappear

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0654-R1

Page (5) of (78)

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 - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) - Audio clip playback - PTZ preset
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
Radiometry	
Temperature Detect Range	None
Temperature Accuracy	None
Temperature Detection	None
Additional	None
Network	
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
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet open platform
General	
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
Environmental & Electrical	
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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-EM-22T0654-R1
Page (6) of (78)

Mechanical	
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
DORI (EN62676-4 standard)	
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)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



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 230 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	XNO-8083R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	LG15N54	503NZWY038929	LG Electronics Inc.	-
Notebook Adapter	PA-1900-14	OF2R2633487017764	LITE-ON TECHNOLOGY COPORATION	-
Alarm	PRO-SL		SENSOR PRO	-
Button Alarm	-	-	-	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
Mic	MP1000	-	-	-
SmartPhone	iPhone 6s	-	Apple Inc.	-
Micro SD Card	-	-	SanDisk	-

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)	2 Pin	AC/DC Adapter	2 Pin	1.6	U
	RJ-45	Notebook	RJ-45	3.0	S
	Alarm OUT	Alarm	Alarm IN	4.0	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	3.5 mm	Mic	3.5 mm	1.8	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	3.5 mm	SmartPhone	3.5 mm	1.1	U
	DC Jack	Notebook Adapter	DC Jack	1.9	S

* 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 Adapter	RJ-45	3.0	S
	Alarm OUT	Alarm	Alarm IN	4.0	U
	Alarm IN	Button Alarm	Alarm OUT	3.5	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	3.5 mm	Mic	3.5 mm	1.8	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
PoE Adapter	RJ-45	Notebook	RJ-45	2.0	S
Notebook	3.5 mm	SmartPhone	3.5 mm	1.1	U
	DC Jack	Notebook Adapter	DC Jack	1.9	S

* Unshielded=U, Shielded=S



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0654-R1

Page (10) of (78)

1.7 EUT Operating Mode(s)

■ DC, PoE MODE

Test Mode	operating
- DC Mode	Check the Normal Operation status. after testing, check if the recording is normally done on the Micro SD Card
- PoE Mode	

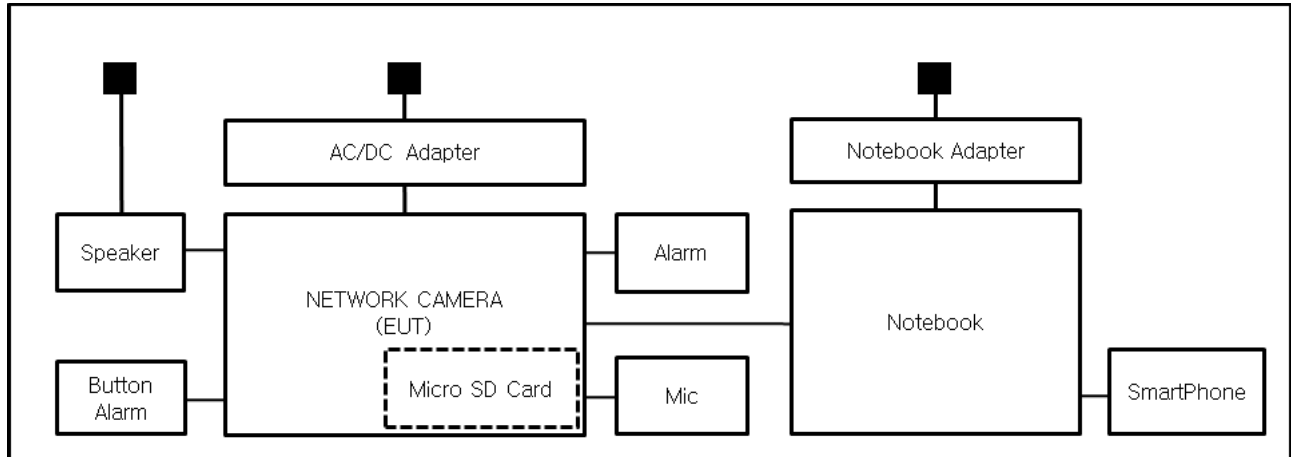
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

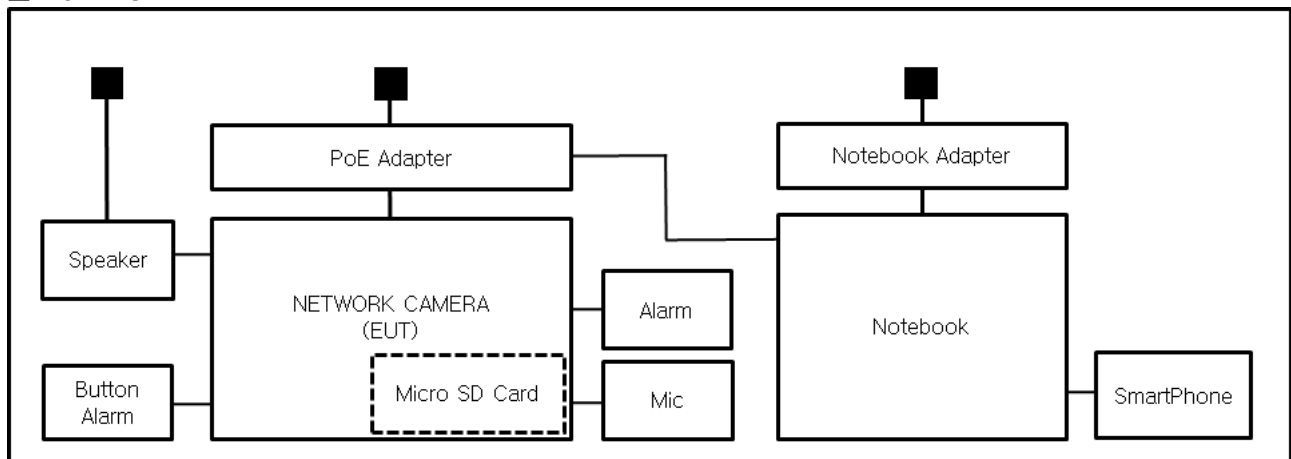
1.8 Configuration

■ AC Main
 □ DC Main

■ DC MODE



■ PoE MODE



1.9 Remarks when standards applied

The USB, VIDEO ports were excluded from the test as administrator ports.



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) 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 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
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber 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 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

2.1 Conducted Emissions at Mains Power Ports

Test Date

Jul. 09, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions

Temperature: (24,4 ± 0,1) °C

Relative Humidity: (44,7 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jul. 09, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023

Test Conditions

Temperature: (24,4 ± 0,1) °C
Relative Humidity: (44,7 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 09, 2022

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	03, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (24,3 ± 0,1) °C
Relative Humidity: (44,2 ± 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

Jul. 12, 2022

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	03, 31, 2023
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 02, 2023

Test Conditions

Temperature: (24,6 ± 0,2) °C

Relative Humidity: (45,5 ± 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

RemarksSee Appendix A for test data.

2.5 Harmonic Current Emissions

Test Date

Jul. 09, 2022

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (24,4 ± 0,1) °C

Relative Humidity: (46,3 ± 0,1) % R.H.

Classification of Equipment for Harmonic Current Emissions

- ☒ Class A
☐ Class B
☐ Class C(Below 25 W)
☐ Class C(Above 25 W)
☐ Class D

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Jul. 09, 2022

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (24,4 ± 0,1) °C
Relative Humidity: (46,3 ± 0,1) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 Alarm systems-Part 4: Electromagnetic compatibility Product family
standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change,
and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.
For component of CCTV systems, where the status is monitored by observing the TV picture,
then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:
(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
(b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could
still be used; and
(c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no
residual
change in the EUT or any change in outputs, which could be interpreted by associated
equipment
as a change. The EUT shall meet the acceptance criteria for the functional test, after the
conditioning.

3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Jul. 12, 2022

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	02, 24, 2023
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (24,6 ± 0,1) °C
Relative Humidity: (45,7 ± 0,1) % R.H.
Atmospheric Pressure: (99,5 ± 0,1) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

Location of Discharge:

