



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-23T0219
Page (1) of (68)

EMC TEST REPORT

Test Report No. : KES-EM-23T0219
Date of Issue : Mar. 14, 2023
Product name : Network Camera
Model/Type No. : XNP-C9303RW
Variant Model : XNP-C8303RW
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 : Feb. 21, 2023
Test date : Feb. 28, 2023 ~ Mar. 02, 2023
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Jun Soo, Jung
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.

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-23T0219
Page (2) of (68)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 14, 2023	KES-EM-23T0219	Issued

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	4
1.2	Variant Model Differences.....	5
1.3	Device Modifications	5
1.4	Equipment Under Test.....	5
1.5	Support Equipments	5
1.6	External I/O Cabling	6
1.7	EUT Operating Mode(s)	6
1.8	Configuration.....	7
1.9	Remarks when standards applied	8
1.10	Calibration Details of Equipment Used for Measurement	8
1.11	Test Facility	8
1.12	Laboratory Accreditations and Listings	8
2.0	Test Regulations.....	9
2.1	Conducted Emissions at Mains Power Ports	10
2.2	Conducted Emissions at Telecommunication Ports	11
2.3	Radiated Electric Field Emissions(Below 1 GHz)	12
2.4	Radiated Electric Field Emissions(Above 1 GHz)	13
2.5	Harmonic Current Emissions	14
2.6	Voltage Fluctuations and Flicker	15
3.0	Criteria for compliance	16
3.1	Electrostatic Discharge.....	18
3.2	Radiated Electric Field Immunity	22
3.3	Electrical Fast Transients/Bursts	25
3.4	Surge Transients	27
3.5	Conducted Disturbance	30
3.6	Voltage Dips and Short Interruptions	33
APPENDIX A – TEST DATA.....		35
Conducted Emissions at Mains Power Ports.....		35
Conducted Emissions at Telecommunication Ports		37
Radiated Electric Field Emissions(Below 1 GHz)		38
Radiated Electric Field Emissions(Above 1 GHz)		39
Harmonic Current Emissions and Voltage Fluctuations and Flicker		40
Test Setup Photos and Configuration		43
Conducted Emissions at Mains Power Ports.....		43
Conducted Emissions at Telecommunication Ports		44
Radiated Electric Field Emissions(Below 1 GHz)		45
Radiated Electric Field Emissions(Above 1 GHz)		46
Harmonic Current Emissions and Voltage Fluctuations and Flicker		47
Electrostatic Discharge		48
Radiated Electric Field Immunity		48
Electrical Fast Transients/Bursts		49
Surge Transients.....		49
Conducted Disturbance.....		50
Voltage Dips and Short Interruptions.....		50
EUT External Photographs		51
EUT Internal Photographs		52



1.0 General Product Description

Main Specifications of EUT are:

Video		Radiometry	
Imaging Device	1/2.8" CMOS	Temperature Detect Range	None
Resolution	3840x2160, 2592x1944, 2592x1464, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x480, 720x576, 720x480, 640x480, 640x360, 320x240	Temperature Accuracy	None
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz) (@8MP Max. 5fps)	Temperature Detection	None
NETD	None	Additional	None
Pixel Size	None	Network	
Min. Illumination	Color: 0.1Lux(F1.6, 1/30sec) BW: 0Lux(IR LED On)	Ethernet	Metal shielded RJ-45(10/100BASE-T)
Video Out	None	Video Compression	H.265/H.264: Main/Baseline/High, MJPEG
Video Transmission Distance	None	Audio Compression	None
Lens		Smart Codec	Manual(Sea area), WiseStreamII
Focal Length (Zoom Ratio)	5~150mm(30x) zoom (digital 32x, total 960x zoom)	Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Max. Aperture Ratio	F1.6(Wide) - F4.5(Tele)	Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Angular Field of View	H: 57.42°(Wide)-2.19°(Tele) / V: 33.54°(Wide)-1.25°(Tele)	Streaming	Unicast(20 users) / Multicast (128 users) Multiple streaming/Up to 10 profiles
Min. Object Distance	3m(9.84ft)	Protocol	P4: 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, PIM-SM, UPnP, Bonjour, LLDP, SRTP, NTCIP, MQTT
Focus Control	Oneshot AF, Focus save	SIP support (VoIP, Peer-to-peer, SIP)	None
Lens Type	DC auto iris	Security	
Mount Type	None	HTTP(S) Login Authentication	
Optional Lens	None	Digest Login Authentication	
Pan / Tilt / Rotate		IP Address Filtering	
Pan / Tilt / Rotate Range	None	User access log	
Pan Range	360° Endless	802.1X Authentication(EAP-TLS, EAP-LEAP)	
Pan Speed	Max. 500°/sec, Manual: 0.024°/sec~250°/sec	Device certificate(Hanwha Techwin Root CA)	
Tilt Range	110°(-20°~90°)	Application Programming Interface	
Tilt Speed	Max. 350°/sec, Manual: 0.024°/sec~250°/sec	ONVIF Profile S/G/T	
Rotate Range	None	SUNAPI(HTTP API)	
Sequence	Preset(300ea), Swing, Group(6ea), Trace, Tour, Auto Run, Schedule	Wisenet open platform	
Preset Accuracy	Up to ±0.1°, Pan/Tilt correction	General	
Operational		Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Camera Title	Displayed up to 85 characters	Web Viewer	None
Direction Indicator	Support	Edge Storage	Micro SD/SDHC/SDXC 2slot 1TB
Day & Night	Auto(CR)/Color/BW/Schedule	Memory	4GB RAM, 512MB Flash
Backlight Compensation	BLC, HLC, WDR, SDR	Environmental & Electrical	
Wide Dynamic Range	Extreme WDR(120dB)	Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / +74°C(+165°F) (MAX) based on NEMA-TS 2(2.2.7) * Start up should be done at above -30°C 0~95% RH(Non-condensing)
Digital Noise Reduction	SSNR V	Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / 0~90% RH
Digital Image Stabilization	Support(built-in gyro sensor)	Certification	IP66, IK10, NEMA-4X, NEMA-TS 2(2.2.2.8, 2.2.9)
Defog	Support	Input Voltage	HPoE(IEEE802.3bt, Class6, Type3, Injector included)
Motion Detection	8ea, 8point polygonal zones	Power Consumption	Typical 26W, Max 46W
Privacy Masking	32ea, Quadangle Support - Color: Grey/Green/Red/Blue/Black/White - Mosaic	Mechanical	
Gain Control	Manual / Max	Color / Material	White, Black / Aluminum+Polycarbonate
White Balance	ATW / Narrow ATW /AWC /Manual /Indoor /Outdoor /Mercury /Sodium	RAL Code	White: RAL9003 / Black: RAL9005
LDC	None	Product Dimensions / Weight	ø184.9x318.8mm(7.28x12.55") / 5.6kg (12.34lb)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec)	Compatible Conduit hole / Gangbox	None
Digital PTZ	None	Hanging Mount (Dome)	None
Video Rotation	Flip, Mirror	Skin Cover	None
Analytics	Classified object type : Person/Face/Vehicle/License plate	Skin Cover (Dome)	None
	Attributes : Vehicle(Type:car/bus/truck/motorcycle/bicycle)	Weather Cap (Dome)	None
	Support DetectionShot	Power Module	None
	Analytics events based on AI engine	Backbox	None
	- Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit)	Certifications & Standards	
	Analytics events	Network	None
Business Intelligence	- Defocus detection, Motion detection, Tampering, Fog detection, Shock detection, Virtual area(Appear/Disappear)	EMC	None
	* Audio detection, Sound classification(with NW I/O Box)	Safety	None
	Serial Interface	Environment	None
	Alarm I/O	Video	None
Alarm Triggers	Analytics, Network disconnect	DORI (EN62676-4 standard)	
	* Alarm input(with NW I/O Box)	Detect (25PPM/ 8PPF)	Wide: 140.2m(460ft) / Tele: 4018.1m(13182.6ft)
	File upload via FTP and e-mail	Observe (63PPM/ 19PPF)	Wide: 56.1m(184ft) / Tele: 1607.2m(5273.1ft)
	Notification via e-mail	Recognize (125PPM/ 38PPF)	Wide: 28.0m(92ft) / Tele: 803.6m(2636.5ft)
Alarm Events	SD/SDHC/SDXC or NAS recording at event triggers	Identify (250PPM/ 76PPF)	Wide: 14.0m(46ft) / Tele: 401.8m(1318.3ft)
	PTZ Preset	LPR/ANPR/MMCR	
	Handover	Speed Description	None
	* Alarm output(with NW I/O Box)	Speed limit	None
Audio Streaming	Audio In	Min. Forward Distance	None
	Audio Out	Max. Forward Distance	None
	IR Viewable Length	Max. Horizontal Angle	None
	IR Illuminator (Optional)	Max. Vertical Angle	None
IR Radiation angle	None	Horizontal Offset	None
	IR LED	Camera Height	None
	IR Wavelength	Lane Coverage	None
	IR Operation	Vehicle Recognition	None
Water Removal	Support(Wiper)	Available Countries	None
	Auto Tracking	Wisenet Road AI LPR/ANPR/MMCR	
	Coaxial Protocol	Solution	None
	Color Palettes	Speed Description	None
Auto Tracking	Object auto tracking(Person/Vehicle), Target lock tracking	Lane Coverage	None
		Speed limit	None
		Min. Forward Distance	None
		Max. Forward Distance	None
Coaxial Protocol		Max. Horizontal Angle	None
		Max. Vertical Angle	None
		Horizontal Offset	None
		Camera Height	None
Color Palettes		Vehicle Recognition	None
		Available Countries	None

