EMC TEST REPORT

Test Report No.	:	KES-EM-22T0270
Date of Issue	:	Mar. 24, 2022
Product name	:	CCTV CAMERA
Model/Type No.	:	PNM-12082RVD
Variant Model	:	-
Applicant	:	Hanwha Techwin Co., Ltd.
Applicant Address	:	6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Manufacturer	:	1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. 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)
Equipment authorization	:	**Supplier's Declaration of Conformity**
Date of Receipt	:	Feb. 23, 2022
Test date	:	Mar. 02, 2022 ~ Mar. 04, 2022
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Hyun, Won
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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
Mar. 24, 2022	KES-EM-22T0270	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 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) 7
1.8 Configuration 8
1.9 Remarks when standards applied 9
1.10 Calibration Details of Equipment Used for Measurement 9
1.11 Test Facility 9
1.12 Laboratory Accreditations and Listings 9
2.0 Test Regulations 10
2.1 Conducted Emissions at Mains Power Ports 11
2.2 Radiated Electric Field Emissions(Below 1 ㎓) 12
2.3 Radiated Electric Field Emissions(Above 1 ㎓) 13
APPENDIX A – TEST DATA 14
Conducted Emissions at Mains Power Ports 14
Radiated Electric Field Emissions(Below 1 ㎓) 16
Radiated Electric Field Emissions(Above 1 ㎓) 18
Test Setup Photos and Configuration 19
Conducted Emissions at Mains Power Ports 19
Radiated Electric Field Emissions(Below 1 ㎓) 20
Radiated Electric Field Emissions(Above 1 ㎓) 21
EUT External Photographs 22
EUT Internal Photographs 23

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 :

Video	
Imaging Device	1/2.8" CMOS x 2CH
Resolution	3328x1872, 3072x1728, 2592x1944, 2688x1520, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: 6MP Max.15fps MJPEG: Max.15fps
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.16lux(F1.67, 1/30sec, 30IRE) BW: 0.016lux(F1.67, 1/30sec, 30IRE), 0lux(IR LED on)
Video Out	USB: micro USB Type B, 1280x720 for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	3.54~6.69mm(1.9x) motorized varifocal
Max. Aperture Ratio	F1.67(Wide)~F2.64(Tele)
Angular Field of View	H: 95.08°(Wide)~47.64°(Tele) V: 50.78°(Wide)~26.7°(Tele) D: 112.6°(Wide)~54.74°(Tele)
Min. Object Distance	1.5m(4.92ft)
Focus Control	Simple focus
Lens Type	Fixed IRIS
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0~355°/0~78°/0~180°
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SSDR
Wide Dynamic Range	extremeWDR(120dB)
Digital Noise Reduction	WiseNR, SSNRV
Digital Image Stabilization	None
Defog	Support
Motion Detection	8ea, 8point Polygonal zones
Privacy Masking	32ea, Quadrangle zones - Color: Grey/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)
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view (90°/270°)
Analytics	Analytics events* - Defocus detection, Motion detection, Tampering, Virtual line(Crossing/Direction), Virtual area(Loitering/Enter/Exit) * Support Audio detection, Sound classification via optional SPM-4210 I/O box
Business Intelligence	None
Serial Interface	None
Alarm I/O	* Support Alarm via optional SPM-4210 I/O box
Alarm Triggers	Analytics, Network disconnect, Alarm input via optional SPM-4210 I/O box
Alarm Events	When alarm trigger occurred - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) - * Alarm output via optional SPM-4210 I/O box
Audio Streaming	None
Audio In	* Audio in via optional SPM-4210 I/O box
Audio Out	* Audio out via optional SPM-4210 I/O box
IR Viewable Length	WiseIR 15m(49.21ft)
IR Illuminator (Optional)	None
IR Radiation angle	None
IR LED	None
IR Wavelength	None
IR Operation	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None
Color Palettes	None
Radiometry	
Temperature Detect Range	None
Temperature Accuracy	None
Temperature Detection	None
Additional	None

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

Network	
Ethernet	Metal shielded RJ-45 (10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/Baseline/High, MJPEG
Audio Compression	None
Smart Codec	Manual(5ea area), WiseStreamⅡ
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)
SIP support (VoIP, Peer-to-peer, SIP/P	None
Security	TPM 2.0 (FIPS 140-2 level 2) HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Device Certificate(Hanwha Techwin Root CA, pre-installed) Secure by default certificate Secure OS/Boot/Storage, Verify firmware forgery
Application Programming Interface	ONVIF Profile S/T SUNAPI(HTTP API) Open platform
General	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Greek, Hungarian
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 1slot Max. 512GB
Memory	4GB RAM, 512MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-40°C~+55°C(-40°F ~ +131°F) / Less than 95% RH(Non-condensing) * Start up should be above at -35°C
Storage Temperature / Humidity	-50°C~+60°C(-58°F~+140°F) / Less than 95% RH(Non-condensing)
Certification	IP66, IK10, NEMA4X
Input Voltage	PoE+(IEEE802.3at, Class4)
Power Consumption	PoE+: Max 20W, typical 15.3W
Mechanical	
Color / Material	White / Aluminum Hard-coated dome bubble
RAL Code	RAL9003
Product Dimensions / Weight	215(W)x135(D)x93.2(H)mm(8.46"x5.31"x3.67") / 1330g
Compatible Conduit hole / Gangbox	3/4" (M25) single, double, 4" octagon, 4" square
Hanging Mount (Dome)	None
Skin Cover (Dome)	None
Weather Cap (Dome)	None
Power Module	None
Backbox	None
Certifications & Standards	
Network	None
EMC	None
Safety	None
Environment	None
Video	None
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 60.9m(199.82ft) / Tele: 150.8m(494.65ft)
Observe (63PPM/ 19PPF)	Wide: 24.4m(79.93ft) / Tele: 60.3m(197.86ft)
Recognize (125PPM/ 38PPF)	Wide: 12.2m(39.96ft) / Tele: 30.2m(98.93ft)
Identify (250PPM/ 76PPF)	Wide: 6.1m(19.98ft) / Tele: 15.1m(49.46ft)

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.

☒ PoE

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
CCTV CAMERA	PNM-12082RVD	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	P95G001	9JM8HT2	Wistron Corporation	-
Notebook Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Micro SD Card	-	-	DASHCAM7	32 GB

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

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
CCTV CAMERA (EUT)	RJ-45	PoE Adapter	RJ-45	4.0	S
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	RJ-45	PoE Adapter	RJ-45	2.5	U
	DC Jack	Notebook Adapter	DC Jack	2.0	S

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

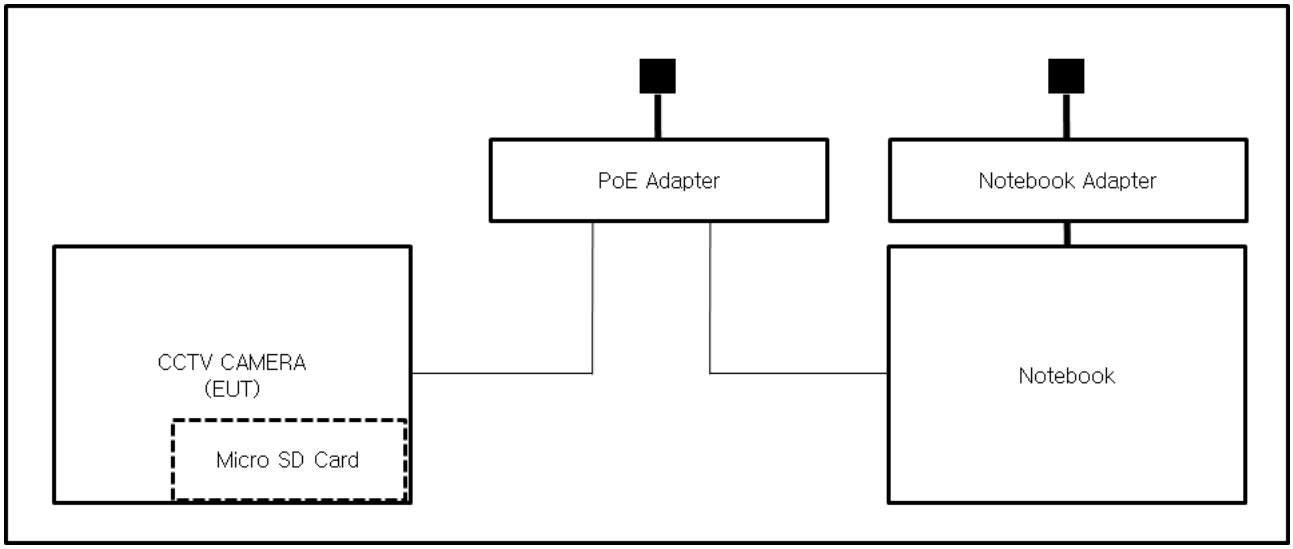
Test mode	operating
Operating Mode	EUT Monitoring, Ping Test

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
Web Viewer	-	Hanwha 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 shchoi@kes.co.kr

1.8 Configuration

■ AC Main
□ DC Main



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

Micro 5 Pin port was excluded from the test as it is an unused port.

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 C63.4a-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 , 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-20056, C-20036, T-20040, G-20057
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 001633 0004

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:

☒ **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 32:17	☐ Class A	☐ Class B
☒ ANSI C63.4a-2017	☒ Class A	☐ Class B

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
Mar. 02, 2022

Test Location
Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions
Temperature: (23,3 ± 0,1) ℃
Relative Humidity: (43,2 ± 0,1) % 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
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

2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Mar. 02, 2022

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions
Temperature: (23,2 ± 0,2) ℃
Relative Humidity: (43,4 ± 0,1) % 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
Feb. 04, 2022

Test Location
SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

Test Conditions
Temperature: (22,9 ± 0,1) ℃
Relative Humidity: (43,2 ± 0,1) % 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