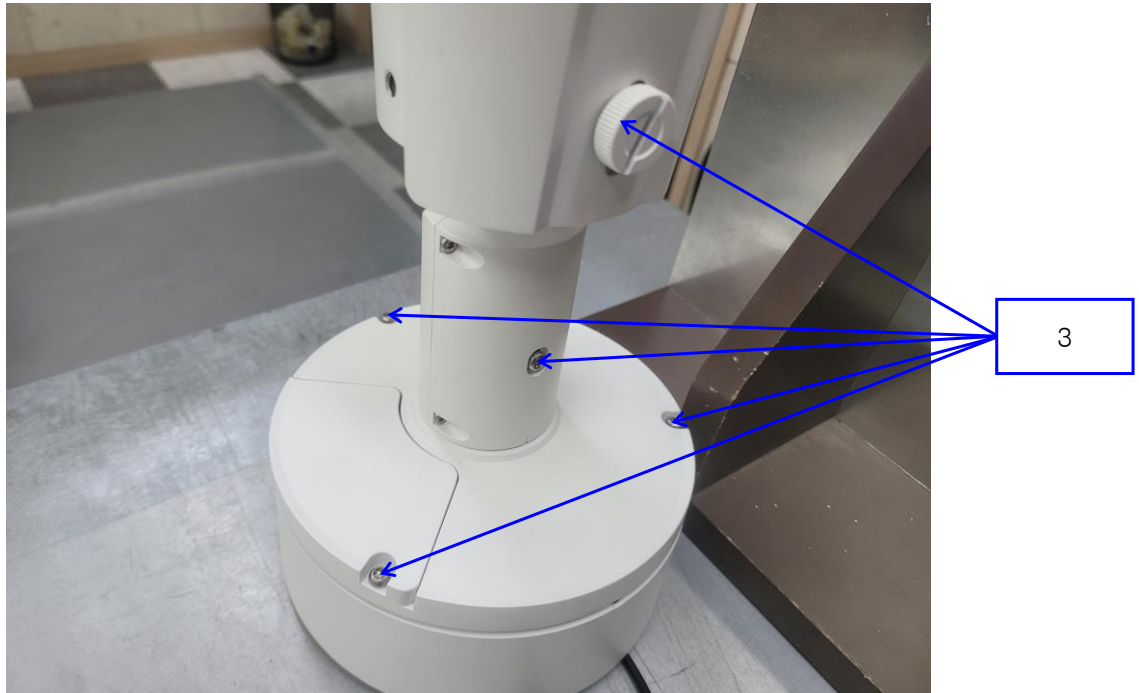
Air
Contact



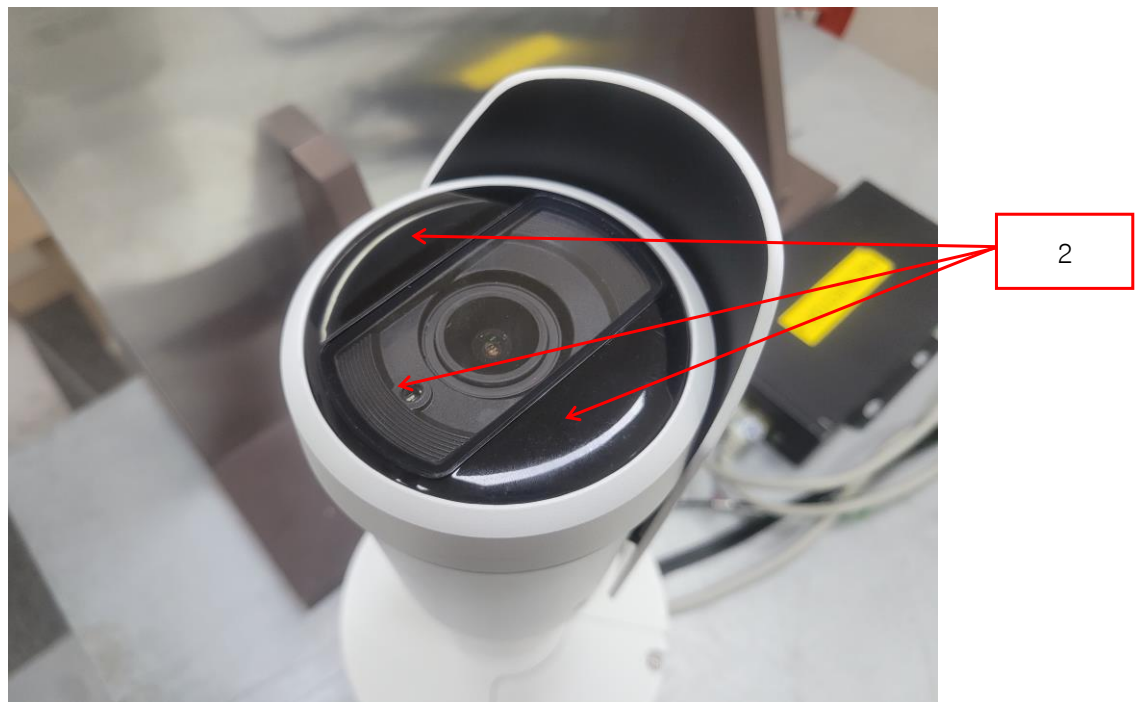
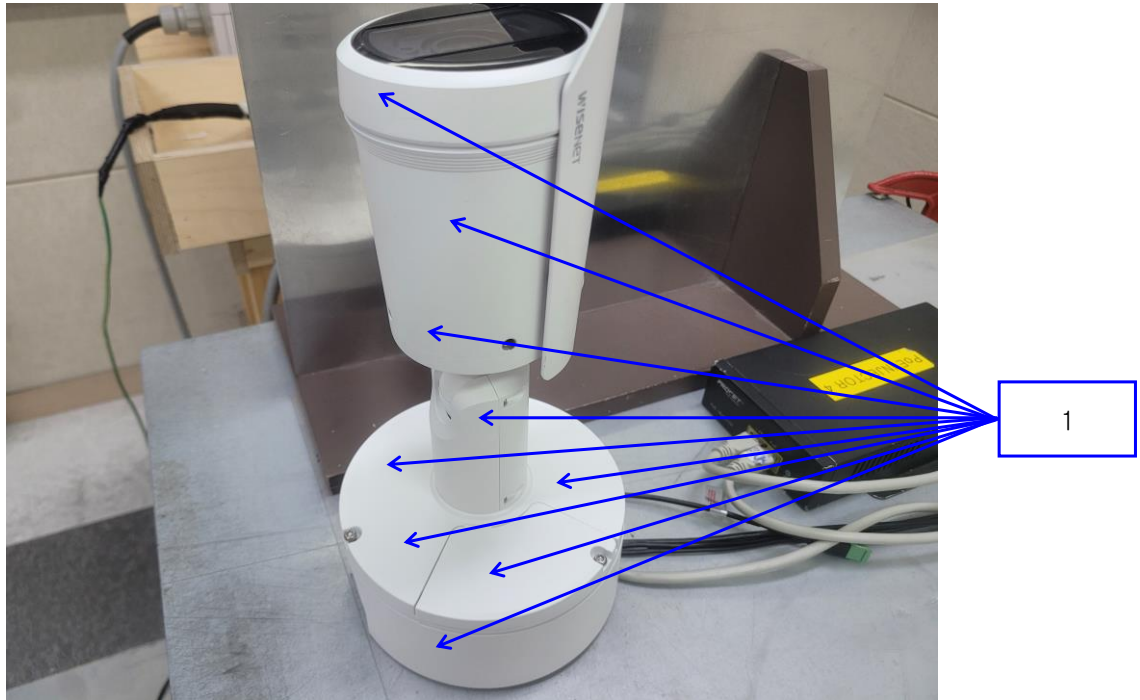
■ DC MODE



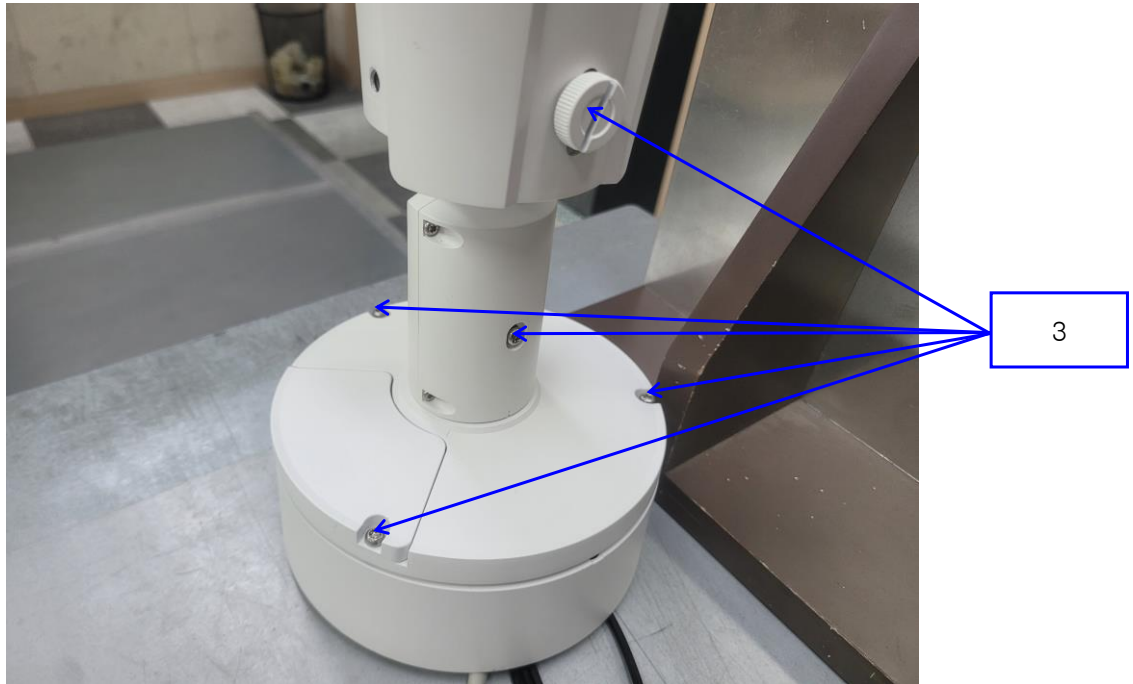
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



■ PoE MODE



[시험기자재]



Test Data

■ DC MODE

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Contact Discharge	Complied	-
2	Lens	Air Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-

Note: "Blank" = Not performed

■ PoE MODE

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Contact Discharge	Complied	-
2	Lens	Air Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:
 Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria

3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Jul. 11, 2022

Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 03, 2022
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	03, 31, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	04, 04, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	04, 04, 2023
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (24,0 ± 0,2) °C
Relative Humidity: (43,9 ± 0,2) % R.H.
Atmospheric Pressure: (99,8 ± 0,1) kPa



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-EM-22T0654-R1
Page (30) of (78)

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



Test Data

■ DC MODE

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

■ PoE MODE

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jul. 15, 2022

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	12, 03, 2022

Test Conditions

Temperature: (24,6 ± 0,1) °C
Relative Humidity: (45,1 ± 0,1) % R.H.
Atmospheric Pressure: (100,0 ± 0,1) kPa

Test Specifications

Pulse Amplitude & Polarity:
(AC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data

■ DC MODE

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	Complied	Complied
N	Complied	Complied
PE	-	-
L – N	Complied	Complied
L – PE	-	-
N – PE	-	-
L – N – PE	-	-

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied

Note: “Blank” = Not performed

■ PoE MODE
☐ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	-	-
N	-	-
PE	-	-
L – N	-	-
L – PE	-	-
N – PE	-	-
L – N – PE	-	-

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
Alarm IN	Complied	Complied
Alarm OUT	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results
☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks
PASS Required Performance Criteria

3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014/A1:2017

Test Date

Jul. 15, 2022

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☐	CDN	CNV 508N1	EM TEST	P1610176296	12, 03, 2022

Test Conditions

Temperature: (24,6 ± 0,2) °C
Relative Humidity: (45,1 ± 0,1) % R.H.
Atmospheric Pressure: (100,0 ± 0,1) kPa



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0654-R1

Page (36) of (78)

Test Specifications

AC Power Lines

Source Impedance: 12 ohm for common Mode and 2 ohm for differential Mode

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance:

42 ohm for common Mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Test Data

■ DC MODE

☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	Complied	Complied

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	-	-
N – PE	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
RJ-45	CDN	Complied	Complied
	LINE	Complied	Complied

Note: "Blank" = Not performed

☒ PoE MODE

☐ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	-	-

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	-	-
N – PE	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
RJ-45	CDN	Complied	Complied
	LINE	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria
☐ NOT APPLICABLE

Remarks

PASS Required Performance Criteria

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jul. 14, 2022

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 24, 2022
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43694	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43697	11, 24, 2022
☒	CDN	CDN ST08A	TESEQ	43886	11, 24, 2022
☐	CDN	CDN T8RJ45	EM TEST	0909-09	08, 03, 2022
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 25, 2022

Test Conditions

Temperature: (24,3 ± 0,2) °C
Relative Humidity: (45,2 ± 0,2) % R.H.
Atmospheric Pressure: (99,6 ± 0,1) kPa



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-EM-22T0654-R1
Page (40) of (78)

Test Specifications

Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

Required Performance Criteria: ☒ Complied

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Test Data

■ DC MODE

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	Complied

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
Alarm IN	Clamp	Complied
Alarm OUT	Clamp	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

■ PoE MODE

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
Alarm IN	Clamp	Complied
Alarm OUT	Clamp	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria

3.6 Voltage Dips and Short Interruptions

Reference Standard

EN IEC 61000-4-11:2020

Test Date

Jul. 15, 2022

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	03, 31, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023

Test Conditions

Temperature: (24,6 ± 0,1) °C
Relative Humidity: (45,1 ± 0,1) % R.H.
Atmospheric Pressure: (100,0 ± 0,1) kPa



Test Specifications & Observations/Remarks

- Voltage Dips and Short Interruptions

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5 000	<u>Degradation</u>

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria
☐ NOT APPLICABLE

Remarks

During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered by no operator's intervention.

