EMC TEST REPORT

Test Report No.	:	KES-E1-19T0092
Date of Issue	:	Feb. 15, 2019
Product name	:	Network Camera
Model/Type No.	:	XND-6081RF
Variant Mode	:	-
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, KOREA
Manufacturer	:	1. Hanwha Techwin (Tianjin) Co.,Ltd. 2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. 3. D-TECH CO.,LTD.
Manufacturer Address	:	1. No.11 Weiliu Rd,Micro-Electronic Industrial Park, TEDA,Tianjin, 300385,People's Republic of China 2. Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam 3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)
Equipment authorization	:	Supply's Declaration of Conformity
Date of Receipt	:	Jan. 21, 2019
Test date	:	Jan. 22, 2019 ~ Jan. 23, 2019
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by



Min Seong, Kim
EMC Test Engineer

Reviewed by



Dong-Hun, Jang
EMC Technical Manager

This test report is not related to 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 shchoi@kes.co.kr

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 15, 2019	KES-E1-19T0092	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.

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 7
1.6 External I/O Cabling 8
1.7 EUT Operating Mode(s) 9
1.8 Configuration 9
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 at Mains Power Ports 13
2.2 Radiated Electric Field Emissions(Below 1 ㎓) 14
2.3 Radiated Electric Field Emissions(Above 1 ㎓) 15
APPENDIX A – TEST DATA 16
Conducted Emissions at Mains Power Ports 16
Radiated Electric Field Emissions(Below 1 ㎓) 18
Radiated Electric Field Emissions(Above 1 ㎓) 20
Test Setup Photos and Configuration 22
Conducted Voltage Emissions 22
Radiated Electric Field Emissions(Below 1 ㎓) 23
Radiated Electric Field Emissions(Above 1 ㎓) 24
EUT External Photographs 25
EUT Internal Photographs 26

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 shchoi@kes.co.kr

1.0 General Product Description

Main Specifications of EUT are:

Items		Description		
		XNV-6081/XNV-6081R	XND-6081V/XND-6081RV	XND-6081F/XND-6081RF
Video	Imaging Device	1/2.8" 2MP CMOS		
	Effective Pixels	1945(H) x 1097(V)		
	NETD	None		
	Pixel Size	None		
	Min. Illumination	XNV-6081/XND-6081V/XND-6081F - Color : 0.015 Lux(F1.4, 1/30sec), B/W : 0.0015 Lux(F1.4, 1/30sec) XNV-6081R/XND-6081RV/XND-6081RF - Color : 0.015 Lux(F1.4, 1/30sec), B/W : 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)	2.8~12mm(4.3x) motorized varifocal		
	Max. Aperture Ratio	F1.4(Wide) ~ F3.6(Tele)		
	Angular Field of View	H : 119.5°(Wide) ~ 27.9°(Tele) V : 62.8°(Wide) ~ 15.7°(Tele) D : 142.1°(Wide) ~ 32.0°(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		
Operational	IR Viewable Length	50m(164.04ft)		
	Camera Title	Displayed up to 85 characters		
	Day & Night	Auto (ICR)		
	Backlight Compensation	BLC, HLC, WDR, SSDR		
	Wide Dynamic Range	150dB		
	Digital Noise Reduction	SSNR V		
	Digital Image Stabilization	Support (built-in Gyro Sensor)		
	Defog	Support		
	Motion Detection	8ea, 8point Polygonal zones		
	Privacy Masking	32ea, polygonal zones - Color : Gray, Green, Red, Blue, Black, White - Mosaic		
	Gain Control	Low / Middle / High		
	White Balance	ATW / AWC / Manual / Indoor / Outdoor		
	LDC	Support		
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)		
	Video Rotation	Flip, Mirror, Hallway 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		

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 shchoi@kes.co.kr

Items		Description		
		XNV-6081/XNV-6081R	XND-6081V/XND-6081RV	XND-6081F/XND-6081RF
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/Built-in mic) 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		
	Coaxial Protocol	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	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240		
	Max. Framerate	H.265/H.264: Max. 60fps/50fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)		
Network	Smart Codec	Manual(5ea area), 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, QoS, 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		

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 shchoi@kes.co.kr

Items		Description		
		XNV-6081/XNV-6081R	XND-6081V/XND-6081RV	XND-6081F/XND-6081RF
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	-25°C ~ +60°C (-13°F ~ +140°F) / Less than 90% RH	
	Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH		
	Certification	IP66/IP67, IK10+, NEMA4X	IP52, IK10	IP52, Plenum rate(UL2820)
Electrical	Input Voltage	PoE(IEEE802.3af, Class3), 24VAC, 12VDC	PoE(IEEE802.3af, Class3), 12VDC	
	Power Consumption	XNV-6081 - PoE: Max 7.0W, typical 4.90W 12VDC: Max 5.4W, typical 3.70W 24VAC: Max 7.1W, typical 4.90W XNV-6081R - PoE: Max 12.95W, typical 10.30W 12VDC: Max 10.8W, typical 8.40W 24VAC: Max 13.3W, typical 10.40W XND-6081V/XND-6081F - PoE : Max 7.0W, typical 4.20W 12VDC : Max 5.4W, typical 3.10W XND-6081RV/XND-6081RF - PoE: Max 12.95W, typical 9.4W 12VDC: Max 10.8W, typical 7.6W		
Mechanical	Color / Material	White / Aluminum		
	RAL Code	RAL9003		
	Product dimensions / weight	XNV-6081 : Ø180x125mm(7.09x4.92"), 1.45kg(3.20 lb) XNV-6081R : Ø180x125mm(7.09x4.92"), 1.75kg(3.86 lb)	Ø160x125mm (6.30x4.92"), 1.45kg(3.20 lb)	Ø205x155mm(8.07x6.10"), 1.80kg(3.97 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 shchoi@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	XND-6081RF	-	Hanwha Techwin (Tianjin) Co.,Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	GS728TPP	-	NETGEAR	-
Notebook	NT500R5M	0Q7491AJ800552B	Samsung Electronics Co., Ltd.	-
Notebook Adapter	A13-040N2A	AD-4019C	Chicony Power Technology Co., Ltd.	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
MIC	MP1000	-	-	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Button Alarm	-	-	-	-
Micro SD Card	-	-	SanDisk	4 GB
Smart Phone	LG-SU760	108KPQJ0186212	LG Electronics 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 shchoi@kes.co.kr

