



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-19T0098-R1
Date of Issue : Feb. 24, 2023
Product name : Network Camera
Model/Type No. : XNV-8081R
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Jan. 21, 2019
Test date : Feb. 12, 2019 ~ Feb. 14, 2019
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.

**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-E1-19T0098-R1
Page (2) of (44)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 18, 2019	KES-E1-19T0098	Issued
Feb. 24, 2023	KES-E1-19T0098-R1	Change the Applicant and manufacturer at the request of the customer, Factory deletion 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	6
1.2	Variant Model Differences	6
1.3	Device Modifications	6
1.4	Equipment Under Test.....	6
1.5	Support Equipments	6
1.6	External I/O Cabling	7
1.7	EUT Operating Mode(s)	8
1.8	Configuration.....	8
1.9	Remarks when standards applied	10
1.10	Calibration Details of Equipment Used for Measurement	10
1.11	Test Facility	10
1.12	Laboratory Accreditations and Listings	10
2.0	Test Regulations.....	11
2.1	Conducted Emissions Mains Power Ports.....	13
2.2	Conducted Emissions at Telecommunication Ports.....	14
2.3	Radiated Electric Field Emissions(Below 1 GHz)	15
2.4	Radiated Electric Field Emissions(Above 1 GHz)	16
APPENDIX A – TEST DATA.....		17
Conducted Emissions at Mains Power Ports.....		17
Conducted Emissions at Telecommunication Ports		19
Radiated Electric Field Emissions(Below 1 GHz)		25
Radiated Electric Field Emissions(Above 1 GHz).....		28
Test Setup Photos and Configuration		31
Conducted Voltage Emissions		31
Conducted Telecommunication Emissions		32
Radiated Electric Field Emissions(Below 1 GHz)		33
Radiated Electric Field Emissions(Above 1 GHz).....		34
EUT External Photographs		35
EUT Internal Photographs		36



1.0 General Product Description

Main Specifications of EUT are:

Items	Description		
	XONV-8081R	XOND-8081RV	XOND-8081RF
Video	Imaging Device	1/1.8" GMP CMOS	
	Effective Pixels	2616(81) x 1976(V)	
	NETD	None	
	Pixel Size	None	
	Min. Illumination	Color : 0.07 Lux(F1.2, 1/50sec) BW : 0 Lux(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	
Lens	Focal Length (Zoom Ratio)	3.6~9.4mm(2.6x) motorized varifocal	
	Max. Aperture Ratio	F1.2(Wide) ~ F2.4(Tele)	
	Angular Field of View	H : 102.5°(Wide) ~ 38.7°(Tele) V : 74.2°(Wide) ~ 29.0°(Tele) D : 135.5°(Wide) ~ 48.6°(Tele)	
	Min. Object Distance	0.5m (1.64ft)	
	Focus Control	Simple focus	
	Lens Type	DC Auto Iris, P-iris	
	Mount Type	None	
	Optional Lens	None	
Pan / Tilt / Rotate	Pan / Tilt / Rotate range	0°~360° / -45°~85° / 0°~355°	
	Pan Range	Remote adjustment (Max. 200 cycles)	
	Pan Speed	None	
	Tilt Range	None	
	Tilt Speed	None	
	Rotate Range	None	
	Sequence	None	
	Preset Accuracy	None	
	Azimuth	None	
	Auto Tracking	None	

Items	Description		
	XONV-8081R	XOND-8081RV	XOND-8081RF
Operational	IR Viewable Length	50m(164.04ft)	
	Camera Title	Displayed up to 86 characters	
	Day & Night	Auto (ICR)	
	Backlight Compensation	BLC, HLC, WDR, SSOR	
	Wide Dynamic Range	150dB	
	Digital Noise Reduction	SSNR V	
	Digital Image Stabilization	Support (built-in Gyro Sensor)	
	Detog	Support	
	Motion Detection	Box, Spoint Polygonal zones	
	Privacy Masking	32box, polygonal zones - Color : Gray, Green, Red, Blue, Black, White - Mosaic	
	Gain Control	Low / Middle / High	
	White Balance	ATW / WVC / Manual / Indoor / Outdoor	
	LDC	Support	
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)	
	Video Rotation	Flip, Mirror, Halfway view(90°/270°)	
	Analytics	Defocus detection, Directional detection, Fog detection, Face detection, Motion detection, Digital auto tracking, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection, Sound classification, Shock detection	
	Business Intelligence	People counting, Queue management, Heatmap	
	Serial Interface	None	
	Alarm I/O	Input 1ea / Output 1ea	
	Alarm Triggers	Analytics, Network disconnect, Alarm input	



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-E1-19T0098-R1

Page (5) of (44)

Items	Description		
	XNV-8081R	XND-8081RV	XND-8081RF
Operational	Alarm events	- File upload via FTP, E-Mail - Notification via E-Mail - SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover - Audio playback	
	Audio In	Selectable (Mic IN/Line IN) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm	Selectable (Mic IN/Line IN) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
	Audio out	Line out, Max output level: 1 Vrms	
	Wiper	None	
	Coastal Protocol	None	
	Video Transmission Distance	None	
	Video Transmission Distance	None	
Radiometry	Temperature detect range	None	
	Temperature accuracy	None	
	Temperature detection	None	
	Additional	None	
Network	Ethernet	RJ-45 (10/100BASE-T)	
	Video Compression	H.265/H.264: Main/Baseline/High, MJPEG	
	Resolution	2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240	
	Max. Frame rate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)	

Items	Description		
	XNV-8081R	XND-8081RV	XND-8081RF
Network	Smart Codec	Manual(See spec), WiseStream II	
	Bitrate Control	H.264/H.265 : CBR or VBR MJPEG : VBR	
	Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)	
	Audio Compression	G.711 μ-law / G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 16KHz	
	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, CoS, PIM-SM, UPnP, Bonjour, LLDP	
	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication (EAP-TLS, EAP-LEAP)	
	Edge Storage	Micro SD/SDHC/SDXC 2slot 512GB	
	Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet Open Platform	
	Web Viewer	Supported OS : Windows 7 / 8.1 / 10, MAC OS X 10.10, 10.11, 10.12 Recommended Browser : Google Chrome Supported web browsers : MS Explorer11, MS Edge, Mozilla Firefox (Window 64bit only), Apple Safari (Mac OS X only)	
	Memory	1024MB RAM, 256MB Flash	

Items	Description		
	XNV-8081R	XND-8081RV	XND-8081RF
Environmental	Operating Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH * Start up should be done at above -35°C	
	Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH	
	Certification	IP66/IP67, IK10+, NEMA4X	IP52, IK10
Electrical	Input Voltage	PoE(IEEE802.3af, Class3), 24VAC, 12VDC	PoE(IEEE802.3af, Class3), 12VDC
	Power Consumption	PoE: Max 12.95W, typical 10.90W 12VDC: Max 11.7W, typical 8.90W 24VAC: Max 14.9W, typical 11.30W	PoE: Max 12.95W, typical 10.10W 12VDC: Max 11.7W, typical 7.90W
	Color / Material	White / Aluminum	
Mechanical	RAL Code	RAL9003	
	Product dimensions / weight	Ø180x125mm(7.09x4.92"), 1.75kg(3.86 lb)	Ø160x125mm(6.30x4.92"), 1.45kg(3.20 lb)

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.

Voltage ☐ 230 Vac ☐ 100 Vac ☒ 24 Vac ☒ 12 Vdc ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ 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	XNV-8081R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
AC module	SPC-100AC	-	-	AC 24 V

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	PD-9501GR/AC	-	CHANGZHOU WUJIN HONGGUANG RADIO CO., LTD.	-
Notebook	X56K	HN11N5151FJ0045W	HANSUNG	-
Notebook Adapter	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
Mike	MP1000	-	-	-
Gpad	LG-V480	-	LG	-
Alarm button	-	-	-	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN 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



1.6 External I/O Cabling

■ AC 24 V, DC 12 V

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	RJ-45	Notebook	RJ-45	4.0	U
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	Mike	3.5 mm	1.7	U
	2Pin	Alarm IN	2Pin	3.0	U
	2Pin	Alarm Out	2Pin	3.0	U
Notebook	3.5 mm	Gpad	3.5 mm	1.6	U

* Unshielded=U, Shielded=S

■ PoE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	RJ-45	POE Adapter	RJ-45	4.0	U
	3.5 mm	Speaker	3.5 mm	1.4	U
	3.5 mm	Mike	3.5 mm	1.7	U
	2Pin	Alarm IN	2Pin	3.0	U
	2Pin	Alarm Out	2Pin	3.0	U
Notebook	3.5 mm	Gpad	3.5 mm	1.6	U
	RJ-45	POE Adapter	RJ-45	4.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