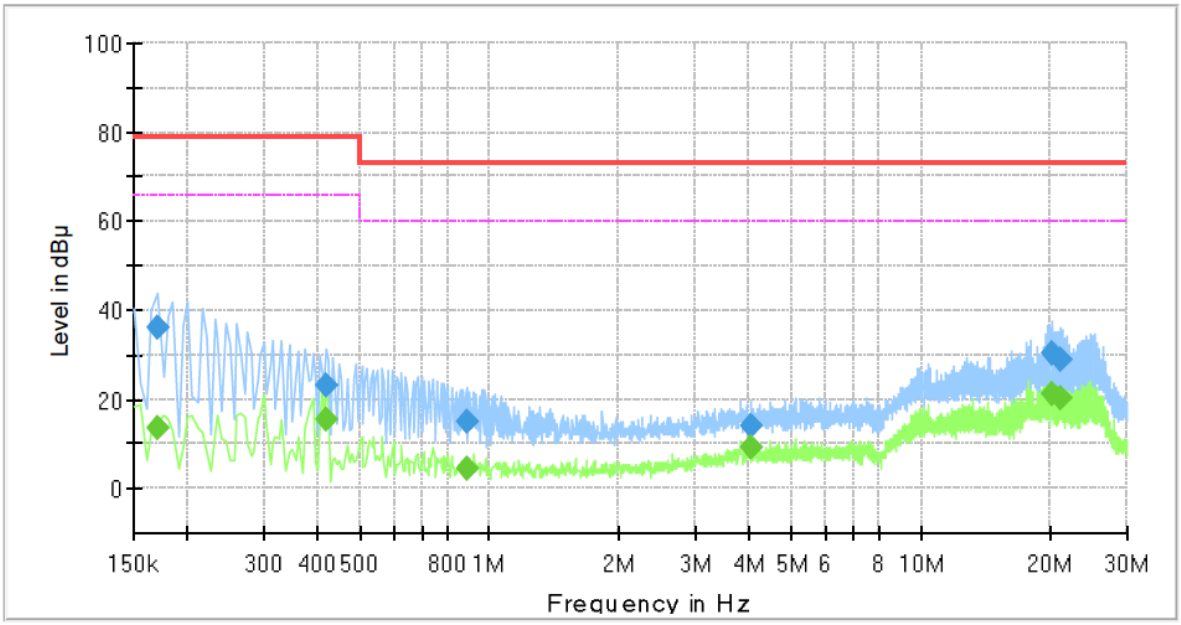
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-12082RVD
Phase:	
Mode:	H
Operator Name:	KES



Final_Result

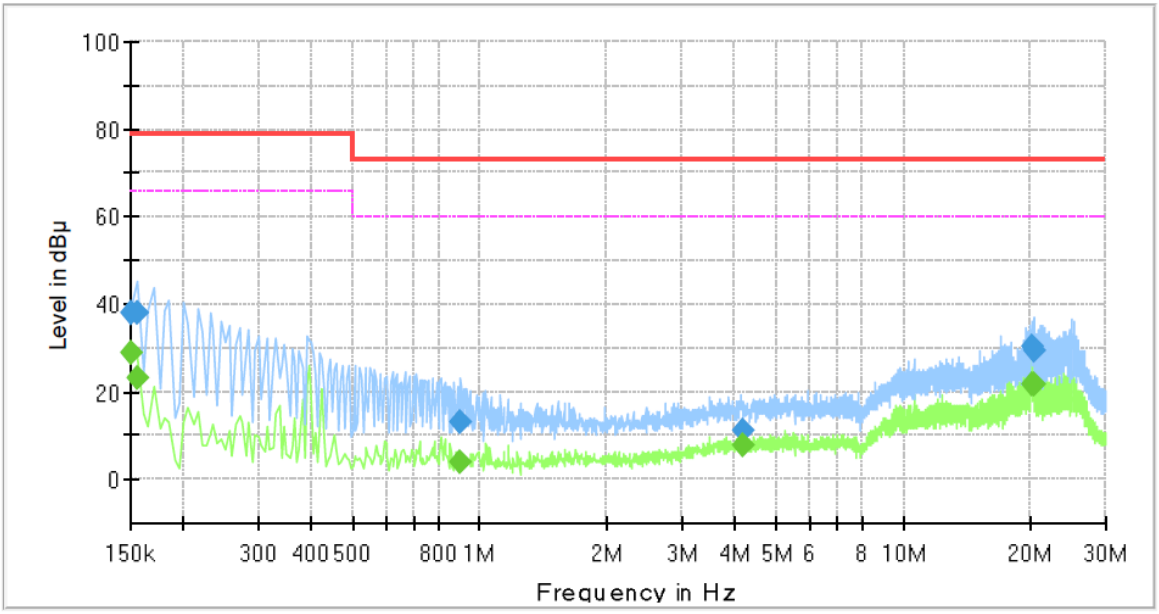
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	13.75	66.00	52.25	1000.0	9.000	L1	19.4
0.170000	36.21	---	79.00	42.79	1000.0	9.000	L1	19.4
0.420000	---	15.52	66.00	50.48	1000.0	9.000	L1	19.6
0.420000	23.19	---	79.00	55.81	1000.0	9.000	L1	19.6
0.885000	---	4.32	60.00	55.68	1000.0	9.000	L1	20.1
0.885000	14.74	---	73.00	58.26	1000.0	9.000	L1	20.1
4.045000	---	9.11	60.00	50.89	1000.0	9.000	L1	19.9
4.045000	13.94	---	73.00	59.06	1000.0	9.000	L1	19.9
20.180000	---	21.41	60.00	38.59	1000.0	9.000	L1	20.1
20.180000	30.34	---	73.00	42.66	1000.0	9.000	L1	20.1
21.025000	---	20.45	60.00	39.55	1000.0	9.000	L1	20.1
21.025000	28.78	---	73.00	44.22	1000.0	9.000	L1	20.1

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

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-12082RVD
Phase:	
Mode:	N
Operator Name:	KES



Final_Result

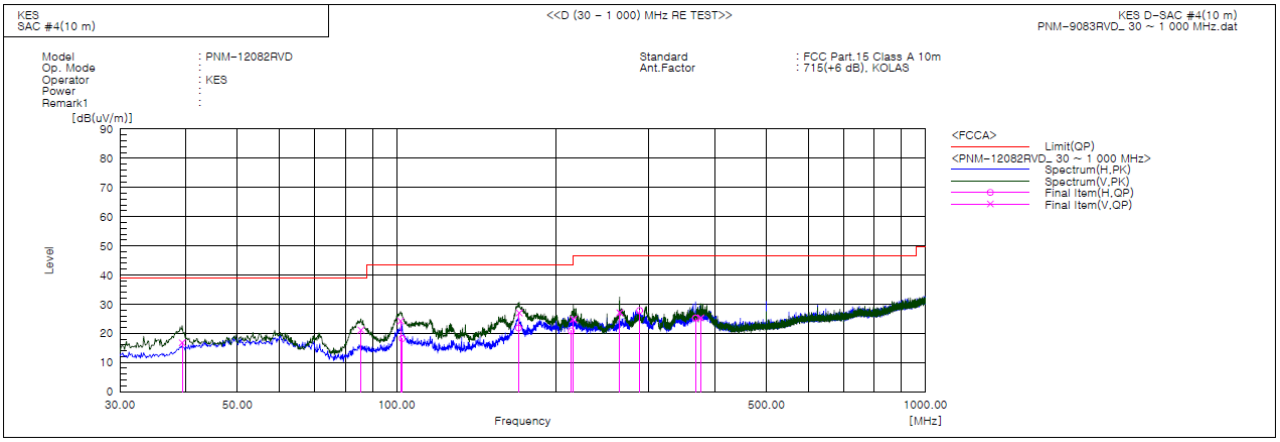
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	28.86	66.00	37.14	1000.0	9.000	N	19.4
0.150000	38.11	---	79.00	40.89	1000.0	9.000	N	19.4
0.155000	---	23.37	66.00	42.63	1000.0	9.000	N	19.4
0.155000	37.95	---	79.00	41.05	1000.0	9.000	N	19.4
0.900000	---	3.89	60.00	56.11	1000.0	9.000	N	20.1
0.900000	13.21	---	73.00	59.79	1000.0	9.000	N	20.1
4.155000	---	7.88	60.00	52.12	1000.0	9.000	N	19.9
4.155000	11.30	---	73.00	61.70	1000.0	9.000	N	19.9
20.235000	---	21.79	60.00	38.21	1000.0	9.000	N	20.2
20.235000	30.55	---	73.00	42.45	1000.0	9.000	N	20.2
20.250000	---	21.58	60.00	38.42	1000.0	9.000	N	20.2
20.250000	29.29	---	73.00	43.71	1000.0	9.000	N	20.2

◆ 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 ㎓)

- 47 CFR Part 15, Subpart B

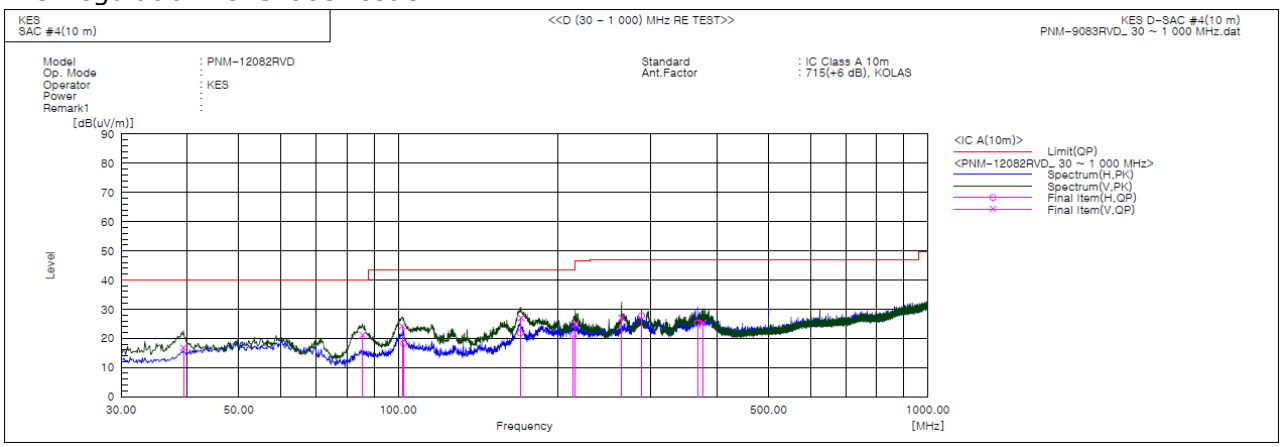


Final Result

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	39.336	V	39.7	-22.9	16.8	39.0	22.2	395.0	65.0	
2	85.654	V	47.0	-25.9	21.1	39.0	17.9	150.0	166.0	
3	101.780	V	46.7	-22.5	24.2	43.5	19.3	100.0	283.0	
4	102.508	H	40.7	-22.5	18.2	43.5	25.3	389.0	316.0	
5	170.044	H	46.0	-24.2	21.8	43.5	21.7	368.0	221.0	
6	170.529	V	51.2	-24.2	27.0	43.5	16.5	125.0	111.0	
7	213.936	H	41.4	-20.6	20.8	43.5	22.7	400.0	267.0	
8	215.876	V	45.4	-20.6	24.8	43.5	18.7	109.0	212.0	
9	264.013	V	46.0	-18.9	27.1	46.5	19.4	115.0	152.0	
10	288.020	H	46.2	-18.4	27.8	46.5	18.7	356.0	142.0	
11	367.560	H	40.1	-14.9	25.2	46.5	21.3	298.0	146.0	
12	375.684	V	40.1	-14.8	25.3	46.5	21.2	146.0	322.0	