1.6 External I/O Cabling

■ 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	3.5	U
	3.5 ㎜	Speaker	3.5 ㎜	1.4	U
	3.5 ㎜	MIC	3.5 ㎜	1.4	U
	2 Pin	Alarm	Line-In	3.0	U
	2 Pin	Button Alarm	Line-Out	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
Notebook	3.5 ㎜	Smart Phone	3.5 ㎜	1.0	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)	PoE Adaptor	RJ-45 (PoE)	3.5	U
	3.5 ㎜	Speaker	3.5 ㎜	1.4	U
	3.5 ㎜	MIC	3.5 ㎜	1.4	U
	2 Pin	Alarm	Line-In	3.0	U
	2 Pin	Button Alarm	Line-Out	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
Notebook	3.5 ㎜	Smart Phone	3.5 ㎜	1.0	U
	RJ-45 (DATA)	PoE Adaptor	RJ-45 (DATA)	3.0	U

* Unshielded=U, Shielded=S

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 shchoi@kes.co.kr

1.7 EUT Operating Mode(s)

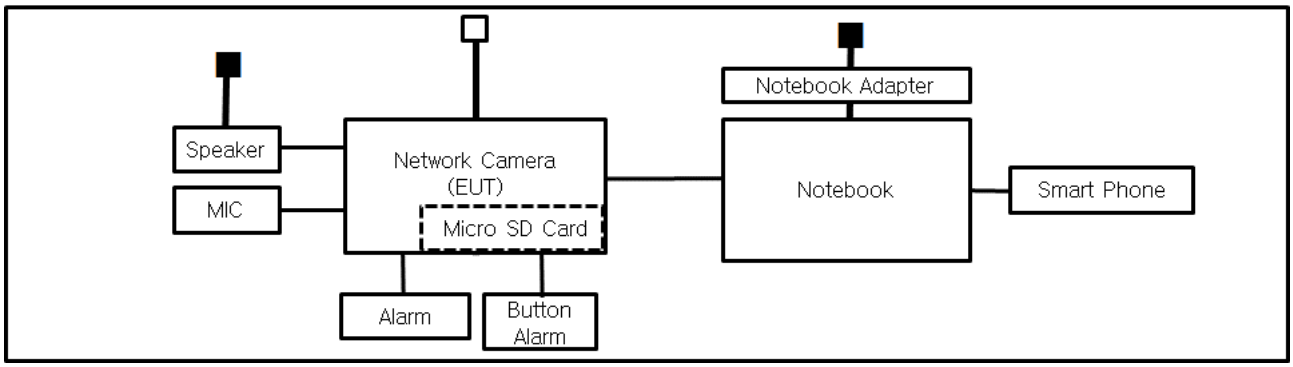
Test mode	operating
DC 12 V	EUT Monitoring, Ping Test
PoE	EUT Monitoring, Ping Test

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

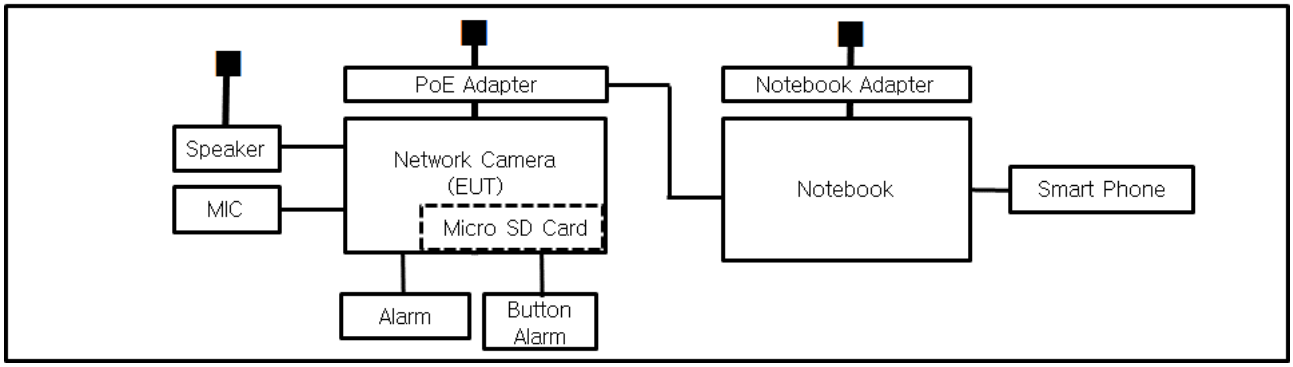
1.8 Configuration

■ AC Main
□ DC Main

■ DC 12 V



■ PoE



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 shchoi@kes.co.kr

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, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**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, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	23298-1
JAPAN	**VCCI**	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	R-4308, C-4798, T-2311, G-914
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 17 07 01633 001

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 shchoi@kes.co.kr

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011		
☐ EN 61000-6-1:2007		
☐ EN 61000-6-4:2007 +A1:2011		
☐ EN 61000-6-2:2005		
☐ EN 55011:2007 +A1:2010	☐ Group 1 ☐ Class A	☐ Group 2 ☐ Class B
☐ EN 55014-1:2006 +A2:2011		
☐ EN 55014-2:1997 +A2:2008		
☐ EN 55015:2013		
☐ EN 55032:2015	☐ Class A	☐ Class B
☐ EN 55024:2010		
☐ EN 50130-4:2011 +A1:2014		
☐ EN 61000-3-2:2014		
☐ EN 61000-3-3:2013		
☐ EN 61326-1:2013		

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 shchoi@kes.co.kr

☐ **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 C63.4-2014	☒ Class A	☐ Class B
☒ **IC Regulation ICES-003 : 2016**		
☐ CAN/CSA CISPR 22-10	☐ Class A	☐ Class B
☒ ANSI C63.4-2014	☒ 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 shchoi@kes.co.kr

2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

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: ℃
Relative Humidity: % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A: It is not tested apply because it is powered by DC and PoE.