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

Added Derived model of difference in simple model name.
Basic model and electrical circuitry, structure and performance are the same.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
Network Camera	XNP-C9303RW	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
Fiber PoE Injector	PT-PSE109GBRO- AH-S	PT2250220748	Dongguan PROCET Network Technology Co.,Ltd	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Fiber PoE Injector	PT-PSE109GBRO- AH-S	PT2023220053	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	9JM8HT2	8KM8HT2	DELL INC.	-
Notebook Adapter	HA65NM130	-	Chicony Power Technology(Suzhou)Co .,Ltd.	-
Optical Module 1	NEXT-SFP10G-SR	-	Shenzhen yichen technology development Co., Ltd.	-
Optical Module 2	NEXT-SFP10G-SR	-	Shenzhen yichen technology development Co., Ltd.	-
Micro SD card 1	-	-	SanDisk	-
Micro SD card 2	-	-	SanDisk	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	LAN	Fiber PoE Injector (EUT)	PoE	2.5	U
	Micro SD card slot	Micro SD card 1	Micro SD card slot	-	-
	Micro SD card slot	Micro SD card 2	Micro SD card slot	-	-
Fiber PoE Injector (EUT)	Optical slot	Optical Module 1	Optical slot	-	-
	LAN	Notebook	LAN	3.1	U
	Ground	Ground	Ground	-	-
Optical Module 1	Optical	Optical Module 2	Optical	5.0	U
Optical Module 2	Optical slot	Fiber PoE Injector	Optical slot	-	-
Notebook	DC jack	Notebook Adapter	Line	1.5	U

* Unshielded=U, Shielded=S

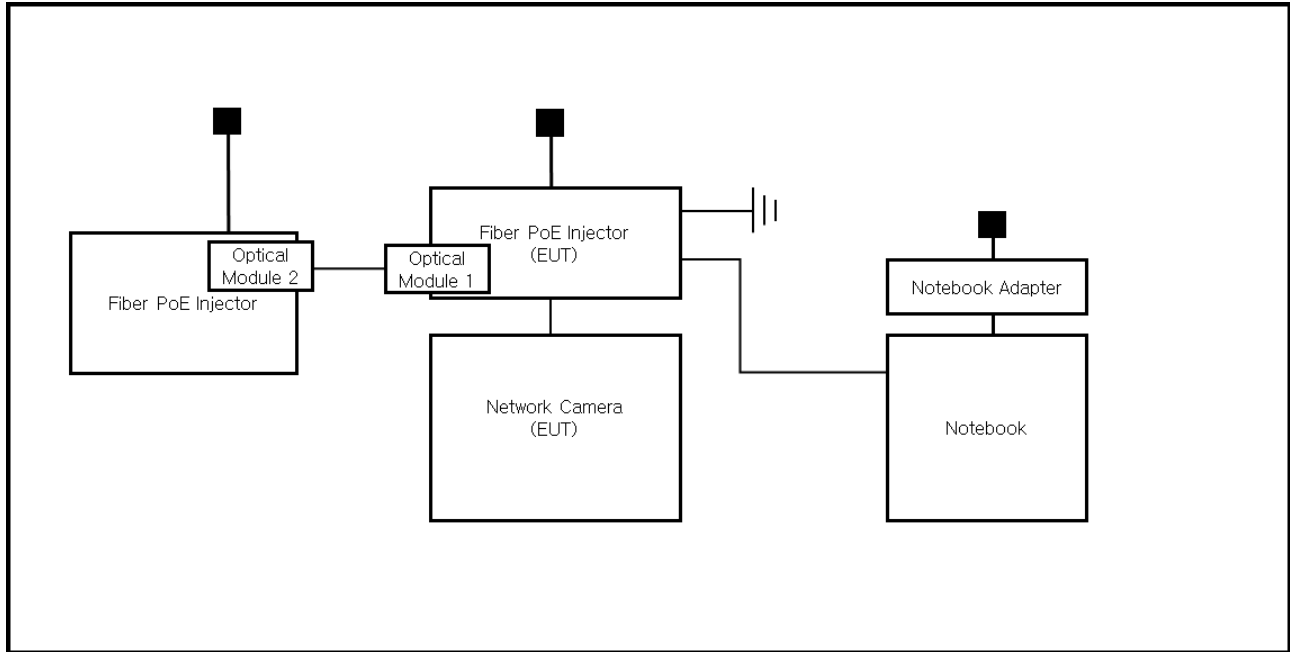
1.7 EUT Operating Mode(s)

Test Mode	operating
Operation	1. Check if the EUT image is output to the laptop normally. 2. Check if the network is operating normally through a ping test. 3. After the test, check if the EUT video has been recorded normally.

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

1.8 Configuration

■ AC Main
□ DC Main



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) 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
Mar. 02, 2023Test 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	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Test Conditions

Temperature: (23,4 ± 0,1) °C
Relative Humidity: (42,5 ± 0,1) % R.H.Frequency Range of Measurement
150 kHz to 30 MHzInstrument Settings
IF Band Width: 9 kHzTest Results
The requirements are:☒ PASS
☐ NOT PASS
☐ NOT APPLICABLERemarks
See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Mar. 02, 2023Test 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	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 22, 2023
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 22, 2023

Test Conditions

Temperature: (23,4 ± 0,1) °C
Relative Humidity: (42,5 ± 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date
Feb. 28, 2023Test 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, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (23,8 ± 0,1) °C
Relative Humidity: (45,8 ± 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
N/ATest Location
SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☐	EMI TEST RECEIVER	ESR7	R & S	101190	08, 01, 2023
☐	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
☐	ATTENUATOR	8491A	HP	35496	03, 03, 2024
☐	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

Test Conditions

Temperature: °C
Relative Humidity: % 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

Not applicable, the EUT of the maximum clock frequency is 48 Mhz.
(If the maximum clock frequency is 108 Mhz or less, measurement up to 1 Ghz)

2.5 Harmonic Current Emissions

Test Date
Mar. 02, 2023

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: (23,5 ± 0,1) °C
Relative Humidity: (44,2 ± 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.

**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-23T0219
Page (15) of (68)

2.6 Voltage Fluctuations and Flicker

Test Date
Mar. 02, 2023

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: (23,5 ± 0,1) °C
Relative Humidity: (44,2 ± 0,1) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

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

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

Mar. 01, 2023

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	01, 31, 2024
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (23,0 ± 0,1) °C
 Relative Humidity: (44,8 ± 0,1) % R.H.
 Atmospheric Pressure: (100,8 ± 0,0) 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

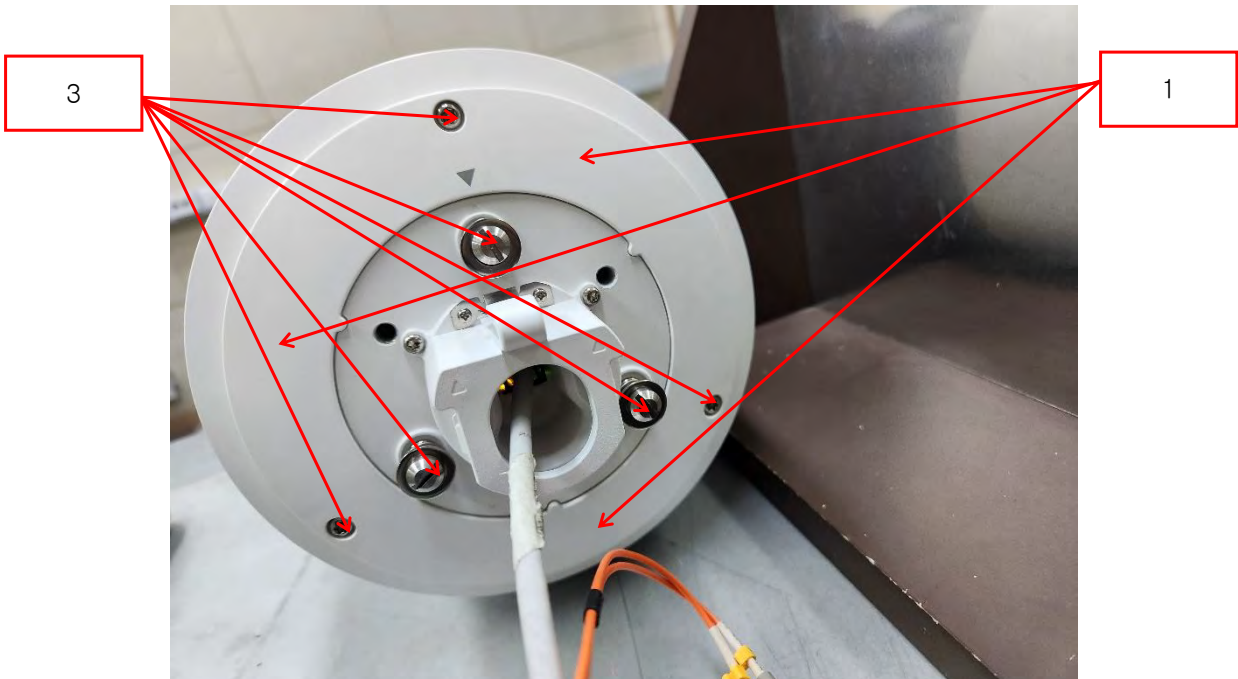
Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

