

EMC TEST REPORT For RCM

Test Report No. : KES-EM-21T0488-R1
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : PNM-9031RV
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 : May. 17, 2021
Test date : May. 21, 2021
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Kang Hyeon, Kim
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



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 23, 2021	KES-EM-21T0488	Issued
Feb. 24, 2023	KES-EM-21T0488-R1	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.



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.....	10
1.9	Remarks when standards applied	11
1.10	Calibration Details of Equipment Used for Measurement	11
1.11	Test Facility	11
1.12	Laboratory Accreditations and Listings	오류! 책갈피가 정의되어 있지 않습니다.
2.0	Test Regulations.....	12
2.1	Conducted Emissions at Mains Power Ports	14
2.2	Conducted Emissions at Telecommunication Ports.....	15
2.3	Radiated Electric Field Emissions(Below 1 GHz)	15
2.4	Radiated Electric Field Emissions(Above 1 GHz)	17
APPENDIX A – TEST DATA.....		18
	Conducted Emissions at Mains Power Ports.....	18
	Conducted Emissions at Telecommunication Ports	20
	Radiated Electric Field Emissions(Below 1 GHz)	22
	Radiated Electric Field Emissions(Above 1 GHz).....	24
	Test Setup Photos and Configuration	26
	Conducted Emissions at Mains Power Ports.....	26
	Conducted Emissions at Telecommunication Ports	27
	Radiated Electric Field Emissions(Below 1 GHz)	29
	Radiated Electric Field Emissions(Above 1 GHz).....	31
	EUT External Photographs.....	33
	EUT Internal Photographs	34



1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.8" 5MP CMOS (x4)
Resolution	6720x2240, 5952x1984, 4992x1664, 3840x1280, 3072x1024, 1920x640, 1152x384
Max. Framerate	H.265/H.264: Max. 20fps/20fps(60Hz/50Hz)@15MP MJPEG: Max. 15fps(60Hz/50Hz)
Min. Illumination	TBD
Video Out	USB : Micro USB Type B, 1280x720 for installation
Lens	
Focal Length (Zoom Ratio)	4.3mm Fixed
Max. Aperture Ratio	F1.6
Angular Field of View	192°(H) x 65°(V) [TBD] / 180°(H) x 70°(V) [TBD]
Min. Object Distance	3m(9.84ft)
Focus Control	Fixed
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0~355° / 0~60° / -
Operational	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SSDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR V
Defog	Not Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	6ea, rectangular zones - Color: Grey/Green/Red/Blue/Black/White
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	None
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec)
Digital PTZ	None

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



Video Rotation	Flip, Mirror
Analytics	Defocus detection, Motion detection, Appear/Disappear, Enter/Exit, Tampering, Virtual line, Audio detection
Business Intelligence	Heatmap
Alarm I/O	Selectable 2 port
Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC at event triggers Alarm output
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
IR Viewable Length	Min. 20m(65.6ft), Wise IR
Network	
Ethernet	Metal shielded RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/High, MJPEG
Audio Compression	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
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(15 users) / Multicast Multicast Multiple streaming(Up to 4 profiles, Up to 3 with different resolution)
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) Device Certificate(Hanwha Techwin Root CA) TPM 2.0 with FIPS 140-2 level2
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API)
General	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Edge Storage	Micro SD/SDHC/SDXC 2slots 512GB (256GBx2)
Memory	8GB RAM, 4GB Flash
Environmental & Electrical	
Operating Temperature / Humidity	- Normal : -40°C~+55°(-40°F ~ +131°F) / - Intermittent : -40°C~+60°C(-40°F ~ +140°F), 8Hrs - Less than 95% RH(Non-condensing) * Startup should be above -30°C "
Storage Temperature / Humidity	-50°C~+60°C(-58°F~+140°F) / Less than 90% RH
Certification	IP66, IK10, NEMA4X
Input Voltage	PoE+ (IEEE802.3at, Class4), 12VDC
Power Consumption	PoE+: Max 23.5W, Typical 18.0W 12VDC: Max 20.5W, Typical 16.0W
Mechanical	
Color / Material	White / Aluminum
RAL Code	RAL9003
Product Dimensions / Weight	Ø253x170mm / 2.6Kg

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

1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 240 V, 50 Hz ☒ 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
NETWORK CAMERA	PNM-9031RV	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	P89F	21599158359	DELL	-
Notebook Adaptor	LA240PM190	0D0X04	LITE-ON TECHNOLOGY CO.,LTD.	-
Alarm1	-	-	-	-
Alarm2	-	-	-	-
Micro SD Card	-	-	SanDisk	32 GB
Smartphone	SHV-E210L	R33D713KA3F	Samsung	-
Headset	K550	-	Britz®	-
AC/DC Adaptor	2ACB022F	-	Channel Well Technology Co.,Ltd.	-
PoE Adaptor	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-