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

- IC Regulation ICES-003 Issue 7



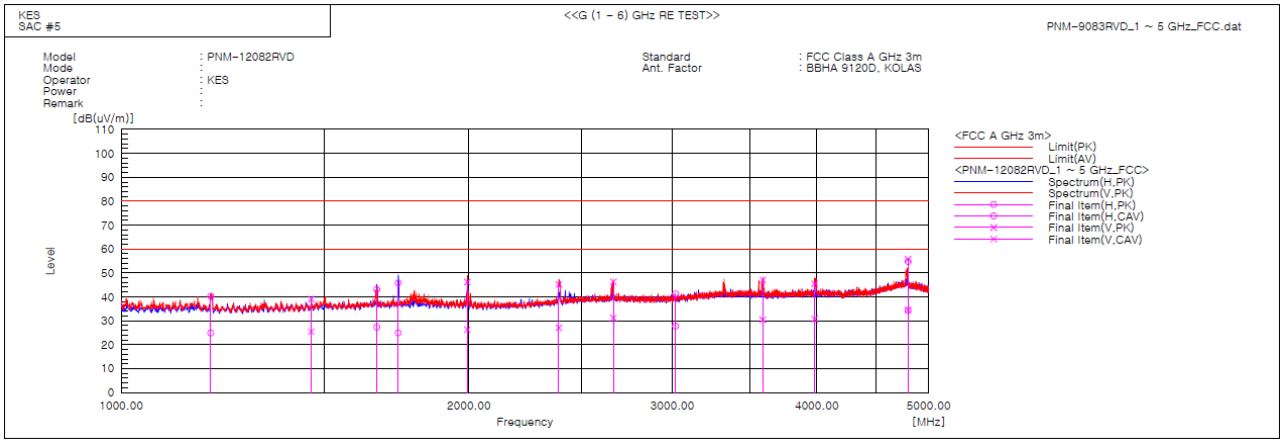
Final Result

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	39.336	V	39.7	-22.9	16.8	40.0	23.2	395.0	65.0	
2	85.654	V	47.0	-25.9	21.1	40.0	18.9	150.0	166.0	
3	101.780	V	46.7	-22.5	24.2	43.5	19.3	100.0	283.0	
4	102.508	H	40.7	-22.5	18.2	43.5	25.3	389.0	316.0	
5	170.044	H	46.0	-24.2	21.8	43.5	21.7	368.0	221.0	
6	170.529	V	51.2	-24.2	27.0	43.5	16.5	125.0	111.0	
7	213.936	H	41.4	-20.6	20.8	43.5	22.7	400.0	267.0	
8	215.876	V	45.4	-20.6	24.8	43.5	18.7	109.0	212.0	
9	264.013	V	46.0	-18.9	27.1	47.0	19.9	115.0	152.0	
10	288.020	H	46.2	-18.4	27.8	47.0	19.2	356.0	142.0	
11	367.560	H	40.1	-14.9	25.2	47.0	21.8	298.0	146.0	
12	375.684	V	40.1	-14.8	25.3	47.0	21.7	146.0	322.0	

♦ 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 ㎓)



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	1195.346	H	47.0	31.6	-6.7	40.3	24.9	80.0	60.0	39.7	35.1	198.0	62.0	
2	1460.101	V	44.1	30.5	-5.0	39.1	25.5	80.0	60.0	40.9	34.5	100.0	267.7	
3	1664.374	H	47.4	31.6	-4.3	43.1	27.3	80.0	60.0	36.9	32.7	400.0	102.9	
4	1736.870	H	49.8	29.0	-4.0	45.8	25.0	80.0	60.0	34.2	35.0	400.0	62.4	
5	1993.074	V	49.1	29.2	-2.9	46.2	26.3	80.0	60.0	33.8	33.7	341.0	202.2	
6	2391.651	V	46.8	28.7	-1.6	45.2	27.1	80.0	60.0	34.8	32.9	318.0	235.1	
7	2666.718	V	46.5	31.4	-0.2	46.3	31.2	80.0	60.0	33.7	28.8	254.0	196.8	
8	3018.668	H	40.2	26.8	1.0	41.2	27.8	80.0	60.0	38.8	32.2	400.0	170.3	
9	3591.951	V	45.2	28.5	1.9	47.1	30.4	80.0	60.0	32.9	29.6	100.0	163.3	
10	3982.382	V	42.4	27.6	3.1	45.5	30.7	80.0	60.0	34.5	29.3	100.0	30.0	
11	4796.432	V	49.2	28.0	6.6	55.8	34.6	80.0	60.0	24.2	25.4	149.0	159.4	
12	4798.357	H	48.2	27.8	6.6	54.8	34.4	80.0	60.0	25.2	25.6	400.0	104.9	

♦ Calculation

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

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

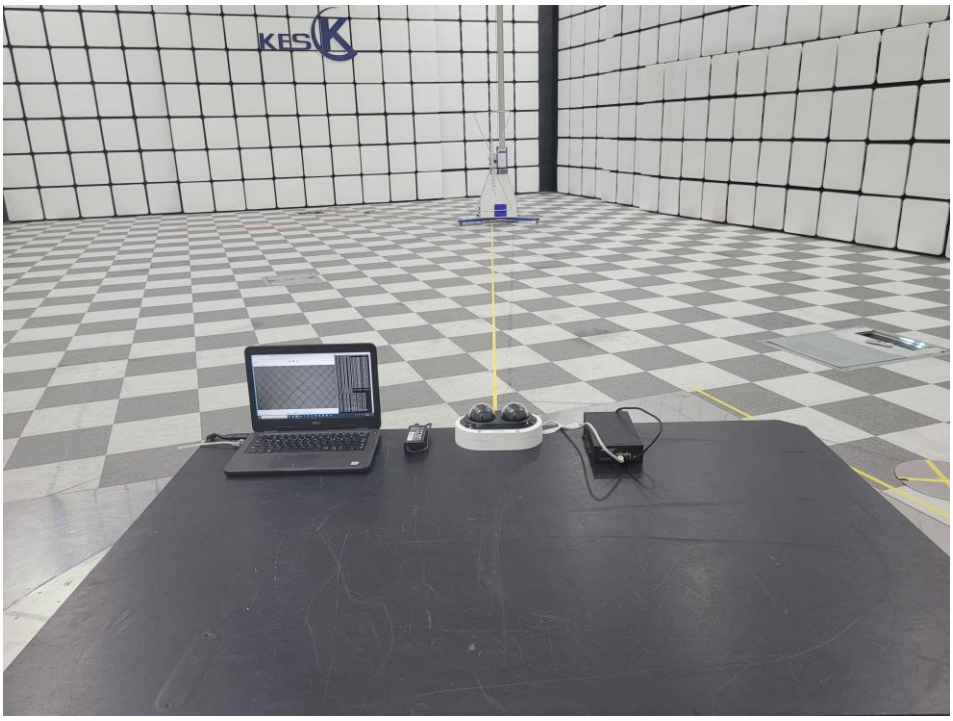
Conducted Emissions at Mains Power Ports

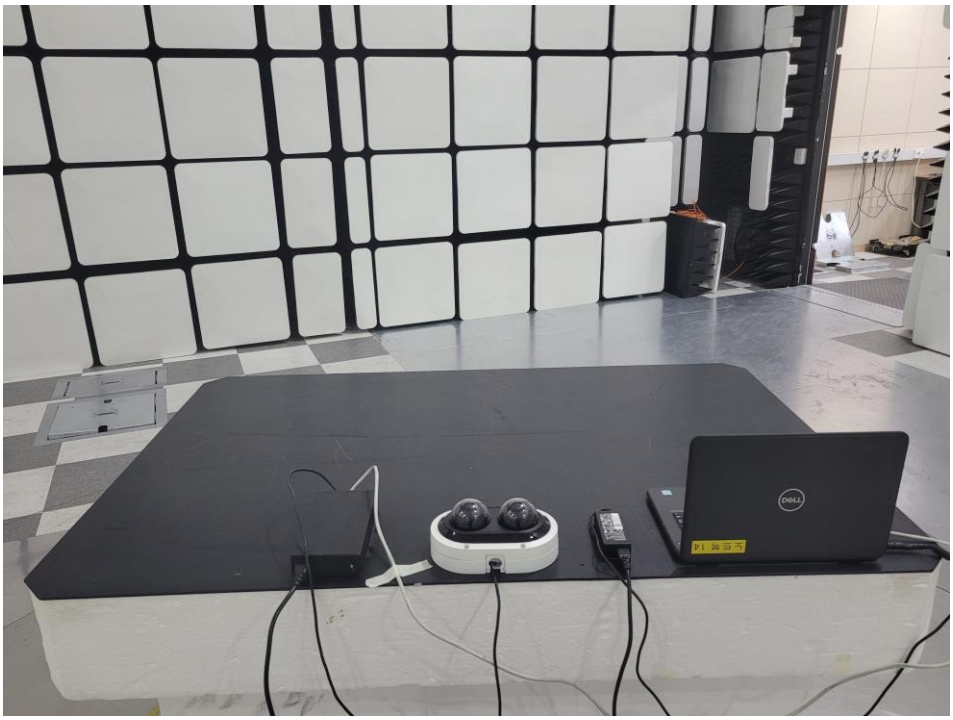




This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

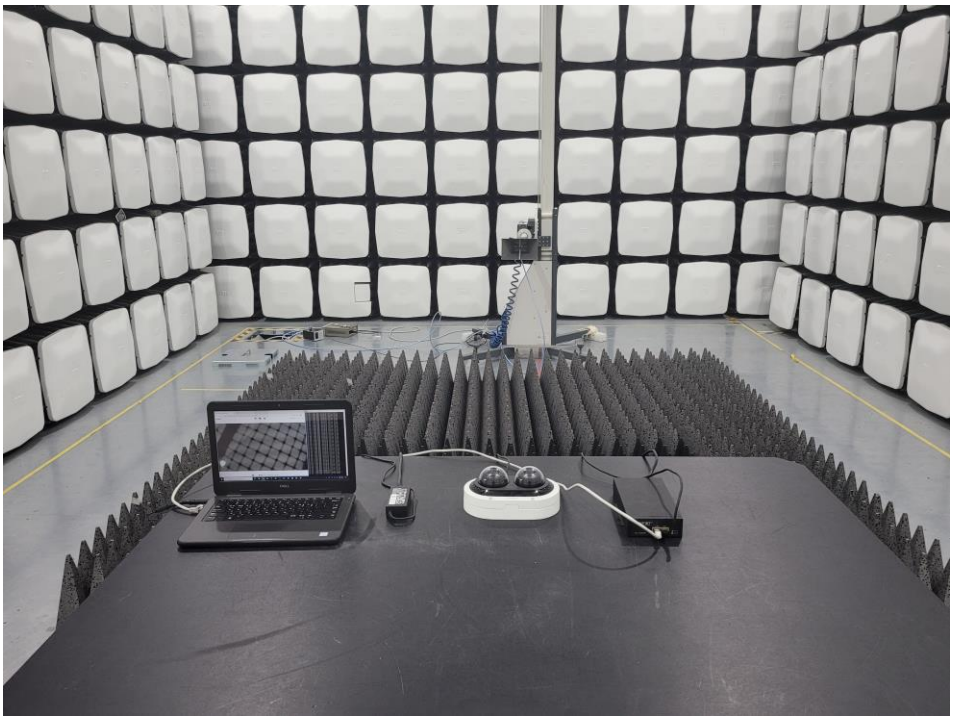
Radiated Electric Field Emissions(Below 1 ㎓)