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

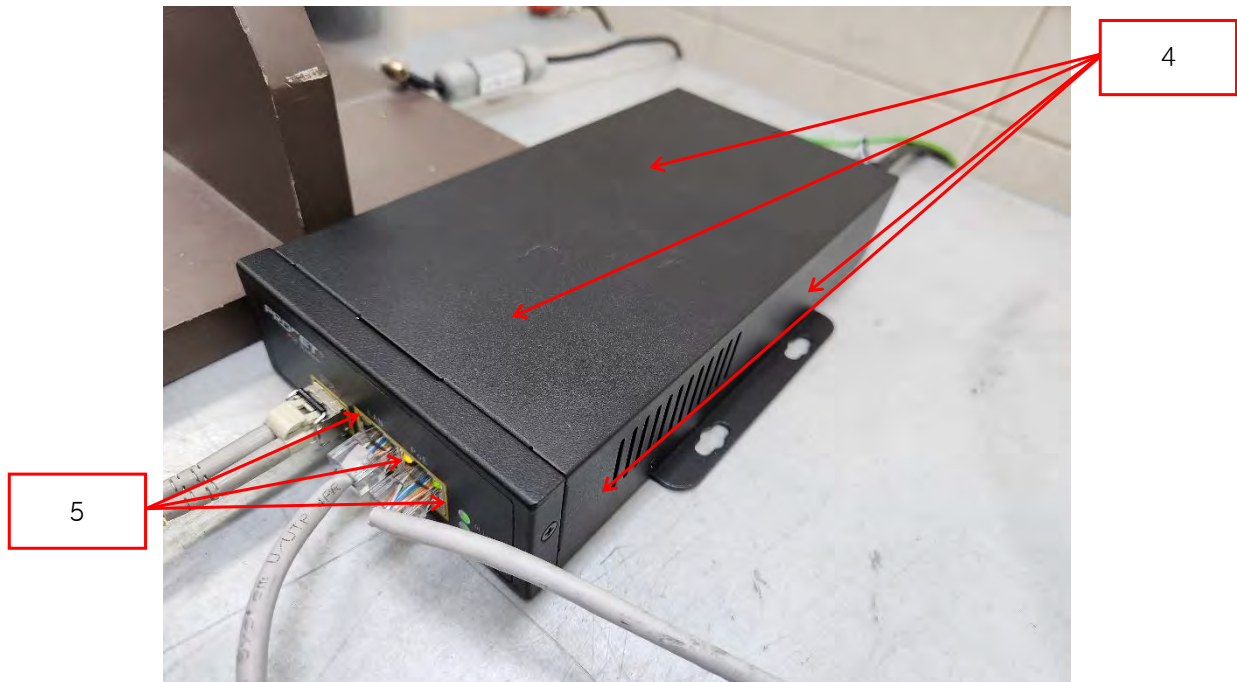
Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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-23T0219
Page (21) of (68)

Test Data**Indirect Discharge**

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 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Screw	Contact Discharge	Complied	-
4	Injector Enclosure	Contact Discharge	Complied	-
5	Around the port	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

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

3.2 Radiated Electric Field Immunity

Reference Standard
EN IEC 61000-4-3:2020Test Date
Feb. 28, 2023Test 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, 01, 2023
☒	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: (23,7 ± 0,1) °C
Relative Humidity: (45,0 ± 0,1) % R.H.
Atmospheric Pressure: (100,9 ± 0,0) 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-23T0219
Page (23) of (68)

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

**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-23T0219

Page (24) of (68)

Test Data

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

RemarksPASS Required Performance Criteria

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

3.3 Electrical Fast Transients / Bursts

Reference Standard
EN 61000-4-4:2012

Test Date
Mar. 01, 2023

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	11, 28, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 28, 2023

Test Conditions

Temperature: (23,0 ± 0,1) °C
Relative Humidity: (44,8 ± 0,1) % R.H.
Atmospheric Pressure: (100,8 ± 0,0) 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

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

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

☐ 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)
LAN(Injector)	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/A1:2017Test Date
Mar. 01, 2023Test Location
EMS-Surge: 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	11, 28, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
☐	CDN	CNV 508N1	EM TEST	P1610176296	11, 29, 2023

Test Conditions

Temperature: (23,0 ± 0,1) °C

Relative Humidity: (44,8 ± 0,1) % R.H.

Atmospheric Pressure: (100,8 ± 0,0) 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-23T0219
Page (28) of (68)

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

☒ 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	Complied	Complied
N – PE	Complied	Complied

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
LAN(CAMERA)	CDN	Complied	Complied
	LINE	Complied	Complied
LAN(Injector)	CDN	Complied	Complied
	LINE	Complied	Complied
PoE(Injector)	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

Remarks

PASS Required Performance Criteria

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Mar. 01, 2023

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, 10, 2023
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 10, 2023
☒	CDN	CDN M016	TESEQ	43694	11, 10, 2023
☒	CDN	CDN M016	TESEQ	43697	11, 10, 2023
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 01, 2023
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 14, 2023

Test Conditions

Temperature: (23,6 ± 0,1) °C

Relative Humidity: (42,1 ± 0,1) % R.H.

Atmospheric Pressure: (100,7 ± 0,0) 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-23T0219
Page (31) of (68)

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

**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-23T0219
Page (32) of (68)

Test Data

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N – PE	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
LAN(Injector)	CDN	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 61000-4-11:2020Test Date
Mar. 01, 2023Test 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	11, 29, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023

Test Conditions

Temperature: (23,0 ± 0,1) °C
Relative Humidity: (44,8 ± 0,1) % R.H.
Atmospheric Pressure: (100,8 ± 0,0) 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-23T0219
Page (34) of (68)

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.

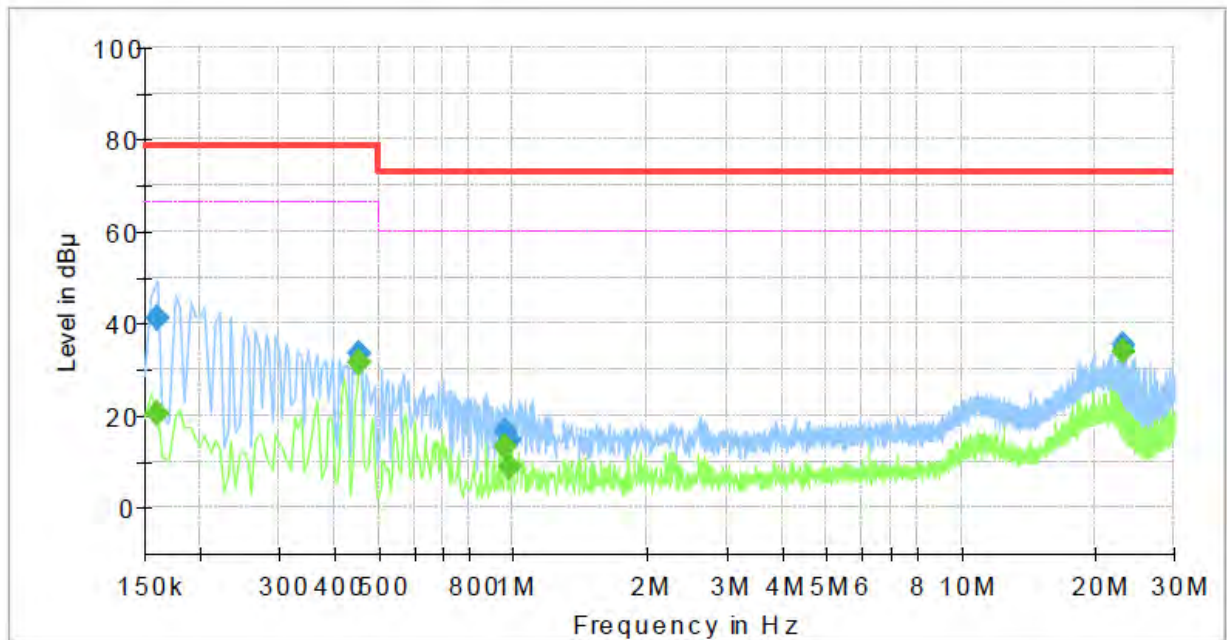
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XNP-C9303RW
Phase:	L1
Mode:	
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	20.40	66.00	45.60	1000.0	9.000	L1	19.5
0.160000	41.34	---	79.00	37.66	1000.0	9.000	L1	19.5
0.455000	---	31.48	66.00	34.52	1000.0	9.000	L1	19.7
0.455000	33.31	---	79.00	45.69	1000.0	9.000	L1	19.7
0.965000	---	13.24	60.00	46.76	1000.0	9.000	L1	20.1
0.965000	16.55	---	73.00	56.45	1000.0	9.000	L1	20.1
0.985000	---	8.68	60.00	51.32	1000.0	9.000	L1	20.1
0.985000	14.65	---	73.00	58.35	1000.0	9.000	L1	20.1
23.130000	---	33.98	60.00	26.02	1000.0	9.000	L1	20.2
23.130000	35.51	---	73.00	37.49	1000.0	9.000	L1	20.2