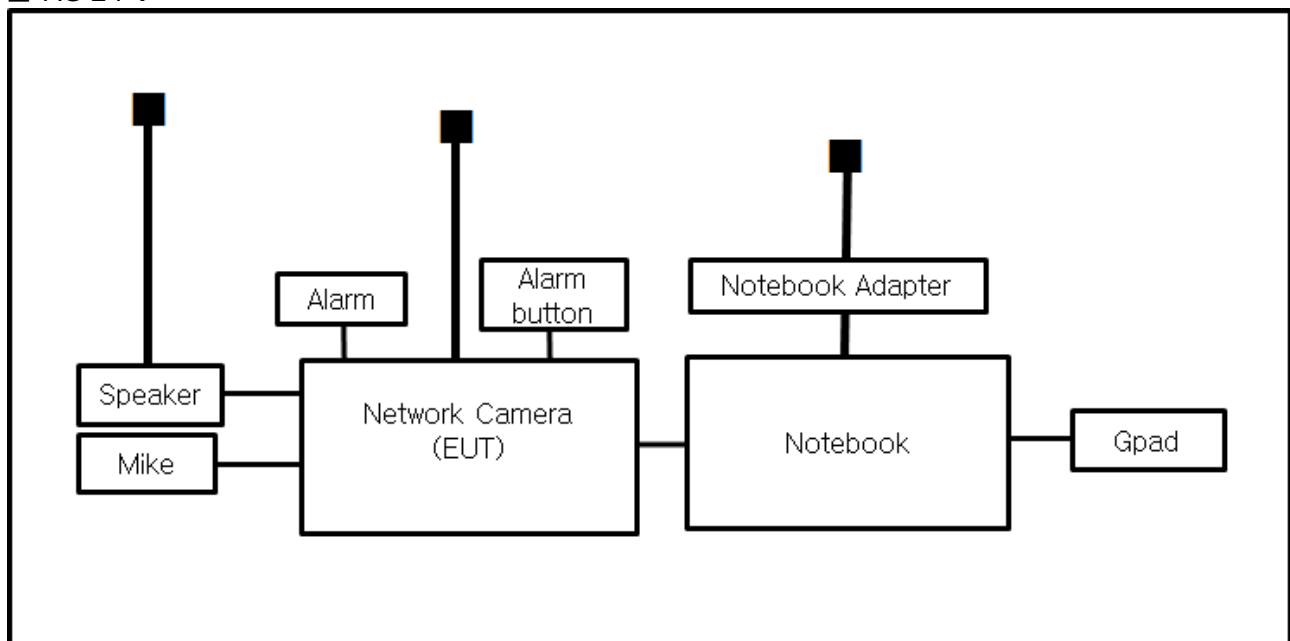
Test mode	operating
AC 24 V, DC 12 V, POE	EUT Monitoring, Ping Test

EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

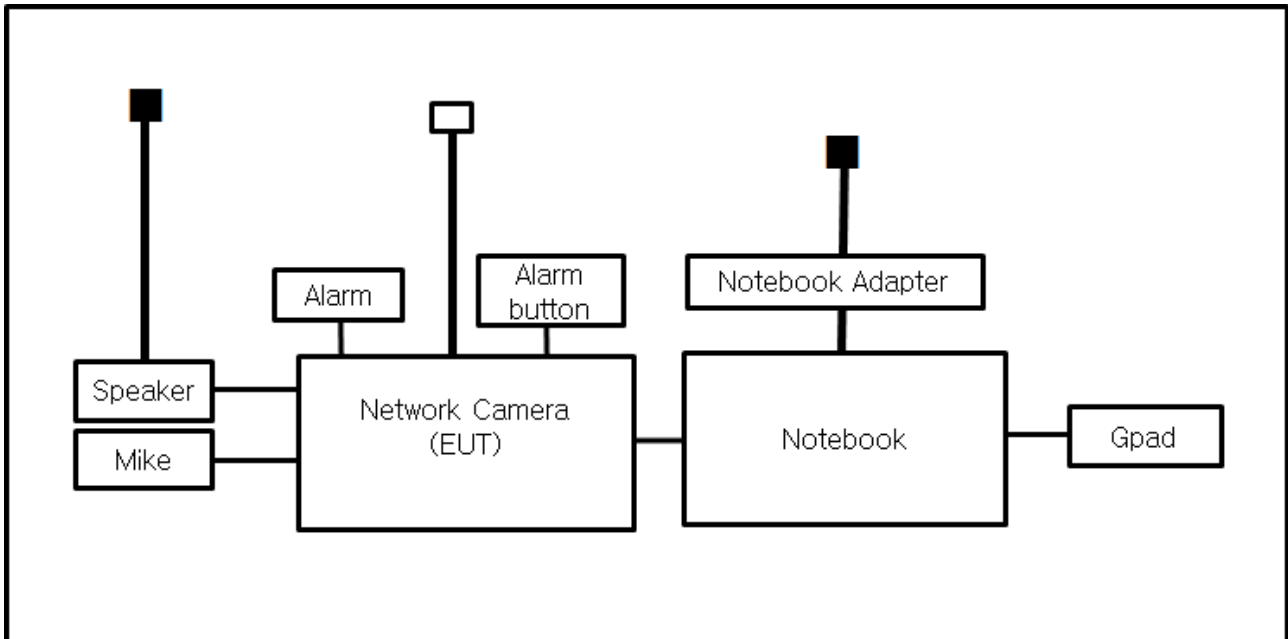
1.8 Configuration

■ AC Main
 □ DC Main

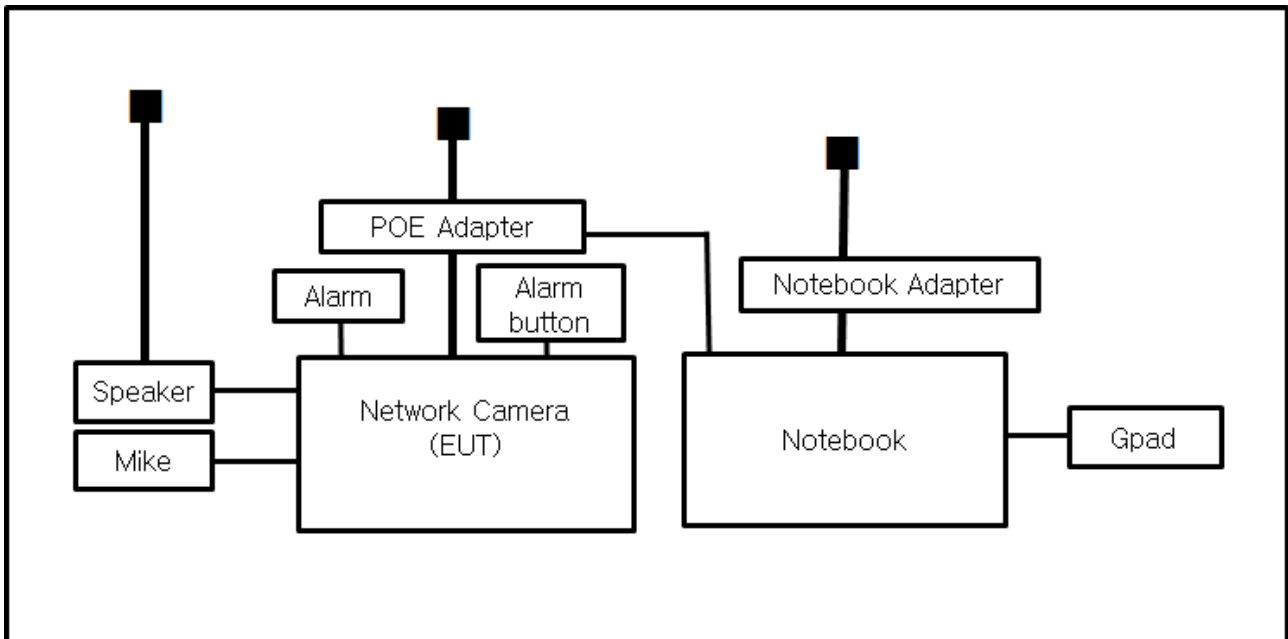
■ AC 24 V



■ DC 12 V



■ PoE



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 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547 :2009

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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-E1-19T0098-R1
Page (12) of (44)

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

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



2.1 Conducted Emissions Mains Power Ports

Test Date

Feb. 12, 2019

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	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 04, 2020
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019

Test Conditions

Temperature: 22,1 °C
Relative Humidity: 43,9 % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Feb. 12, 2019

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	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 04, 2020
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2020

Test ConditionsTemperature: 22,1 °C
Relative Humidity: 43,9 % 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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Feb. 12, 2019

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019
☒	ATTENUATOR	8491A	HP	32173	03, 21, 2019
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020

Test Conditions

Temperature: 21,4 °C
Relative Humidity: 42,0 % 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

Feb. 14, 2019

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 06, 2019
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 41,6 % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

APPENDIX A – TEST DATA

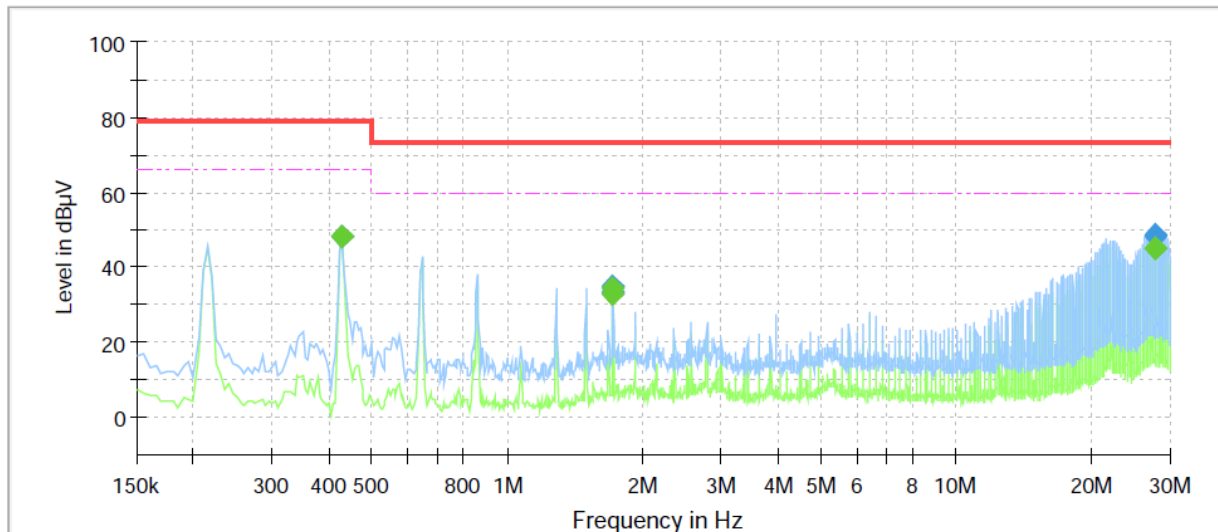
Conducted Emissions at Mains Power Ports