1.6 External I/O Cabling

■ AC/DC Adaptor

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	Notebook	RJ-45	3.5	S
	Alarm OUT	Alarm1	Alarm IN	3.0	U
	Alarm IN	Alarm2	Alarm OUT	3.0	U
	Audio OUT	Headset	Audio IN	1.4	U
	Audio IN	Headset	Audio OUT	1.6	U
	Slot	Micro SD Card	Slot	-	-
Notebook	Audio IN	Smartphone	Audio OUT	1.0	U

* Unshielded=U, Shielded=S

■ PoE Adaptor

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	S
	Alarm OUT	Alarm1	Alarm IN	3.0	U
	Alarm IN	Alarm2	Alarm OUT	3.0	U
	Audio OUT	Headset	Audio IN	1.4	U
	Audio IN	Headset	Audio OUT	1.6	U
	Slot	Micro SD Card	Slot	-	-
Notebook	Audio IN	Smartphone	Audio OUT	1.0	U
	RJ-45(LAN)	PoE Adaptor	RJ-45(LAN)	3.0	U

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

Test Mode	operating
Operation (AC/DC Adaptor, PoE Adaptor)	the test was conducted while checking the camera video output from the laptop and making sure that they operate normally while performing a ping test.

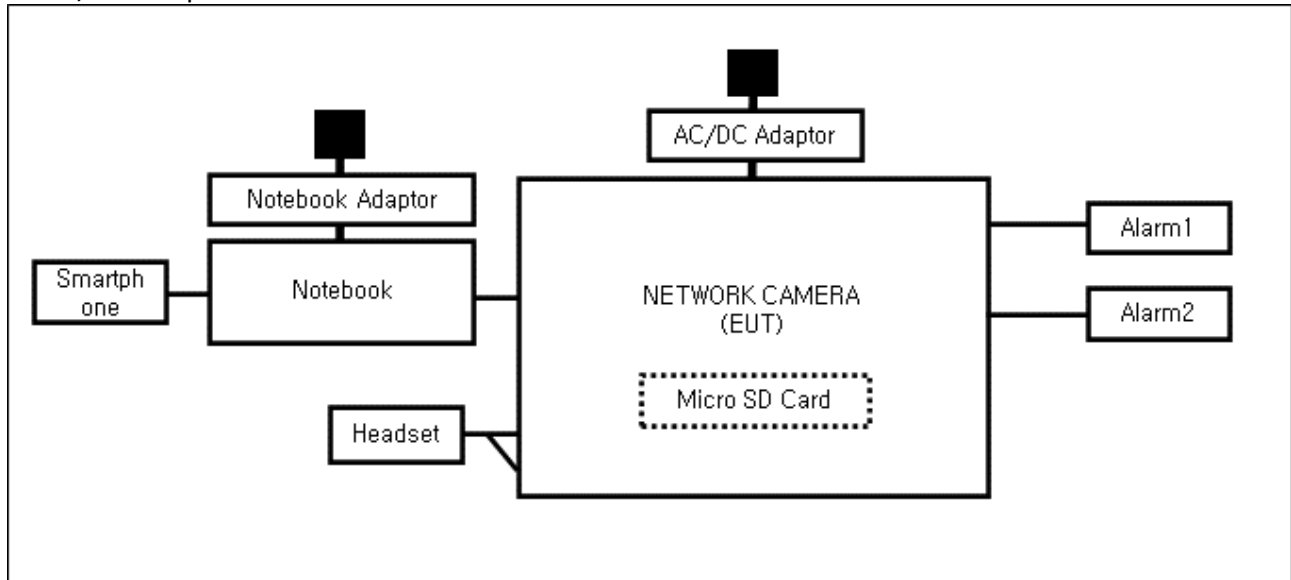
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