APPENDIX A – TEST DATA

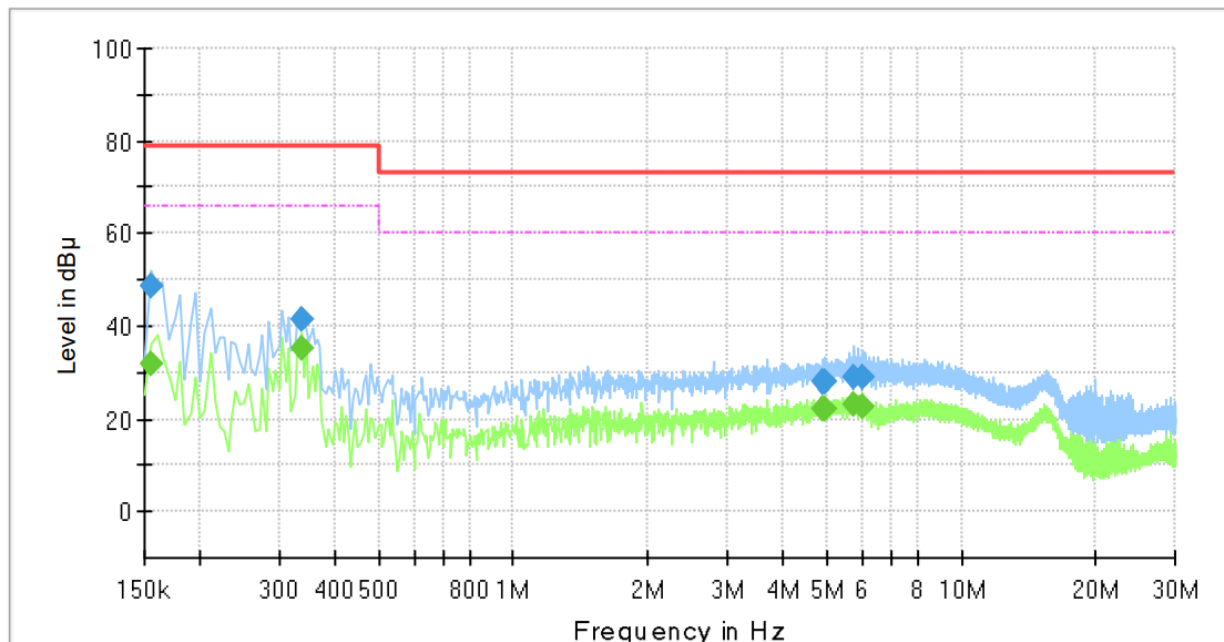
Conducted Emissions at Mains Power Ports

■ DC MODE

[HOT]

Common Information

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



Final Result

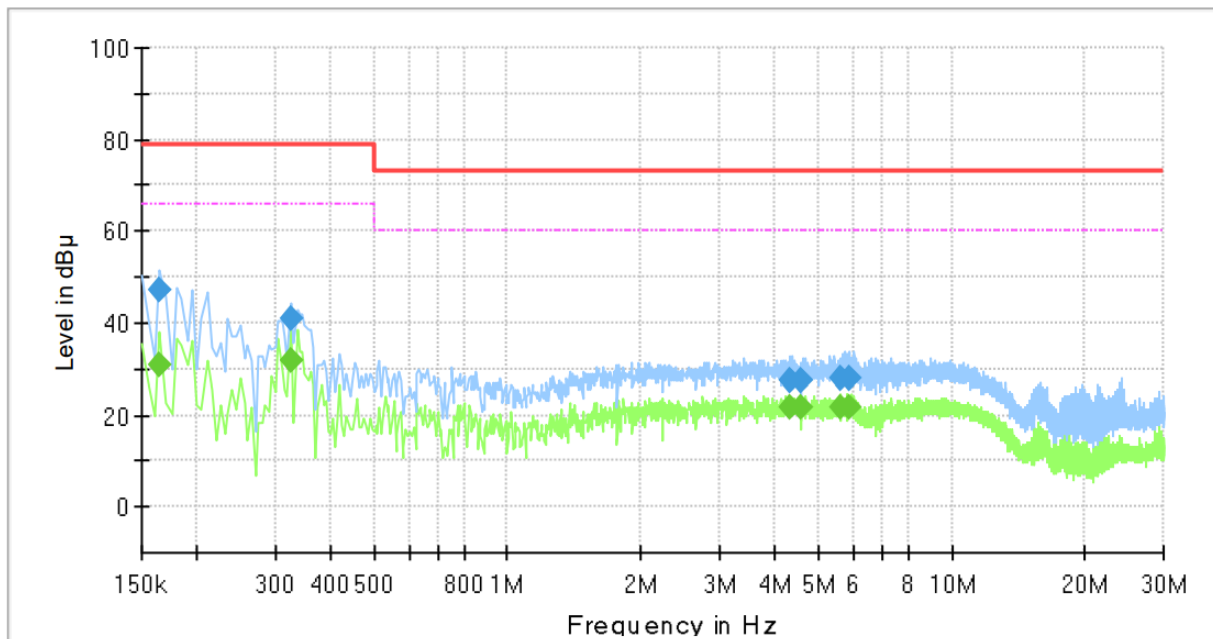
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	31.56	66.00	34.44	1000.0	9.000	L1	19.4
0.155000	48.73	---	79.00	30.27	1000.0	9.000	L1	19.4
0.335000	---	35.19	66.00	30.81	1000.0	9.000	L1	19.5
0.335000	41.23	---	79.00	37.77	1000.0	9.000	L1	19.5
4.920000	---	22.34	60.00	37.66	1000.0	9.000	L1	19.6
4.920000	27.90	---	73.00	45.10	1000.0	9.000	L1	19.6
4.980000	---	22.40	60.00	37.60	1000.0	9.000	L1	19.6
4.980000	28.14	---	73.00	44.86	1000.0	9.000	L1	19.6
5.730000	---	23.10	60.00	36.90	1000.0	9.000	L1	19.5
5.730000	28.90	---	73.00	44.10	1000.0	9.000	L1	19.5
5.990000	---	22.69	60.00	37.31	1000.0	9.000	L1	19.5
5.990000	28.92	---	73.00	44.08	1000.0	9.000	L1	19.5

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: XNO-8083R
 Phase:
 Mode: DC_N
 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	---	31.04	66.00	34.96	1000.0	9.000	N	19.4
0.165000	47.19	---	79.00	31.81	1000.0	9.000	N	19.4
0.325000	---	31.89	66.00	34.11	1000.0	9.000	N	19.5
0.325000	40.91	---	79.00	38.09	1000.0	9.000	N	19.5
4.345000	---	21.80	60.00	38.20	1000.0	9.000	N	19.8
4.345000	27.48	---	73.00	45.52	1000.0	9.000	N	19.8
4.585000	---	21.89	60.00	38.11	1000.0	9.000	N	19.7
4.585000	27.35	---	73.00	45.65	1000.0	9.000	N	19.7
5.590000	---	21.93	60.00	38.07	1000.0	9.000	N	19.5
5.590000	27.75	---	73.00	45.25	1000.0	9.000	N	19.5
5.905000	---	21.79	60.00	38.21	1000.0	9.000	N	19.5
5.905000	27.92	---	73.00	45.08	1000.0	9.000	N	19.5

◆ 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))

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

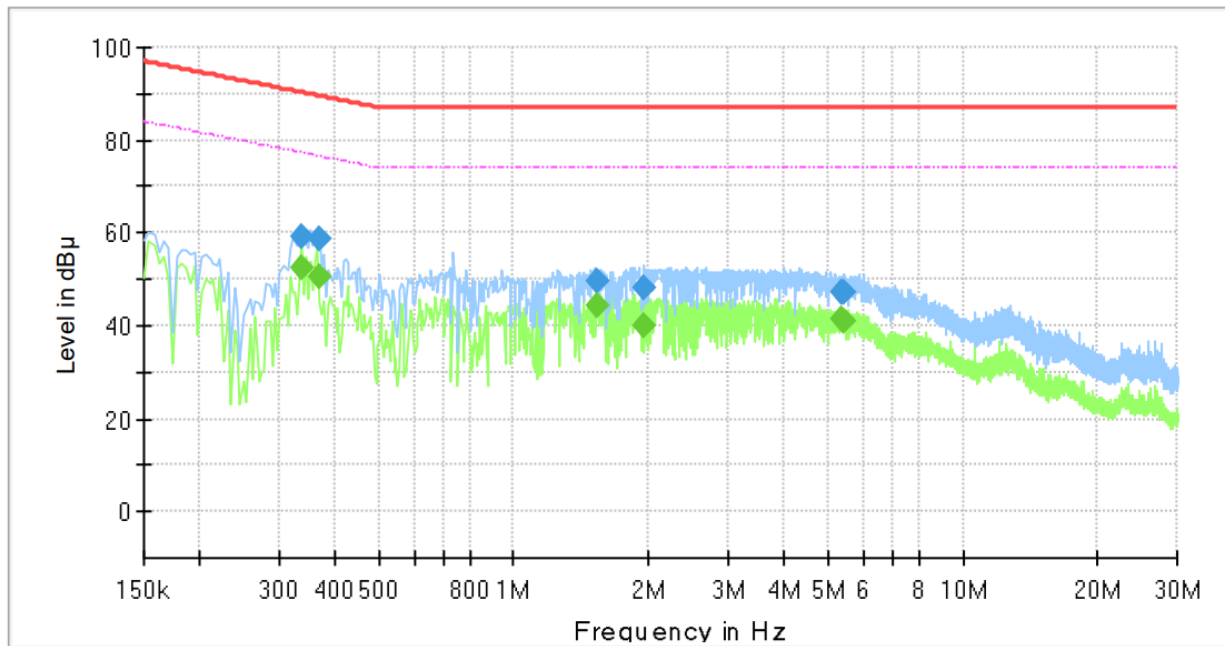
Conducted Emissions at Telecommunication Ports

■ DC MODE

[1 000 Mbps]

Common Information

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



Final Result

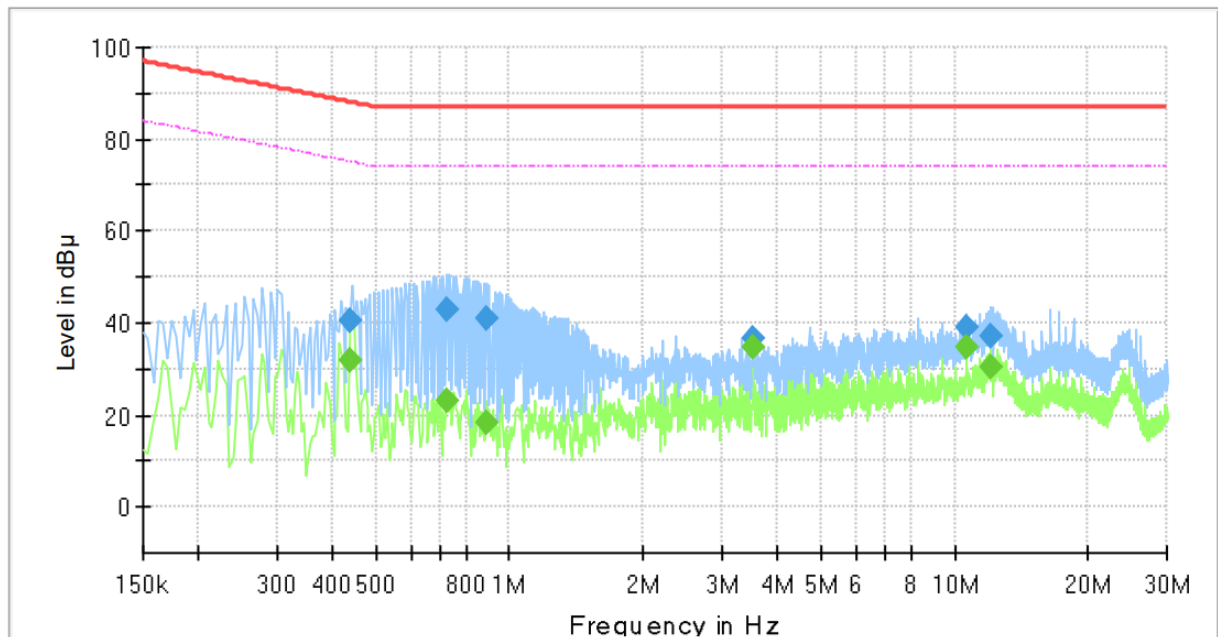
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.338000	---	52.42	77.25	24.83	1000.0	9.000	Single Line	19.3
0.338000	59.22	---	90.25	31.03	1000.0	9.000	Single Line	19.3
0.370000	---	50.38	76.50	26.12	1000.0	9.000	Single Line	19.4
0.370000	58.56	---	89.50	30.94	1000.0	9.000	Single Line	19.4
1.534000	---	44.10	74.00	29.90	1000.0	9.000	Single Line	20.1
1.534000	49.36	---	87.00	37.64	1000.0	9.000	Single Line	20.1
1.946000	---	39.77	74.00	34.23	1000.0	9.000	Single Line	20.2
1.946000	48.14	---	87.00	38.86	1000.0	9.000	Single Line	20.2
5.386000	---	41.28	74.00	32.72	1000.0	9.000	Single Line	19.4
5.386000	47.29	---	87.00	39.71	1000.0	9.000	Single Line	19.4
5.450000	---	41.15	74.00	32.85	1000.0	9.000	Single Line	19.4
5.450000	47.26	---	87.00	39.74	1000.0	9.000	Single Line	19.4