■ AC 24 V

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-8081R
Mode	AC 24 V_H
Operator Name:	KES



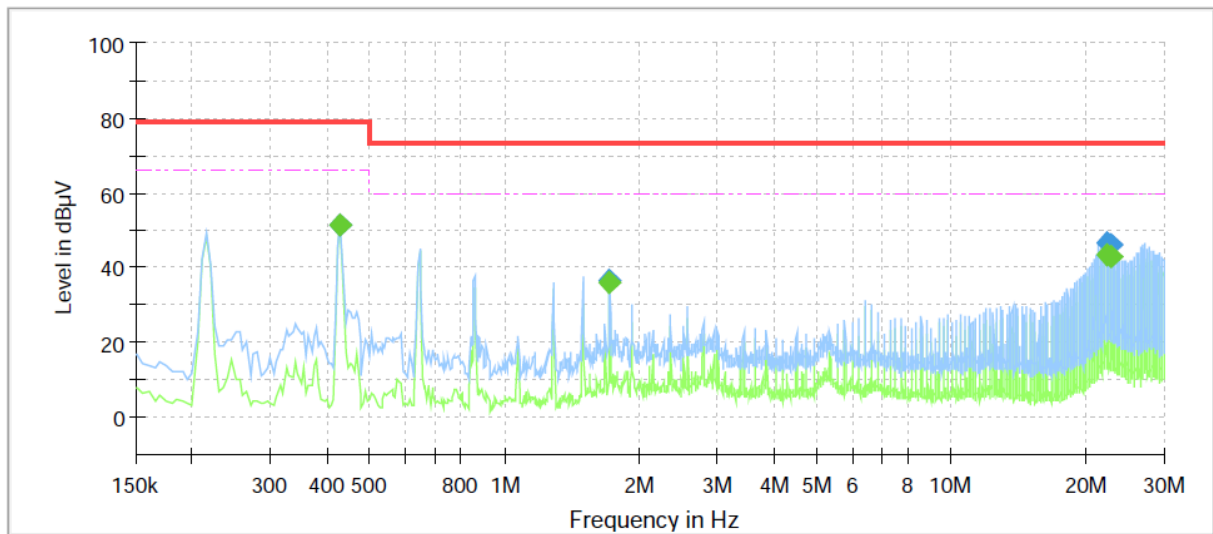
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	48.34	66.00	17.66	1000.0	9.000	L1	19.6
0.430000	48.39	---	79.00	30.61	1000.0	9.000	L1	19.6
1.715000	---	34.29	60.00	25.71	1000.0	9.000	L1	19.7
1.715000	34.83	---	73.00	38.17	1000.0	9.000	L1	19.7
1.720000	---	32.98	60.00	27.02	1000.0	9.000	L1	19.7
1.720000	33.49	---	73.00	39.51	1000.0	9.000	L1	19.7
27.685000	---	44.92	60.00	15.08	1000.0	9.000	L1	20.3
27.685000	48.46	---	73.00	24.54	1000.0	9.000	L1	20.3
27.900000	---	44.78	60.00	15.22	1000.0	9.000	L1	20.3
27.900000	48.32	---	73.00	24.68	1000.0	9.000	L1	20.3

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-8081R
Mode	AC 24 V_N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	51.14	66.00	14.86	1000.0	9.000	N	19.6
0.430000	51.19	---	79.00	27.81	1000.0	9.000	N	19.6
1.715000	---	35.88	60.00	24.12	1000.0	9.000	N	19.7
1.715000	36.70	---	73.00	36.30	1000.0	9.000	N	19.7
22.325000	---	43.64	60.00	16.36	1000.0	9.000	N	20.3
22.325000	46.55	---	73.00	26.45	1000.0	9.000	N	20.3
22.755000	---	43.06	60.00	16.94	1000.0	9.000	N	20.3
22.755000	46.20	---	73.00	26.80	1000.0	9.000	N	20.3

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

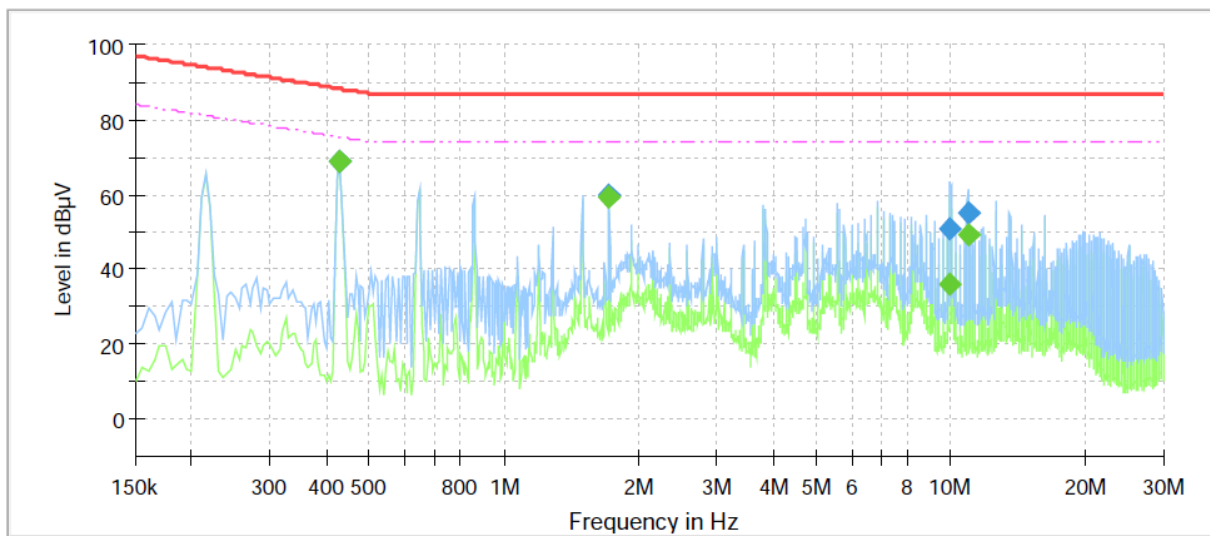
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Conducted Emissions at Telecommunication Ports

■ AC 24 V
[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-8081R
Mode	AC 24 V_10 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	68.72	75.25	6.53	1000.0	9.000	Single Line	19.8
0.430000	68.75	---	88.25	19.50	1000.0	9.000	Single Line	19.8
1.715000	---	59.10	74.00	14.90	1000.0	9.000	Single Line	19.7
1.715000	59.83	---	87.00	27.17	1000.0	9.000	Single Line	19.7
9.985000	---	36.27	74.00	37.73	1000.0	9.000	Single Line	19.9
9.985000	50.78	---	87.00	36.22	1000.0	9.000	Single Line	19.9
10.925000	---	49.28	74.00	24.72	1000.0	9.000	Single Line	19.9
10.925000	54.88	---	87.00	32.12	1000.0	9.000	Single Line	19.9

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-E1-19T0098-R1

Page (20) of (44)

[100 Mbps]

Common Information

Test Description:

Model No.:

Mode

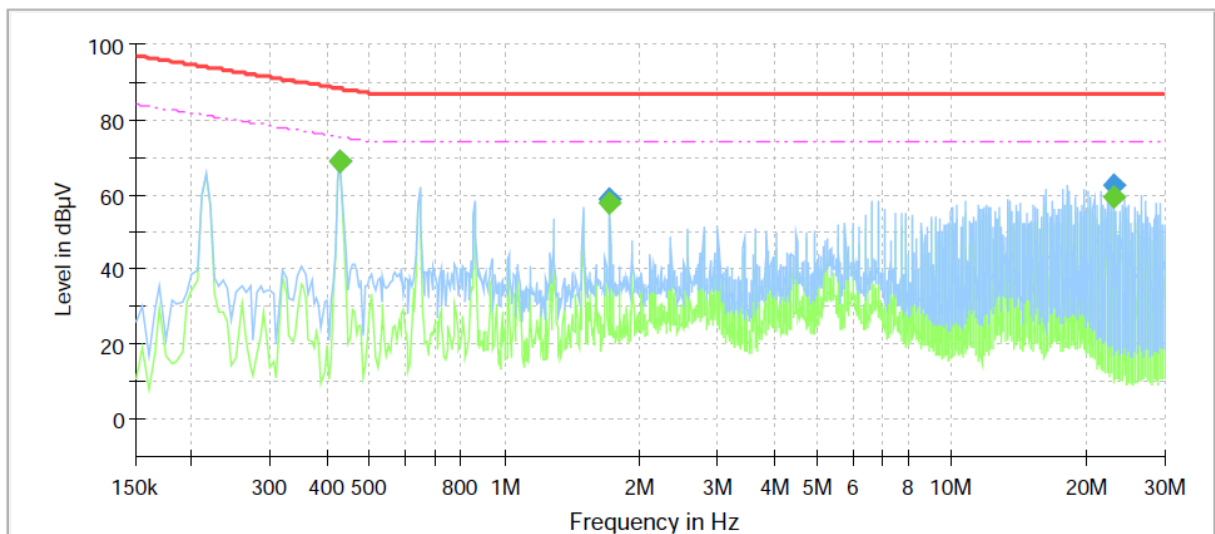
Operator Name:

Telecommunication Emission

XNV-8081R

AC 24 V_100 Mbps

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.430000	---	68.85	75.25	6.40	1000.0	9.000	Single Line	19.7
0.430000	68.89	---	88.25	19.36	1000.0	9.000	Single Line	19.7
1.715000	---	57.91	74.00	16.09	1000.0	9.000	Single Line	19.6
1.715000	58.59	---	87.00	28.41	1000.0	9.000	Single Line	19.6
23.130000	---	59.53	74.00	14.47	1000.0	9.000	Single Line	20.3
23.130000	62.58	---	87.00	24.42	1000.0	9.000	Single Line	20.3

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.