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

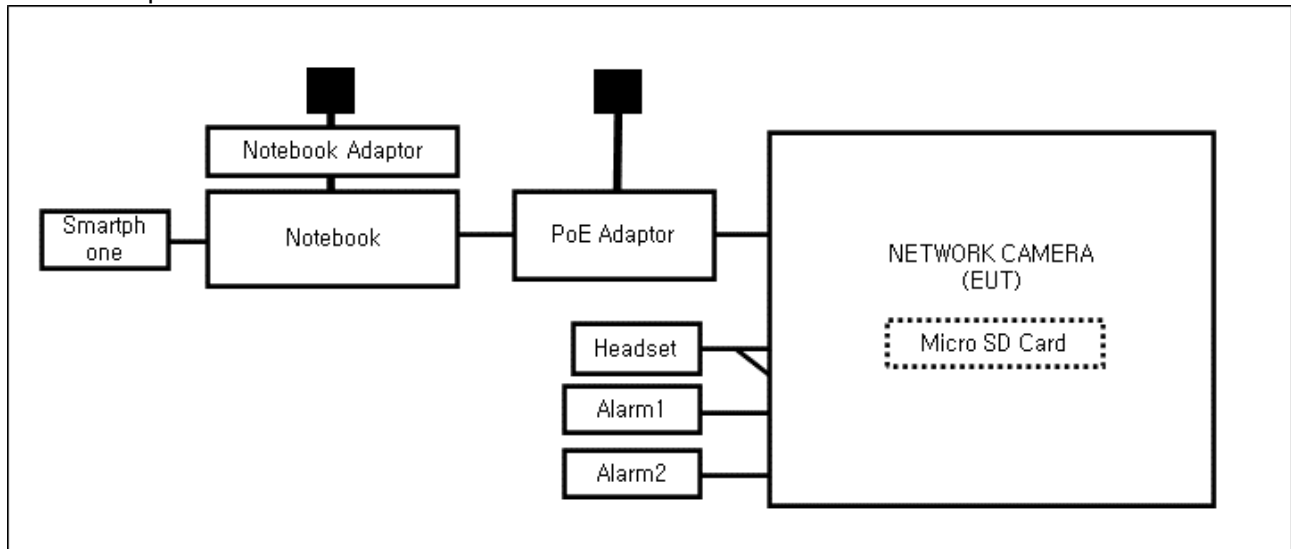
1.8 Configuration

■ AC Main
 □ DC Main

■ AC/DC Adaptor



■ PoE Adaptor



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

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

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004

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

2.0 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



- | | | |
|--|---|----------------------------------|
| ☐ 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 C63.4-2017 | | |
|
 | | |
| ☐ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 32:17 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2017 | | |
|
 | | |
| ☐ RE- Directive 2014/53/EU | | |
|
 | | |
| ☐ EN 301 489-1 V2.2.3 | | |
| ☐ 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 at Mains Power Ports

Test Date

May. 21, 2021

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	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

Test Conditions

Temperature: (23,8 ± 0,4) °C

Relative Humidity: (44,3 ± 0,4) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

May. 21, 2021

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	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 30, 2021
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 10, 2022

Test Conditions

Temperature: (24,2 ± 0,3) °C

Relative Humidity: (44,6 ± 0,3) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

- See Appendix A for test data.
 - For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

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(Below 1 GHz)

Test Date

May. 21, 2021

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, 25, 2021
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions

Temperature: (24,1 ± 0,4) °C
Relative Humidity: (44,3 ± 0,3) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

May. 21, 2021

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, 05, 2021
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (23,8 ± 0,4) °C

Relative Humidity: (44,2 ± 0,3) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

APPENDIX A – TEST DATA

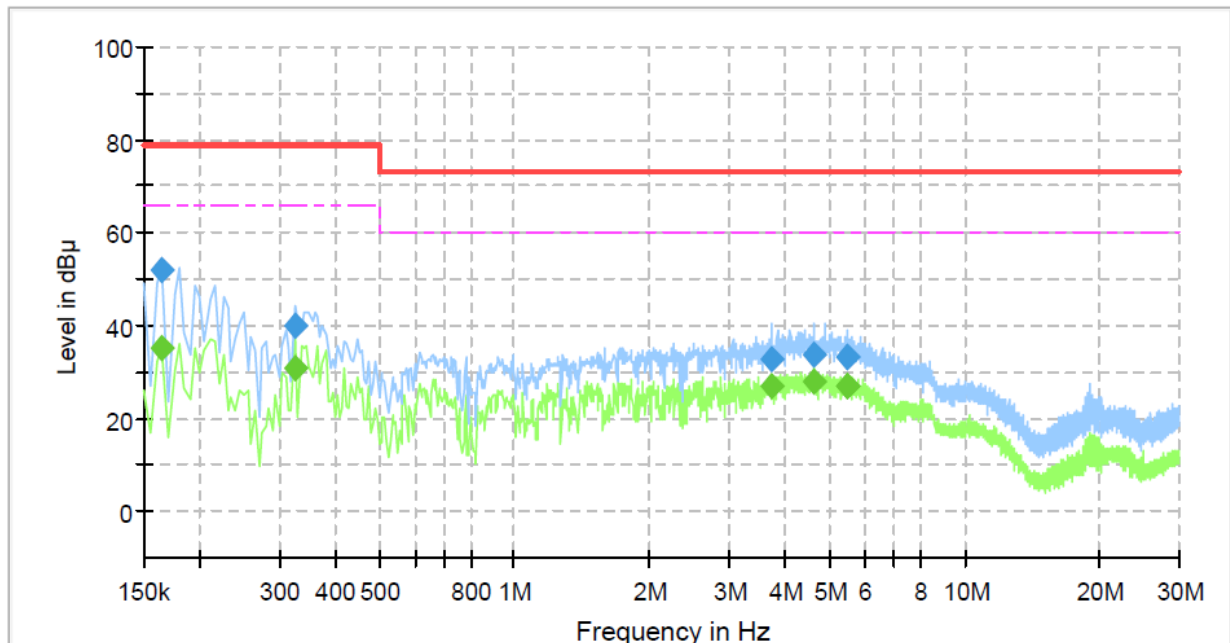
Conducted Emissions at Mains Power Ports