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 shchoi@kes.co.kr

2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Jan. 22, 2019

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

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: 23,8 ℃
Relative Humidity: 51,4 % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

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 shchoi@kes.co.kr

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Jan. 23, 2019

Test Location
SEMI ANECHOIC CHAMBER #4(10 m)

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
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 08, 2020
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	09, 04, 2019

Test Conditions
Temperature: 23,9 ℃
Relative Humidity: 50,9 % R.H.

Frequency Range of Measurement
1 ㎓ to 5 ㎓

Instrument Settings
IF Band Width: 1 ㎒

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 shchoi@kes.co.kr

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

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 shchoi@kes.co.kr

NEUTRAL LINE

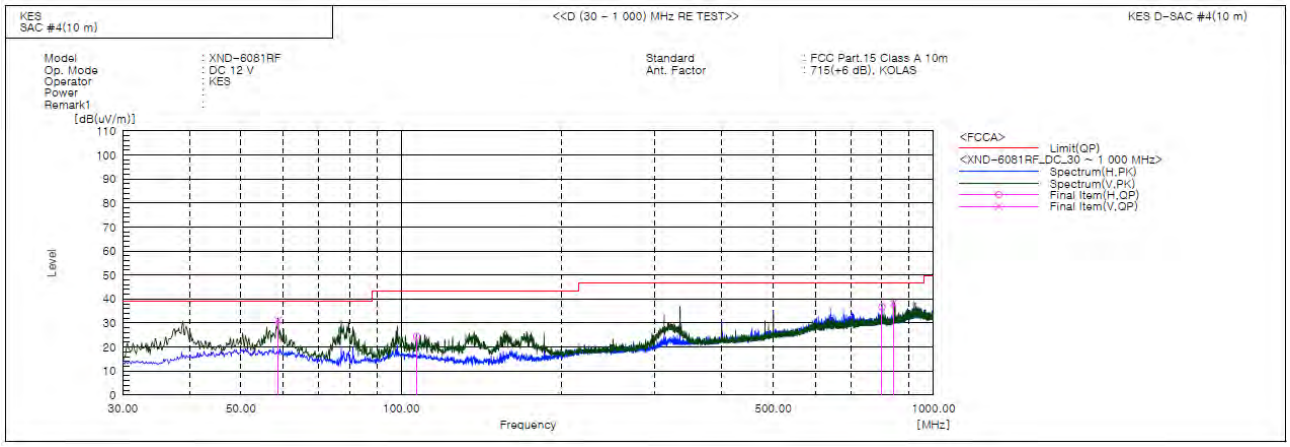
N/A

◆ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
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 shchoi@kes.co.kr

Radiated Electric Field Emissions(Below 1 ㎓)

■ DC 12 V

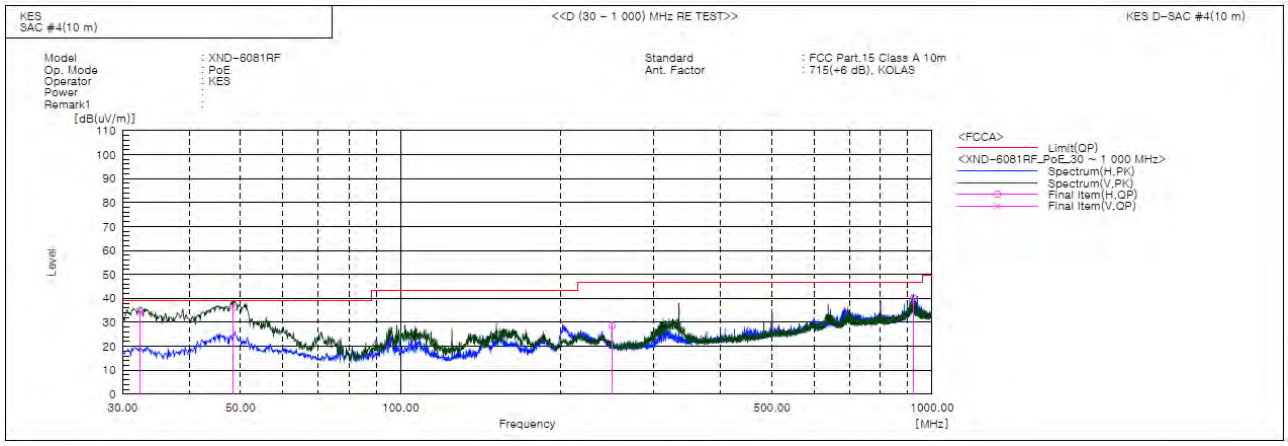


Final Result

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	58.736	V	53.6	-22.5	31.1	39.0	7.9	144.0	275.0	
2	106.994	H	47.1	-22.7	24.4	43.5	19.1	299.0	191.0	
3	800.059	H	44.6	-7.9	36.7	46.5	9.8	237.0	158.0	
4	839.950	V	45.2	-7.0	38.2	46.5	8.3	100.0	318.0	

