



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-E1-17T0482-R2

Page (1) of (40)

EMC TEST REPORT For IC

Test Report No. : KES-E1-17T0482-R2

Date of Issue : Feb. 24, 2023

Product name : NETWORK CAMERA

Model/Type No. : XNV-6085

Variant Model : -

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea

Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.

Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)

Date of Receipt : Jul. 10, 2017

Test date : Jul. 17, 2017 ~ Jul. 18, 2017

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Seong Min, Choi
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-E1-17T0482-R2

Page (2) of (40)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 24, 2017	KES-E1-17T0482	Issued
Nov. 15, 2021	KES-E1-17T0482-R1	- Applicant Address/Manufacturer change at customer's request - Deletion of model name "N" - IC Regulation ICES-003 Issue 7 Update ANSI C63.4-2014 or ANSI C63.4-2014 amended as per ANSI C63.4a-2017
Feb. 24, 2023	KES-E1-17T0482-R2	Change the Applicant and manufacturer at the request of the customer

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

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



TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	7
1.2	Variant Model Differences	7
1.3	Device Modifications	7
1.4	Equipment Under Test.....	7
1.5	Support Equipments	8
1.6	External I/O Cabling	9
1.7	EUT Operating Mode(s)	10
1.8	Configuration	11
1.9	Remarks when standards applied	12
1.10	Calibration Details of Equipment Used for Measurement	13
1.11	Test Facility	13
1.12	Laboratory Accreditations and Listings	13
2.0	Test Regulations.....	14
2.1	Conducted Emissions Mains Power Ports.....	16
2.2	Radiated Electric Field Emissions(Below 1 GHz)	17
2.3	Radiated Electric Field Emissions(Above 1 GHz)	18
APPENDIX A – TEST DATA.....		19
Conducted Emissions at Mains Power Ports.....		19
Radiated Electric Field Emissions(Below 1 GHz)		25
Radiated Electric Field Emissions(Above 1 GHz).....		27
Test Setup Photos and Configuration		30
Conducted Voltage Emissions		30
Radiated Electric Field Emissions(Below 1 GHz)		31
Radiated Electric Field Emissions(Above 1 GHz).....		32
EUT External Photographs.....		33
EUT Internal Photographs		34



1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/1.9" 2.42M CMOS
Total Pixels	1952(H) X 1241(V) approx 2.42M pixels
Effective Pixels	1937(H) X 1097(V) approx 2.12M pixels
Scanning System	Progressive Scan
Min. Illumination	Color : 0.005 Lux(1/30sec, F0.94)
S / N Ratio	50dB
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)	4.1~16.4mm(Optical 4X)
Max. Aperture Ratio	F0.94(Wide) ~ F2.4(Tele)
Angular Field of View	H : 100°(W) ~ 26.2°(T)
Min. Object Distance	0.7m
Focus Control	Auto / Manual / One Push
Lens Type	DC Auto Iris
Mount Type	Board-in type
LDC	On/Off (5 levels with Min/Max)
Pan / Tilt / Rotate	
Pan Range	±185 °
Tilt Range	±73 °
Rotate Range	±110 °
Operational	
Camera Title	Off / On (Displayed up to 85 characters) - W/W : English/Numeric/Special Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC / HLC(Masking/Dimming), WDR
Wide Dynamic Range	150dB
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On (Built-in Gyro sensor)
Digital PTZ	24X, Digital PTZ(Preset, Group)
Defog	Auto/Manual/Off
Motion Detection	Auto / Manual / Off
Privacy Masking	Off/ On(8ea, 8point Polygonal zones), Handover
Gain Control	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
White Balance	ATW / AWC / Manual / Indoor / Outdoor (included Mercury & Sodium)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)

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-E1-17T0482-R2

Page (5) of (40)

Rotate Image	Flip : On/Off Mirror : On/Off Hallway : 90° /270°
Video&Audio Analytics	Tampering, Loitering, Directional Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Sound Classification
Alarm I/O	Input 1ea / Output 1ea
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm events	File upload via FTP, E-Mail Notification via E-Mail local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers External output DPTZ preset
Audio In	Selectable (Mic IN/Line IN/Built-in Mic), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm mono jack), Max output level: 1 Vrms
Pixel Counter	support
Pan/Tilt/Rotate	Remote adjustment (Max. 200 cycle)
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High Motion JPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : Max. 60fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStreamII	support
Video Quality Adjustment	Target Bitrate Level Control
Bitrate Control Method	H.264/H.265 : CBR or VBR, Motion JPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 16KHz
Audio Communication	Bi-directional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)

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-E1-17T0482-R2

Page (6) of (40)

Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming	ONVIF Profile S/G SUNAPI 2.0(HTTP API) Wisenet Open Platform
Webpage Language	English, French, German, Spanish, Italian, Chinese, Russian, Japanese, Swedish, Portuguese, Turkish, Polish, Czech, Dutch, Hungary, Greek
Web Viewer	Supported OS : Windows 7, 8.1, 10, Mac OS X 10.10, 10.11, 10.12 Plug-in Free Webviewer Supported Browser : Google Chrome, MS Edge, Mozilla Firefox(Window 64bit only) , Apple Safari 10 (Mac OS X only) Plug-in Webviewer Supported Browser : MS Explore 11, Apple Safari 10 (Mac OS X only)
Central Management Software	SmartViewer
Environmental	
Operating Temperature / Humidity	-30°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH * Start up should be done at above -10°C
Storage Temperature / Humidity	-40°C ~ +60°C (-40°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP51
Vandal Resistance	IK08
Electrical	
Input Voltage / Current	DC12V,PoE(IEEE802.3af,Class3)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory / Plastic (R), Aluminum (RV)
Dimension (WxHxD)	TBD
Weight	TBD

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 ☐ 120 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-6085	-	HANWHA VISION VIETNAM COMPANY LIMITED	E.U.T

**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-E1-17T0482-R2
Page (8) of (40)

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT630Z5J	JK9091EF400142M	SAMSUNG	-
Notebook Adapter	A13-040N2A	CN60BA4400313AD0 N843KO2OO	Chicony Power Technology (suzhou)Co., Ltd.	-
MIC	CMK-303	-	CAMAC	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI- TECH GROUP.	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Micro SD Card	-	-	SanDisk	-
POE Adapter	POE36U-1AT-R	-	I.T.E. POWER SUPPLY	-
PoE Adaptor	PSE156G	-	-	Conducted Emissions
Notebook	P98F004	21599158359	DELL INC.	Conducted Emissions
Notebook Adaptor	LA240PM190	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	Conducted Emissions
MIC	MP1000	-	-	Conducted 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



1.6 External I/O Cabling

- DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	Notebook	RJ-45	3.2	U
	2PIN	Alarm	2PIN	3.0	U
	Speaker	Speaker	-	1.7	U
	MIC	MIC	-	1.6	U
	Micro SD Card Slot	Micro SD Card	-	-	-

- AC 24 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	Notebook	RJ-45	3.2	U
	2PIN	Alarm	2PIN	3.0	U
	Speaker	Speaker	-	1.7	U
	MIC	MIC	-	1.6	U
	Micro SD Card Slot	Micro SD Card	-	-	-

**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-E1-17T0482-R2

Page (10) of (40)

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	POE Adapter	OUT	3.2	U
	2PIN	Alarm	2PIN	3.0	U
	Speaker	Speaker	-	1.7	U
	MIC	MIC	-	1.6	U
	Micro SD Card Slot	Micro SD Card	-	-	-
Notebook	RJ-45	POE Adapter	IN	1.6	U