■ AC/DC Adaptor

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9031RV
Phase:	RCM
Mode:	DC
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	---	35.05	66.00	30.95	1000.0	9.000	L1	19.4
0.165000	51.81	---	79.00	27.19	1000.0	9.000	L1	19.4
0.325000	---	30.62	66.00	35.38	1000.0	9.000	L1	19.5
0.325000	40.17	---	79.00	38.83	1000.0	9.000	L1	19.5
3.740000	---	26.75	60.00	33.25	1000.0	9.000	L1	20.0
3.740000	32.93	---	73.00	40.07	1000.0	9.000	L1	20.0
4.650000	---	27.79	60.00	32.21	1000.0	9.000	L1	19.7
4.650000	33.91	---	73.00	39.09	1000.0	9.000	L1	19.7
5.470000	---	27.01	60.00	32.99	1000.0	9.000	L1	19.6
5.470000	33.03	---	73.00	39.97	1000.0	9.000	L1	19.6
5.495000	---	27.03	60.00	32.97	1000.0	9.000	L1	19.6
5.495000	33.01	---	73.00	39.99	1000.0	9.000	L1	19.6

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

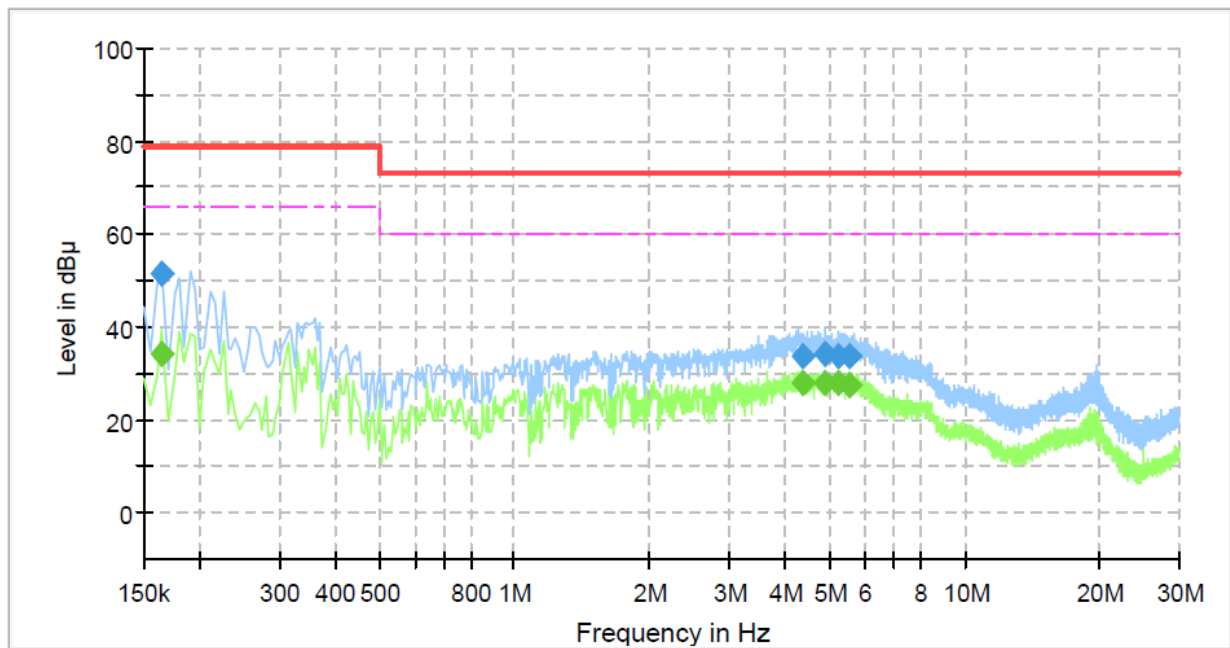
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9031RV
Phase:	RCM
Mode:	DC
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	---	33.98	66.00	32.02	1000.0	9.000	N	19.4
0.165000	51.25	---	79.00	27.75	1000.0	9.000	N	19.4
4.365000	---	27.71	60.00	32.29	1000.0	9.000	N	19.8
4.365000	33.77	---	73.00	39.23	1000.0	9.000	N	19.8
4.880000	---	28.01	60.00	31.99	1000.0	9.000	N	19.7
4.880000	34.07	---	73.00	38.93	1000.0	9.000	N	19.7
5.230000	---	27.88	60.00	32.12	1000.0	9.000	N	19.6
5.230000	33.80	---	73.00	39.20	1000.0	9.000	N	19.6
5.575000	---	27.45	60.00	32.55	1000.0	9.000	N	19.6
5.575000	33.50	---	73.00	39.50	1000.0	9.000	N	19.6