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 shchoi@kes.co.kr

■ PoE



Final Result

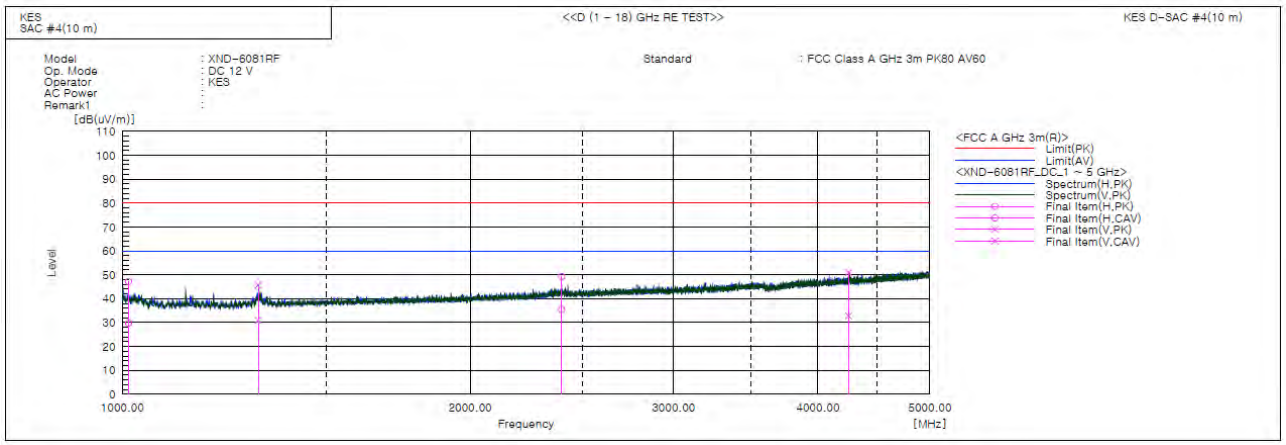
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	32.361	V	59.7	-25.3	34.4	39.0	4.6	100.0	64.0	
2	48.315	V	58.2	-21.7	36.5	39.0	2.5	120.0	131.0	
3	250.003	H	48.9	-20.2	28.7	46.5	17.8	400.0	132.0	
4	922.791	H	46.1	-5.8	40.3	46.5	6.2	371.0	242.0	

♦ Calculation – SAC #4(10 m)
Result(QP) [dB(㎶/m)] = (Reading(QP)[dB(㎶)] + c.f[dB(1/m)]
Margin(QP)[dB] = Limit[dB(㎶/m)] - Result(QP) [dB(㎶/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

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 shchoi@kes.co.kr

Radiated Electric Field Emissions(Above 1 ㎓)

■ DC 12 V

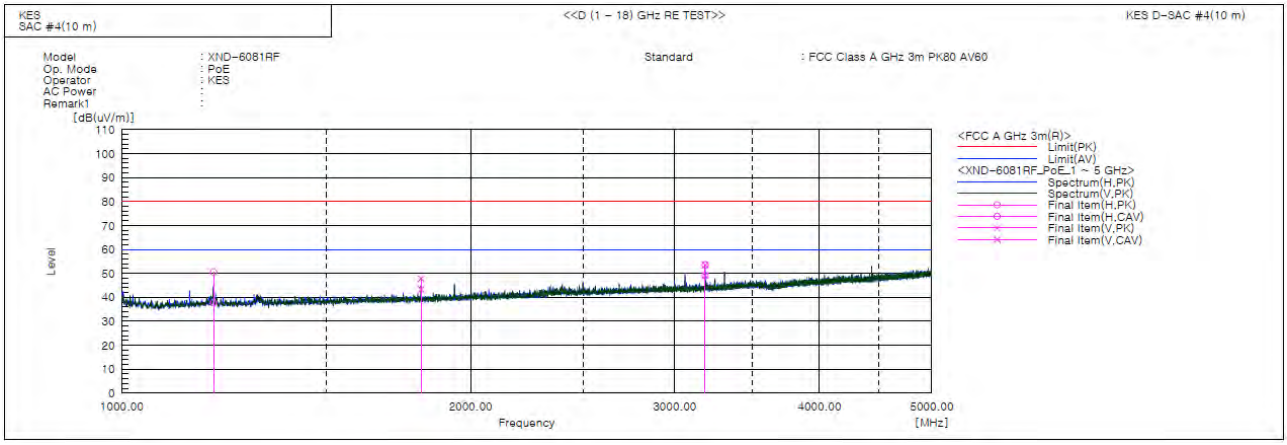


Final Result

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	1012.482	H	53.6	36.2	-6.4	47.2	29.8	80.0	60.0	32.8	30.2	253.0	195.0	
2	1311.010	V	49.8	35.1	-4.1	45.7	31.0	80.0	60.0	34.3	29.0	183.0	320.0	
3	2399.931	H	48.0	34.3	1.2	49.2	35.5	80.0	60.0	30.8	24.5	341.0	197.0	
4	4250.820	V	42.6	24.4	8.4	51.0	32.8	80.0	60.0	29.0	27.2	100.0	2.0	

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 shchoi@kes.co.kr

■ 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	1200.013	H	55.5	42.6	-4.9	50.6	37.7	80.0	60.0	29.4	22.3	310.0	24.0	
2	1812.556	V	49.3	44.9	-1.5	47.8	43.4	80.0	60.0	32.2	16.6	100.0	85.0	
3	3187.600	H	49.5	45.1	4.0	53.5	49.1	80.0	60.0	26.5	10.9	294.0	103.0	
4	3187.613	V	49.5	45.1	4.0	53.5	49.1	80.0	60.0	26.5	10.9	191.0	103.0	

♦ Calculation

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

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

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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