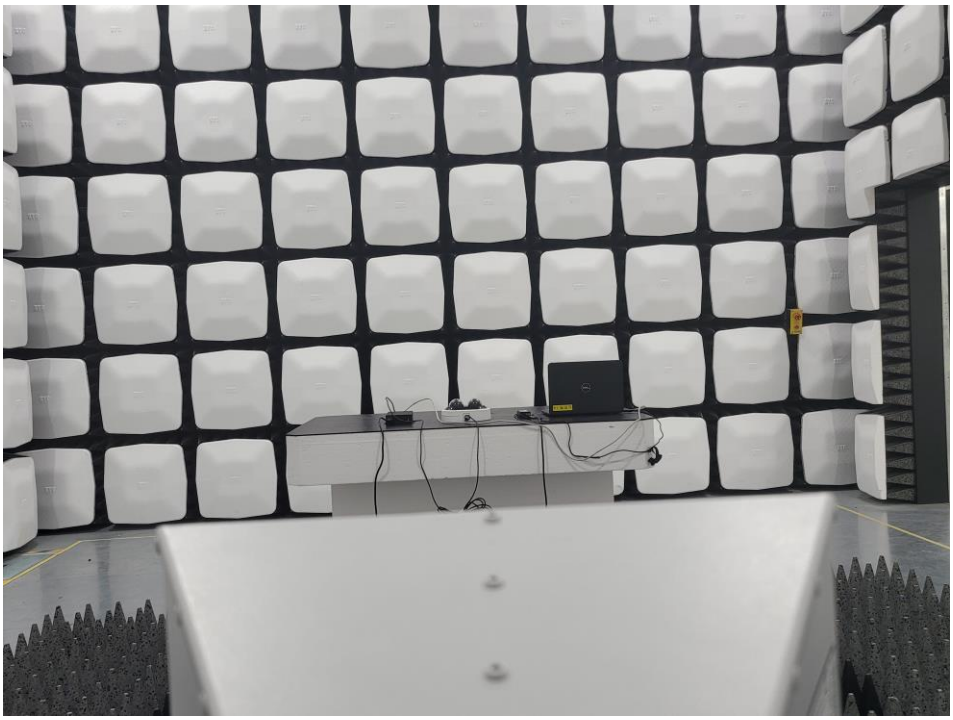




This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Radiated Electric Field Emissions(Above 1 ㎓)





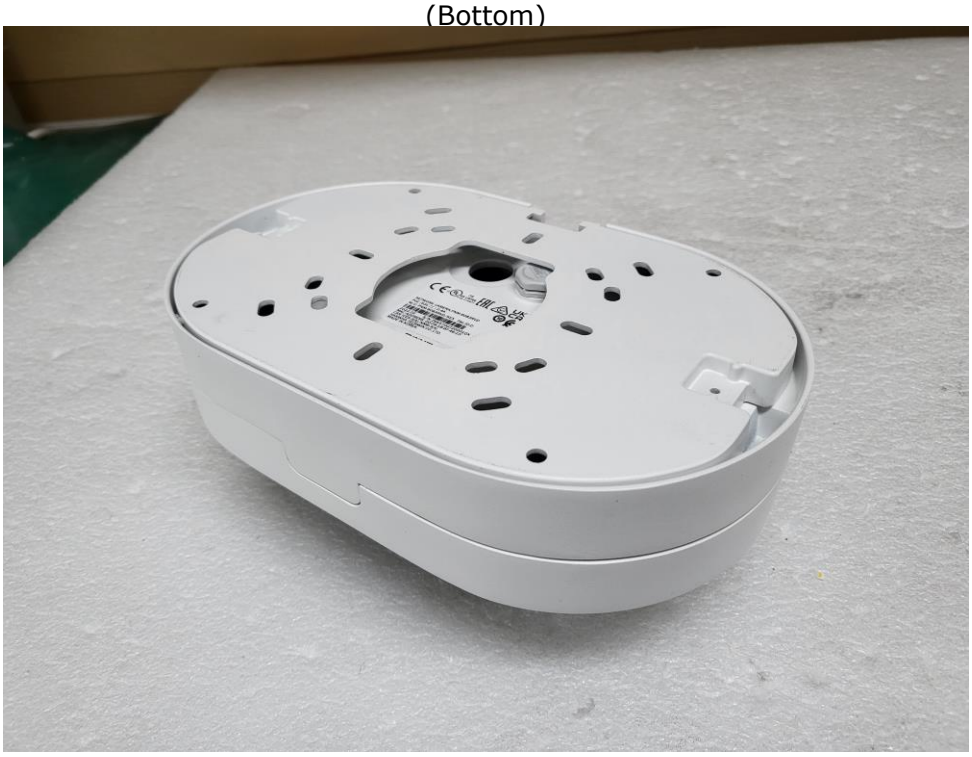
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT External Photographs

(Top)



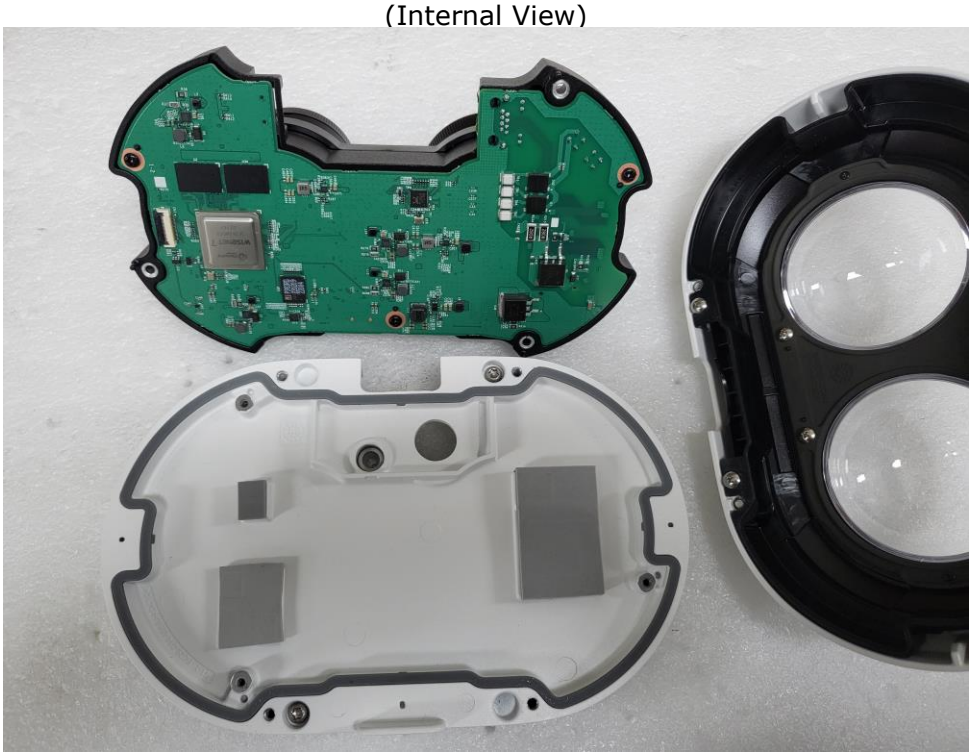
(Bottom)



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

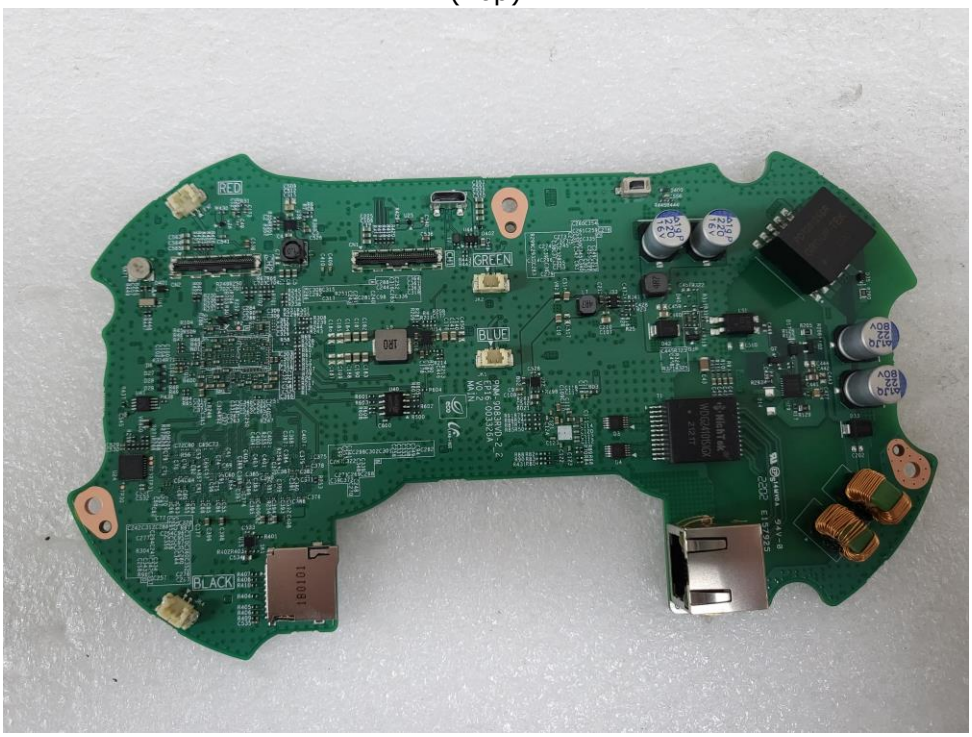
(Internal View)