◆ 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

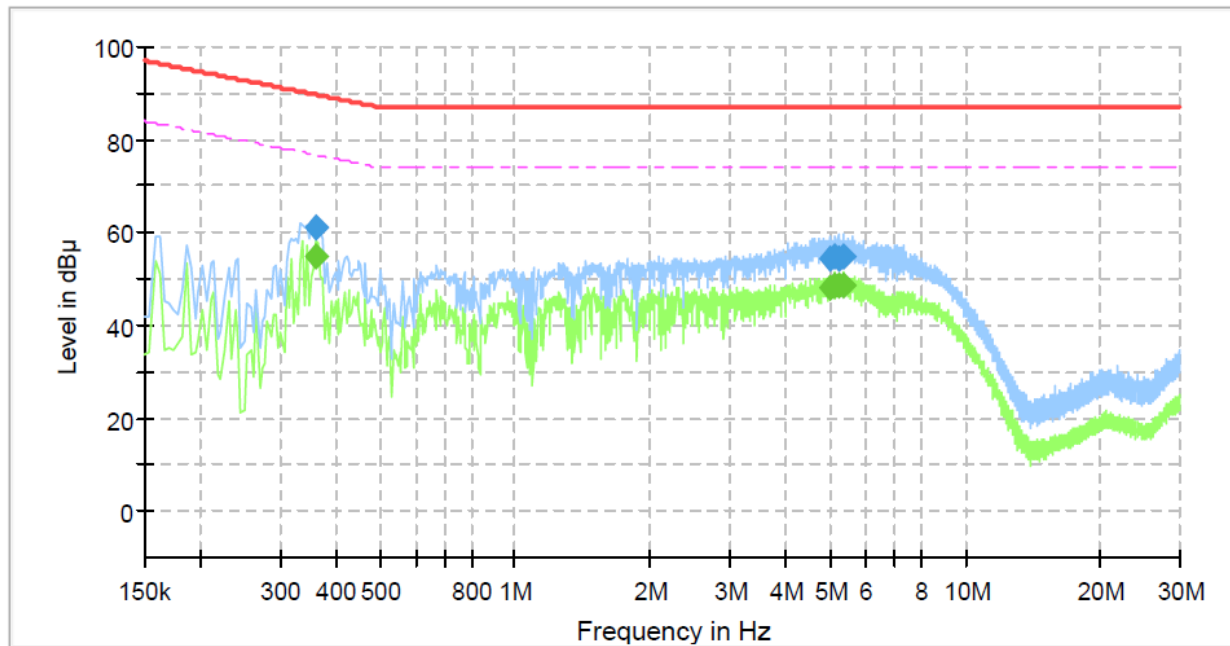
Conducted Emissions at Telecommunication Ports

■ AC/DC Adaptor

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9031RV
Mode :	RCM DC
Speed :	1000
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.362000	---	54.76	76.68	21.92	1000.0	9.000	Single Line	19.5
0.362000	60.93	---	89.68	28.75	1000.0	9.000	Single Line	19.5
4.986000	---	48.20	74.00	25.80	1000.0	9.000	Single Line	19.5
4.986000	54.58	---	87.00	32.42	1000.0	9.000	Single Line	19.5
5.126000	---	48.54	74.00	25.46	1000.0	9.000	Single Line	19.5
5.126000	54.62	---	87.00	32.38	1000.0	9.000	Single Line	19.5
5.222000	---	48.55	74.00	25.45	1000.0	9.000	Single Line	19.5
5.222000	54.53	---	87.00	32.47	1000.0	9.000	Single Line	19.5
5.378000	---	48.45	74.00	25.55	1000.0	9.000	Single Line	19.4
5.378000	54.61	---	87.00	32.39	1000.0	9.000	Single Line	19.4

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

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

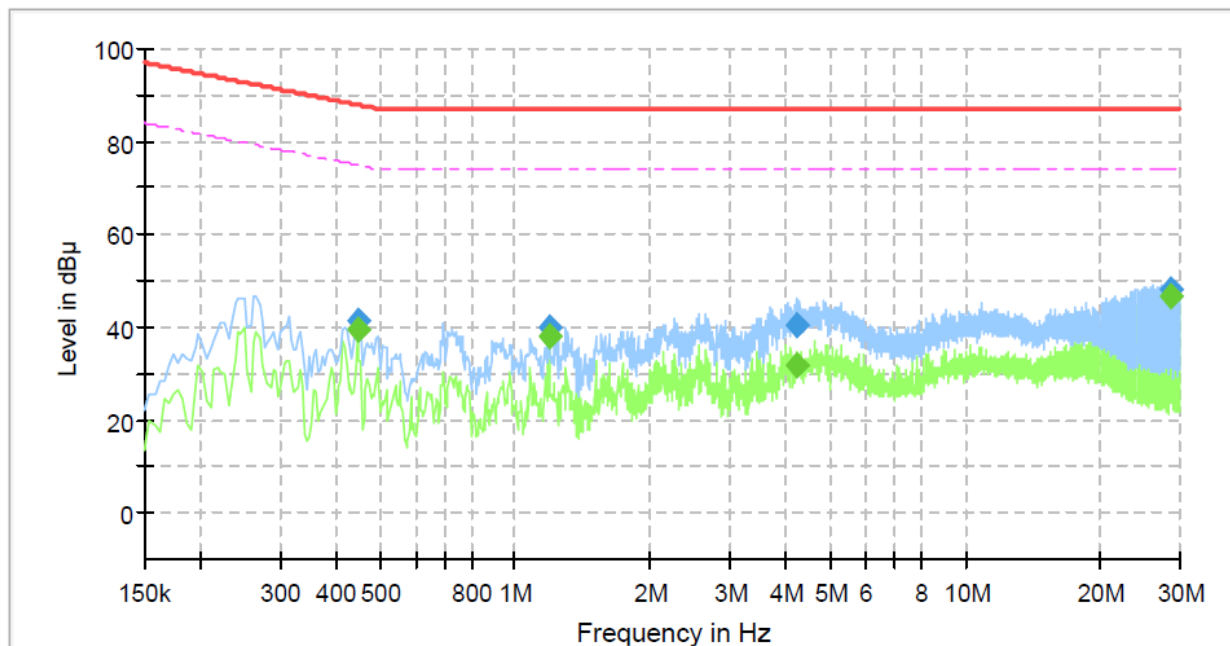
The authenticity of the test report, contact kes@kes.co.kr