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

Test mode	operating
Operating mode	E.U.T Monitoring, Ping Test

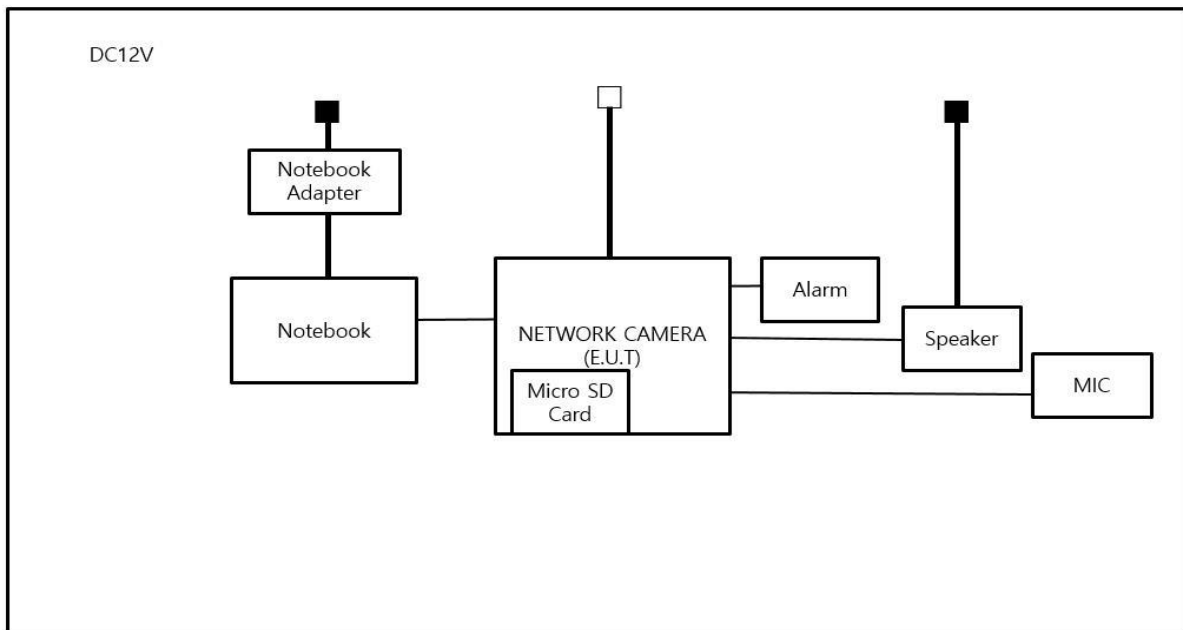
E.U.T Test operating S/W		
Name	Version	Manufacture Company
WebViewer	-	Hanwha Vision Co., Ltd

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

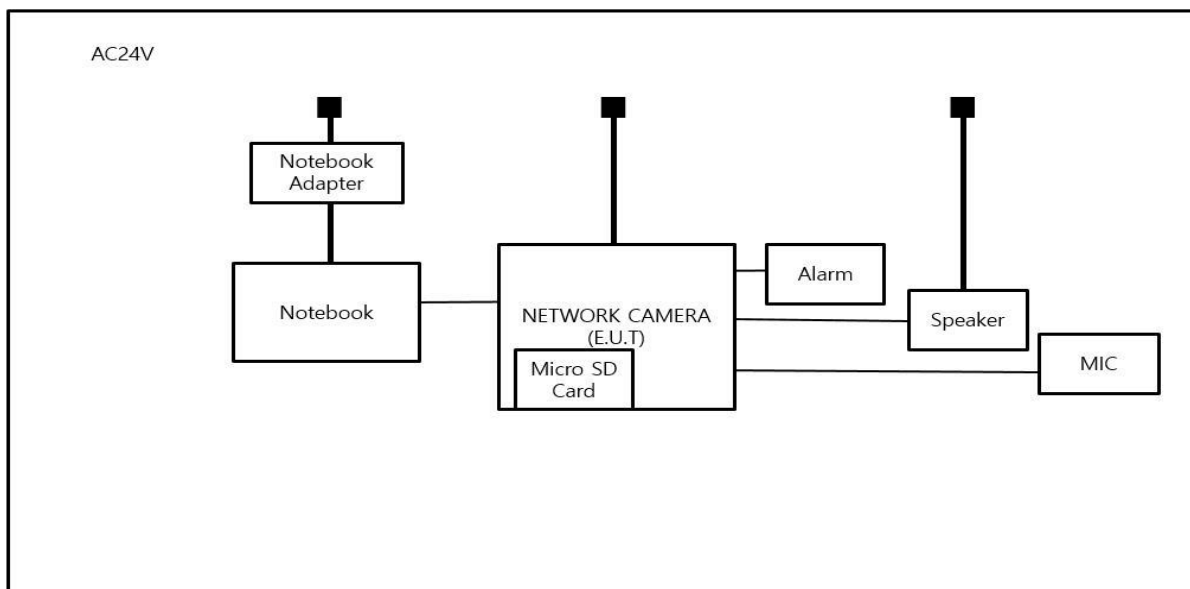
1.8 Configuration

■ AC Main
 □ DC Main

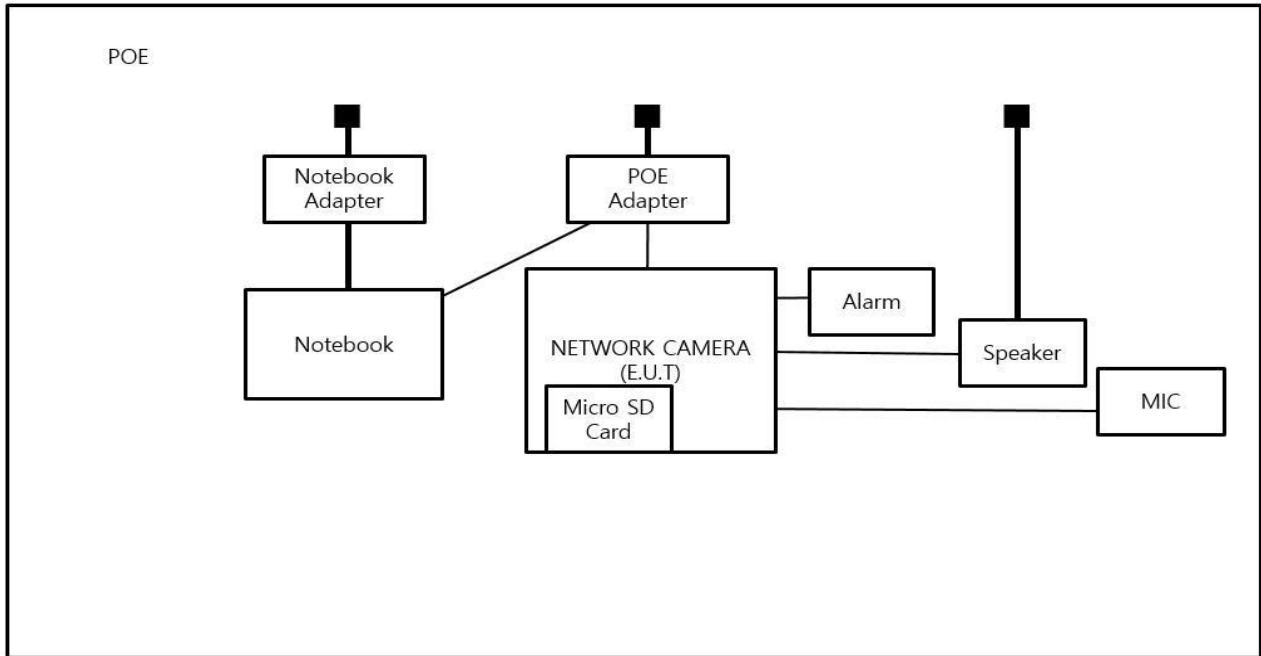
- DC 12 V Mode



- AC 24 V Mode



- PoE Mode



1.9 Remarks when standards applied

- During the DC 12 V mode test in the Conducted Emissions at Mains Power Ports test was conducted using an adapter.
- During the PoE mode test in the Conducted Emissions at Mains Power Ports test, PoE Adaptor, Notebook and MIC were changed and tested.

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, 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 55032:2012

☐ 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-E1-17T0482-R2
Page (15) of (40)

- | | | |
|---|---|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS CISPR22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4a-2017 | ☐ Class A | ☐ Class B |
| ☒ IC Regulation ICES-003 Issue 7 | | |
| ☒ CAN/CSA-CISPR 32:27 | ☒ Class A | ☐ Class B |
| ☐ ANSI C63.4a-2017 | ☐ Class A | ☐ Class B |
| ☐ 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

Jul. 18, 2017

Test Location

Electro wave Shieldroom

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	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017

Test Conditions

Temperature: 22,9 °C

Relative Humidity: 51,9 %

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.