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 shchoi@kes.co.kr

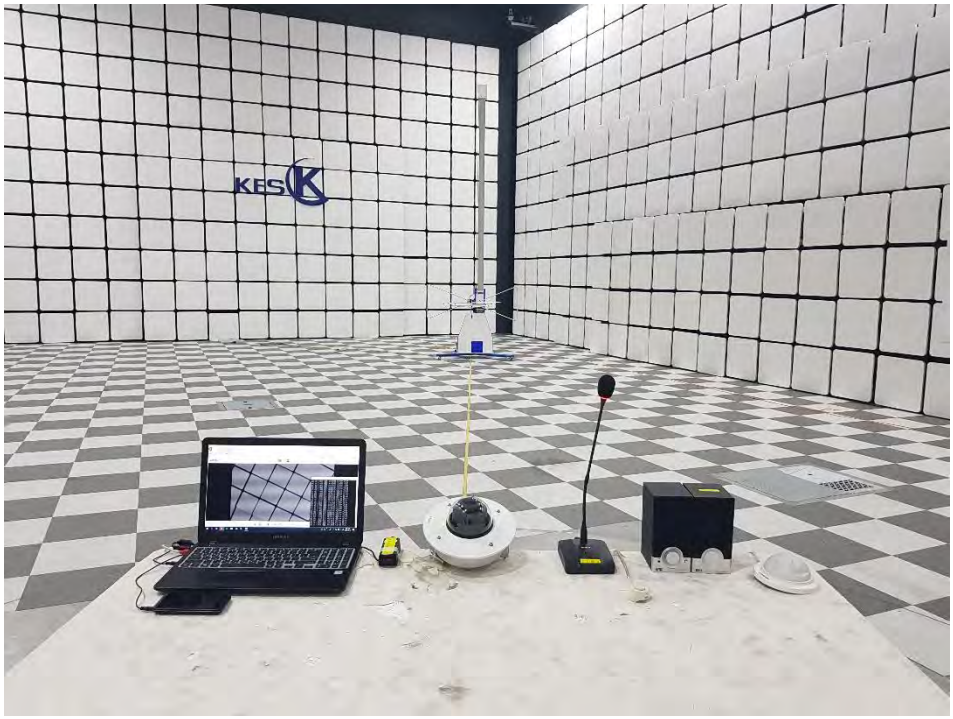
Test Setup Photos and Configuration

Conducted Voltage Emissions

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 shchoi@kes.co.kr

Radiated Electric Field Emissions(Below 1 ㎓)

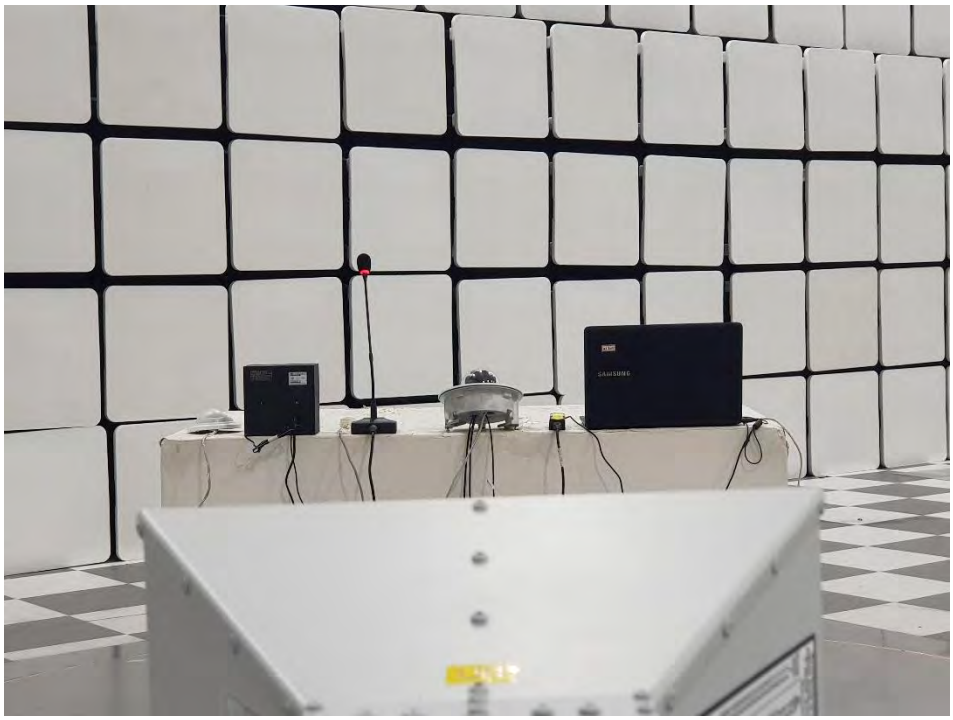




This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Radiated Electric Field Emissions(Above 1 ㎓)





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 shchoi@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 shchoi@kes.co.kr

EUT Internal Photographs

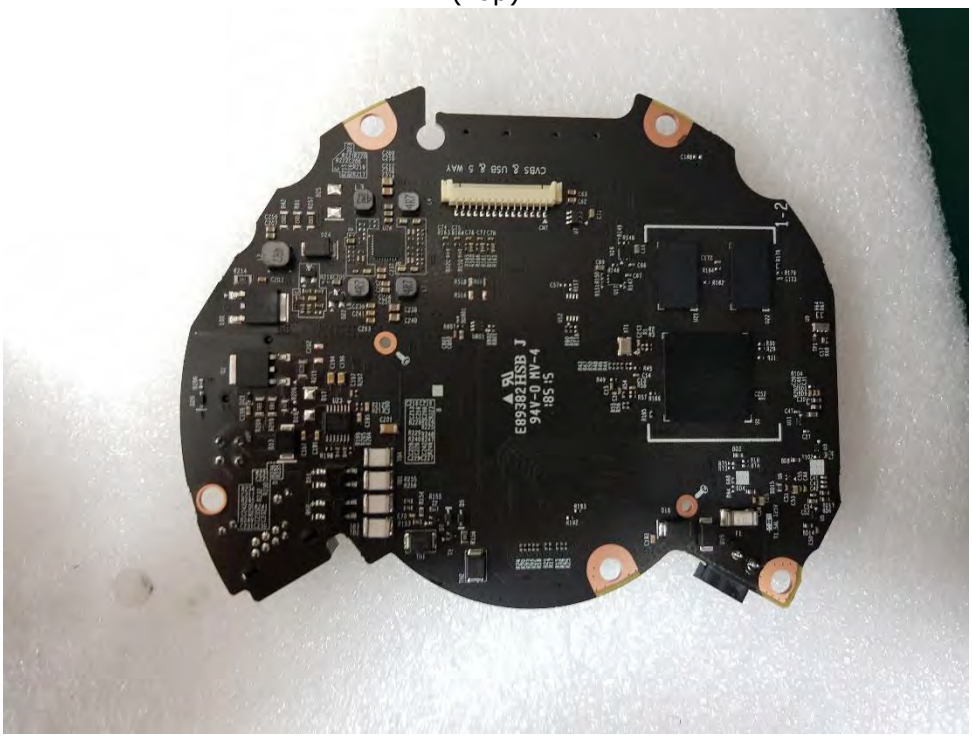
(Internal View)