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

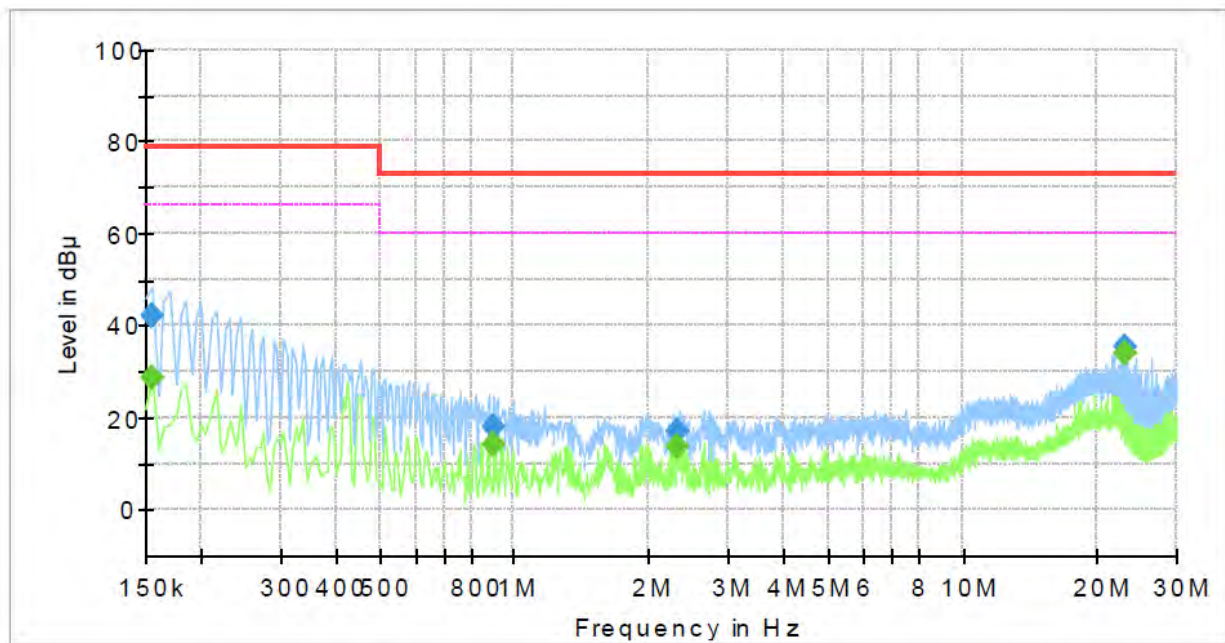
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	XNP-C9303RW
Phase:	N
Mode:	
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	28.40	66.00	37.60	1000.0	9.000	N	19.4
0.155000	42.04	---	79.00	36.96	1000.0	9.000	N	19.4
0.900000	---	14.30	60.00	45.70	1000.0	9.000	N	20.0
0.900000	17.80	---	73.00	55.20	1000.0	9.000	N	20.0
2.315000	---	13.75	60.00	46.25	1000.0	9.000	N	20.3
2.315000	17.20	---	73.00	55.80	1000.0	9.000	N	20.3
23.130000	---	34.05	60.00	25.95	1000.0	9.000	N	20.2
23.130000	35.56	---	73.00	37.44	1000.0	9.000	N	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

Conducted Emissions at Telecommunication Ports

■ LAN(Injector)

[100 Mbps]

Common Information

Test Description:

Model No.:

Mode :

Speed :

Operator Name:

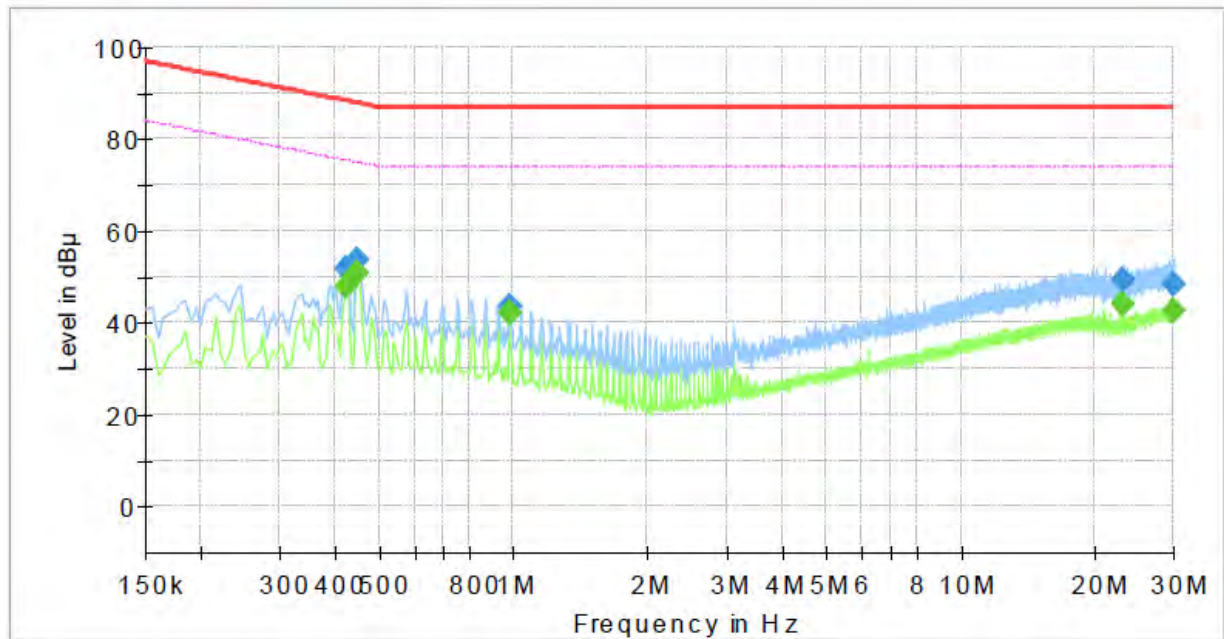
Telecommunication Emission

XNP-C9303RW

LAN(Injector)

100 Mbps

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.425000	---	48.13	75.35	27.22	1000.0	9.000	Single Line	19.7
0.425000	51.93	---	88.35	36.42	1000.0	9.000	Single Line	19.7
0.450000	---	51.03	74.88	23.85	1000.0	9.000	Single Line	19.7
0.450000	53.58	---	87.88	34.30	1000.0	9.000	Single Line	19.7
0.980000	---	42.29	74.00	31.71	1000.0	9.000	Single Line	20.0
0.980000	43.70	---	87.00	43.30	1000.0	9.000	Single Line	20.0
23.130000	---	44.01	74.00	29.99	1000.0	9.000	Single Line	20.1
23.130000	49.47	---	87.00	37.53	1000.0	9.000	Single Line	20.1
29.910000	---	42.49	74.00	31.51	1000.0	9.000	Single Line	20.4
29.910000	48.27	---	87.00	38.73	1000.0	9.000	Single Line	20.4

◆ Calculation

QuasiPeak [dBμV] / CAverage [dBμV] = Reading Value [dBμV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

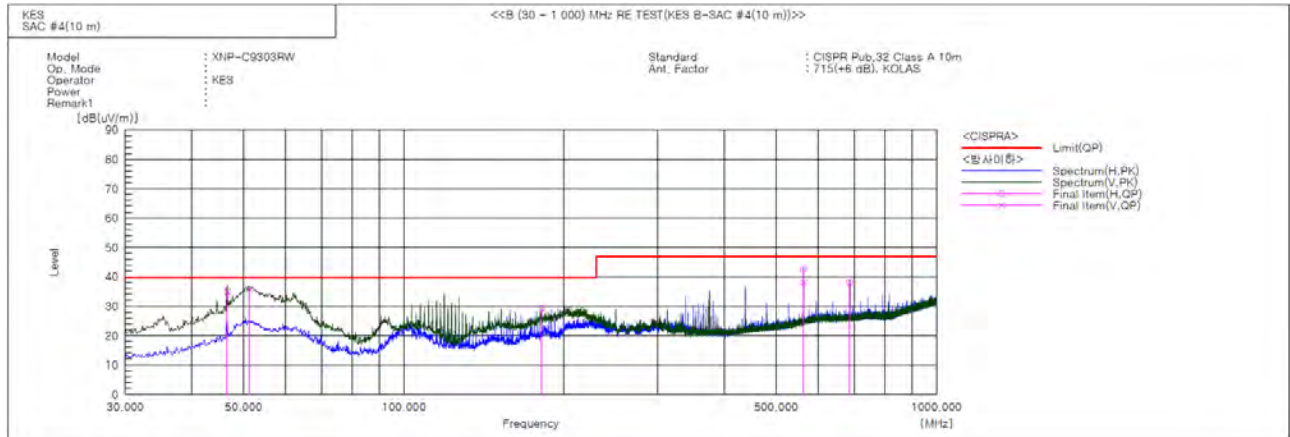
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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)