**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-E1-17T0482-R2

Page (17) of (40)

2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 17, 2017

Test Location☒ OPEN AREA TEST SITE #2 ☐ SAC #4(10 m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	-	-	-	-
☒	EMI TEST RECEIVER	ESVS10	R & S	826008/014	04, 18, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 26,5 °C

Relative Humidity: 60,0.%

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

RemarksSee 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



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jul. 17, 2017

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, 08, 2017
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 24,0 °C

Relative Humidity: 53,0 %

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

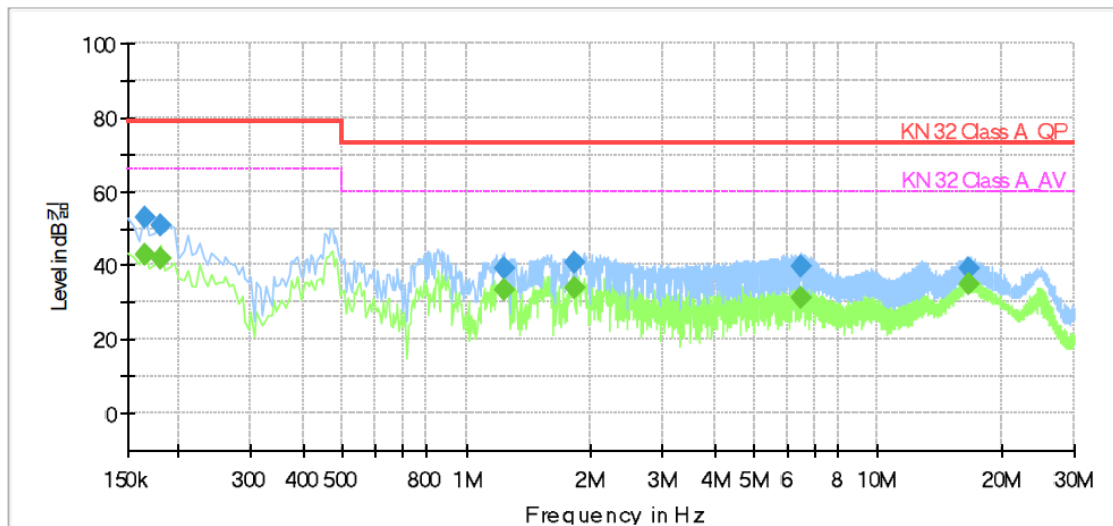
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

- DC 12 V Mode
[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XND-6085N
Mode	DC12V
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	43.14	66.00	22.86	1000.0	9.000	L1	21.0
0.165000	53.09	---	79.00	25.91	1000.0	9.000	L1	21.0
0.180000	---	41.89	66.00	24.11	1000.0	9.000	L1	20.9
0.180000	50.91	---	79.00	28.09	1000.0	9.000	L1	20.9
1.235000	---	33.43	60.00	26.57	1000.0	9.000	L1	20.0
1.235000	39.33	---	73.00	33.67	1000.0	9.000	L1	20.0
1.830000	---	34.10	60.00	25.90	1000.0	9.000	L1	19.9
1.830000	40.69	---	73.00	32.31	1000.0	9.000	L1	19.9
6.525000	---	31.38	60.00	28.62	1000.0	9.000	L1	19.8
6.525000	39.55	---	73.00	33.45	1000.0	9.000	L1	19.8
16.660000	---	34.82	60.00	25.18	1000.0	9.000	L1	20.2
16.660000	39.27	---	73.00	33.73	1000.0	9.000	L1	20.2

Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

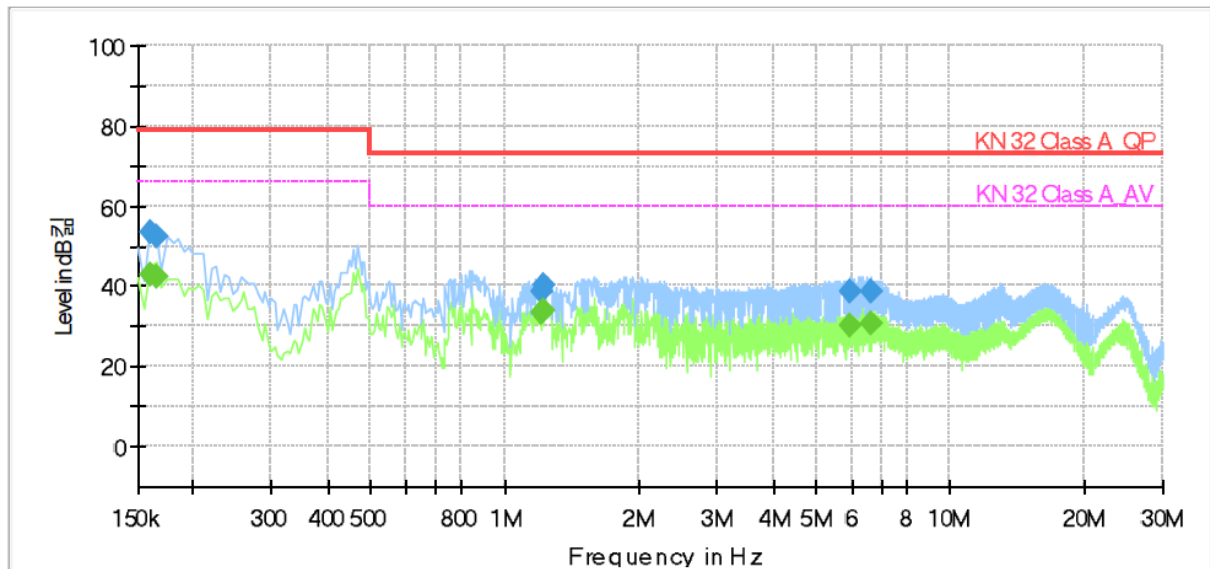
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: XND-6085N
 Mode: DC12V
 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	---	42.66	66.00	23.34	1000.0	9.000	N	21.0
0.160000	53.29	---	79.00	25.71	1000.0	9.000	N	21.0
0.165000	---	42.59	66.00	23.41	1000.0	9.000	N	21.0
0.165000	52.16	---	79.00	26.84	1000.0	9.000	N	21.0
1.210000	---	33.23	60.00	26.77	1000.0	9.000	N	20.1
1.210000	38.85	---	73.00	34.15	1000.0	9.000	N	20.1
1.225000	---	33.89	60.00	26.11	1000.0	9.000	N	20.0
1.225000	40.39	---	73.00	32.61	1000.0	9.000	N	20.0
5.940000	---	30.27	60.00	29.73	1000.0	9.000	N	19.8
5.940000	38.73	---	73.00	34.27	1000.0	9.000	N	19.8
6.630000	---	30.92	60.00	29.08	1000.0	9.000	N	19.8
6.630000	38.77	---	73.00	34.23	1000.0	9.000	N	19.8

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN 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-E1-17T0482-R2

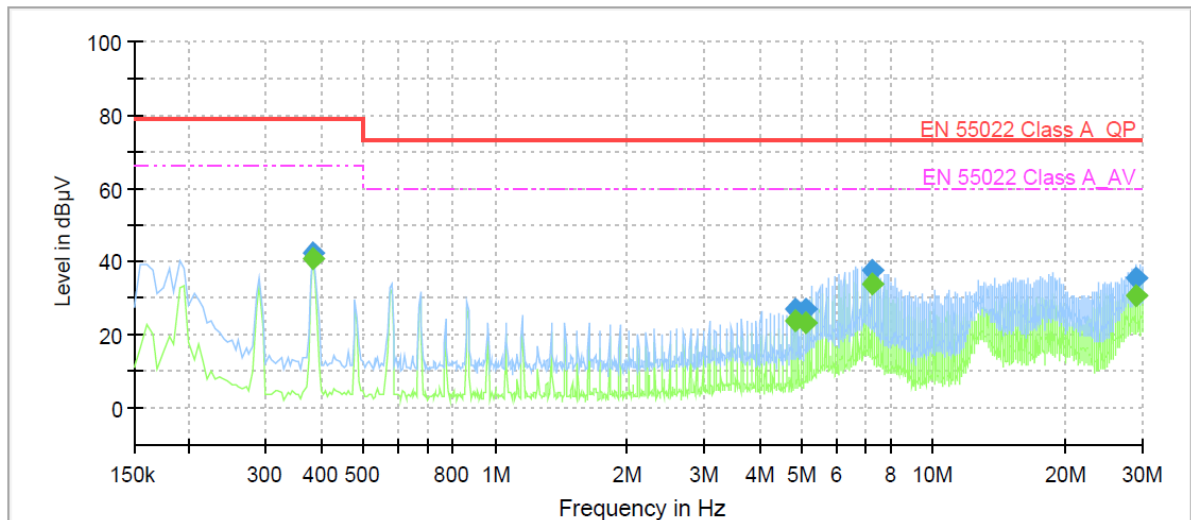
Page (21) of (40)