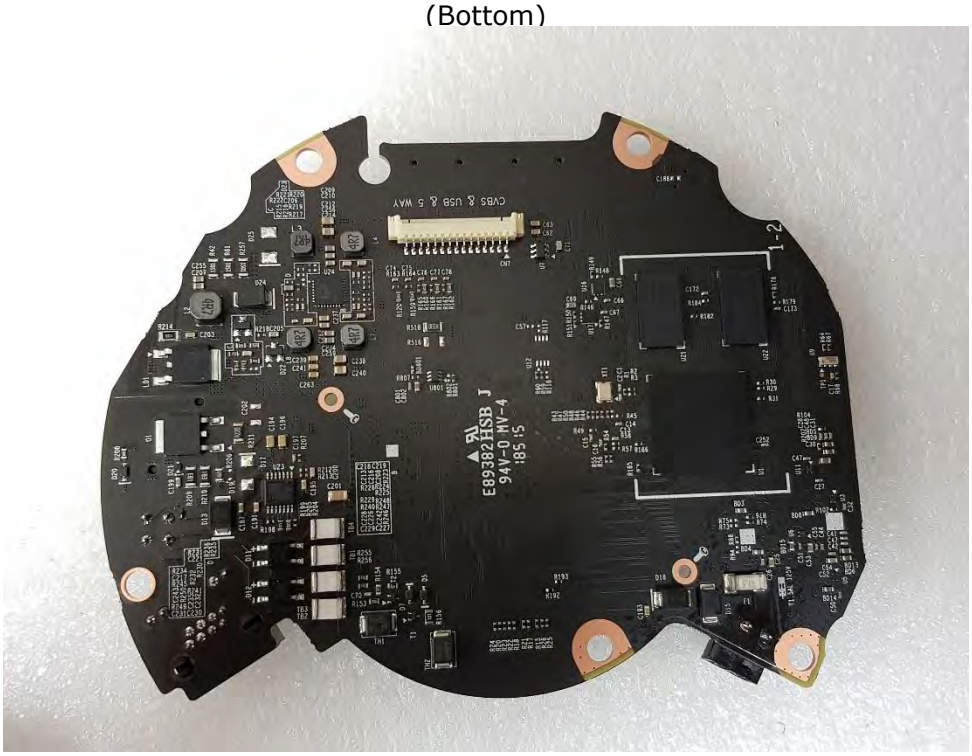
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board

(Top)



(Bottom)



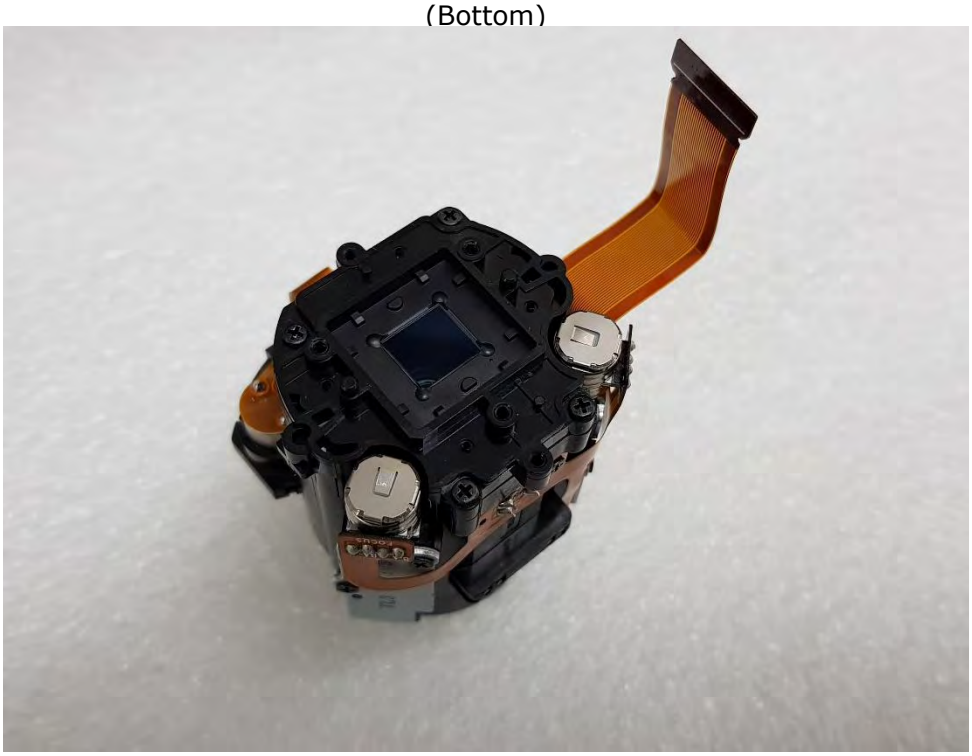
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Lens

(Top)