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	46.611	V	55.6	-20.8	34.8	40.0	5.2	100.0	314.0	
2	51.219	V	56.4	-20.6	35.8	40.0	4.2	108.0	266.0	
3	181.563	H	52.7	-23.4	29.3	40.0	10.7	387.0	70.0	
4	562.530	H	51.8	-9.3	42.5	47.0	4.5	366.0	45.0	
5	562.651	V	47.3	-9.3	38.0	47.0	9.0	115.0	51.0	
6	687.660	H	45.8	-7.6	38.2	47.0	8.8	400.0	190.0	

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

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

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

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

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



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-23T0219
Page (39) of (68)

Radiated Electric Field Emissions(Above 1 GHz)

N/A

◆ Calculation

Result(PK/CAV) [dB($\mu V/m$)] = (Reading(PK/CAV)[dB(μV)] + 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

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

Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.104			
2	0.004	0.332	1.080	n/a
3	0.095	4.152	2.300	PASS
4	0.006	1.284	0.430	PASS
5	0.092	8.062	1.140	PASS
6	0.004	1.414	0.300	n/a
7	0.087	11.291	0.770	PASS
8	0.004	1.840	0.230	n/a
9	0.080	20.043	0.400	PASS
10	0.005	2.632	0.184	n/a
11	0.073	22.071	0.330	PASS
12	0.004	2.428	0.153	n/a
13	0.065	30.792	0.210	PASS
14	0.003	2.274	0.131	n/a
15	0.056	37.258	0.150	PASS
16	0.002	2.153	0.115	n/a
17	0.047	35.600	0.132	PASS
18	0.002	2.127	0.102	n/a
19	0.038	32.122	0.118	PASS
20	0.002	1.871	0.092	n/a
21	0.029	18.355	0.161	PASS
22	0.001	1.451	0.084	n/a
23	0.022	15.203	0.147	PASS
24	0.001	1.373	0.077	n/a
25	0.016	11.587	0.135	PASS
26	0.001	1.207	0.071	n/a
27	0.010	7.906	0.125	PASS
28	0.001	1.306	0.066	n/a
29	0.006	4.840	0.116	PASS
30	0.001	1.291	0.061	n/a
31	0.003	2.577	0.109	n/a
32	0.001	1.105	0.058	n/a
33	0.003	2.491	0.102	n/a
34	0.001	1.184	0.054	n/a
35	0.004	3.821	0.096	n/a
36	0.001	1.292	0.051	n/a
37	0.004	4.713	0.091	n/a
38	0.001	1.552	0.048	n/a
39	0.004	4.931	0.087	n/a
40	0.001	1.460	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	0.104			
2	0.004	0.268	1.620	n/a
3	0.096	2.774	3.450	PASS
4	0.006	0.983	0.645	PASS
5	0.092	5.385	1.710	PASS
6	0.005	1.092	0.450	n/a
7	0.087	7.544	1.155	PASS
8	0.005	1.421	0.345	n/a
9	0.080	13.403	0.600	PASS
10	0.006	1.997	0.276	PASS
11	0.073	14.757	0.495	PASS
12	0.004	1.858	0.230	n/a
13	0.065	20.593	0.315	PASS
14	0.003	1.762	0.197	n/a
15	0.056	24.938	0.225	PASS
16	0.003	1.664	0.173	n/a
17	0.047	23.820	0.199	PASS
18	0.003	1.654	0.153	n/a
19	0.038	21.537	0.178	PASS
20	0.002	1.421	0.138	n/a
21	0.030	18.436	0.161	PASS
22	0.001	1.131	0.125	n/a
23	0.022	15.300	0.147	PASS
24	0.001	1.114	0.115	n/a
25	0.016	11.673	0.135	PASS
26	0.001	0.948	0.106	n/a
27	0.010	7.982	0.125	PASS
28	0.001	0.981	0.099	n/a
29	0.006	4.915	0.116	PASS
30	0.001	0.983	0.092	n/a
31	0.003	2.697	0.109	n/a
32	0.001	0.849	0.086	n/a
33	0.003	2.585	0.102	n/a
34	0.001	0.901	0.081	n/a
35	0.004	3.926	0.096	n/a
36	0.001	0.945	0.077	n/a
37	0.005	4.950	0.091	n/a
38	0.001	1.172	0.073	n/a
39	0.004	5.023	0.087	n/a
40	0.001	1.093	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-23T0219
Page (42) of (68)

Test Data - Voltage Fluctuations

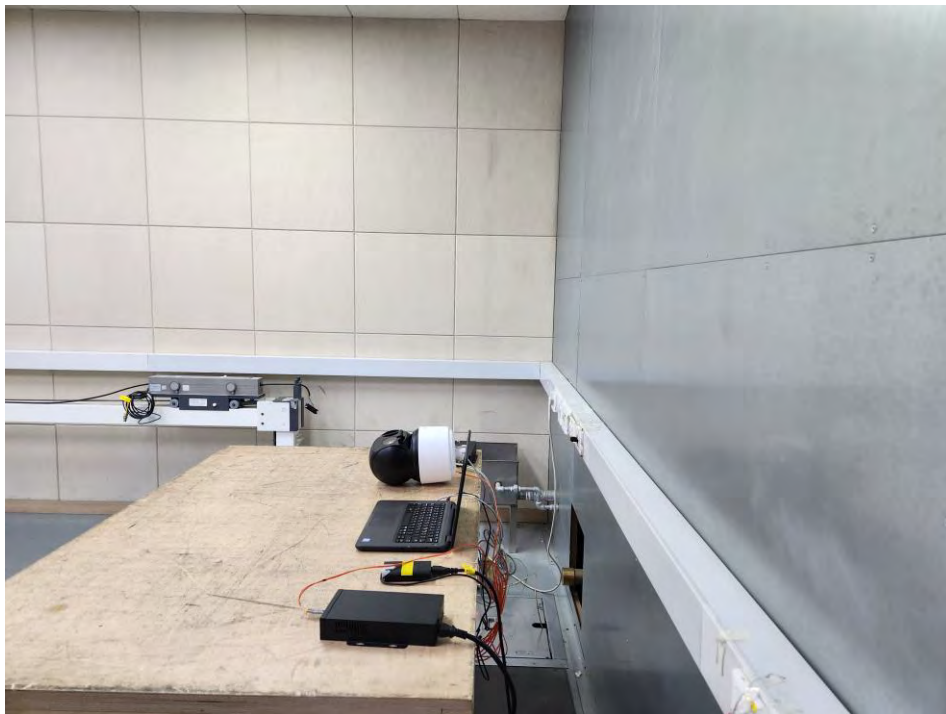
Maximum Flicker results

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



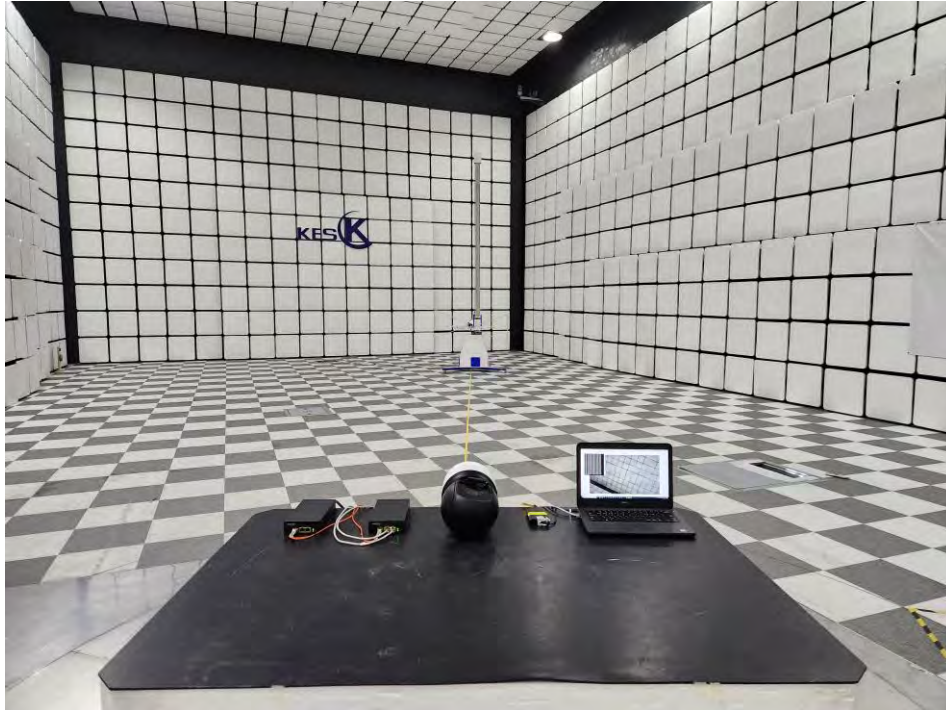
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Emissions at Telecommunication Ports



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)



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-23T0219
Page (46) of (68)

Radiated Electric Field Emissions(Above 1 GHz)

N/A

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

Harmonic Current Emissions and Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Electric Field Immunity



Electrical Fast Transients/Bursts



Surge Transients



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 Disturbance



Voltage Dips and Short Interruptions



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)



EUT Internal View – Board 1

(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 – Board 2

(Top)