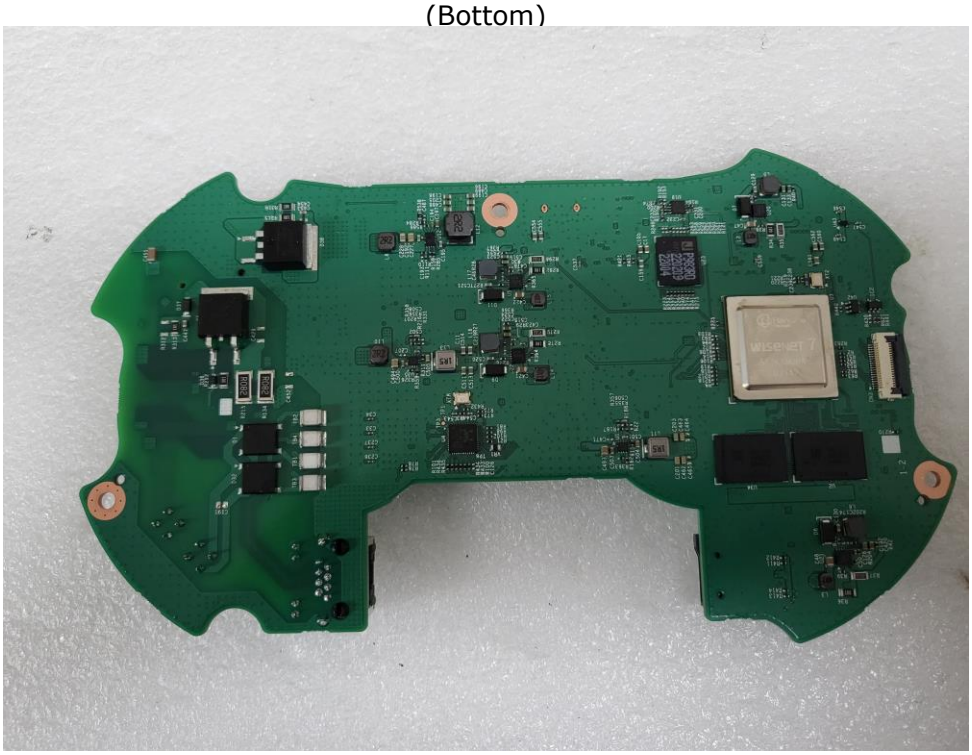
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 1

(Top)



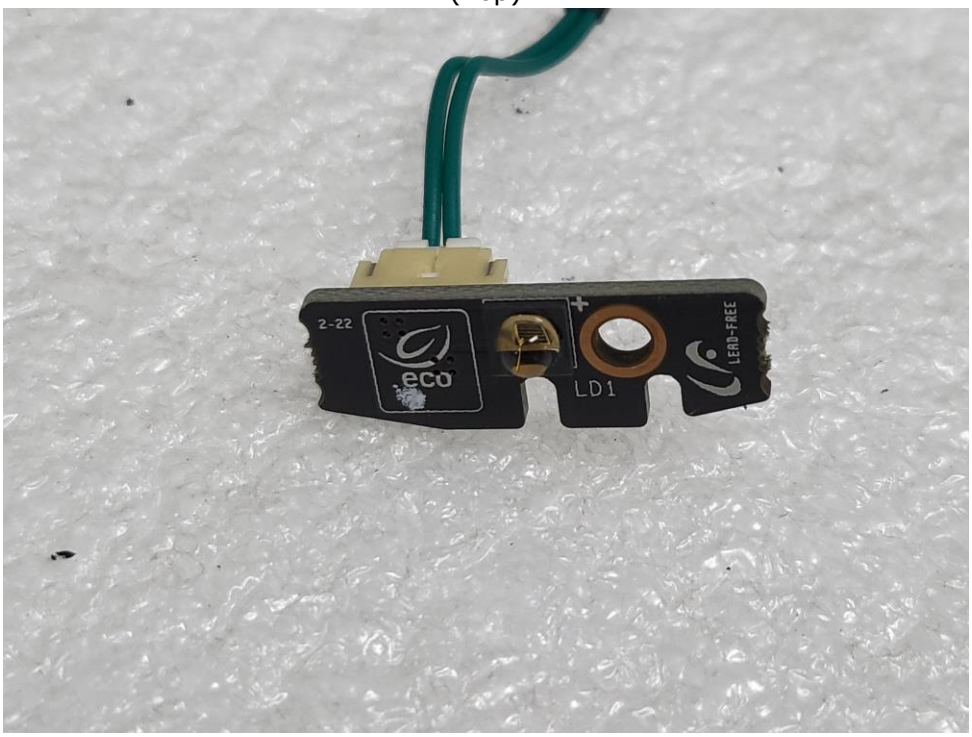
(Bottom)



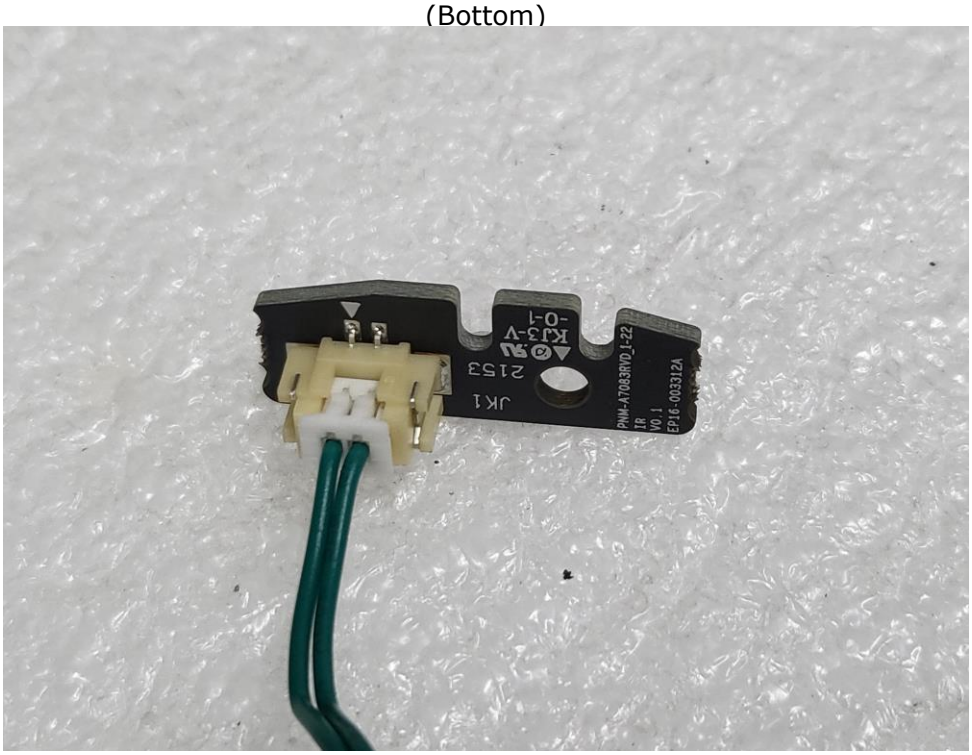
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 2

(Top)



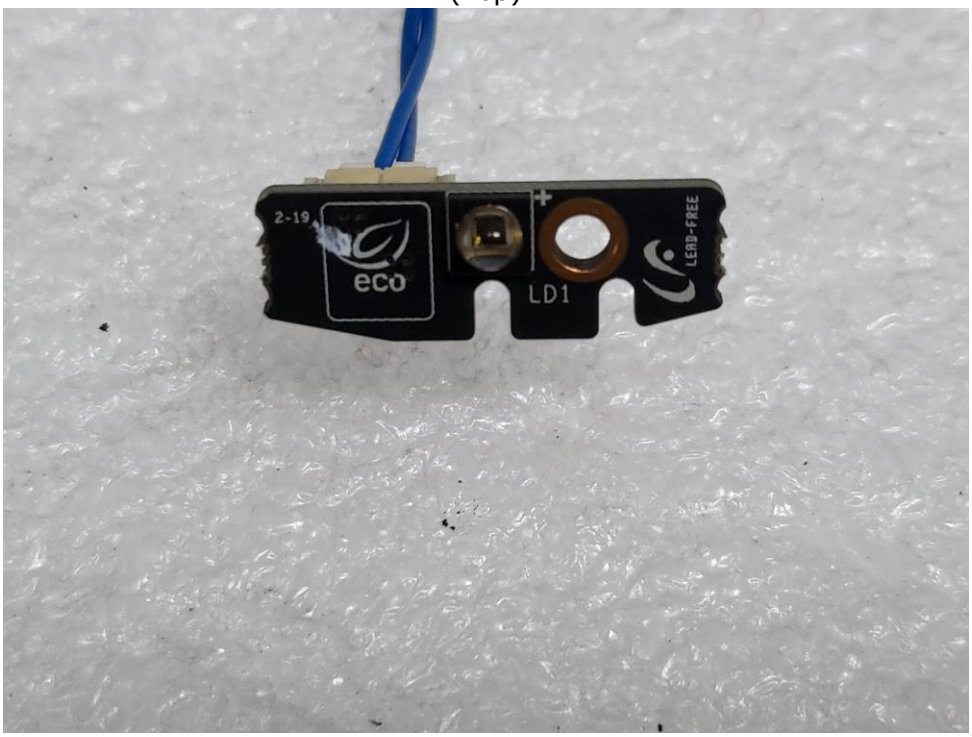
(Bottom)



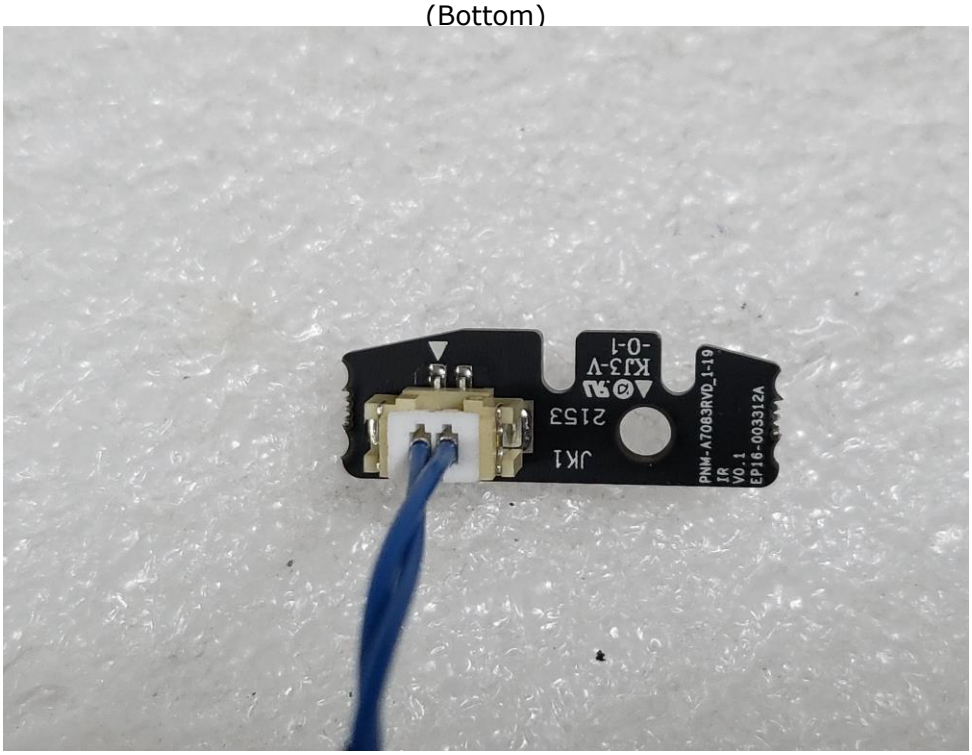
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 3

(Top)



(Bottom)