■ PoE MODE

[1 000 Mbps]

Common Information

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



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.438000	---	31.64	75.10	43.46	1000.0	9.000	Single Line	19.5
0.438000	40.51	---	88.10	47.59	1000.0	9.000	Single Line	19.5
0.722000	---	23.30	74.00	50.70	1000.0	9.000	Single Line	19.8
0.722000	42.66	---	87.00	44.34	1000.0	9.000	Single Line	19.8
0.886000	---	18.32	74.00	55.68	1000.0	9.000	Single Line	20.0
0.886000	40.78	---	87.00	46.22	1000.0	9.000	Single Line	20.0
3.538000	---	34.82	74.00	39.18	1000.0	9.000	Single Line	19.9
3.538000	36.55	---	87.00	50.45	1000.0	9.000	Single Line	19.9
10.610000	---	34.80	74.00	39.20	1000.0	9.000	Single Line	19.8
10.610000	39.16	---	87.00	47.84	1000.0	9.000	Single Line	19.8
12.002000	---	30.34	74.00	43.66	1000.0	9.000	Single Line	19.9
12.002000	37.22	---	87.00	49.78	1000.0	9.000	Single Line	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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

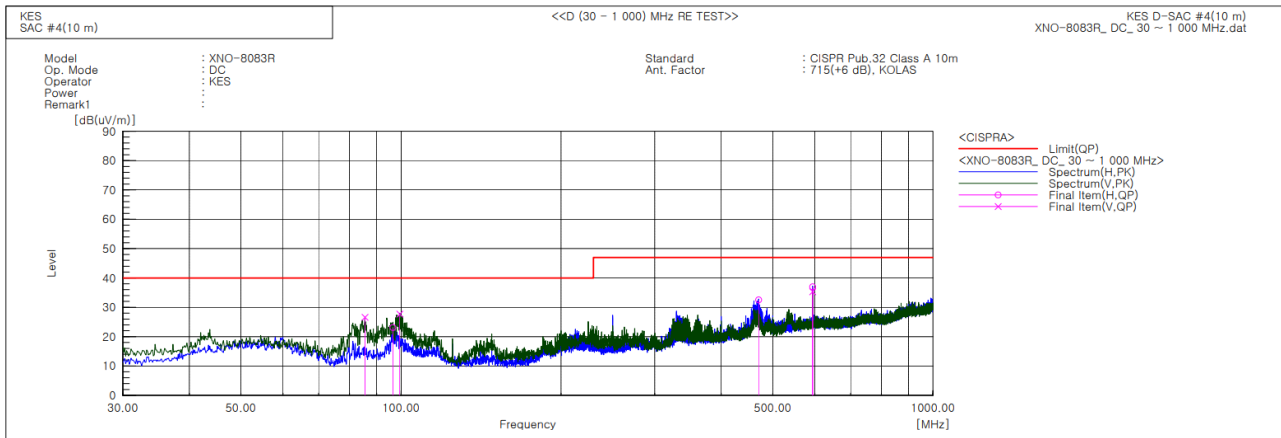
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

Radiated Electric Field Emissions(Below 1 GHz)

DC MODE

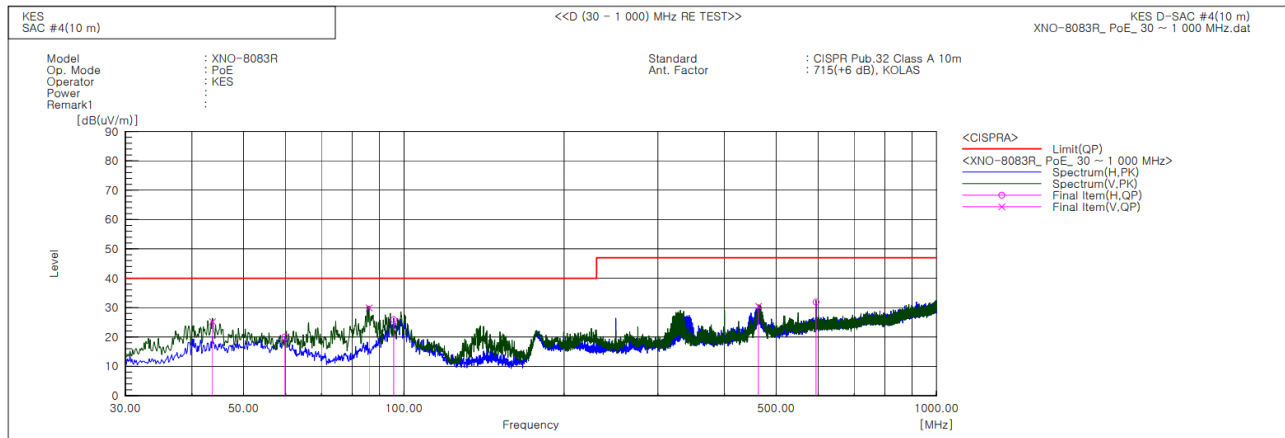


Final Result

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	85.533	V	52.5	-25.9	26.6	40.0	13.4	148.0	325.0	
2	96.566	H	46.2	-23.1	23.1	40.0	16.9	400.0	324.7	
3	99.476	V	50.2	-22.5	27.7	40.0	12.3	154.0	325.0	
4	470.380	H	44.9	-12.4	32.5	47.0	14.5	286.0	8.1	
5	593.985	H	45.6	-8.6	37.0	47.0	10.0	392.0	187.1	
6	594.055	V	43.9	-8.6	35.3	47.0	11.7	100.0	180.5	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

■ 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	43.701	V	46.8	-21.6	25.2	40.0	14.8	112.0	323.8	
2	59.828	H	41.9	-21.9	20.0	40.0	20.0	400.0	70.5	
3	86.018	V	55.6	-25.7	29.9	40.0	10.1	150.0	63.3	
4	95.718	H	49.2	-23.3	25.9	40.0	14.1	369.0	351.6	
5	462.984	V	43.1	-12.6	30.5	47.0	16.5	100.0	252.0	
6	594.055	H	40.5	-8.6	31.9	47.0	15.1	400.0	215.8	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

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

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

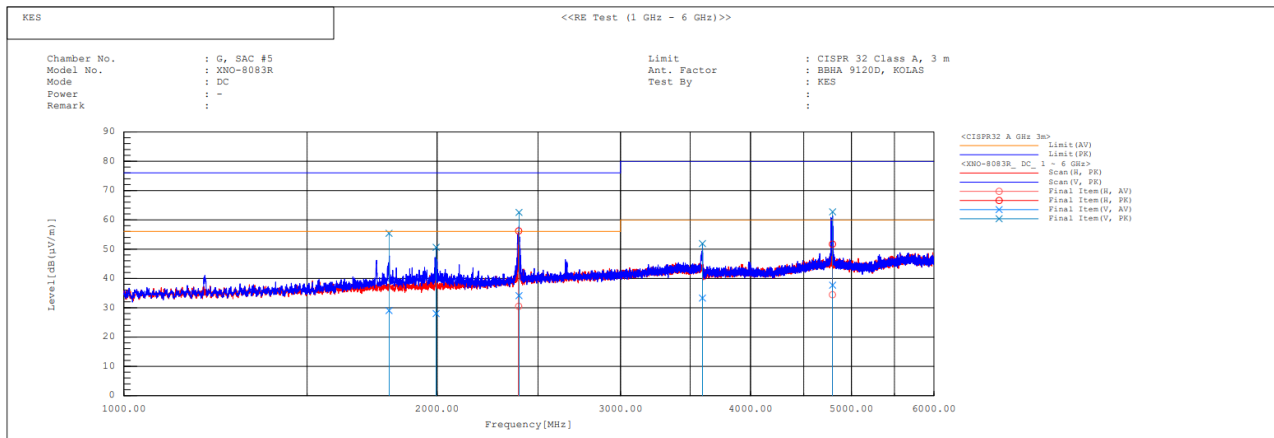
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

DC MODE

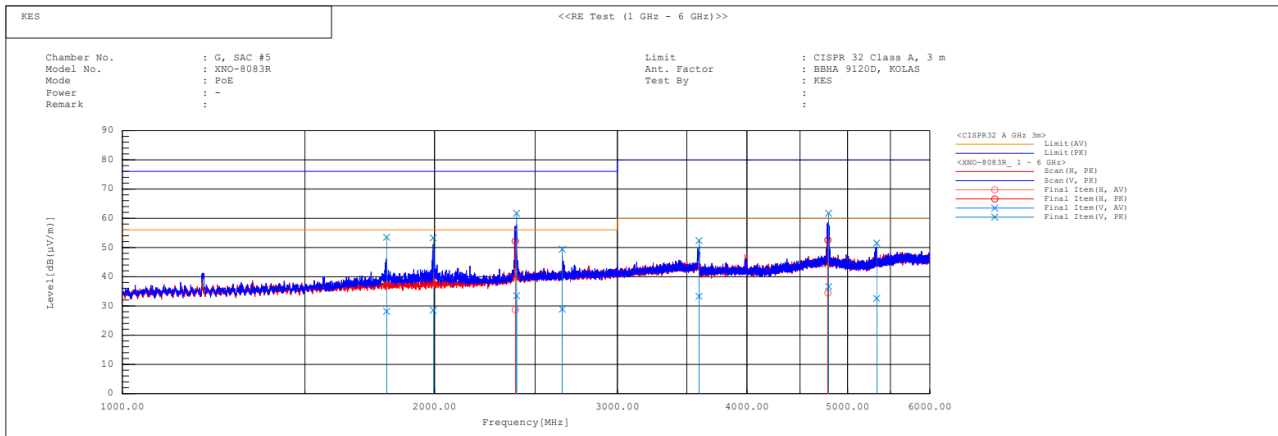


Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB (1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1798.435	V	32.7	59.1	-3.7	29.0	55.4	56.0	76.0	27.0	20.6	100.0	208.5
2	1995.417	V	30.8	53.4	-2.8	28.0	50.6	56.0	76.0	28.0	25.4	100.0	309.7
3	2394.838	H	32.0	57.7	-1.5	30.5	56.2	56.0	76.0	25.5	19.8	100.0	319.9
4	2396.993	V	35.6	64.0	-1.5	34.1	62.5	56.0	76.0	21.9	13.5	100.0	128.9
5	3596.105	V	31.3	49.9	2.0	33.3	51.9	60.0	80.0	26.7	28.1	100.0	128.9
6	4794.312	H	27.9	45.2	6.5	34.4	51.7	60.0	80.0	25.6	28.3	100.0	296.1
7	4796.576	V	31.2	56.2	6.5	37.7	62.7	60.0	80.0	22.3	17.3	100.0	167.5