- AC 24 V Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: XNV-6085N
Mode: AC24V
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.385000	---	40.92	66.00	25.08	1000.0	9.000	L1	20.7
0.385000	42.41	---	79.00	36.59	1000.0	9.000	L1	20.7
4.815000	---	24.10	60.00	35.90	1000.0	9.000	L1	19.7
4.815000	26.98	---	73.00	46.02	1000.0	9.000	L1	19.7
5.105000	---	23.27	60.00	36.73	1000.0	9.000	L1	19.8
5.105000	26.88	---	73.00	46.12	1000.0	9.000	L1	19.8
7.220000	---	33.93	60.00	26.07	1000.0	9.000	L1	19.8
7.220000	37.47	---	73.00	35.53	1000.0	9.000	L1	19.8
28.980000	---	30.79	60.00	29.21	1000.0	9.000	L1	20.3
28.980000	35.24	---	73.00	37.76	1000.0	9.000	L1	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))

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

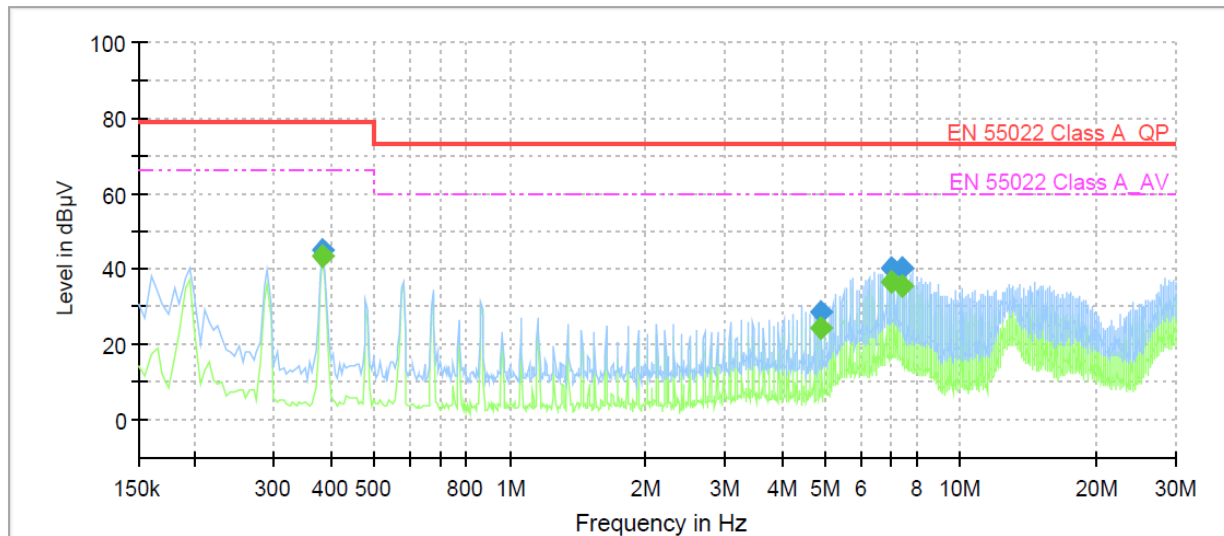
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: XNV-6085N
Mode: AC24V
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.385000	---	43.42	66.00	22.58	1000.0	9.000	N	20.7
0.385000	44.94	---	79.00	34.06	1000.0	9.000	N	20.7
4.910000	---	24.17	60.00	35.83	1000.0	9.000	N	19.7
4.910000	28.38	---	73.00	44.62	1000.0	9.000	N	19.7
7.030000	---	36.67	60.00	23.33	1000.0	9.000	N	19.8
7.030000	40.26	---	73.00	32.74	1000.0	9.000	N	19.8
7.415000	---	35.68	60.00	24.32	1000.0	9.000	N	19.8
7.415000	39.99	---	73.00	33.01	1000.0	9.000	N	19.8

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

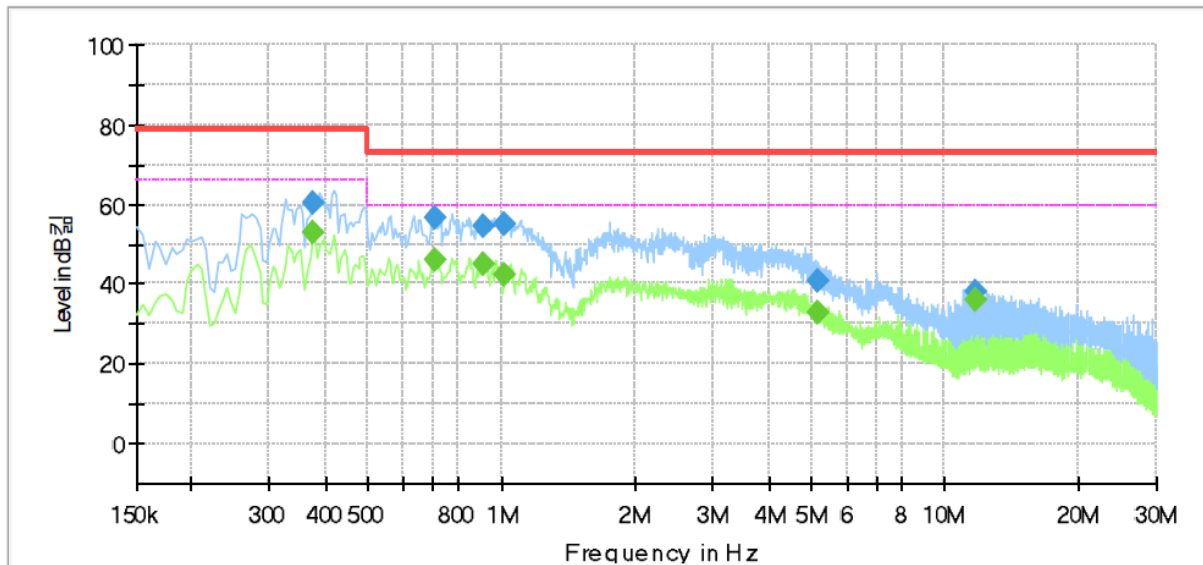
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

- PoE Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6085N
Mode	PoE_H
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.375000	---	53.12	66.00	12.88	1000.0	9.000	L1	20.7
0.375000	60.50	---	79.00	18.50	1000.0	9.000	L1	20.7
0.705000	---	45.89	60.00	14.11	1000.0	9.000	L1	20.3
0.705000	56.67	---	73.00	16.33	1000.0	9.000	L1	20.3
0.905000	---	44.95	60.00	15.05	1000.0	9.000	L1	20.2
0.905000	54.55	---	73.00	18.45	1000.0	9.000	L1	20.2
1.020000	---	42.43	60.00	17.57	1000.0	9.000	L1	20.1
1.020000	54.83	---	73.00	18.17	1000.0	9.000	L1	20.1
5.155000	---	32.71	60.00	27.29	1000.0	9.000	L1	19.7
5.155000	40.72	---	73.00	32.28	1000.0	9.000	L1	19.7
11.785000	---	36.14	60.00	23.86	1000.0	9.000	L1	19.8
11.785000	38.16	---	73.00	34.84	1000.0	9.000	L1	19.8

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))