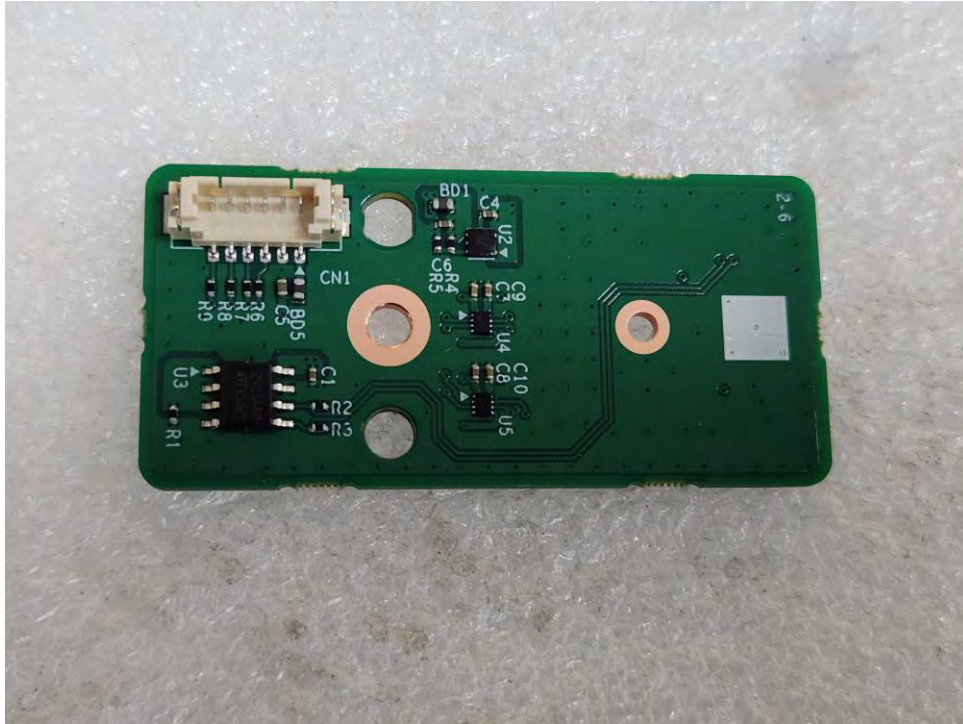
(Bottom)



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 – Board 3

(Top)



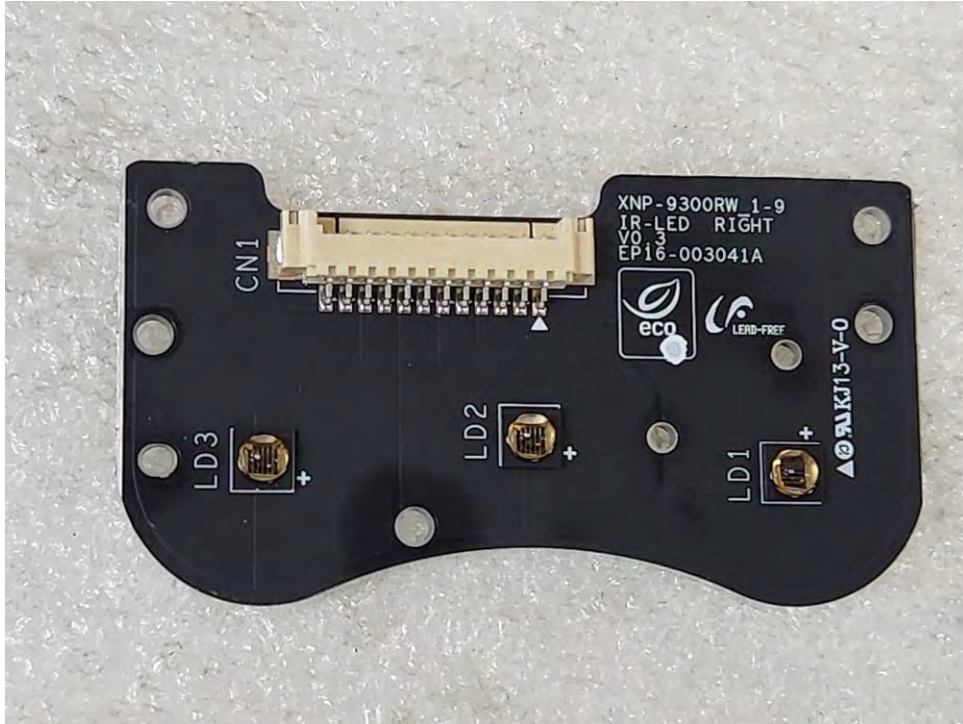
(Bottom)



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 – Board 4

(Top)



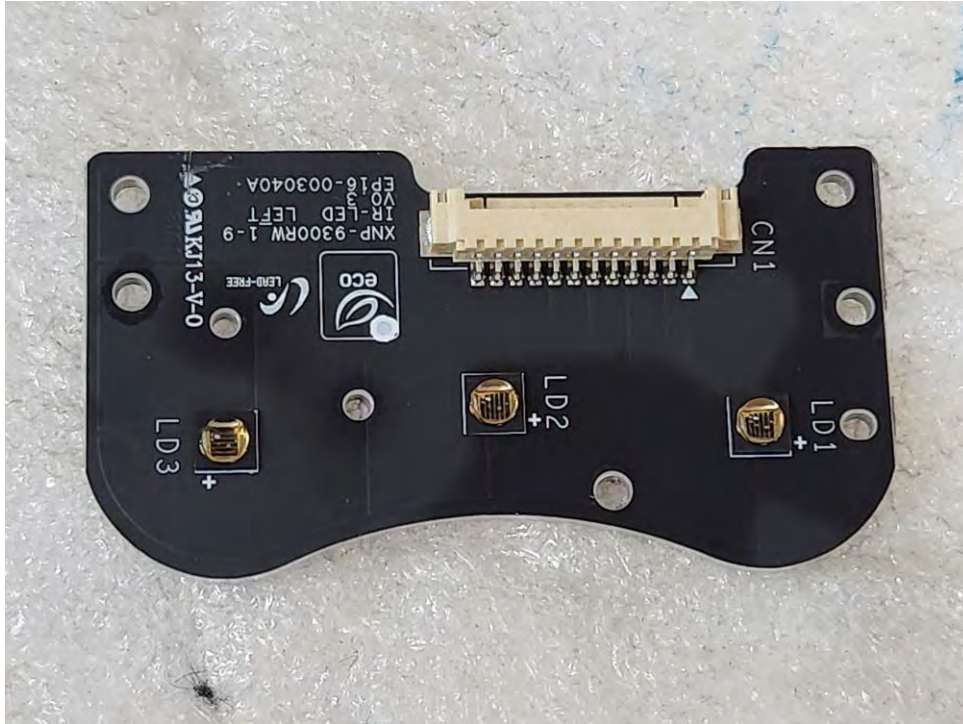
(Bottom)



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 – Board 5

(Top)

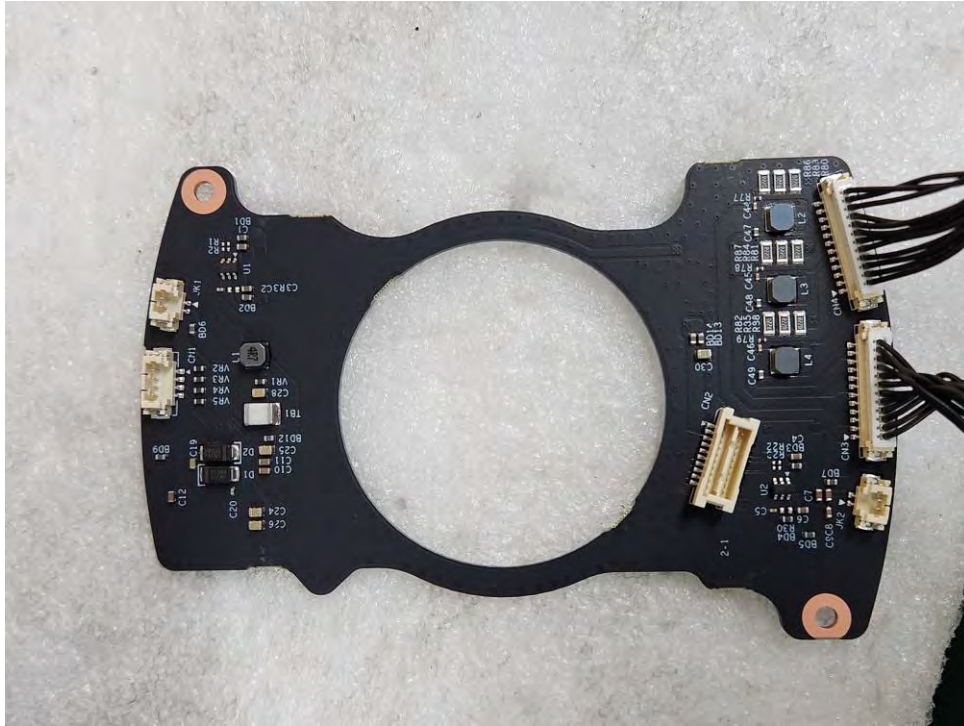


(Bottom)