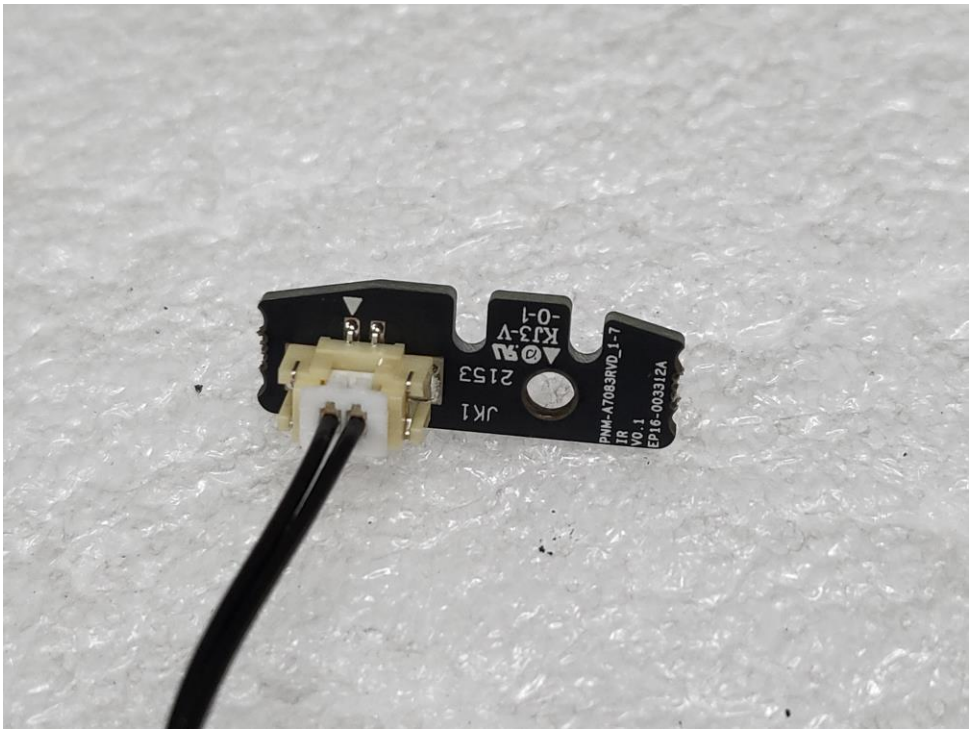
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 4

(Top)



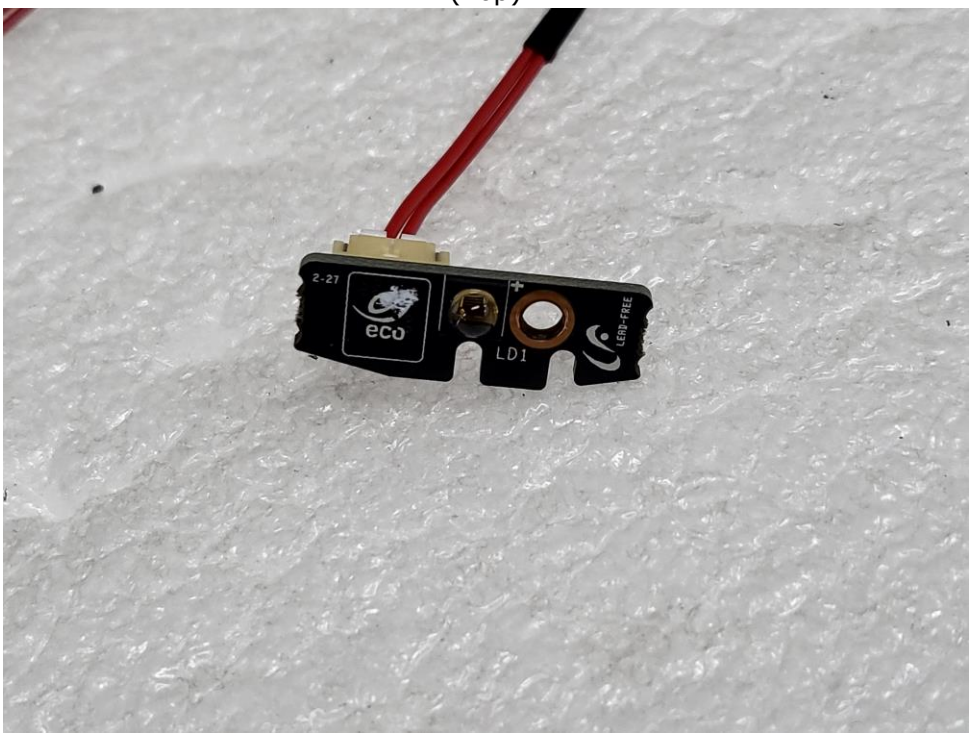
(Bottom)



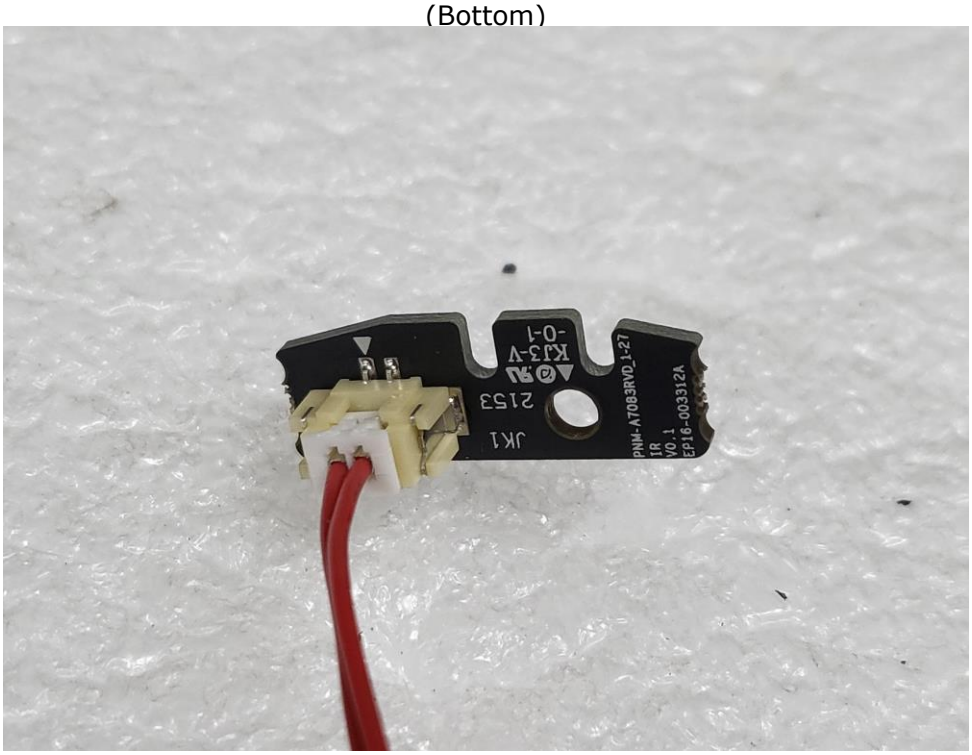
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 5

(Top)



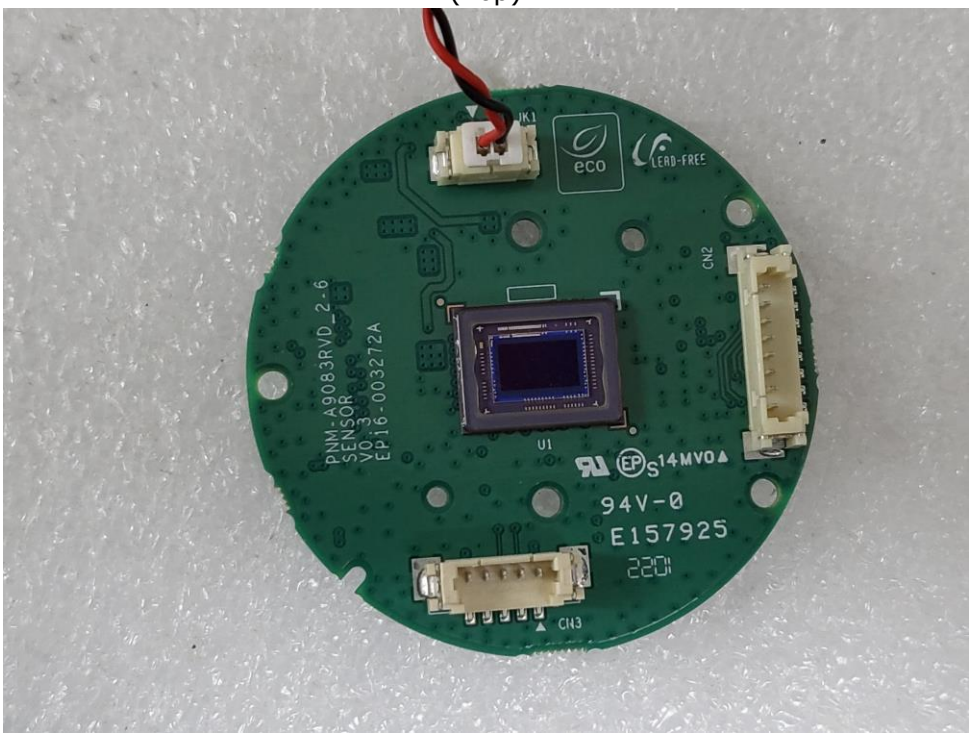
(Bottom)



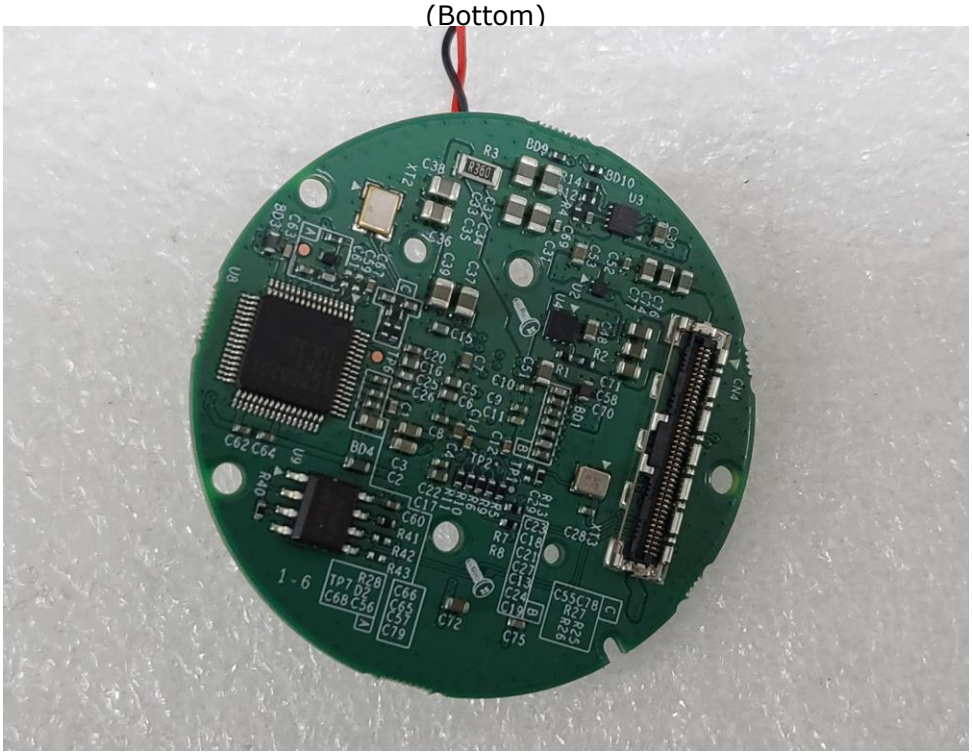
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 6