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

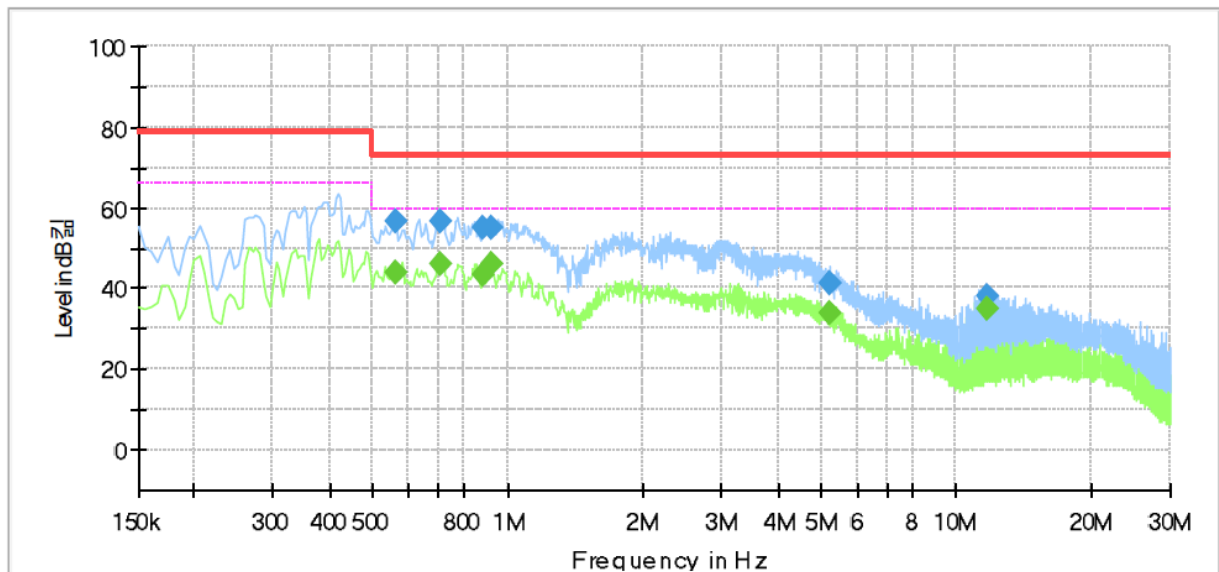
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	XNV-6085N
Mode	PoE_N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.565000	---	43.80	60.00	16.20	1000.0	9.000	N	20.4
0.565000	56.74	---	73.00	16.26	1000.0	9.000	N	20.4
0.705000	---	46.21	60.00	13.79	1000.0	9.000	N	20.3
0.705000	56.87	---	73.00	16.13	1000.0	9.000	N	20.3
0.885000	---	43.42	60.00	16.58	1000.0	9.000	N	20.2
0.885000	55.17	---	73.00	17.83	1000.0	9.000	N	20.2
0.915000	---	45.95	60.00	14.05	1000.0	9.000	N	20.2
0.915000	55.01	---	73.00	17.99	1000.0	9.000	N	20.2
5.235000	---	33.98	60.00	26.02	1000.0	9.000	N	19.7
5.235000	41.15	---	73.00	31.85	1000.0	9.000	N	19.7
11.690000	---	34.72	60.00	25.28	1000.0	9.000	N	19.9
11.690000	37.90	---	73.00	35.10	1000.0	9.000	N	19.9

◆ 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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

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

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



Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
144.00	28.00	V	1.01	7.68	2.72	38.40	40.00	1.60
200.00	17.80	V	1.01	11.81	3.16	32.77	40.00	7.23
225.00	16.20	V	0.07	12.15	3.42	31.77	40.00	8.23
300.00	21.40	V	1.00	13.42	4.10	38.92	47.00	8.08
350.00	19.10	H	2.00	14.52	4.24	37.86	47.00	9.14
400.00	17.60	H	2.00	15.61	4.60	37.81	47.00	9.19

* H : Horizontal, V : Vertical

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

- AC 24 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
61.70	21.70	V	1.00	11.31	1.81	34.82	40.00	5.18
144.00	24.60	V	1.02	7.68	2.72	35.00	40.00	5.00
179.16	20.70	V	1.06	9.18	3.06	32.94	40.00	7.06
275.00	15.70	V	1.50	12.96	3.90	32.56	47.00	14.44
300.00	16.70	H	4.00	13.42	4.10	34.22	47.00	12.78
350.00	17.50	H	2.00	14.52	4.24	36.26	47.00	10.74
400.00	15.90	H	2.00	15.61	4.60	36.11	47.00	10.89

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dB μ V] = 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-E1-17T0482-R2
Page (26) of (40)

- PoE Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dBμV]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
38.98	18.90	V	1.68	11.51	1.52	31.93	40.00	8.07
144.00	26.10	V	1.28	7.68	2.72	36.50	40.00	3.50
200.00	9.20	H	3.23	11.81	3.16	24.17	40.00	15.83
225.00	14.50	H	4.00	12.15	3.42	30.07	40.00	9.93
250.00	18.60	V	1.00	12.49	3.69	34.78	47.00	12.22
350.00	16.40	H	2.00	14.52	4.24	35.16	47.00	11.84

* H : Horizontal, V : Vertical

◆ Calculation

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

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

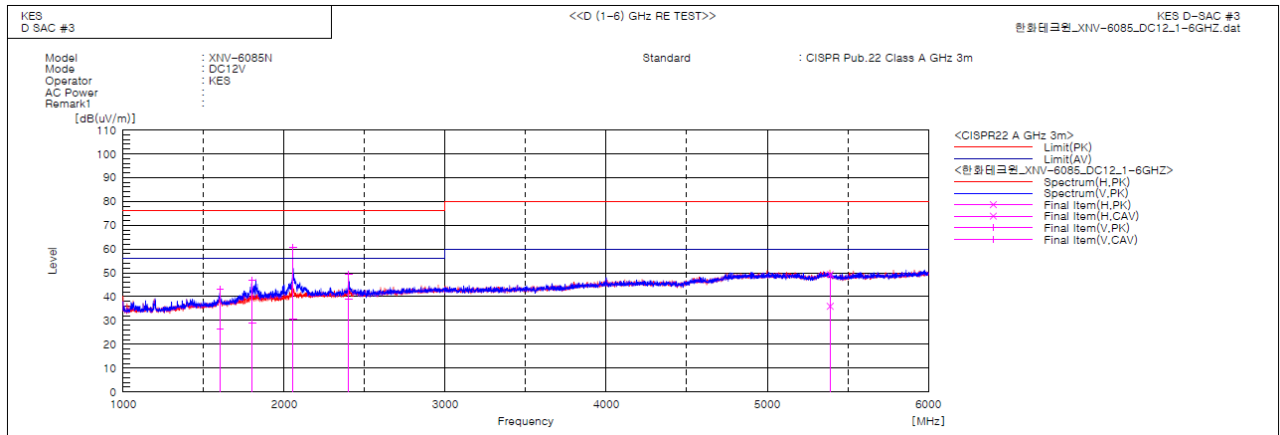
Correction Factor : ANT FACTOR + Cable loss

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



Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1602.759	V	48.3	31.4	-5.1	43.2	26.3	76.0	56.0	32.8	29.7	101.0	17.0	
2	1802.425	V	50.0	32.2	-3.2	46.8	29.0	76.0	56.0	29.2	27.0	101.0	262.3	
3	2055.799	V	61.9	31.8	-1.3	60.6	30.5	76.0	56.0	15.4	25.5	101.0	142.4	
4	2400.120	V	49.1	38.7	0.2	49.3	38.9	76.0	56.0	26.7	17.1	101.0	155.9	
5	5390.450	H	39.1	25.8	10.2	49.3	36.0	80.0	60.0	30.7	24.0	101.0	224.9	

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



KES Co., Ltd.