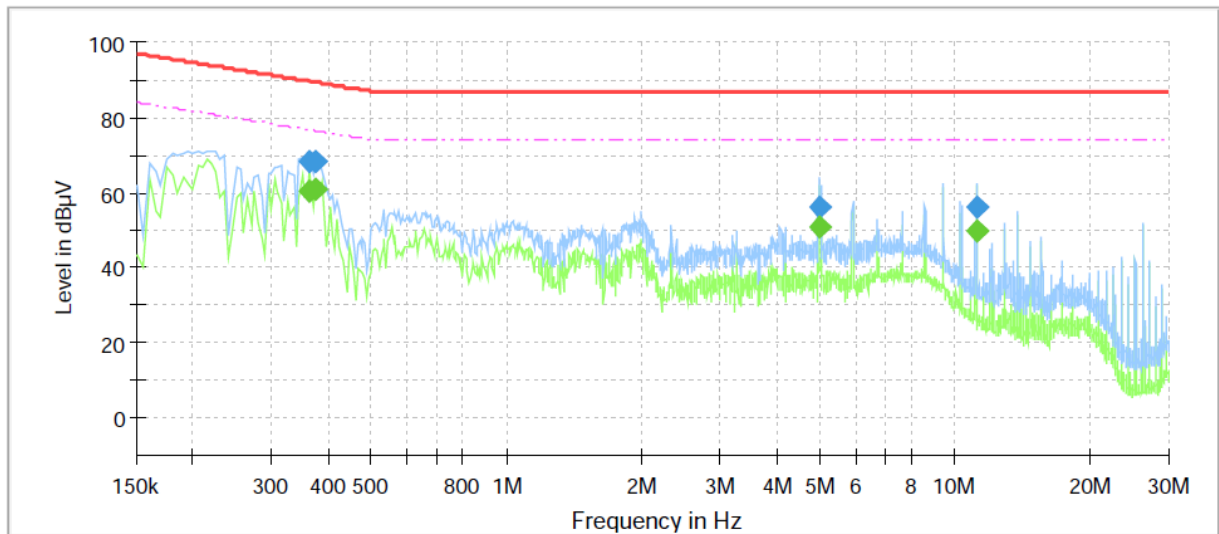
The authenticity of the test report, contact kes@kes.co.kr

■ DC 12 V
[10 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
XNV-8081R
DC 12 V_10 Mbps
KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	60.44	76.61	16.17	1000.0	9.000	Single Line	19.9
0.365000	68.12	---	89.61	21.49	1000.0	9.000	Single Line	19.9
0.375000	---	61.10	76.39	15.29	1000.0	9.000	Single Line	19.9
0.375000	68.48	---	89.39	20.91	1000.0	9.000	Single Line	19.9
5.000000	---	50.69	74.00	23.31	1000.0	9.000	Single Line	19.7
5.000000	56.11	---	87.00	30.89	1000.0	9.000	Single Line	19.7
11.195000	---	50.00	74.00	24.00	1000.0	9.000	Single Line	19.9
11.195000	55.98	---	87.00	31.02	1000.0	9.000	Single Line	19.9



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.:

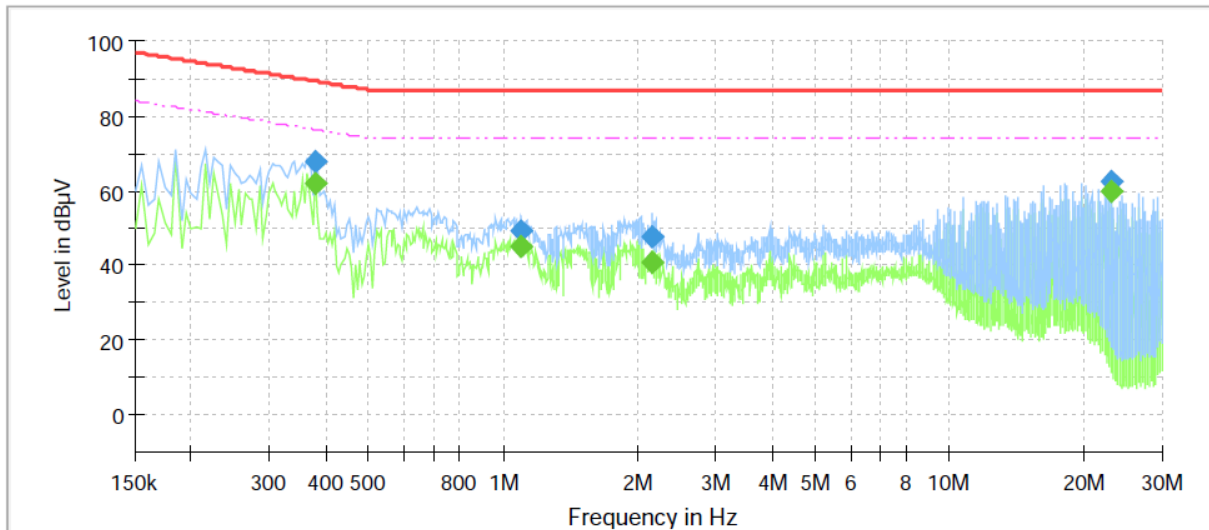
KES-E1-19T0098-R1

Page (22) of (44)

[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: XNV-8081R
Mode: DC 12 V_100 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.380000	---	61.89	76.28	14.39	1000.0	9.000	Single Line	19.7
0.380000	67.65	---	89.28	21.63	1000.0	9.000	Single Line	19.7
1.090000	---	44.96	74.00	29.04	1000.0	9.000	Single Line	19.6
1.090000	49.38	---	87.00	37.62	1000.0	9.000	Single Line	19.6
2.155000	---	40.91	74.00	33.09	1000.0	9.000	Single Line	19.6
2.155000	47.82	---	87.00	39.18	1000.0	9.000	Single Line	19.6
23.130000	---	59.55	74.00	14.45	1000.0	9.000	Single Line	20.3
23.130000	62.60	---	87.00	24.40	1000.0	9.000	Single Line	20.3

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

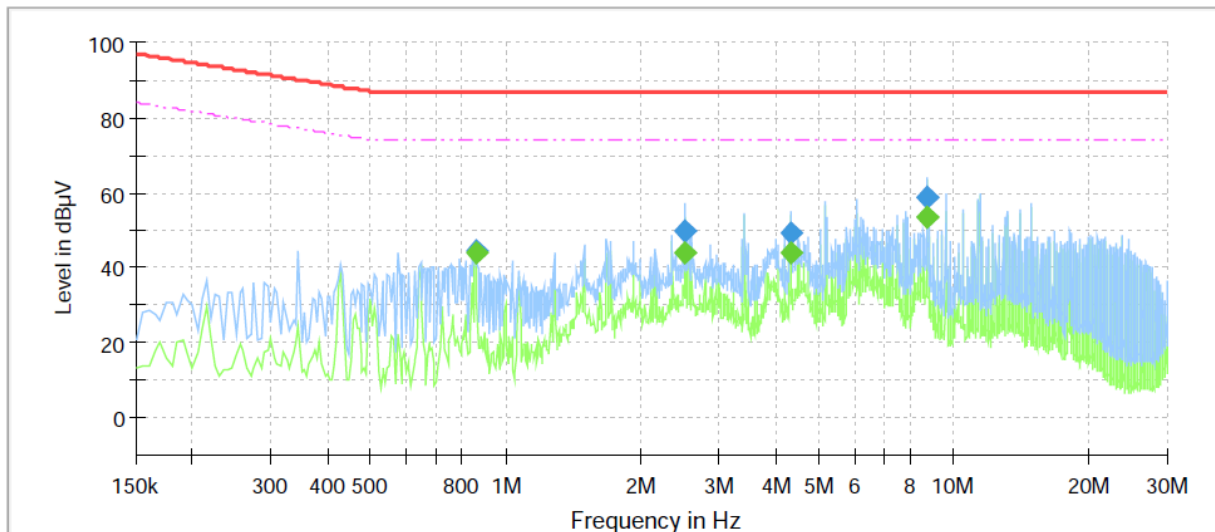
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

■ PoE
[10 Mbps]

Common Information

Test Description: Telecommunication Emission
 Model No.: XNV-8081R
 Mode: POE_10 Mbps
 Operator Name: KES