PoE MODE



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1798.031	V	31.8	57.2	-3.7	28.1	53.5	56.0	76.0	27.9	22.5	100.0	195.1
2	1993.688	V	31.3	56.1	-2.8	28.5	53.3	56.0	76.0	27.5	22.7	100.0	182.2
3	2392.630	H	30.2	53.7	-1.5	28.7	52.2	56.0	76.0	27.3	23.8	100.0	247.0
4	2398.836	V	34.9	63.1	-1.4	33.5	61.7	56.0	76.0	22.5	14.3	100.0	133.3
5	2654.371	V	29.3	49.8	-0.4	28.9	49.4	56.0	76.0	27.1	26.6	100.0	189.5
6	3597.281	V	31.3	50.3	2.0	33.3	52.3	60.0	80.0	26.7	27.7	100.0	130.3
7	4787.559	H	28.0	46.2	6.4	34.4	52.6	60.0	80.0	25.6	27.4	100.0	344.6
8	4795.028	V	30.1	55.2	6.5	36.6	61.7	60.0	80.0	23.4	18.3	100.0	358.1
9	5333.294	V	24.6	43.5	8.0	32.6	51.5	60.0	80.0	27.4	28.5	100.0	156.8

◆ Calculation

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

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

Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.048			
2	0.002	0.204	1.080	n/a
3	0.041	1.791	2.300	PASS
4	0.003	0.655	0.430	n/a
5	0.042	3.667	1.140	PASS
6	0.003	0.881	0.300	n/a
7	0.041	5.359	0.770	PASS
8	0.003	1.169	0.230	n/a
9	0.038	9.569	0.400	PASS
10	0.003	1.416	0.184	n/a
11	0.036	10.977	0.330	PASS
12	0.003	1.680	0.153	n/a
13	0.034	16.259	0.210	PASS
14	0.003	1.987	0.131	n/a
15	0.032	21.015	0.150	PASS
16	0.003	2.198	0.115	n/a
17	0.029	21.882	0.132	PASS
18	0.003	2.455	0.102	n/a
19	0.026	22.278	0.118	PASS
20	0.002	2.699	0.092	n/a
21	0.024	14.780	0.161	PASS
22	0.002	2.965	0.084	n/a
23	0.021	14.241	0.147	PASS
24	0.002	3.209	0.077	n/a
25	0.018	13.694	0.135	PASS
26	0.002	3.413	0.071	n/a
27	0.016	12.931	0.125	PASS
28	0.002	3.719	0.066	n/a
29	0.014	11.812	0.116	PASS
30	0.002	3.841	0.061	n/a
31	0.012	10.975	0.109	PASS
32	0.002	4.074	0.058	n/a
33	0.010	9.976	0.102	PASS
34	0.002	4.171	0.054	n/a
35	0.009	9.340	0.096	PASS
36	0.002	4.332	0.051	n/a
37	0.008	8.712	0.091	PASS
38	0.002	4.416	0.048	n/a
39	0.007	8.375	0.087	PASS
40	0.002	4.398	0.046	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.052			
2	0.003	0.162	1.620	n/a
3	0.045	1.311	3.450	PASS
4	0.003	0.513	0.645	n/a
5	0.046	2.678	1.710	PASS
6	0.003	0.697	0.450	n/a
7	0.045	3.892	1.155	PASS
8	0.003	0.925	0.345	n/a
9	0.042	6.952	0.600	PASS
10	0.003	1.096	0.276	n/a
11	0.039	7.938	0.495	PASS
12	0.003	1.325	0.230	n/a
13	0.037	11.691	0.315	PASS
14	0.003	1.575	0.197	n/a
15	0.034	15.027	0.225	PASS
16	0.003	1.715	0.173	n/a
17	0.031	15.543	0.199	PASS
18	0.003	1.921	0.153	n/a
19	0.028	15.669	0.178	PASS
20	0.003	2.162	0.138	n/a
21	0.025	15.430	0.161	PASS
22	0.003	2.319	0.125	n/a
23	0.022	14.749	0.147	PASS
24	0.003	2.508	0.115	n/a
25	0.019	14.028	0.135	PASS
26	0.003	2.725	0.106	n/a
27	0.016	13.148	0.125	PASS
28	0.003	2.911	0.099	n/a
29	0.014	11.986	0.116	PASS
30	0.003	2.999	0.092	n/a
31	0.012	11.227	0.109	PASS
32	0.003	3.231	0.086	n/a
33	0.011	10.315	0.102	PASS
34	0.003	3.262	0.081	n/a
35	0.009	9.602	0.096	PASS
36	0.003	3.409	0.077	n/a
37	0.008	9.047	0.091	PASS
38	0.002	3.394	0.073	n/a
39	0.008	9.012	0.087	PASS
40	0.002	3.362	0.069	n/a

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-EM-22T0654-R1
Page (55) of (78)

Test Data - Voltage Fluctuations

Maximum Flicker results

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Emissions at Telecommunication Ports

■ DC MODE



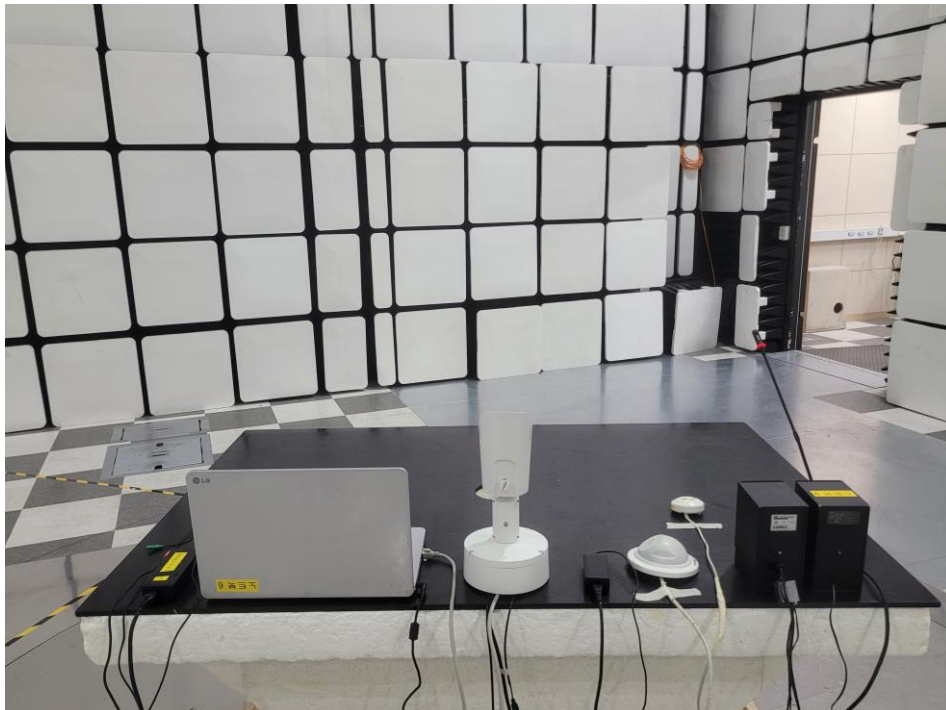
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

■ PoE MODE

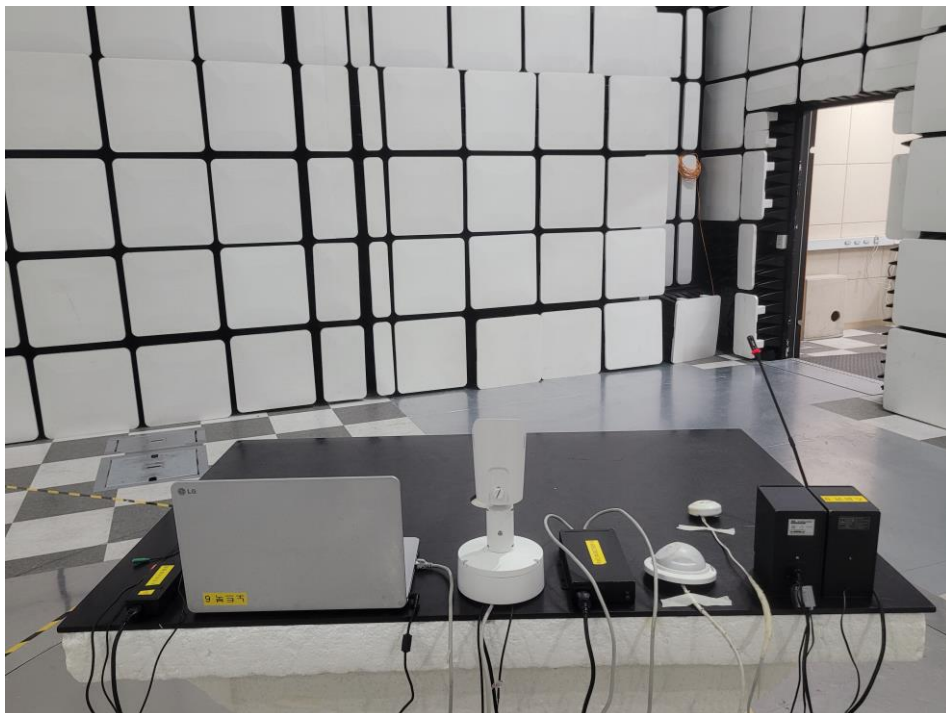


Radiated Electric Field Emissions(Below 1 GHz)