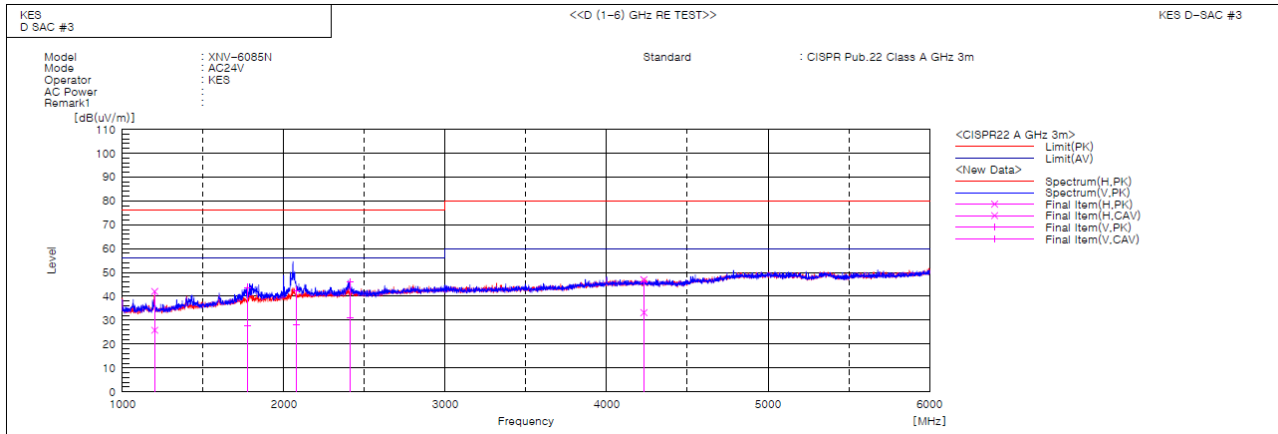
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-E1-17T0482-R2

Page (28) of (40)

- AC 24 V Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1199.759	H	50.5	34.3	-8.5	42.0	25.8	76.0	56.0	34.0	30.2	101.0	338.3	
2	1774.873	V	47.3	31.3	-3.5	43.8	27.8	76.0	56.0	32.2	28.2	101.0	194.5	
3	2078.846	V	43.7	29.2	-1.2	42.5	28.0	76.0	56.0	33.5	28.0	101.0	137.4	
4	2410.669	V	45.9	30.8	0.2	46.1	31.0	76.0	56.0	29.9	25.0	101.0	270.4	
5	4231.071	H	40.5	26.7	6.5	47.0	33.2	80.0	60.0	33.0	26.8	101.0	317.1	

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp 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



KES Co., Ltd.

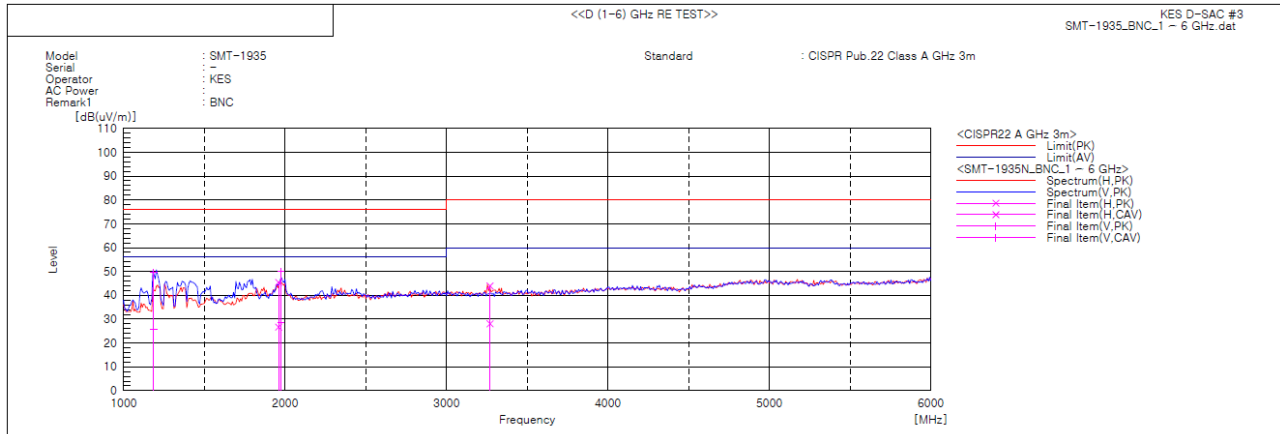
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-E1-17T0482-R2

Page (29) of (40)

- PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1184.882	V	60.0	36.1	-10.3	49.7	25.8	76.0	56.0	26.3	30.2	100.0	348.5	
2	1959.882	H	49.6	30.8	-4.2	45.4	26.6	76.0	56.0	30.6	29.4	100.0	39.9	
3	1974.571	V	54.0	32.5	-4.1	49.9	28.4	76.0	56.0	26.1	27.6	100.0	5.2	
4	3270.048	H	44.2	28.4	-0.3	43.9	28.1	80.0	60.0	36.1	31.9	100.0	34.4	

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp 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

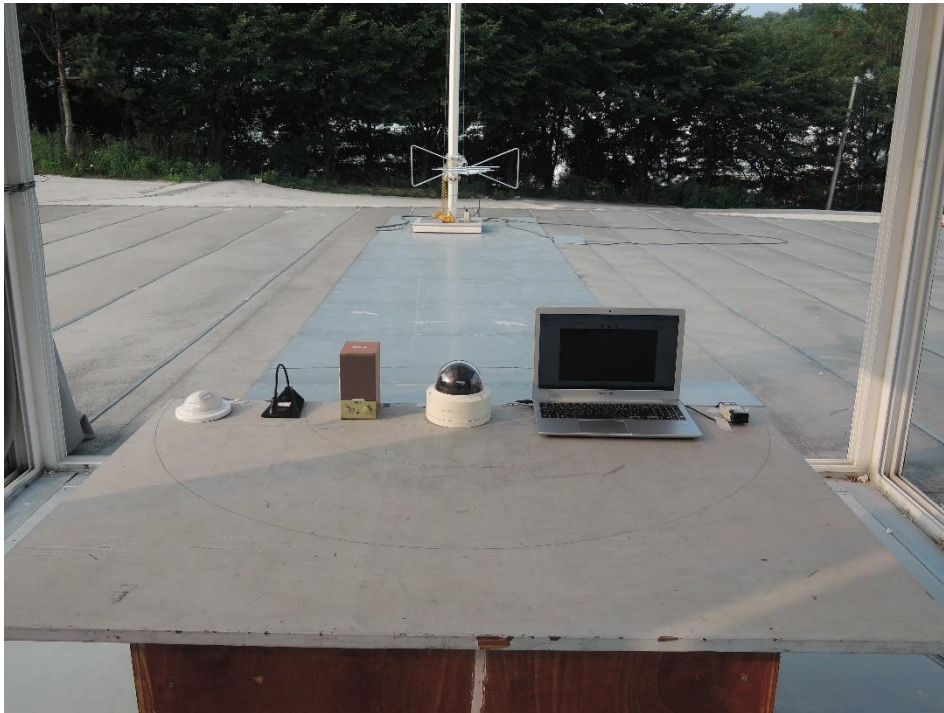
Test Setup Photos and Configuration

Conducted Voltage Emissions



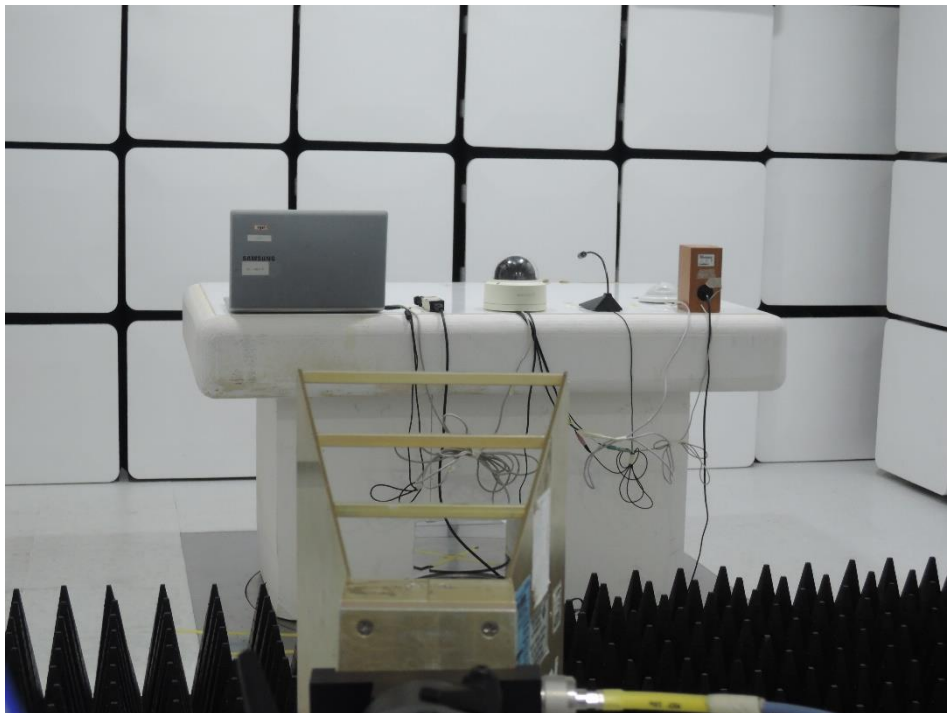
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