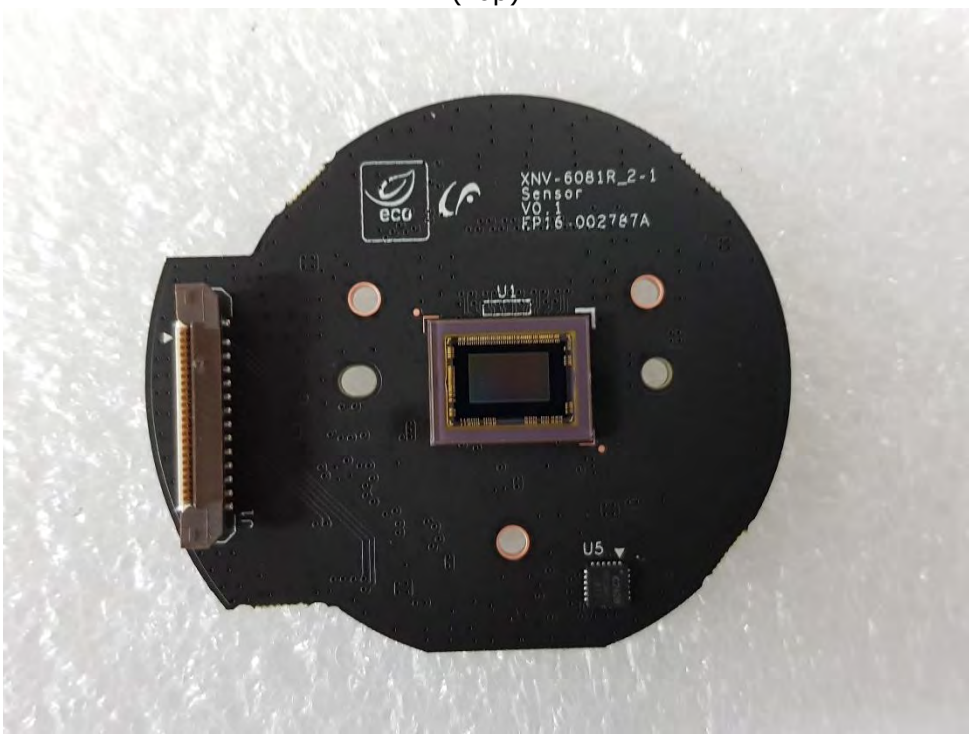
(Bottom)



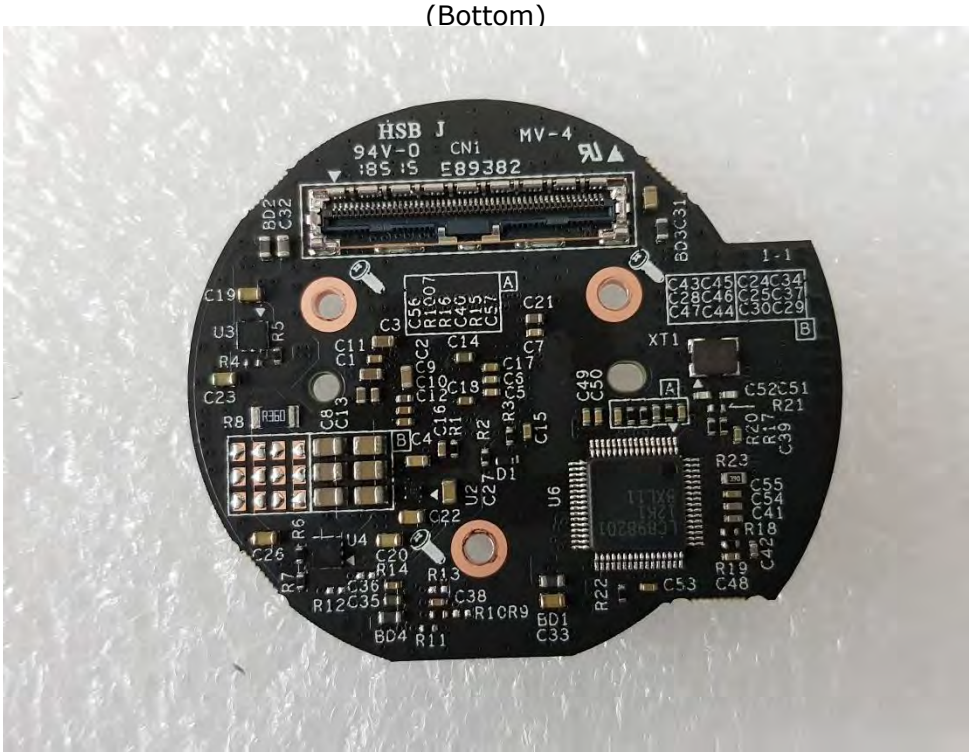
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Lens Board

(Top)



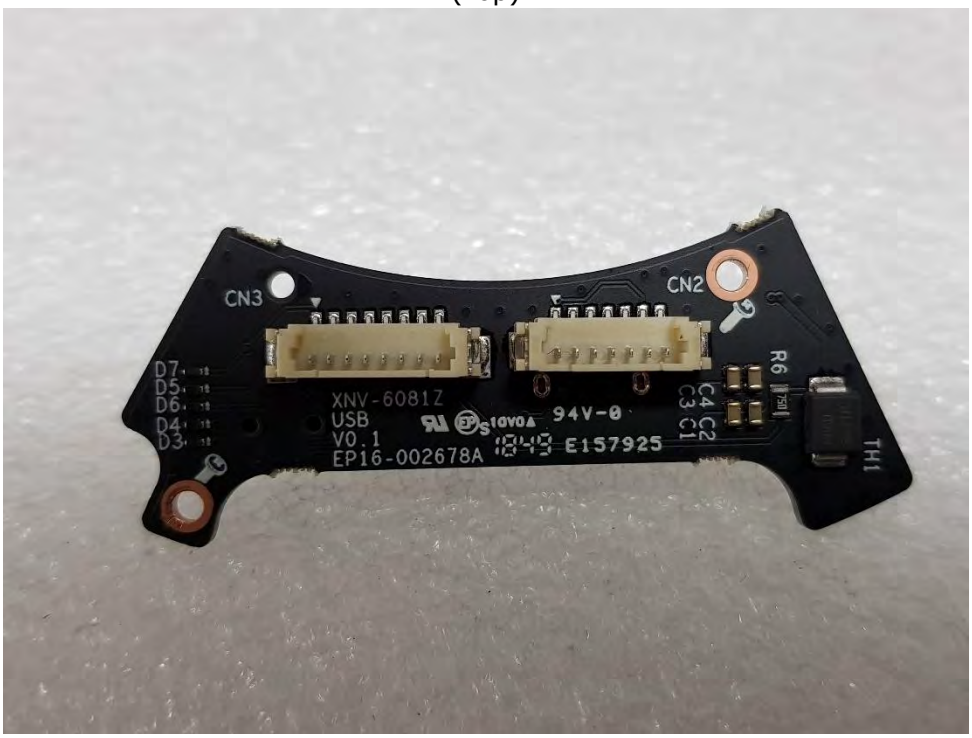
(Bottom)