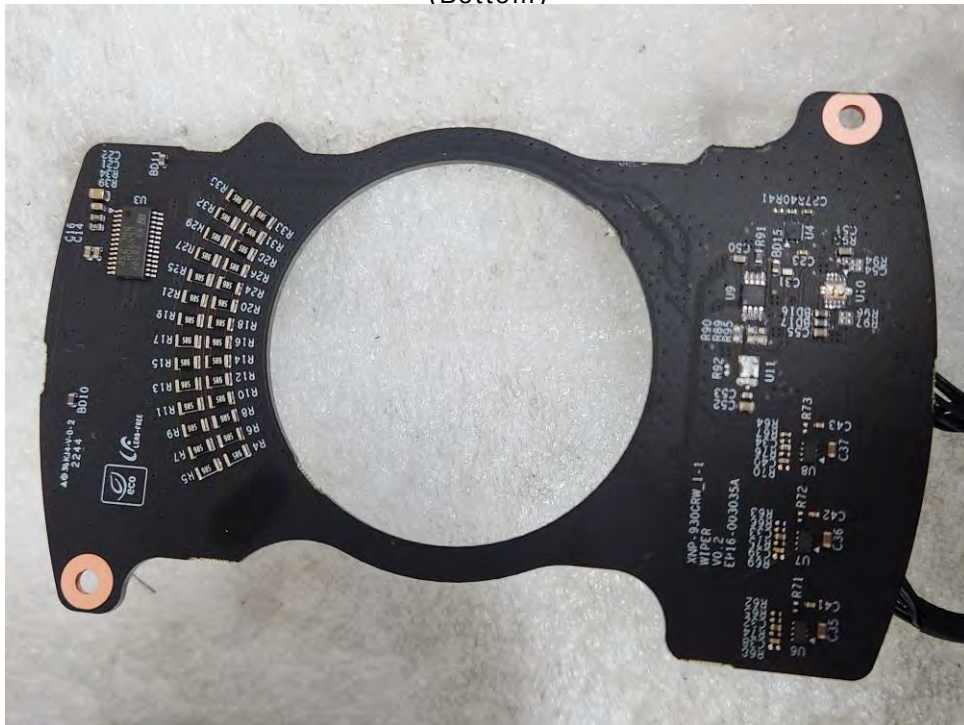


EUT Internal View – Board 6

(Top)



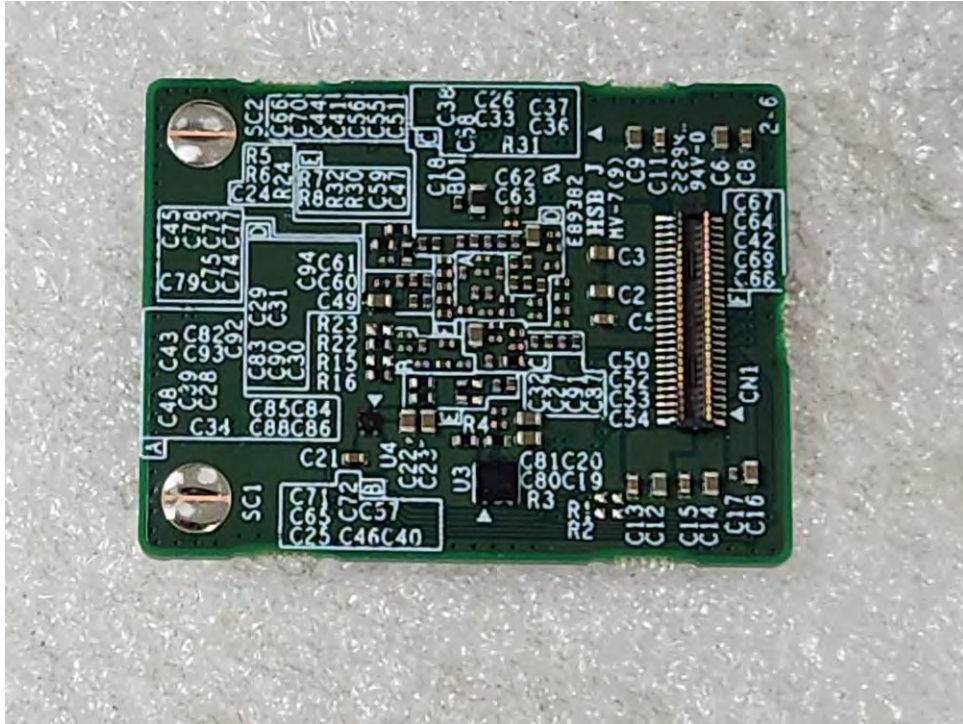
(Bottom)



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 – Board 7

(Top)



(Bottom)



EUT Internal View – Board 8

(Top)



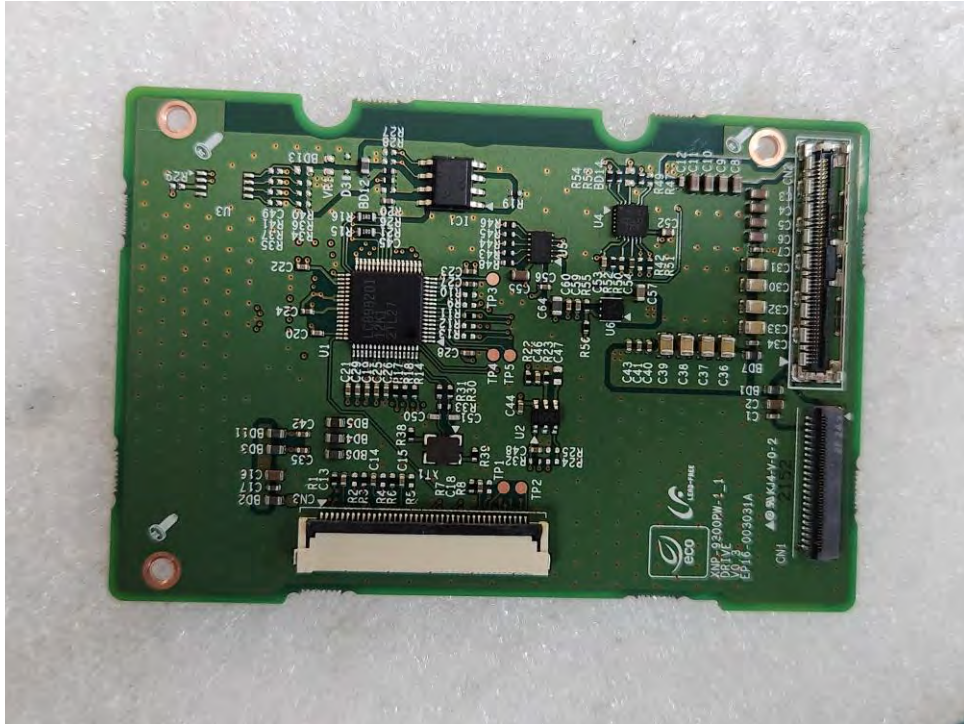
(Bottom)



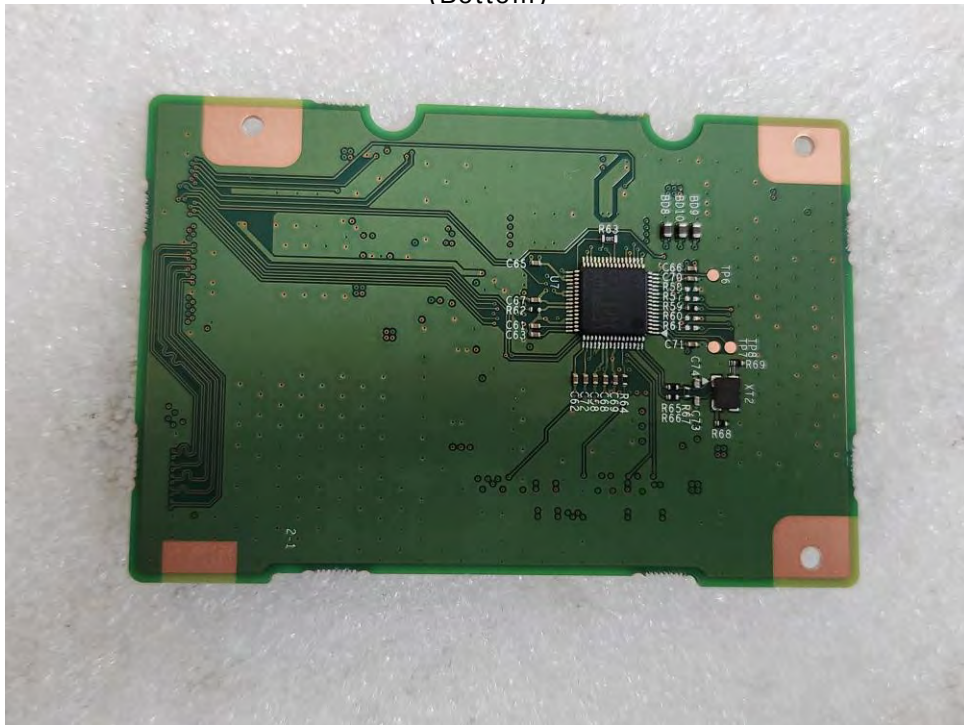
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 9

(Top)



(Bottom)