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

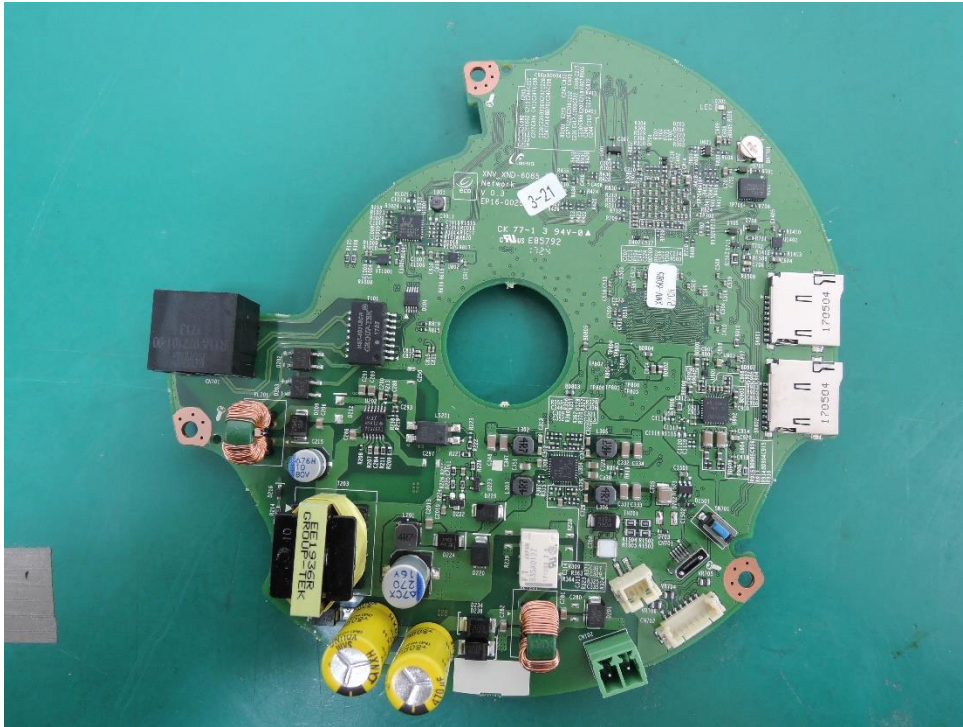
EUT Internal Photographs

(Internal View)

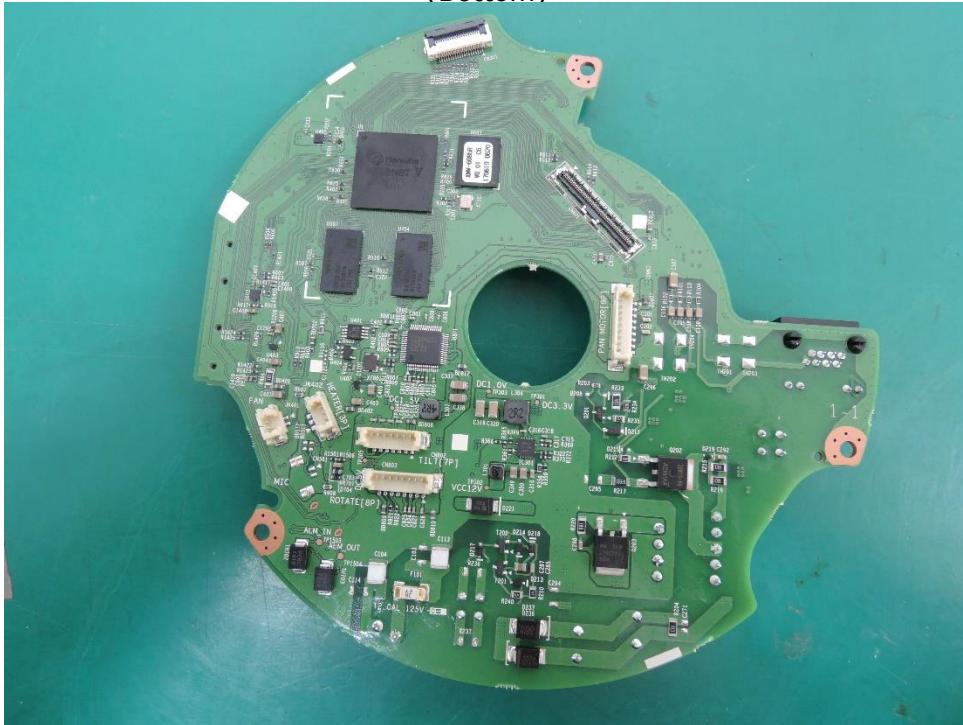


EUT Internal View – Main board

(Top)



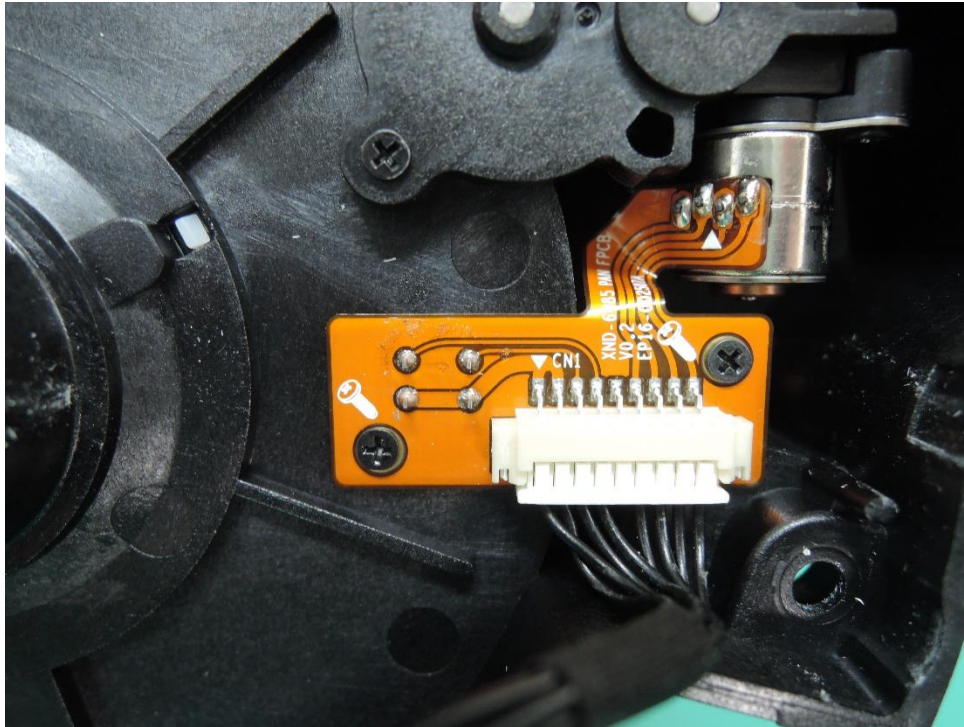
(Bottom)