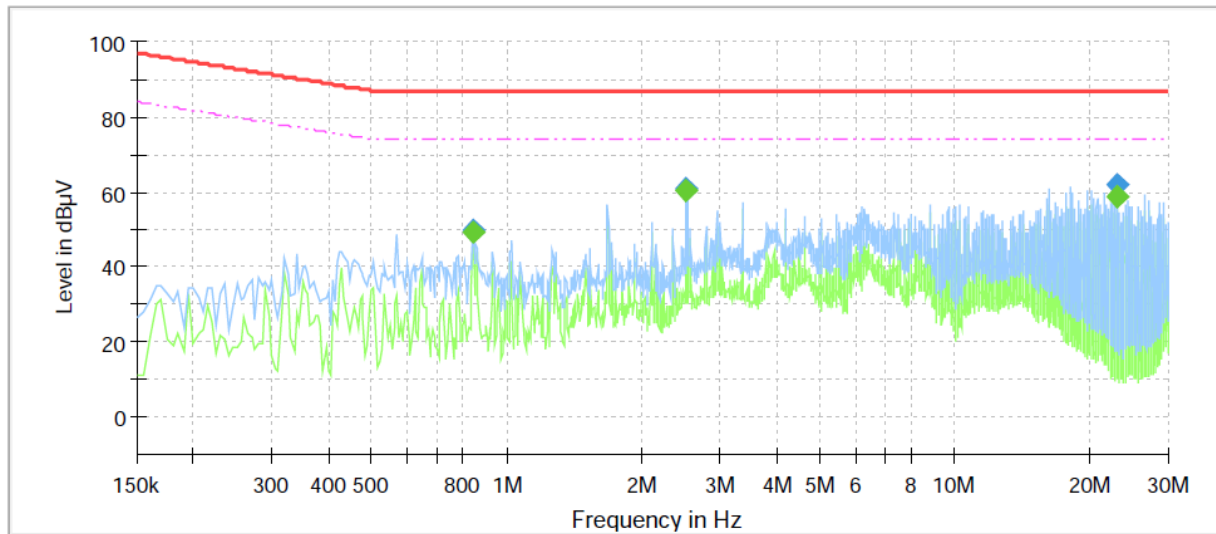
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.860000	---	44.03	74.00	29.97	1000.0	9.000	Single Line	19.8
0.860000	44.30	---	87.00	42.70	1000.0	9.000	Single Line	19.8
2.505000	---	44.05	74.00	29.95	1000.0	9.000	Single Line	19.7
2.505000	49.70	---	87.00	37.30	1000.0	9.000	Single Line	19.7
4.350000	---	43.87	74.00	30.13	1000.0	9.000	Single Line	19.7
4.350000	49.06	---	87.00	37.94	1000.0	9.000	Single Line	19.7
8.750000	---	53.28	74.00	20.72	1000.0	9.000	Single Line	19.8
8.750000	58.70	---	87.00	28.30	1000.0	9.000	Single Line	19.8

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNV-8081R
Mode	POE_100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.840000	---	49.35	74.00	24.65	1000.0	9.000	Single Line	19.6
0.840000	49.71	---	87.00	37.29	1000.0	9.000	Single Line	19.6
2.525000	---	60.23	74.00	13.77	1000.0	9.000	Single Line	19.6
2.525000	60.68	---	87.00	26.32	1000.0	9.000	Single Line	19.6
23.130000	---	58.66	74.00	15.34	1000.0	9.000	Single Line	20.3
23.130000	61.86	---	87.00	25.14	1000.0	9.000	Single Line	20.3

◆ 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))



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

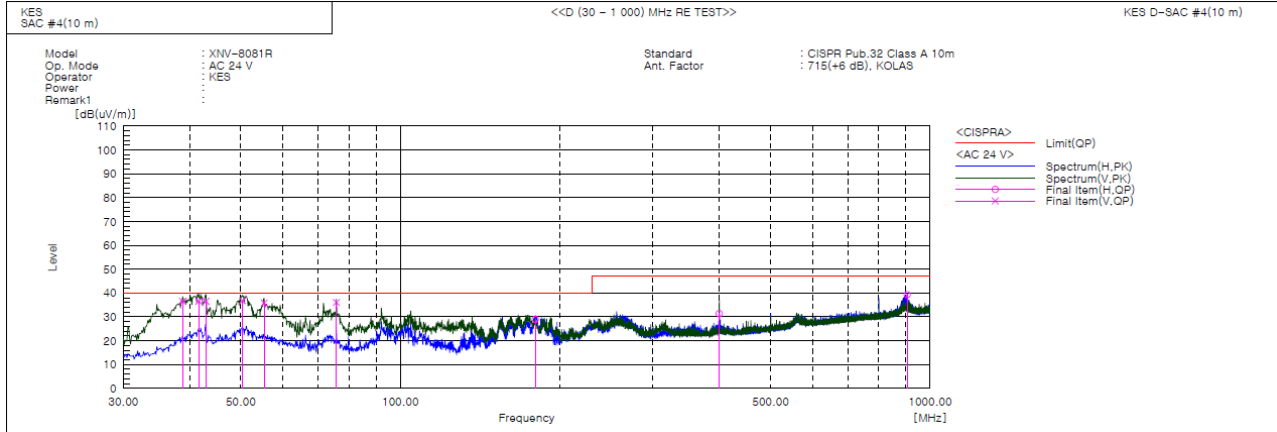
Report No.:

KES-E1-19T0098-R1

Page (25) of (44)

Radiated Electric Field Emissions(Below 1 GHz)

■ AC 24 V



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	38.851	V	60.1	-23.6	36.5	40.0	3.5	100.0	179.0	
2	41.645	V	59.1	-22.5	36.6	40.0	3.4	100.0	110.0	
3	42.974	V	58.8	-22.3	36.5	40.0	3.5	153.0	43.0	
4	50.377	V	58.3	-21.5	36.8	40.0	3.2	108.0	345.0	
5	55.355	V	57.8	-21.9	35.9	40.0	4.1	166.0	285.0	
6	75.711	V	63.2	-27.1	36.1	40.0	3.9	164.0	154.0	
7	179.865	H	52.9	-23.9	29.0	40.0	11.0	400.0	50.0	
8	400.045	H	46.7	-15.3	31.4	47.0	15.6	395.0	129.0	
9	905.309	H	45.0	-5.7	39.3	47.0	7.7	185.0	48.0	

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

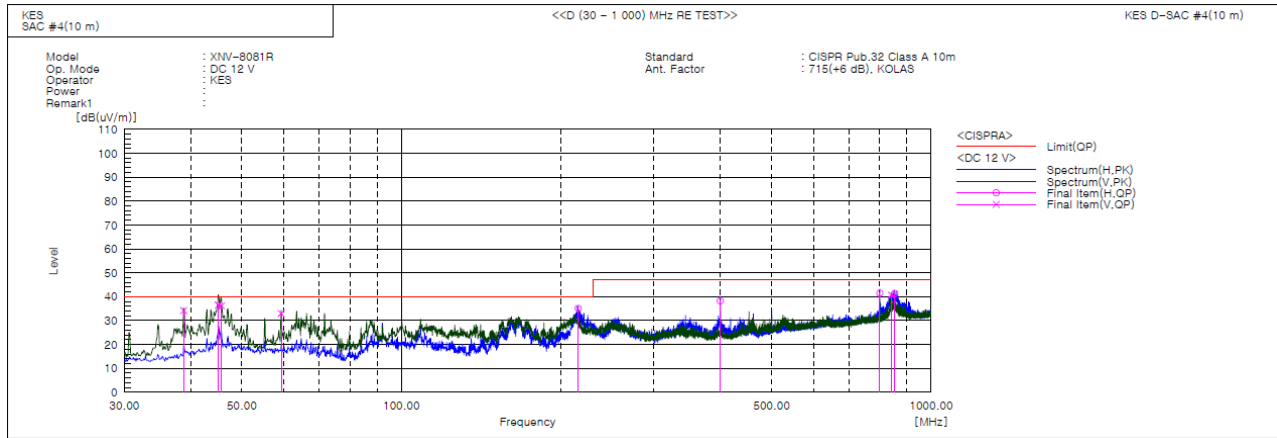


KES Co., Ltd.

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-E1-19T0098-R1
Page (26) of (44)

DC 12 V



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	38.851	V	57.8	-23.6	34.2	40.0	5.8	105.0	254.0	
2	45.156	V	58.5	-22.0	36.5	40.0	3.5	100.0	297.0	
3	45.763	V	58.1	-21.9	36.2	40.0	3.8	153.0	254.0	
4	59.343	V	55.5	-22.5	33.0	40.0	7.0	108.0	294.0	
5	215.755	H	56.0	-20.9	35.1	40.0	4.9	400.0	93.0	
6	400.055	H	53.6	-15.3	38.3	47.0	8.7	195.0	318.0	
7	800.059	H	49.2	-7.7	41.5	47.0	5.5	204.0	21.0	
8	841.041	V	47.5	-6.8	40.7	47.0	6.3	101.0	23.0	
9	853.773	H	47.8	-6.4	41.4	47.0	5.6	206.0	1.0	

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.