■ DC MODE

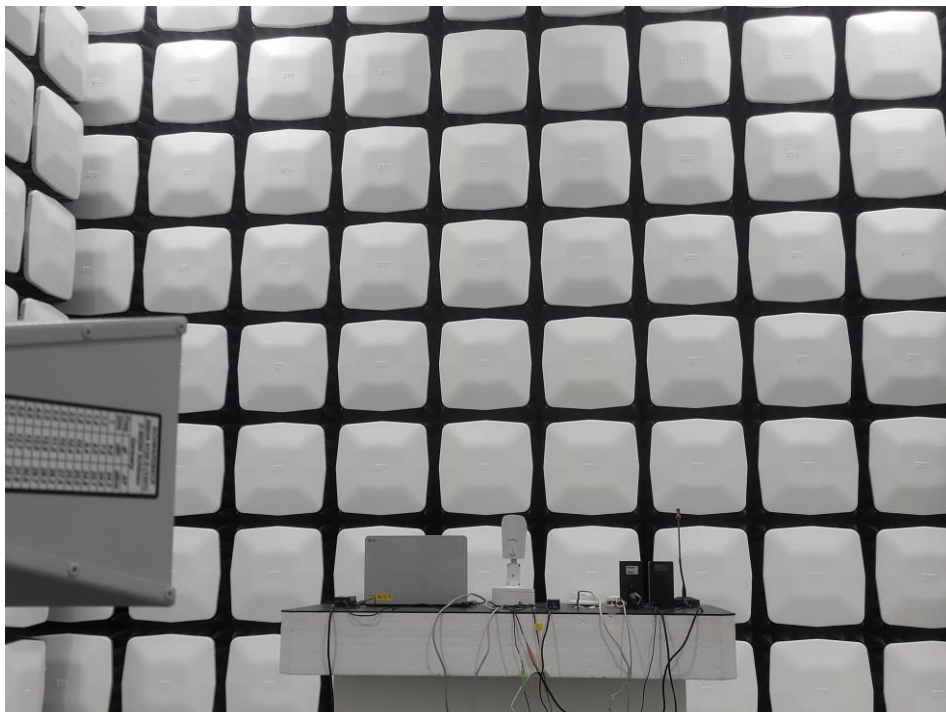
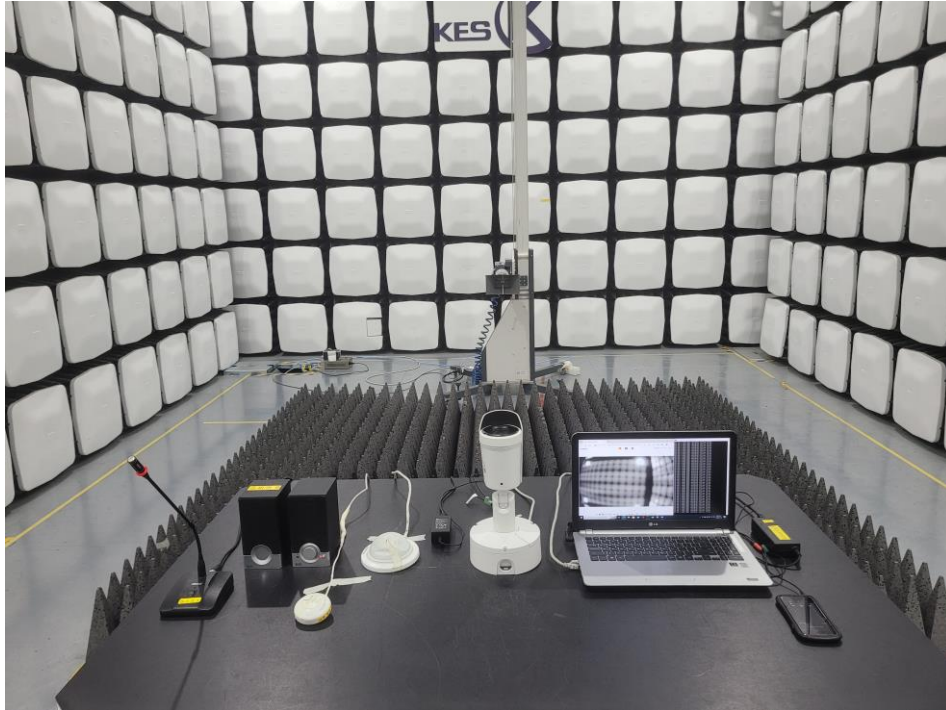


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

■ PoE MODE

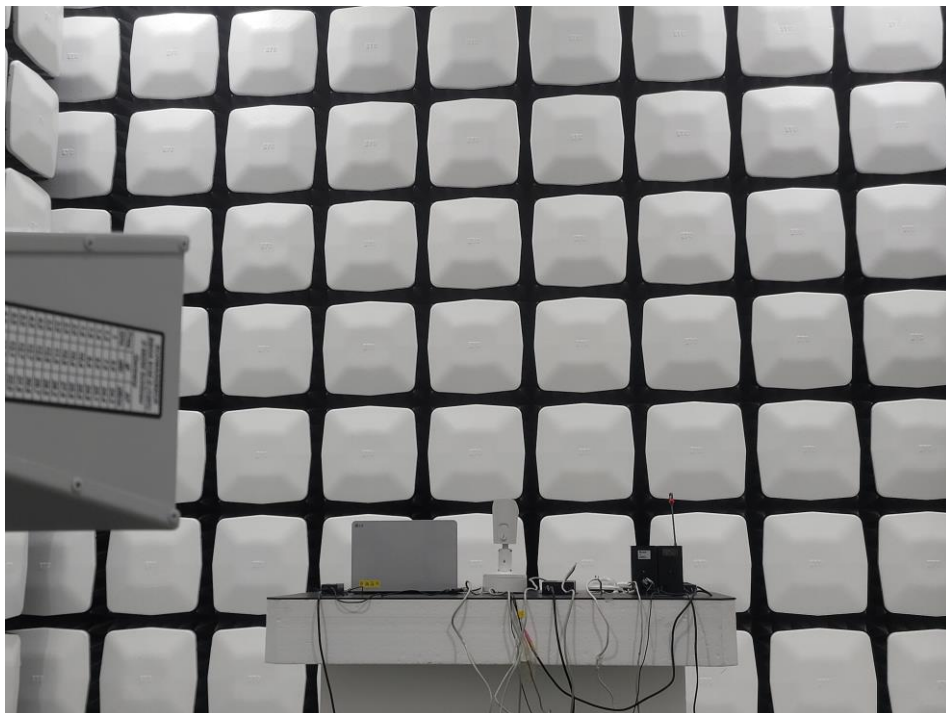
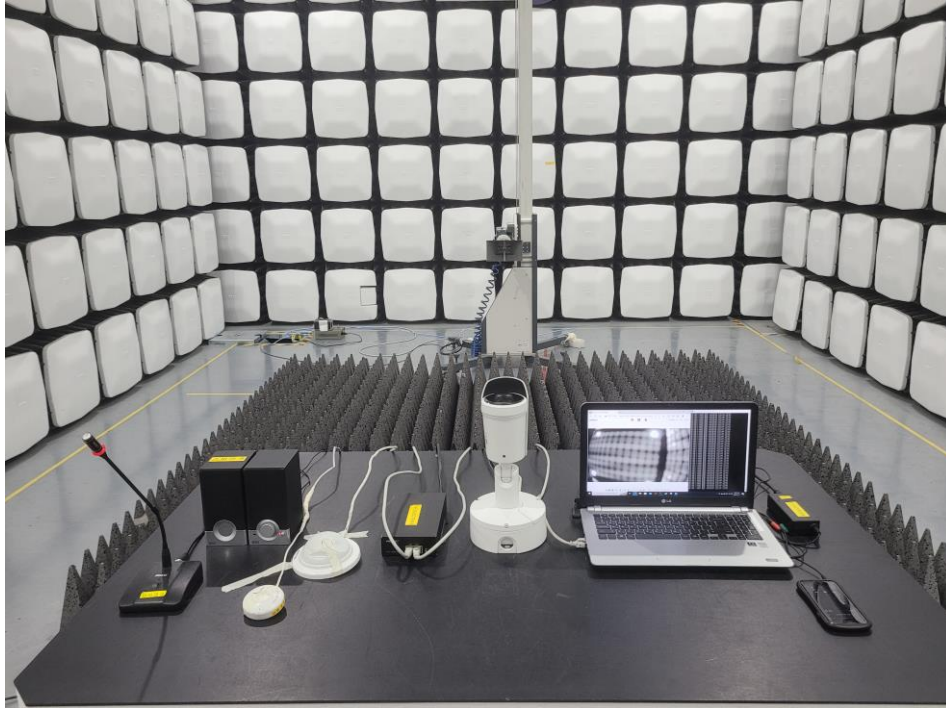
Radiated Electric Field Emissions(Above 1 GHz)

■ DC MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

■ PoE MODE



Harmonic Current Emissions and Voltage Fluctuations and Flicker



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Electrostatic Discharge

■ DC MODE



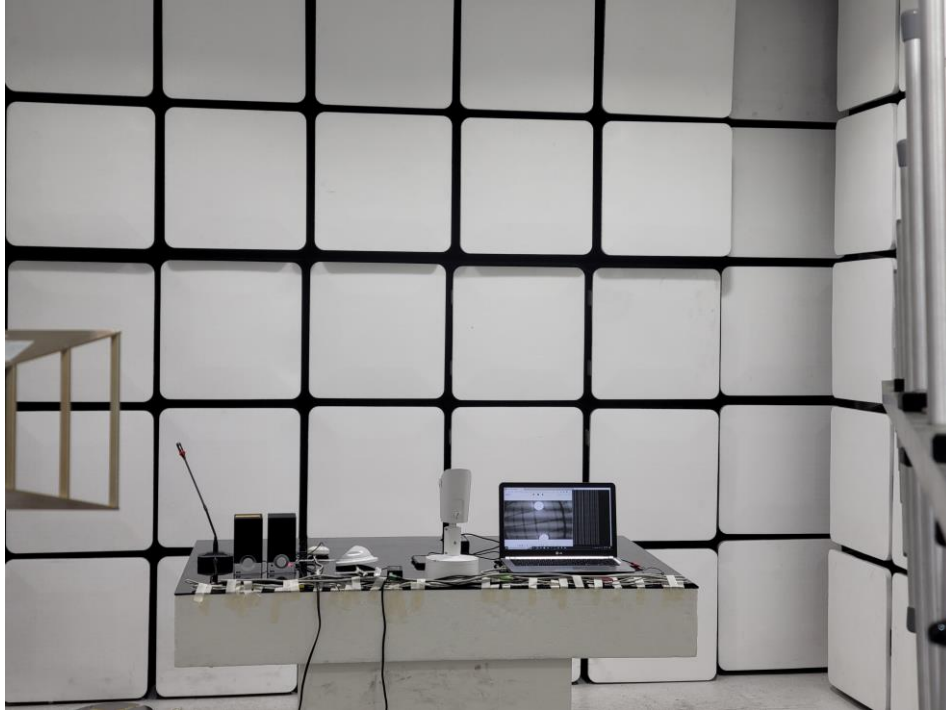
■ PoE MODE



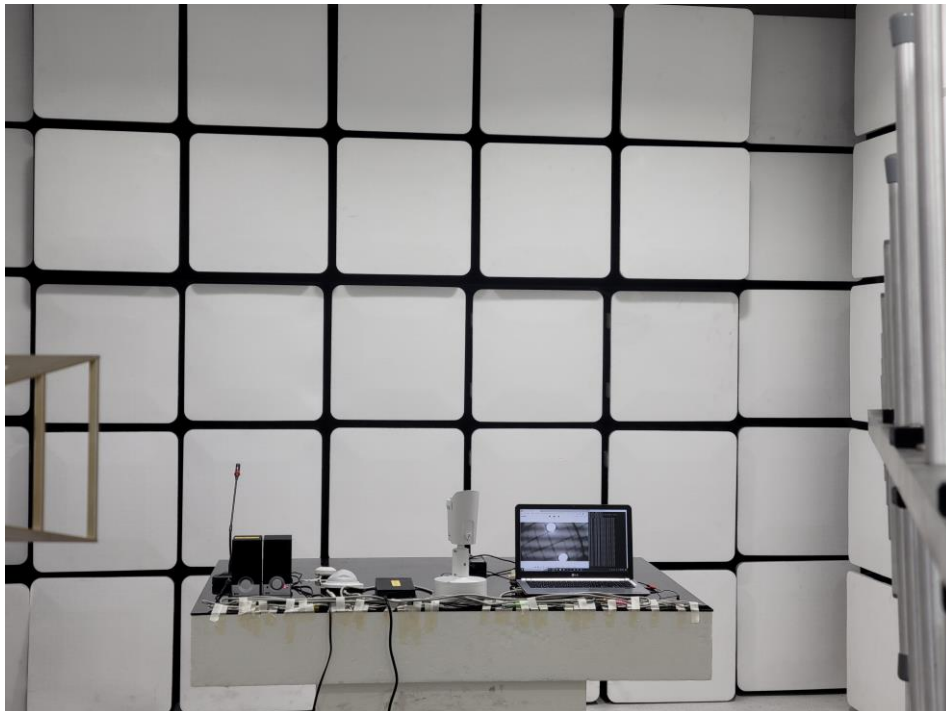
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Radiated Electric Field Immunity

■ DC MODE



■ PoE MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Electrical Fast Transients/Bursts