■ PoE Adaptor

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9031RV
Mode :	RCM PoE
Speed :	1000
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.446000	---	39.30	74.95	35.65	1000.0	9.000	Single Line	19.6
0.446000	41.62	---	87.95	46.33	1000.0	9.000	Single Line	19.6
1.190000	---	37.96	74.00	36.04	1000.0	9.000	Single Line	20.0
1.190000	39.82	---	87.00	47.18	1000.0	9.000	Single Line	20.0
4.206000	---	31.81	74.00	42.19	1000.0	9.000	Single Line	19.7
4.206000	40.29	---	87.00	46.71	1000.0	9.000	Single Line	19.7
28.750000	---	46.48	74.00	27.52	1000.0	9.000	Single Line	20.4
28.750000	48.28	---	87.00	38.72	1000.0	9.000	Single Line	20.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

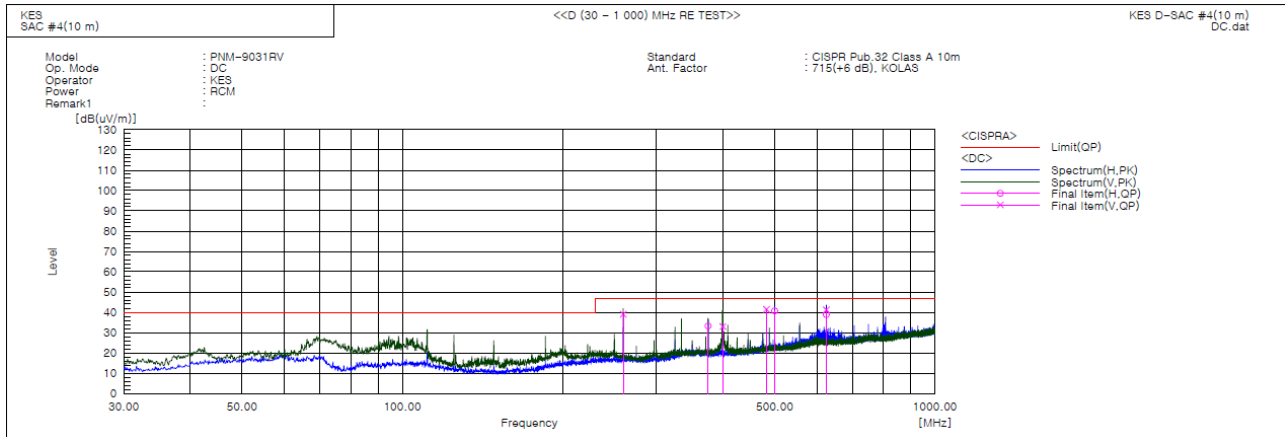
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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



Radiated Electric Field Emissions(Below 1 GHz)

■ AC/DC Adaptor



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	259.890	V	57.9	-18.8	39.1	47.0	7.9	101.0	25.0	
2	374.956	H	48.1	-14.8	33.3	47.0	13.7	325.0	165.0	
3	399.691	V	47.3	-14.3	33.0	47.0	14.0	140.0	210.0	
4	482.626	V	53.6	-12.1	41.5	47.0	5.5	139.0	225.0	
5	499.965	H	52.3	-11.6	40.7	47.0	6.3	287.0	253.0	
6	624.974	H	47.1	-8.2	38.9	47.0	8.1	393.0	124.0	
7	624.974	V	49.4	-8.2	41.2	47.0	5.8	100.0	340.0	