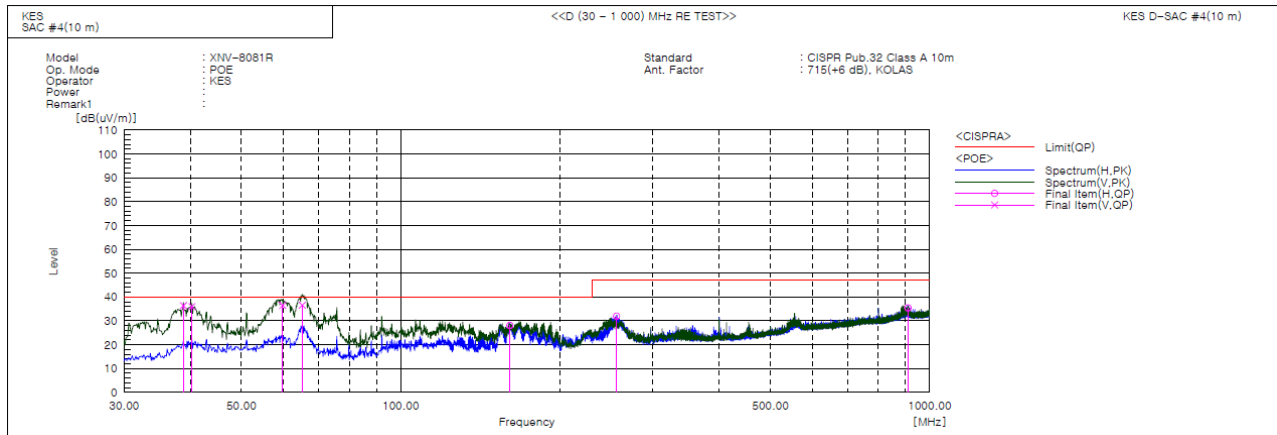
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-E1-19T0098-R1

Page (27) of (44)

PoE



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	38.851	V	60.0	-23.6	36.4	40.0	3.6	107.0	259.0	
2	40.306	V	58.9	-22.9	36.0	40.0	4.0	100.0	64.0	
3	59.828	V	59.1	-22.6	36.5	40.0	3.5	100.0	251.0	
4	65.163	V	60.3	-23.7	36.6	40.0	3.4	137.0	154.0	
5	160.829	H	53.1	-25.0	28.1	40.0	11.9	400.0	62.0	
6	255.889	H	52.0	-20.0	32.0	47.0	15.0	388.0	221.0	
7	910.033	H	41.2	-5.7	35.5	47.0	11.5	105.0	277.0	

◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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

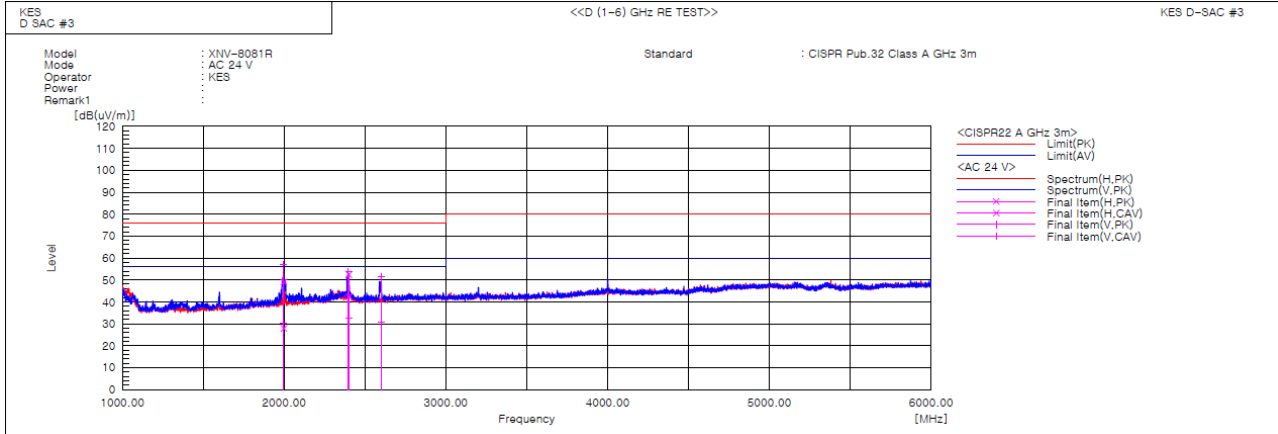
Report No.:

KES-E1-19T0098-R1

Page (28) of (44)

Radiated Electric Field Emissions(Above 1 GHz)

■ AC 12 V



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1995.310	V	59.2	32.5	-2.1	57.1	30.4	76.0	56.0	18.9	25.6	100.0	11.1	
2	1997.809	H	51.1	30.0	-2.1	49.0	27.9	76.0	56.0	27.0	28.1	100.0	292.2	
3	2397.750	V	54.1	33.0	-0.3	53.8	32.7	76.0	56.0	22.2	23.3	100.0	10.5	
4	2399.940	H	52.7	42.5	-0.3	52.4	42.2	76.0	56.0	23.6	13.8	100.0	130.2	
5	2600.548	V	51.3	30.4	0.2	51.5	30.6	76.0	56.0	24.5	25.4	100.0	6.5	

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

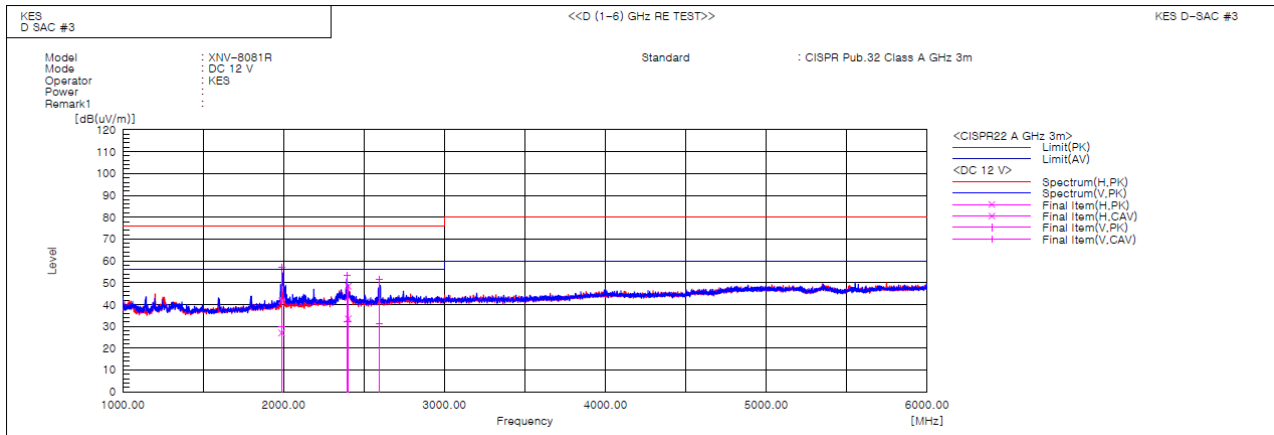


KES Co., Ltd.

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-E1-19T0098-R1
Page (29) of (44)

DC 12 V



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f. [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1987.691	H	43.9	29.2	-2.2	41.7	27.0	76.0	56.0	34.3	29.0	100.0	291.5	
2	1990.721	V	59.0	31.7	-2.1	56.9	29.6	76.0	56.0	19.1	26.4	100.0	18.8	
3	2392.290	V	53.7	32.5	-0.3	53.4	32.2	76.0	56.0	22.6	23.8	100.0	35.3	
4	2401.180	H	48.7	33.8	-0.3	48.4	33.5	76.0	56.0	27.6	22.5	100.0	6.9	
5	2595.161	V	51.4	30.8	0.1	51.5	30.9	76.0	56.0	24.5	25.1	100.0	5.7	

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.

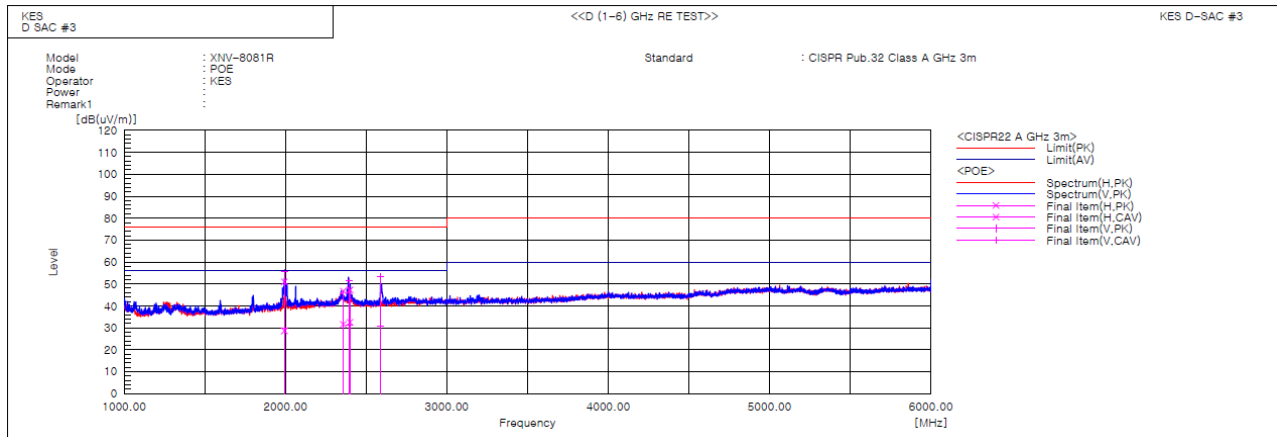
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-E1-19T0098-R1

Page (30) of (44)