(Top)



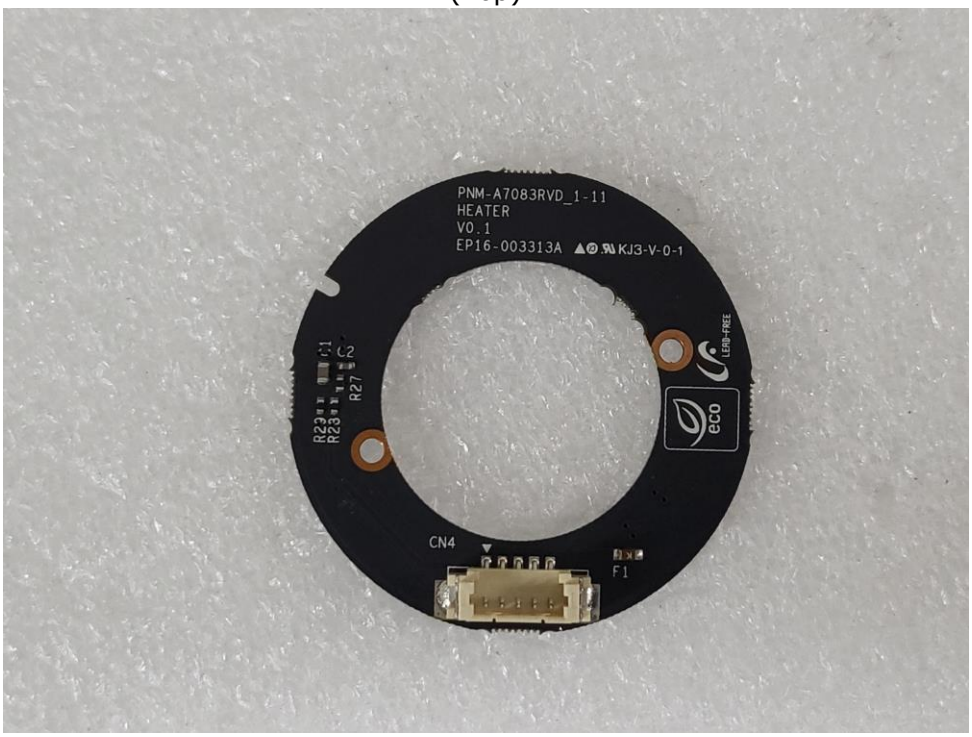
(Bottom)



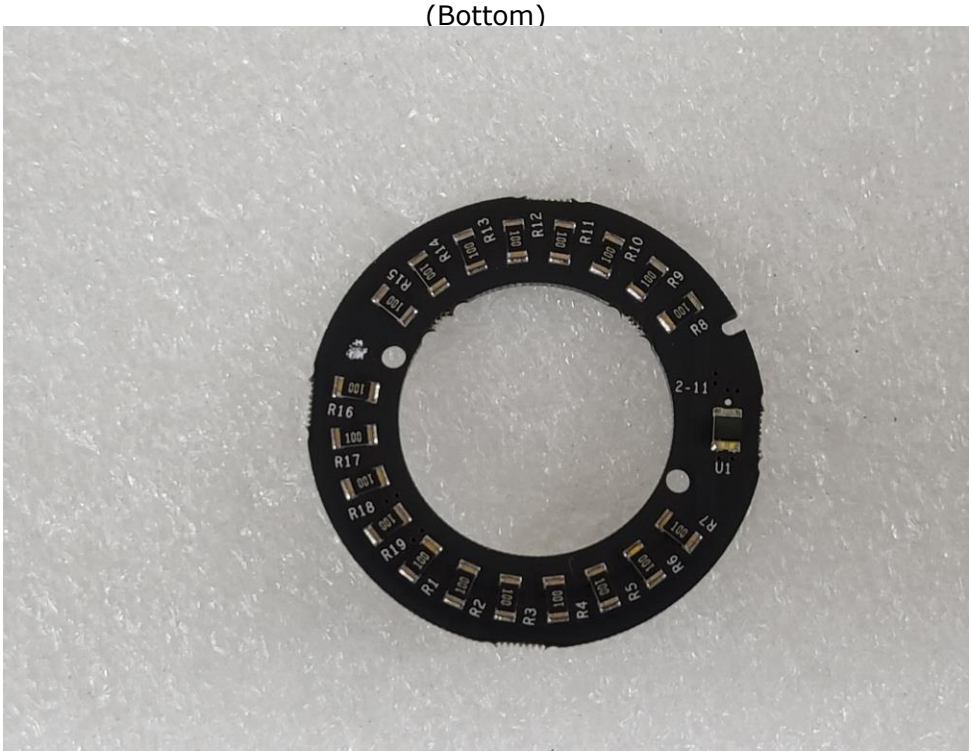
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 7

(Top)



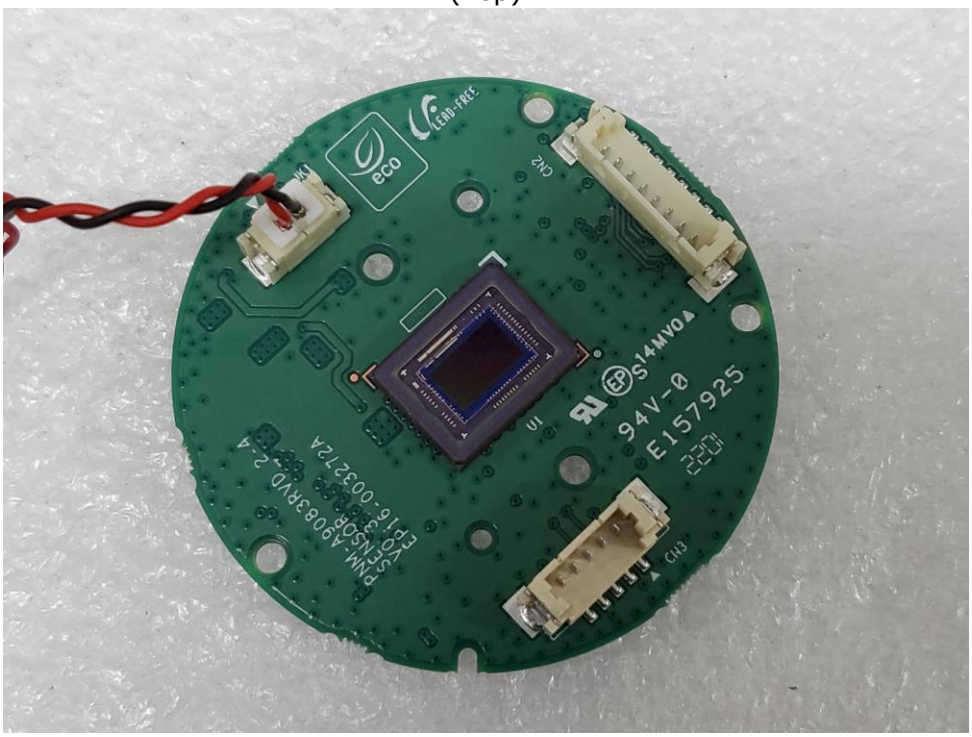
(Bottom)



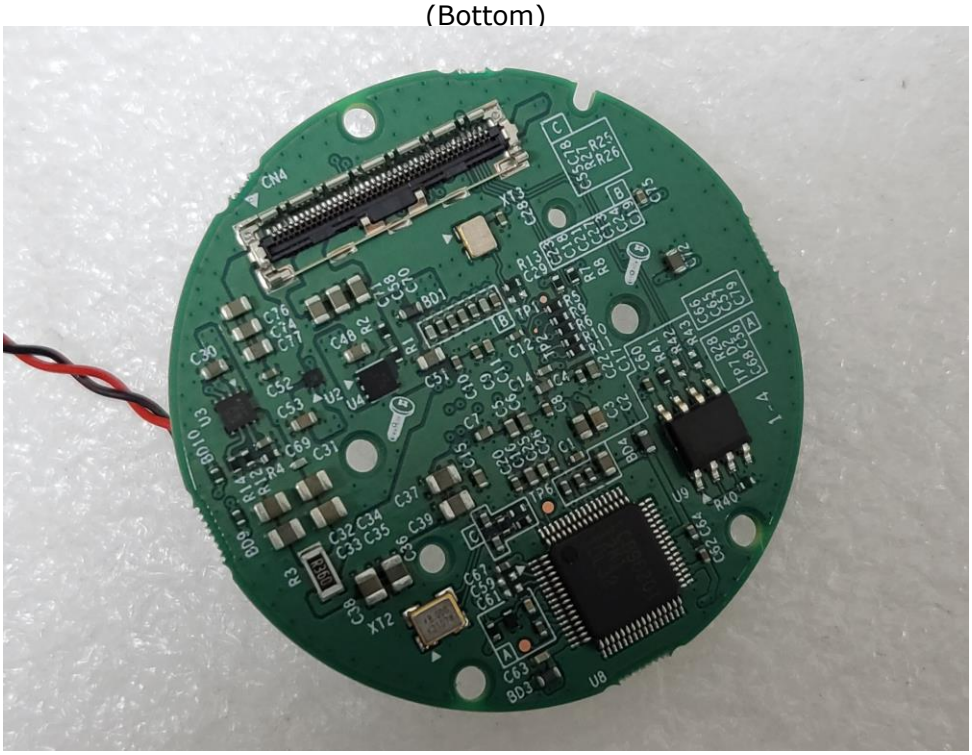
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 8

(Top)