■ DC MODE



■ PoE MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Surge Transients

■ DC MODE



■ PoE MODE



Conducted Disturbance

■ DC MODE



■ PoE MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Voltage Dips and Short Interruptions

■ DC MODE



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT External Photographs

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal Photographs

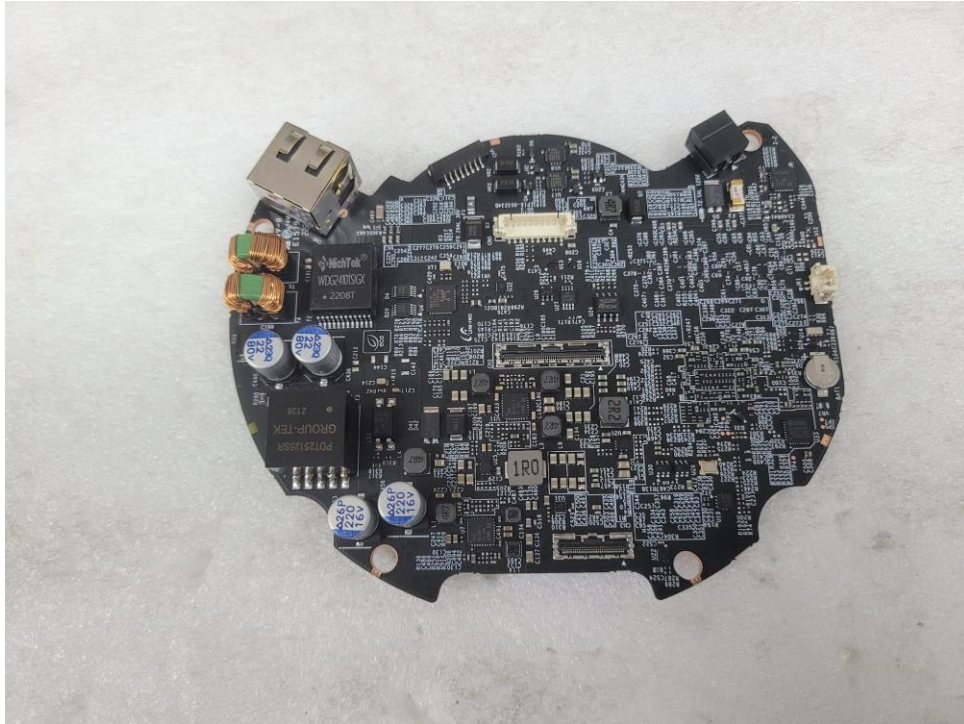
(Internal View)



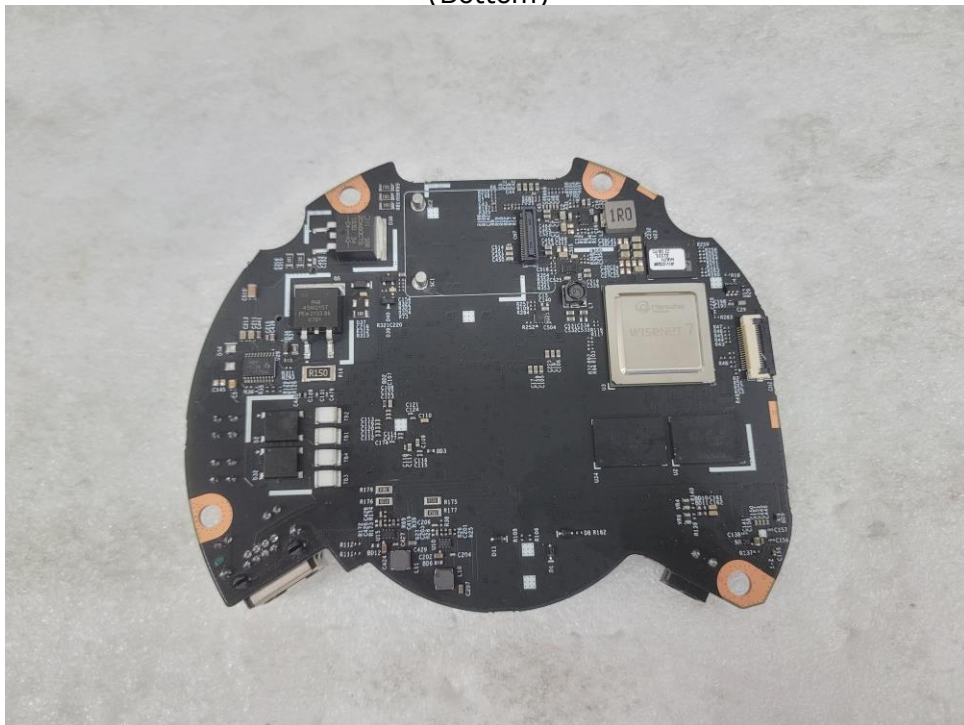
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View –Main Board

(Top)



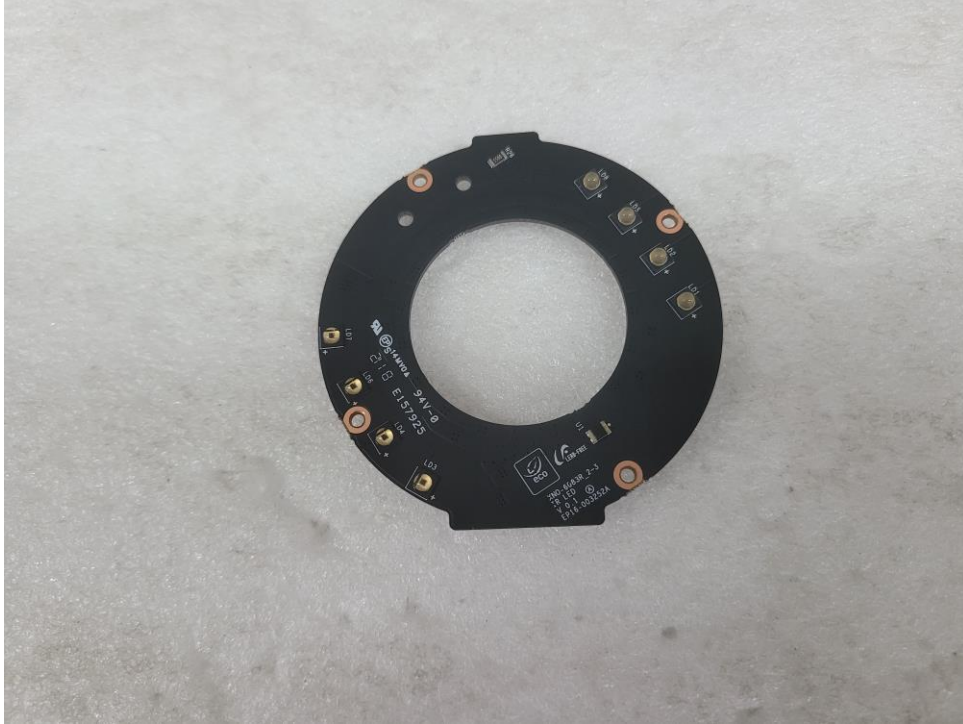
(Bottom)



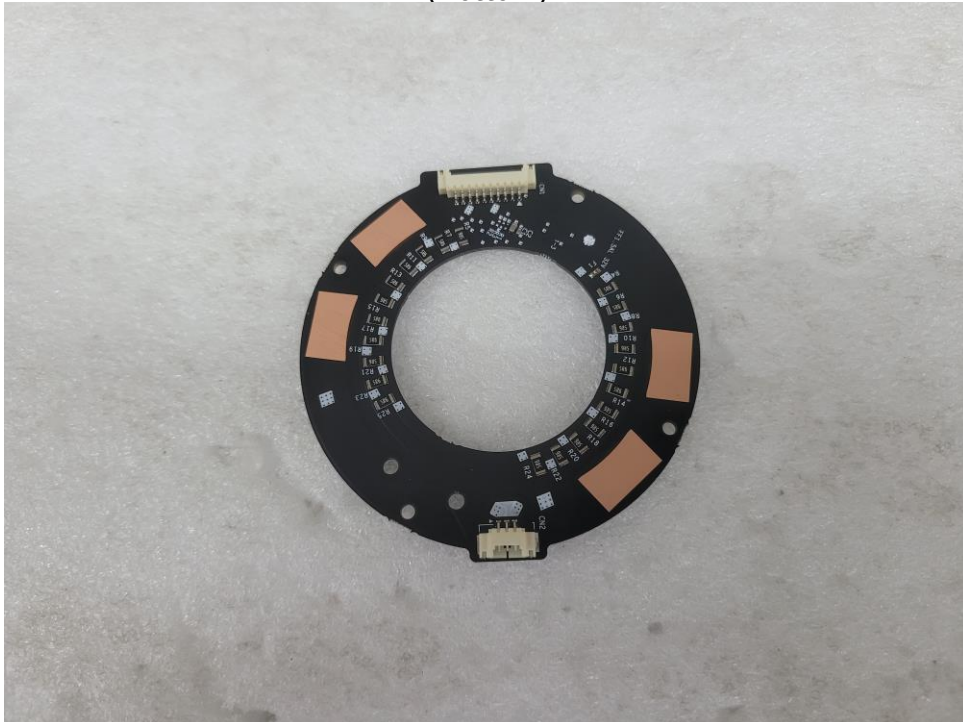
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – LED Board

(Top)



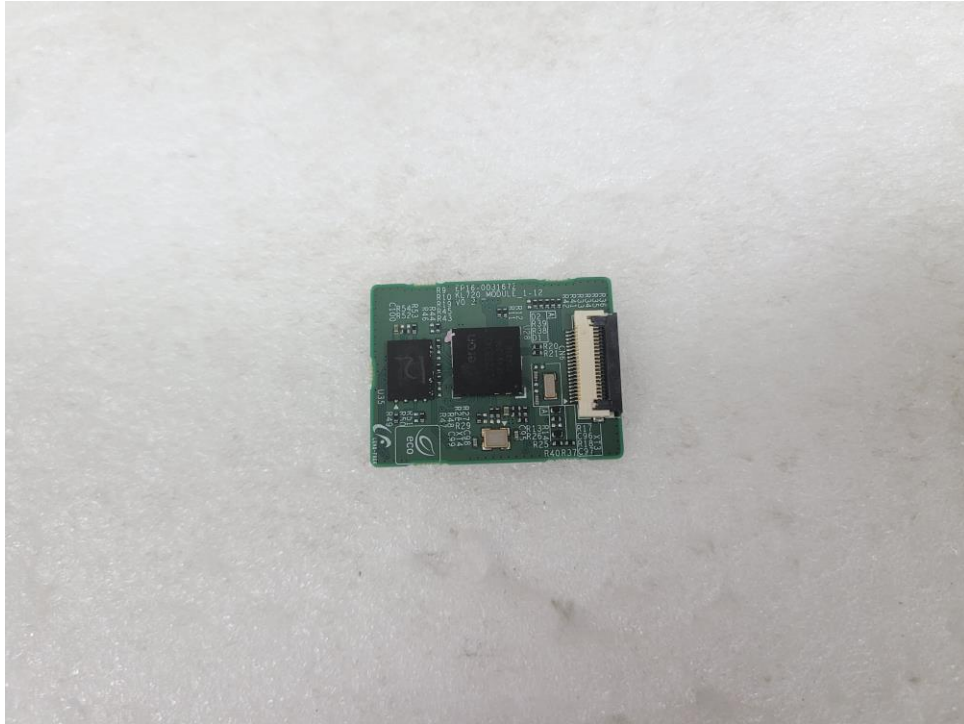
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Module Board