PoE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1993.450	V	57.5	31.8	-2.1	55.4	29.7	76.0	56.0	20.6	26.3	100.0	4.8	
2	1993.560	H	53.1	30.7	-2.1	51.0	28.6	76.0	56.0	25.0	27.4	100.0	353.4	
3	2357.157	H	47.2	32.0	-0.5	46.7	31.5	76.0	56.0	29.3	24.5	100.0	88.4	
4	2394.949	V	51.6	31.3	-0.3	51.3	31.0	76.0	56.0	24.7	25.0	100.0	11.0	
5	2399.230	H	47.6	32.9	-0.3	47.3	32.6	76.0	56.0	28.7	23.4	100.0	355.0	
6	2588.980	V	53.1	30.5	0.1	53.2	30.6	76.0	56.0	22.8	25.4	100.0	5.7	

◆ Calculation

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

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

Test Setup Photos and Configuration

Conducted Voltage Emissions



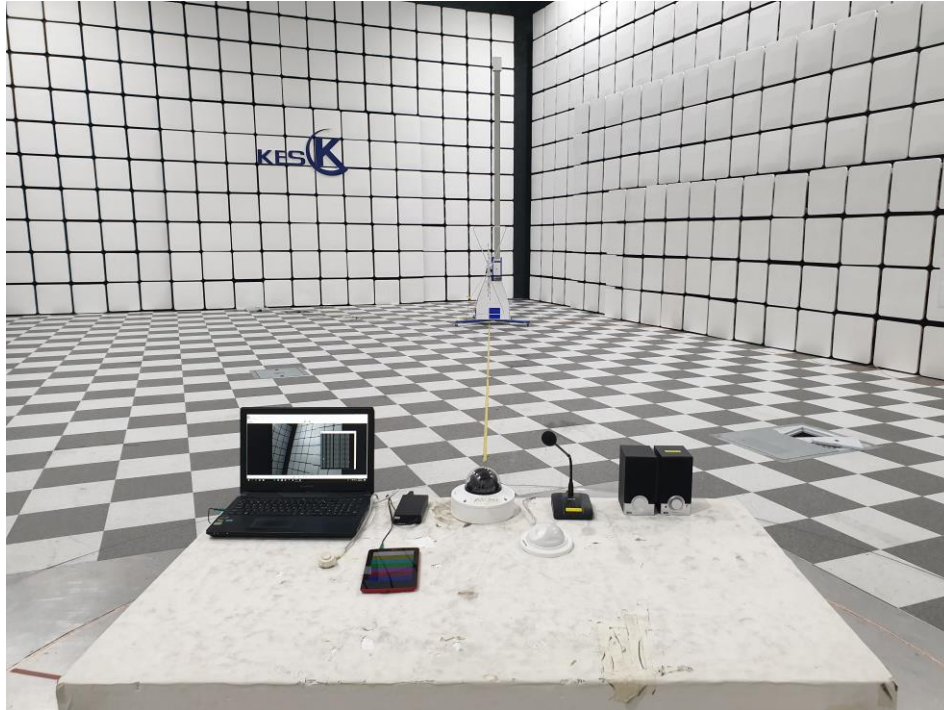
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Telecommunication Emissions



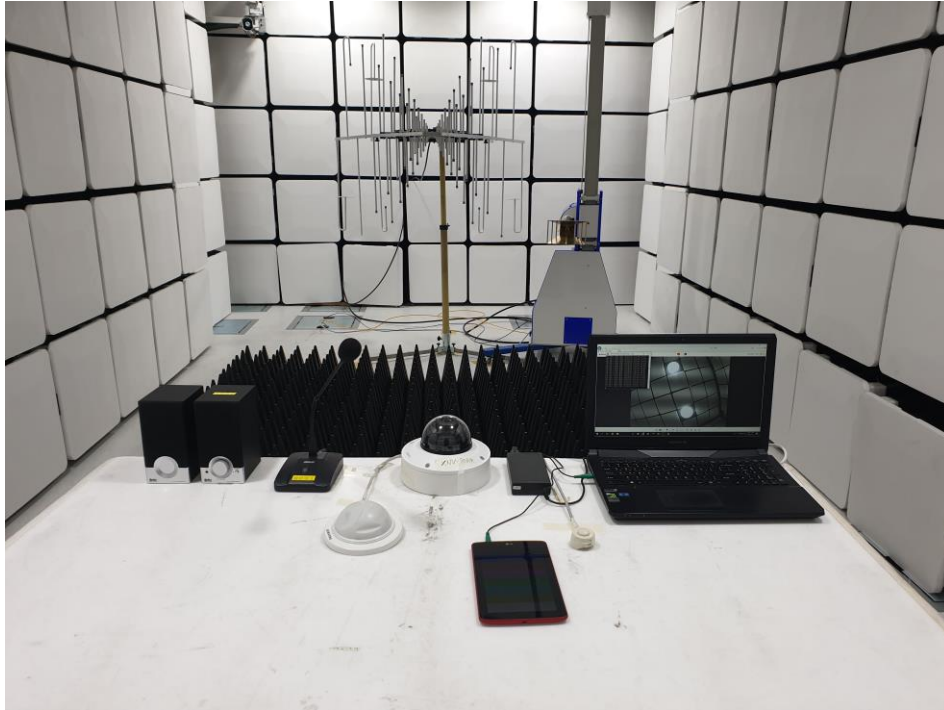
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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

Radiated Electric Field Emissions(Above 1 GHz)



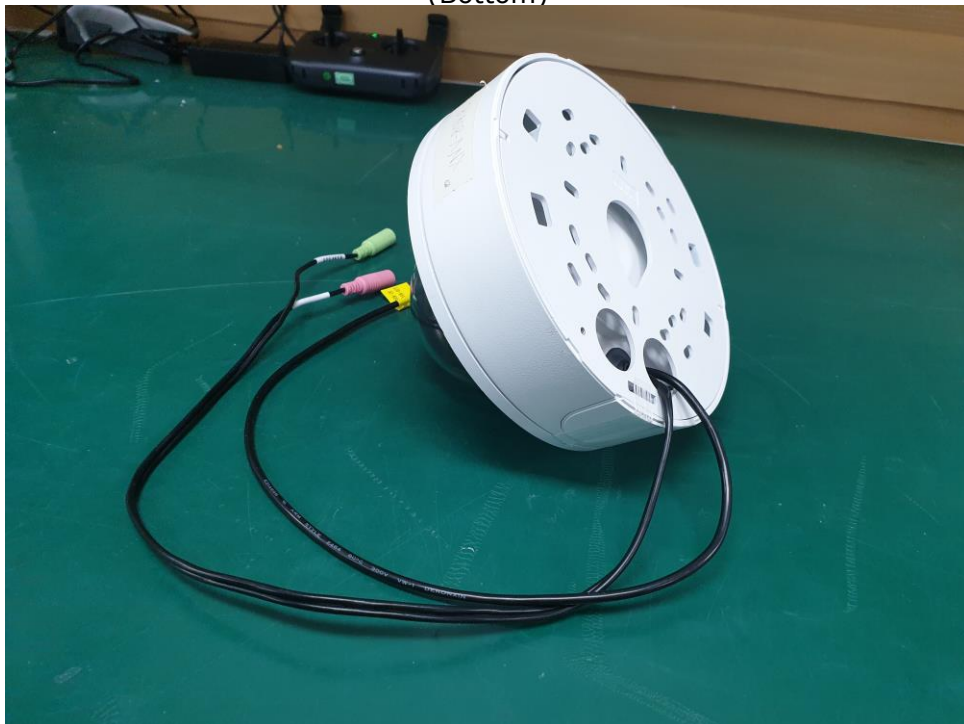
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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

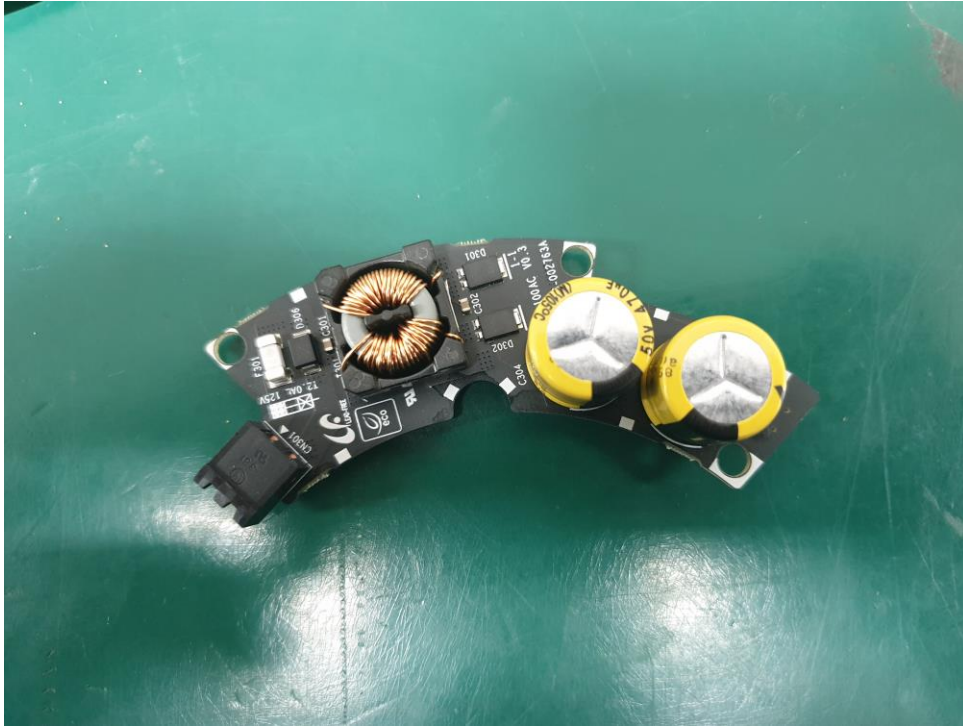
EUT Internal Photographs

(Internal View)