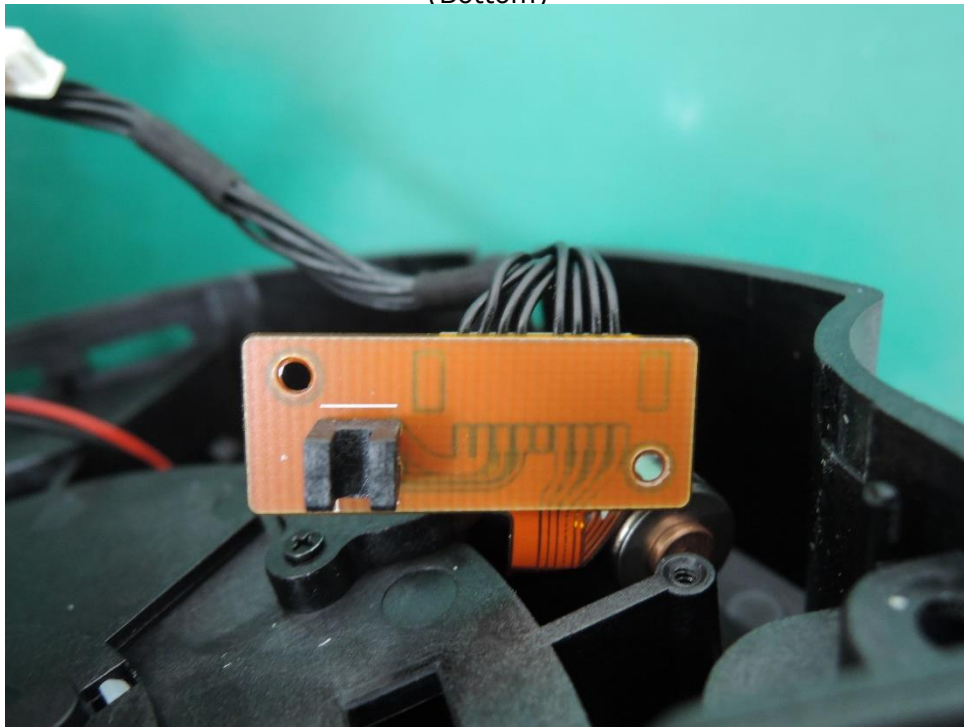
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – PAN FPCB board

(Top)



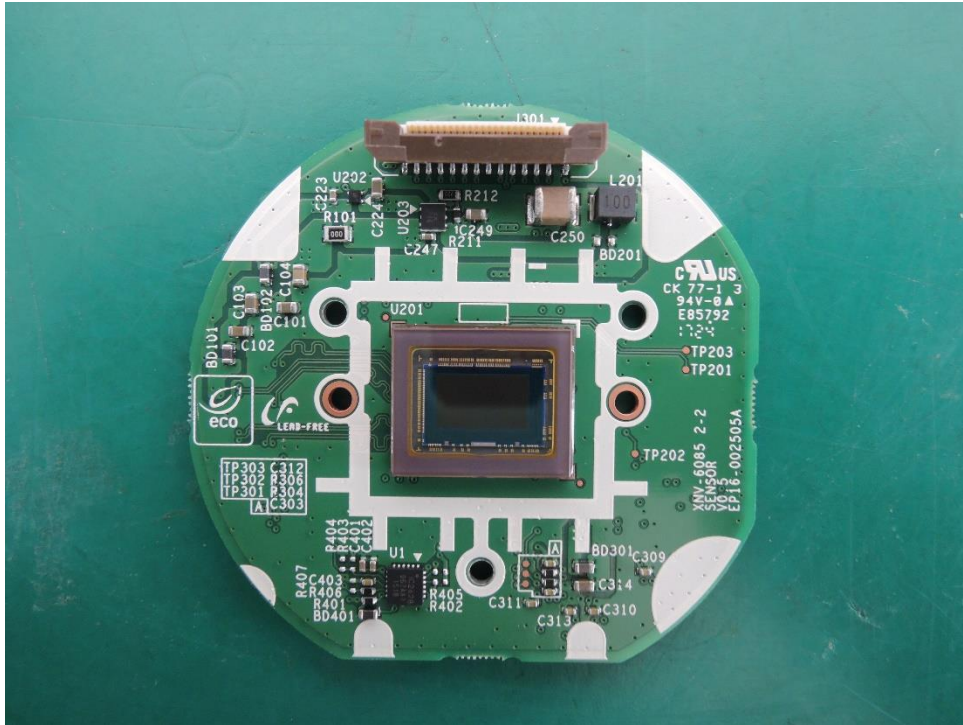
(Bottom)



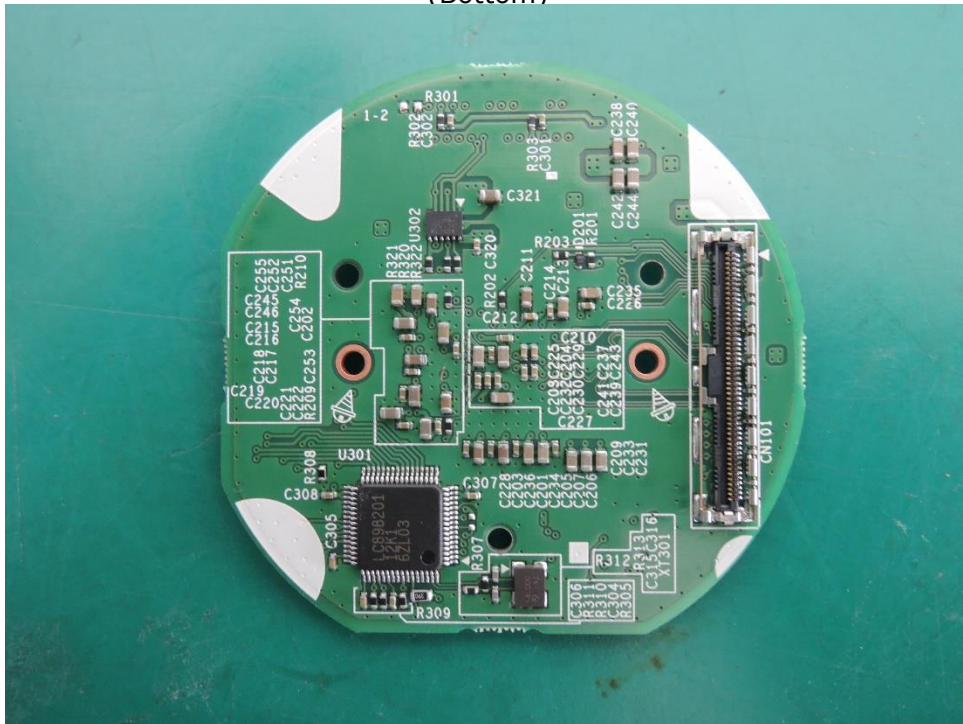
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Sensor board

[\(Top\)](#)



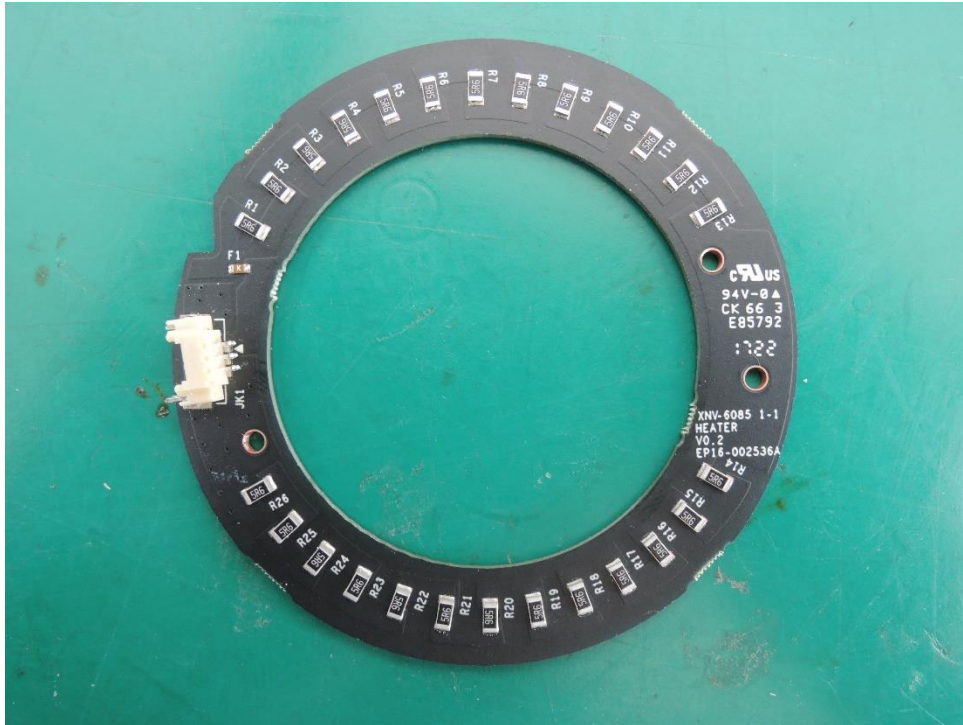
(Bottom)



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 – Heater 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 – 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



CAN ICES-3 (A)/NMB-3(A)

[LABEL VIEW]