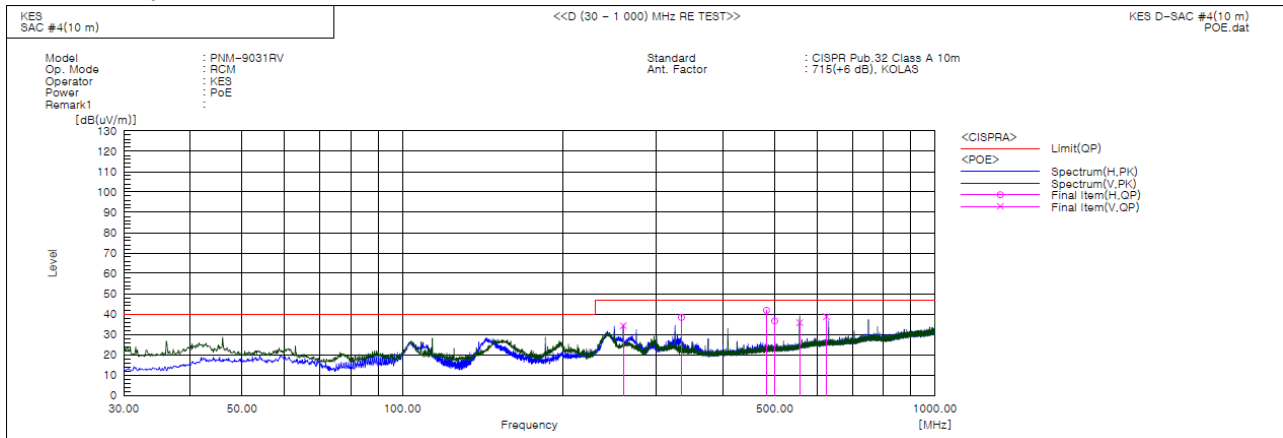
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

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



■ PoE Adaptor



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	259.890	V	53.1	-18.8	34.3	47.0	12.7	114.0	111.0	
2	334.095	H	54.2	-15.9	38.3	47.0	8.7	269.0	277.0	
3	482.626	H	53.9	-12.1	41.8	47.0	5.2	375.0	221.0	
4	499.965	H	48.2	-11.6	36.6	47.0	10.4	400.0	335.0	
5	556.831	V	45.9	-10.1	35.8	47.0	11.2	100.0	103.0	
6	624.974	V	46.9	-8.2	38.7	47.0	8.3	153.0	296.0	

◆ Calculation

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

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

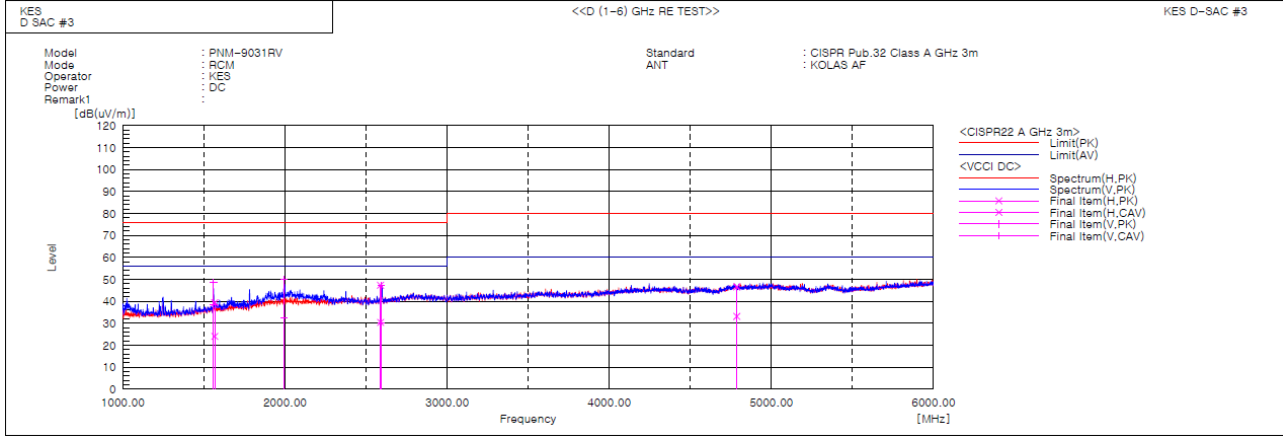
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

■ AC/DC Adaptor



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	1566.949	H	44.9	29.6	-5.5	39.4	24.1	76.0	56.0	36.6	31.9	100.0	57.6	
2	1559.820	V	54.3	44.2	-5.6	48.7	38.6	76.0	56.0	27.3	17.4	100.0	98.8	
3	1994.211	V	50.7	33.3	-0.9	49.8	32.4	76.0	56.0	26.2	23.6	100.0	352.0	
4	2593.670	V	47.1	29.9	0.3	47.4	30.2	76.0	56.0	28.6	25.8	100.0	304.7	
5	2589.411	H	47.0	30.2	0.3	47.3	30.5	76.0	56.0	28.7	25.5	100.0	38.1	
6	4786.864	H	38.1	24.7	8.5	46.6	33.2	80.0	60.0	33.4	26.8	100.0	190.1	