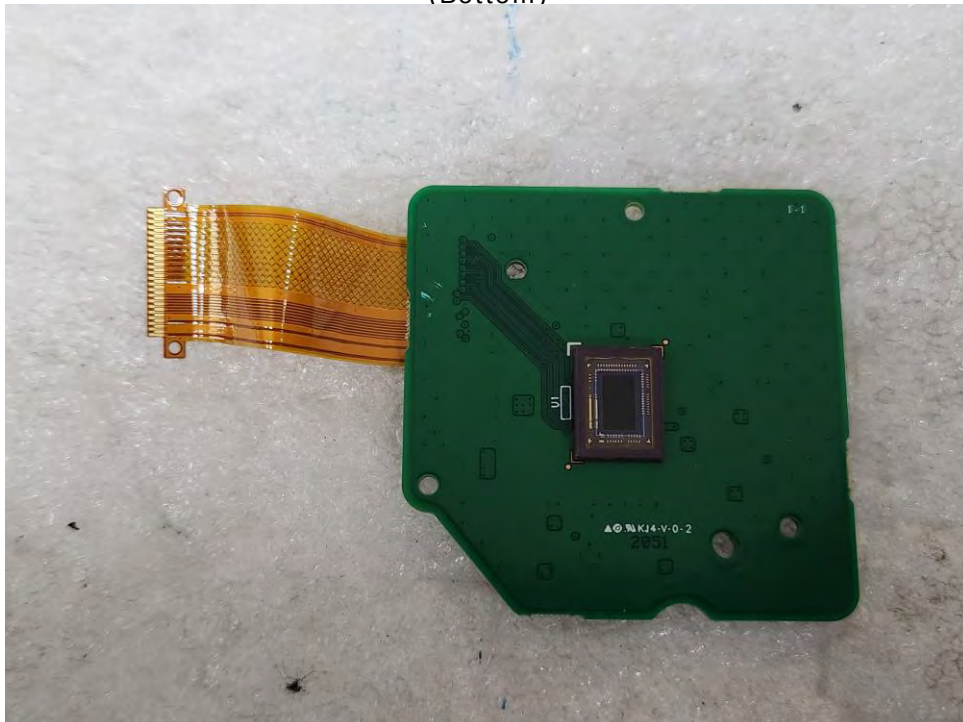
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 10

(Top)

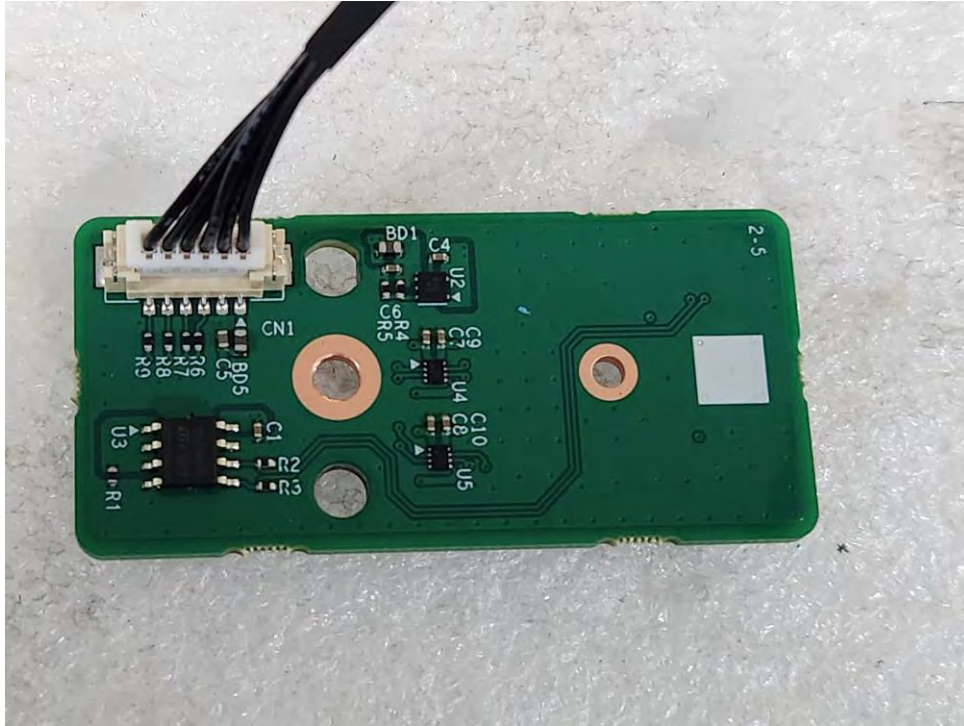


(Bottom)

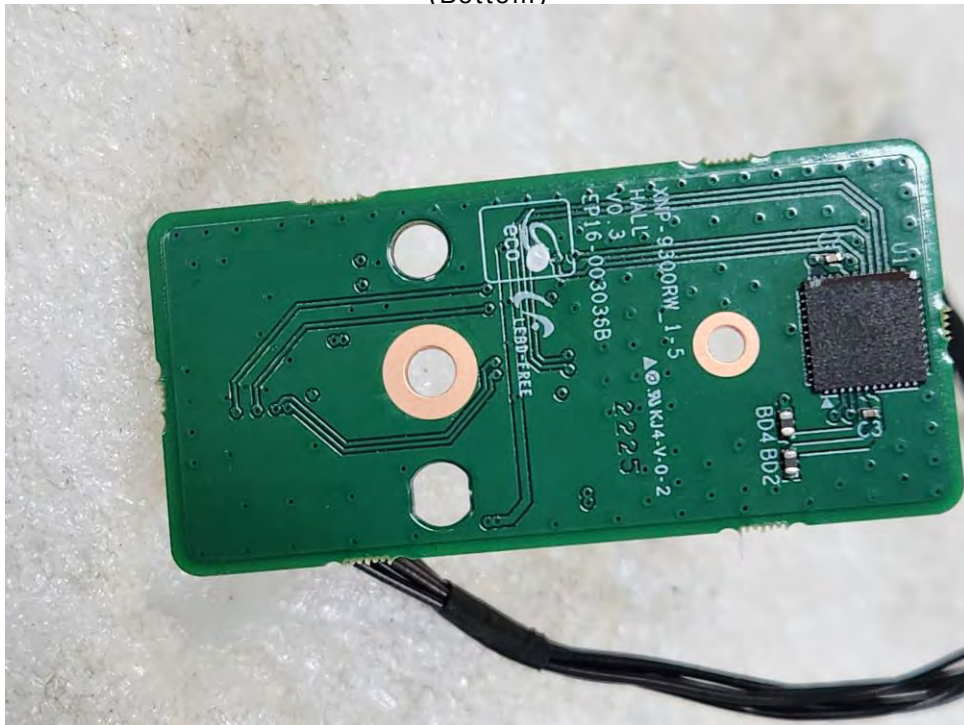


EUT Internal View – Board 11

(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 – Camera

(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 – Injector

(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 – Fan 1

(Top)



(Bottom)



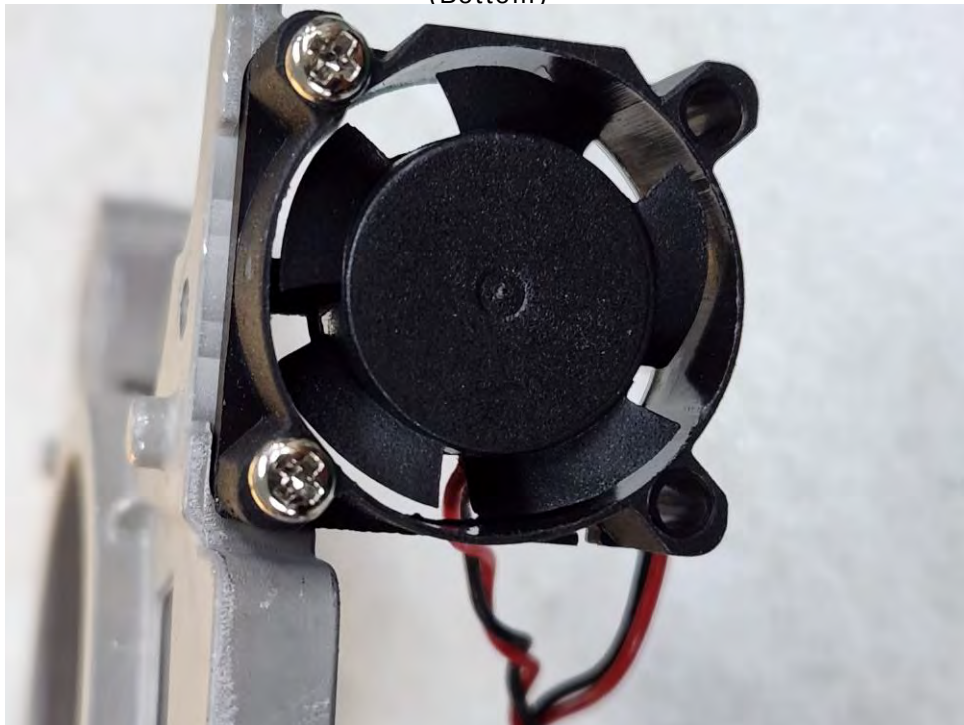
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Fan 2

(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 : XNP-C9303RW

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