(Top)



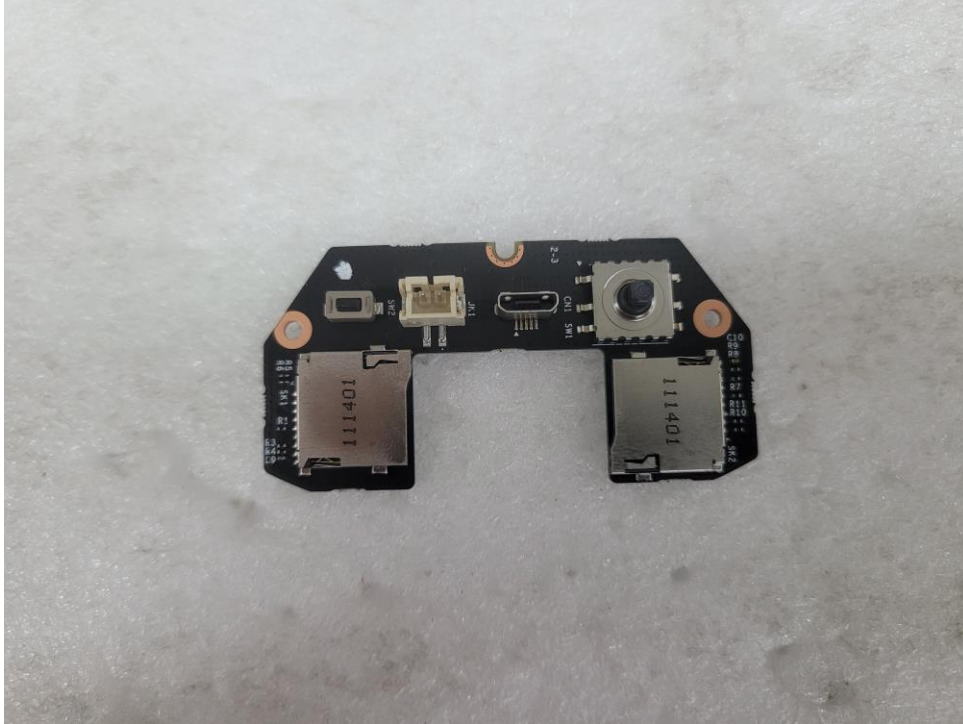
(Bottom)



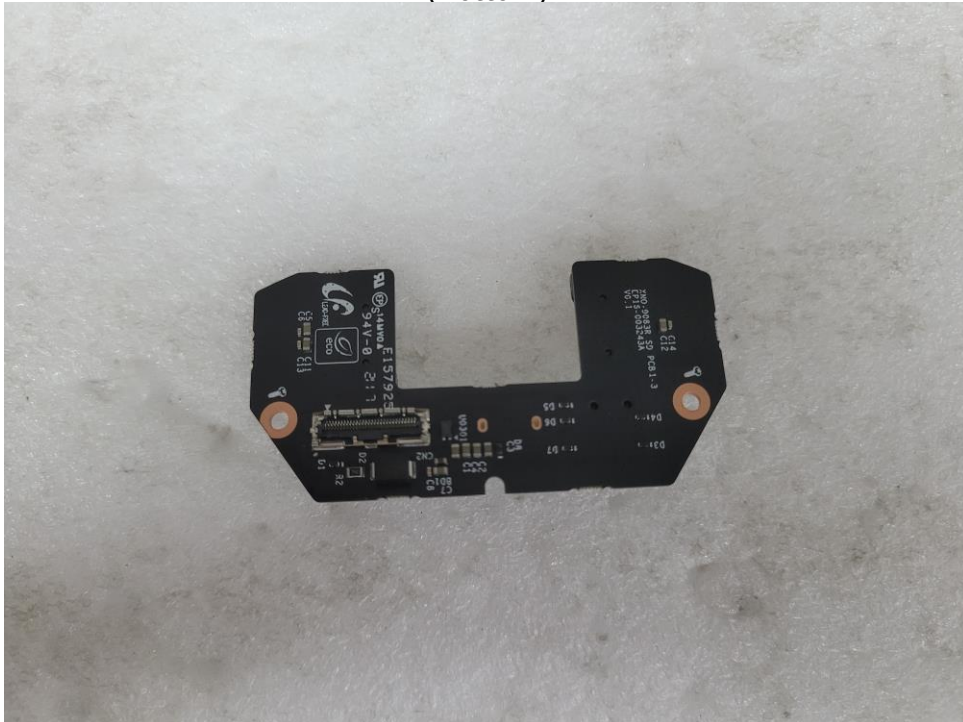
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Port Board

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT EUT Internal View – Lens

(Top)

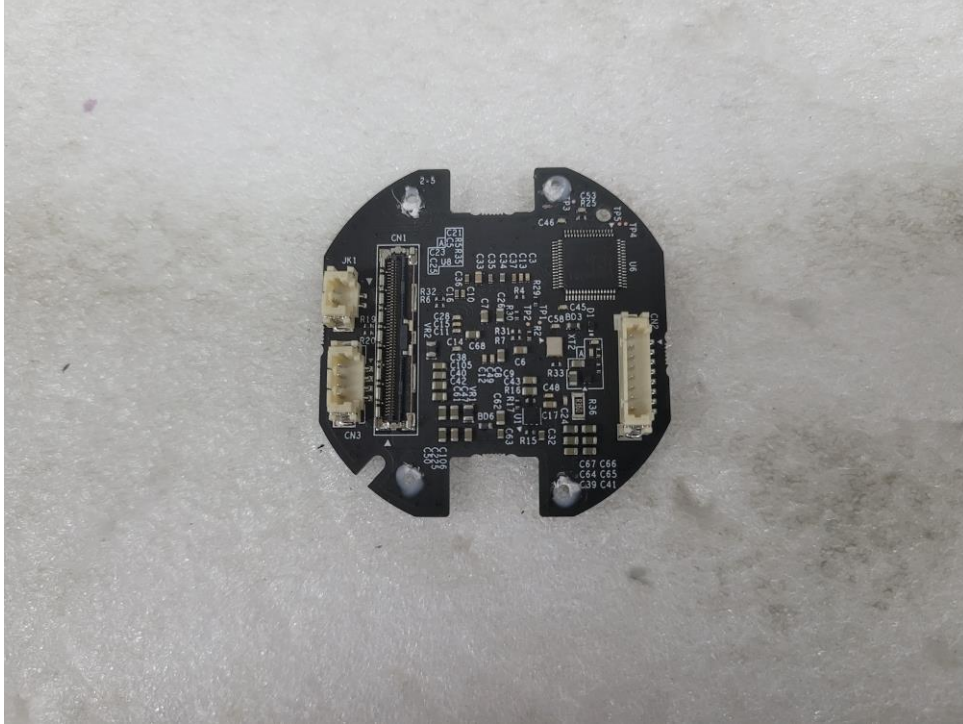


(Bottom)

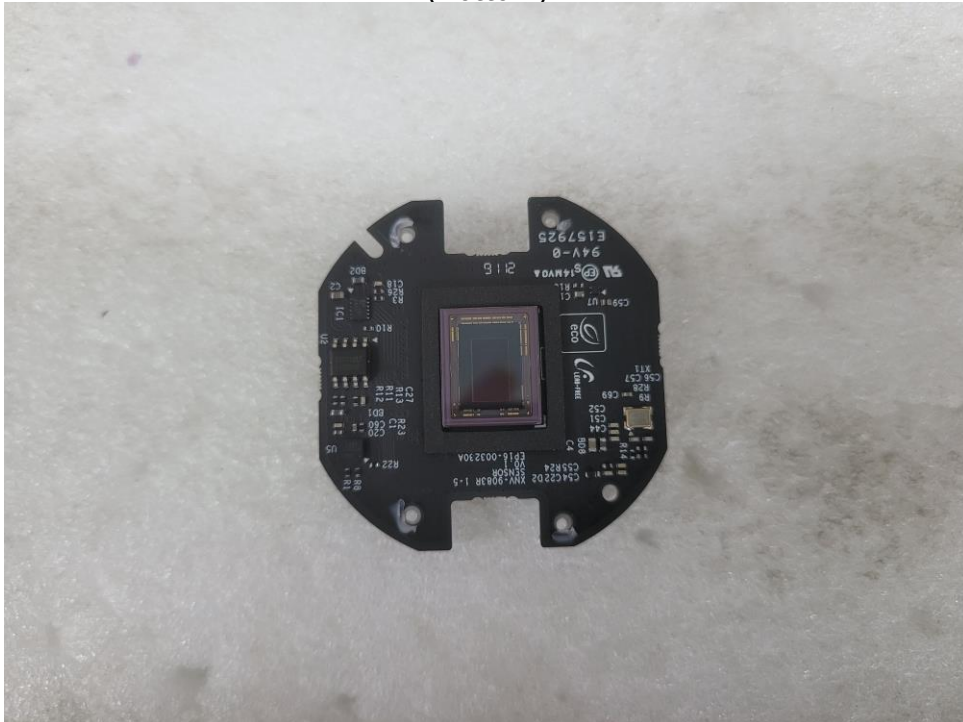


EUT EUT Internal View – Lens Board

(Top)

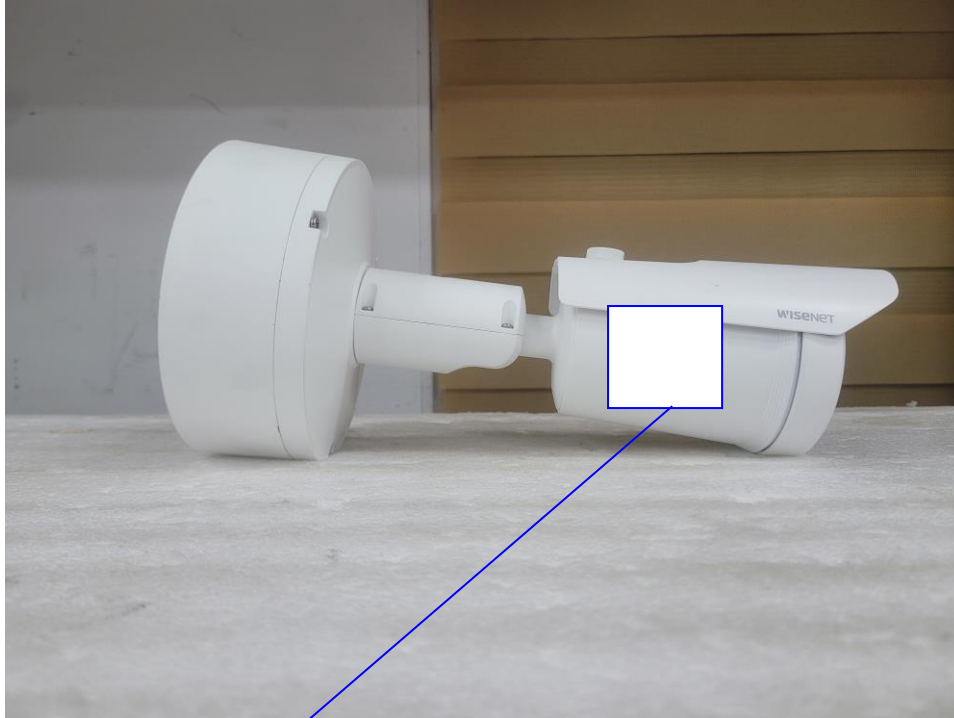


(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Label and Location



NETWORK CAMERA

Model No : XNO-8083R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