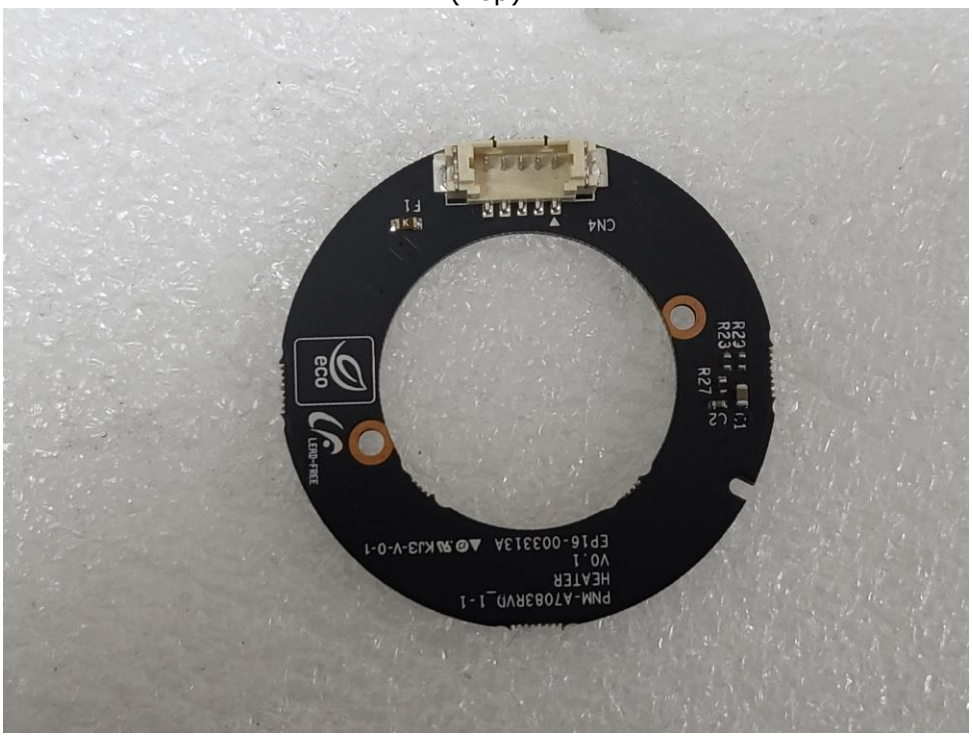
(Bottom)



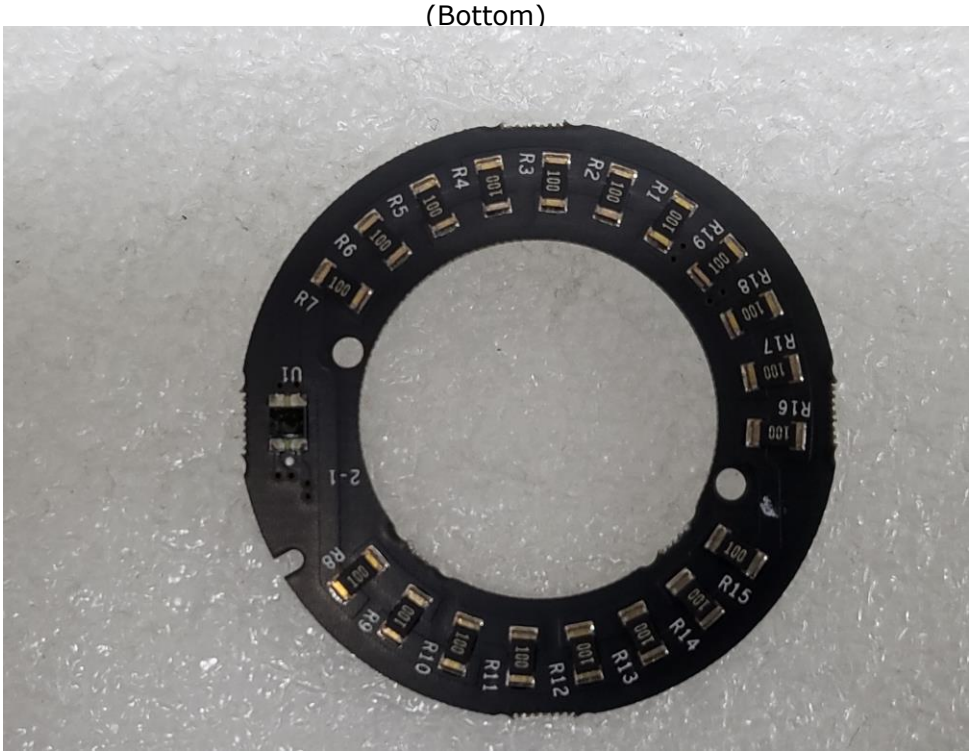
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 9

(Top)



(Bottom)



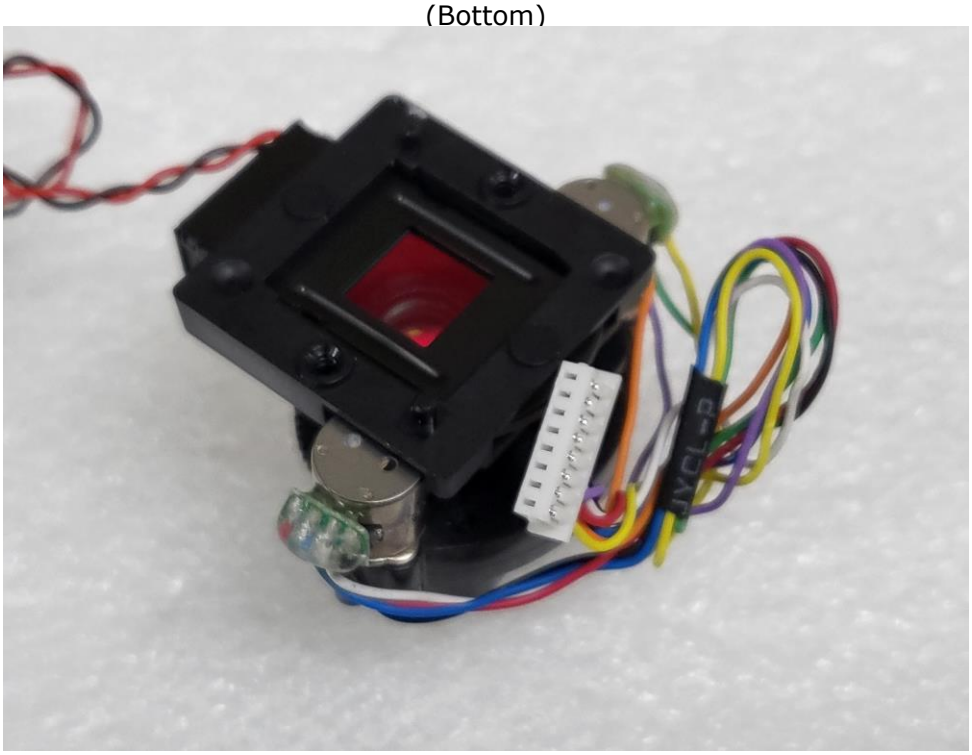
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Lens 1

(Top)



(Bottom)



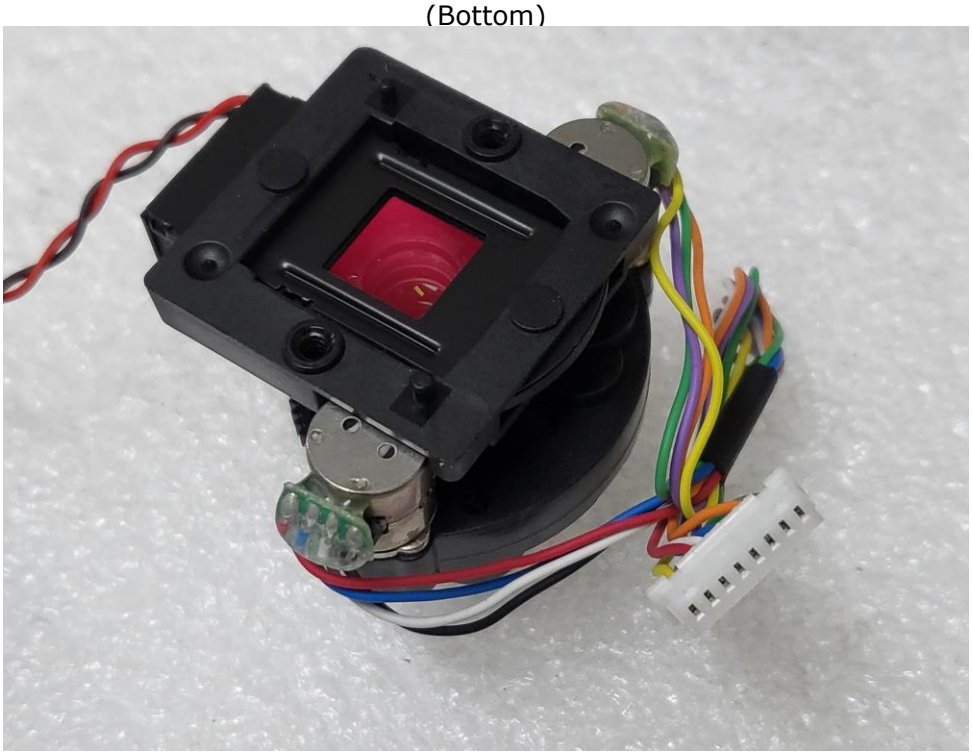
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Lens 2

(Top)

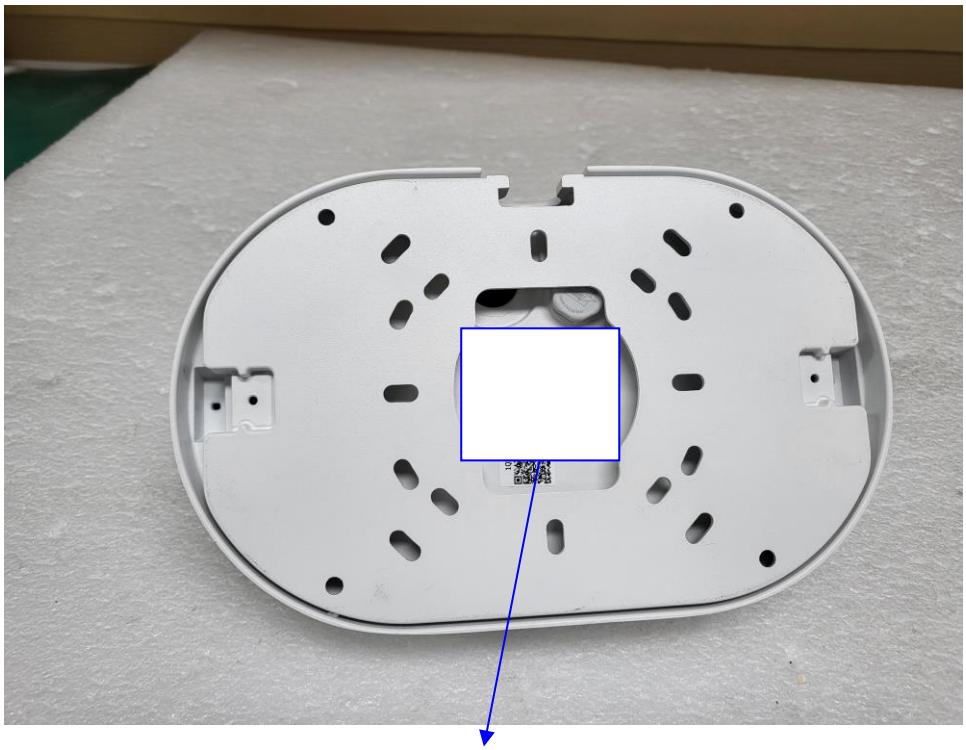


(Bottom)



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 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