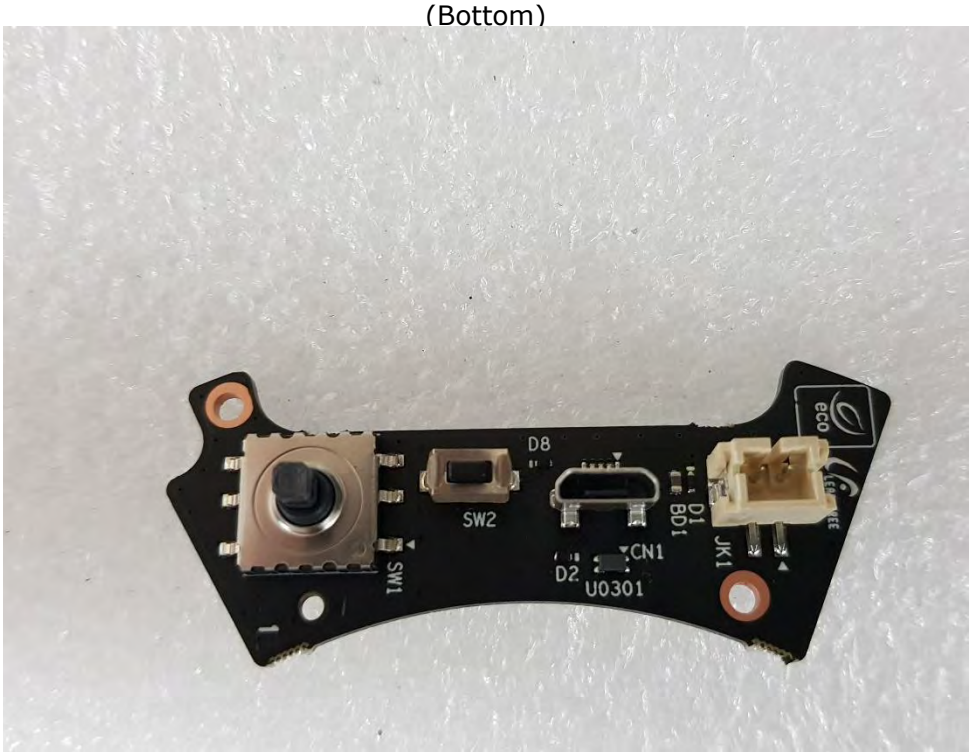
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Switch Board

(Top)

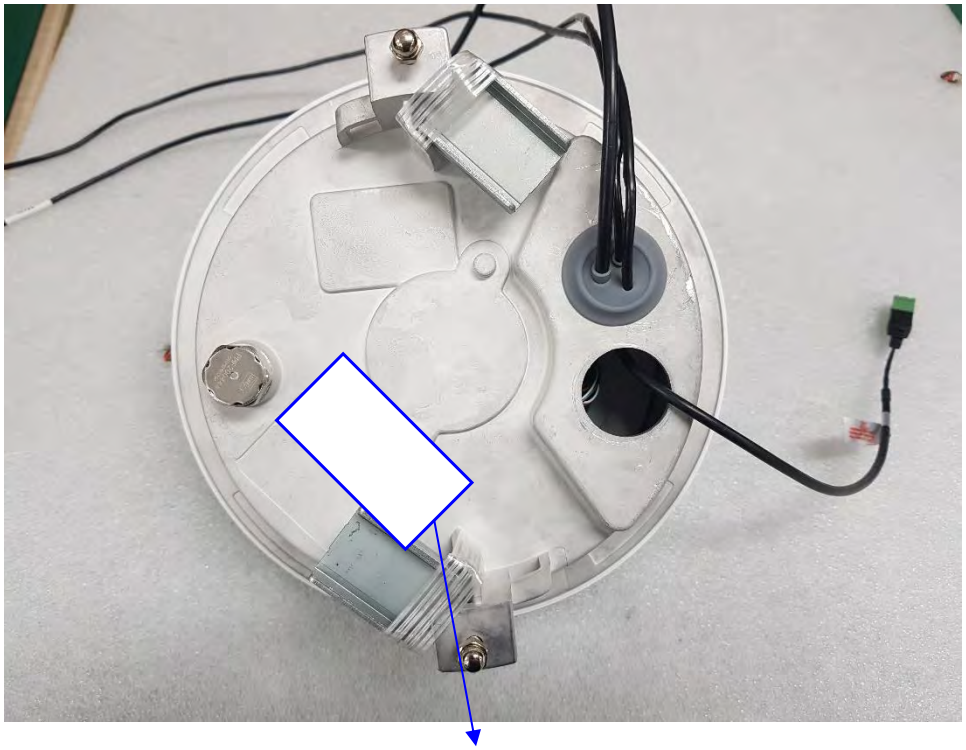


(Bottom)



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 shchoi@kes.co.kr

Label Photographs



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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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 shchoi@kes.co.kr