EUT Internal View – AC 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 – AC Module

(Top)



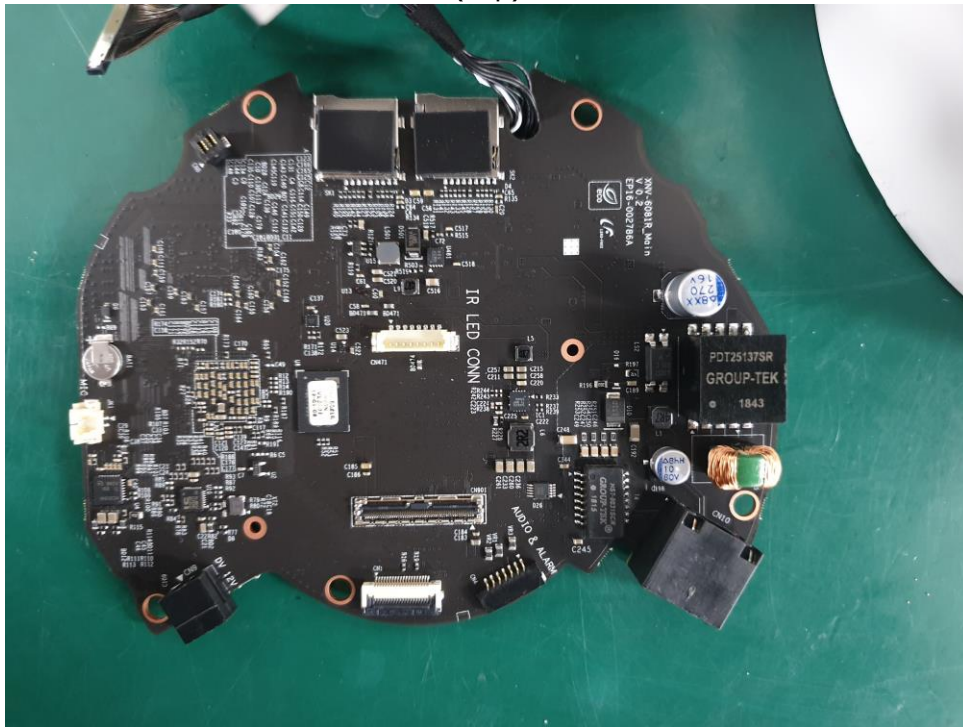
(Bottom)



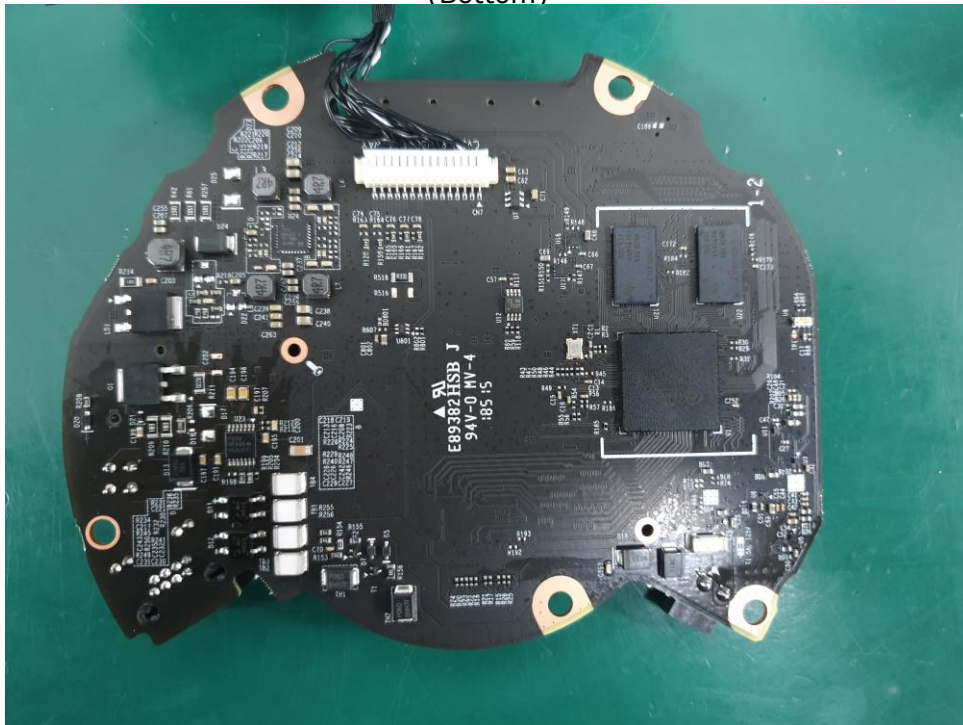
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 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)



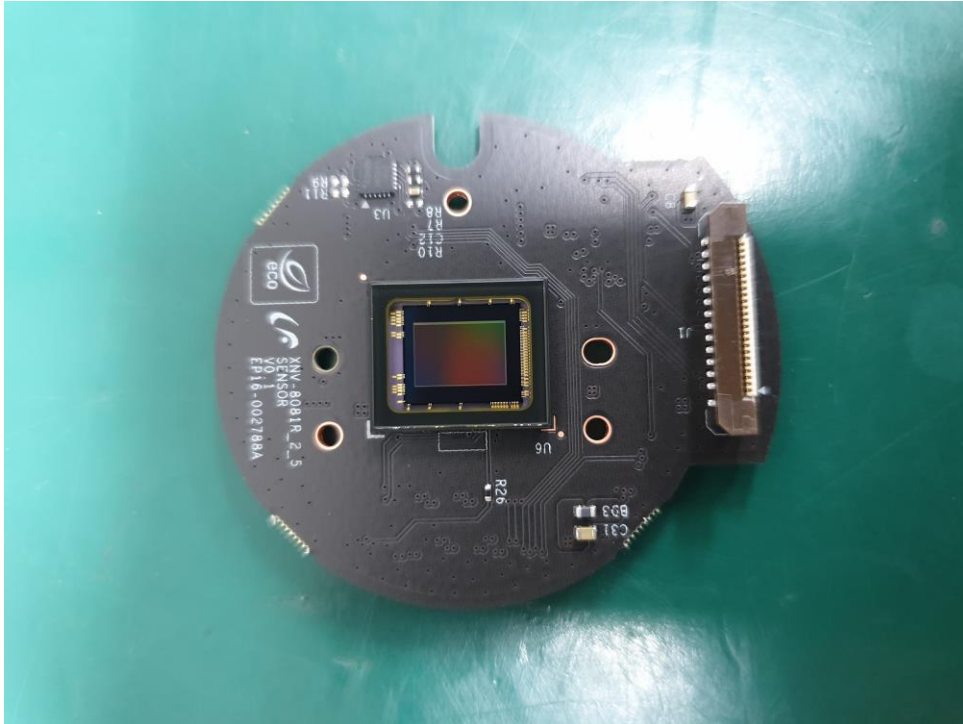
(Bottom)



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 – Camera Lens

(Top)

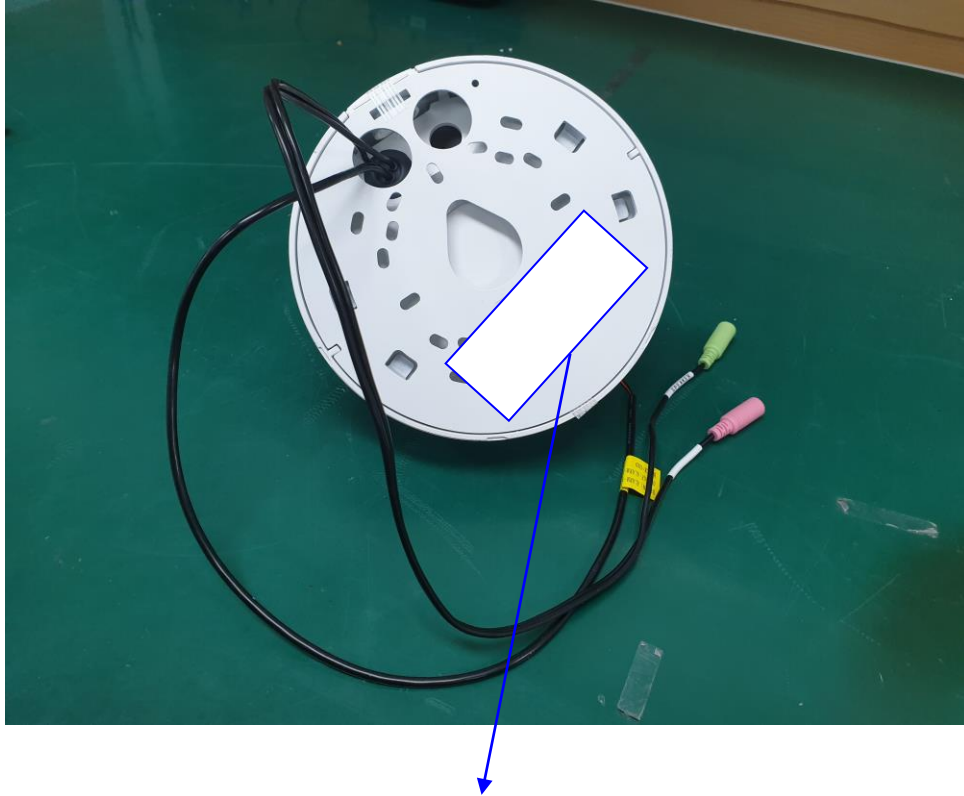


(Bottom)



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 Photographs



この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A