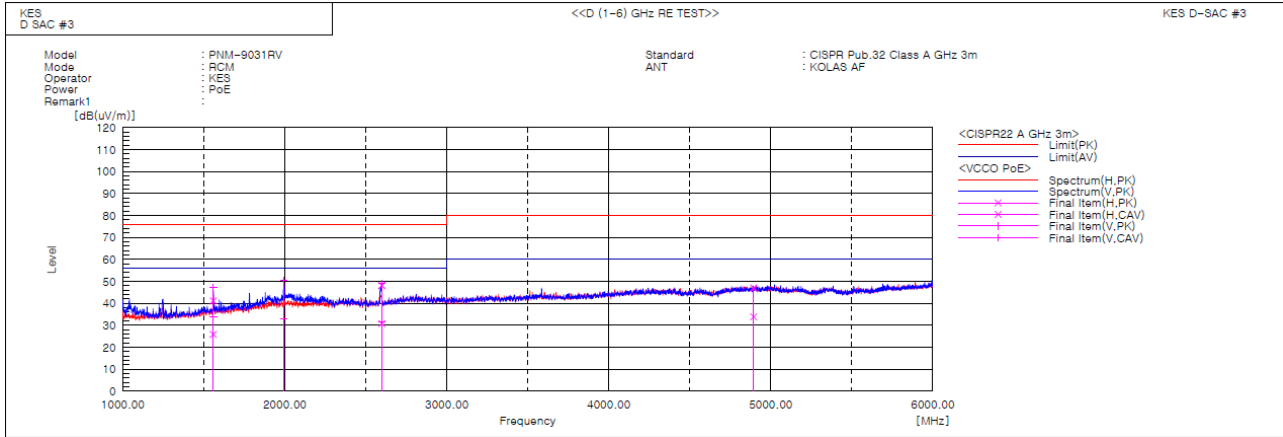
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

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



■ PoE Adaptor



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	1558.960	H	46.8	31.5	-5.6	41.2	25.9	76.0	56.0	34.8	30.1	100.0	342.3	
2	1559.560	V	52.8	39.3	-5.6	47.2	33.7	76.0	56.0	28.8	22.3	100.0	329.4	
3	1994.470	V	51.4	34.0	-0.9	50.5	33.1	76.0	56.0	25.5	22.9	100.0	0.6	
4	2599.189	V	48.9	31.2	0.3	49.2	31.5	76.0	56.0	26.8	24.5	100.0	312.5	
5	2599.230	H	47.9	30.5	0.3	48.2	30.8	76.0	56.0	27.8	25.2	100.0	39.5	
6	4893.864	H	38.2	25.1	8.8	47.0	33.9	80.0	60.0	33.0	26.1	100.0	4.6	

◆ 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 kes@kes.co.kr

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ AC/DC Adaptor



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

Conducted Emissions at Telecommunication Ports

■ AC/DC Adaptor



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

■ PoE Adaptor



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

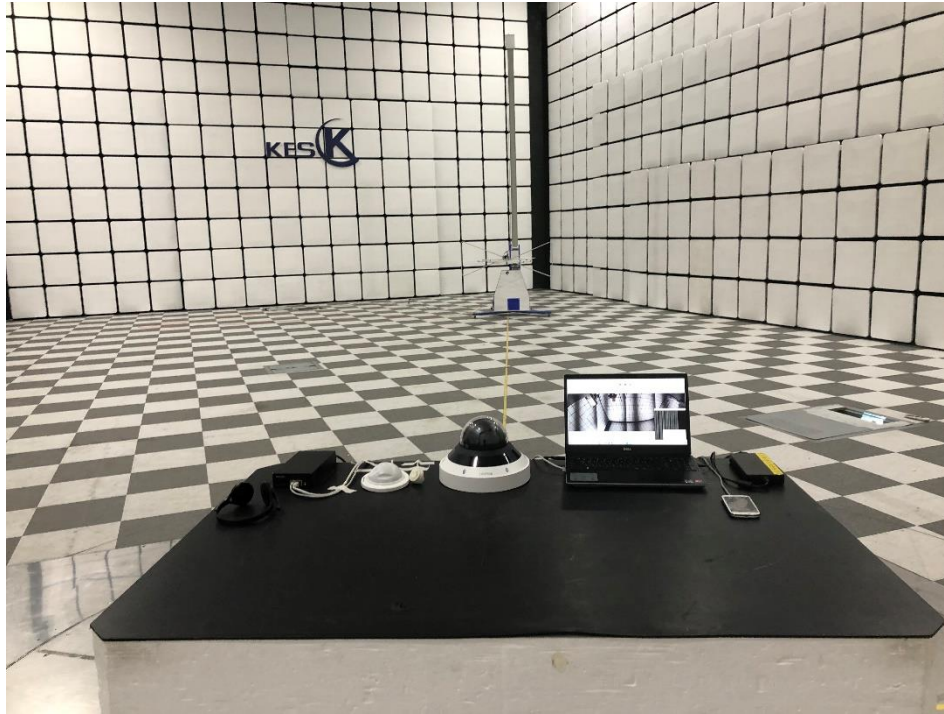
Radiated Electric Field Emissions(Below 1 GHz)

■ AC/DC Adaptor



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

■ PoE Adaptor



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)

■ AC/DC Adaptor



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

■ PoE Adaptor



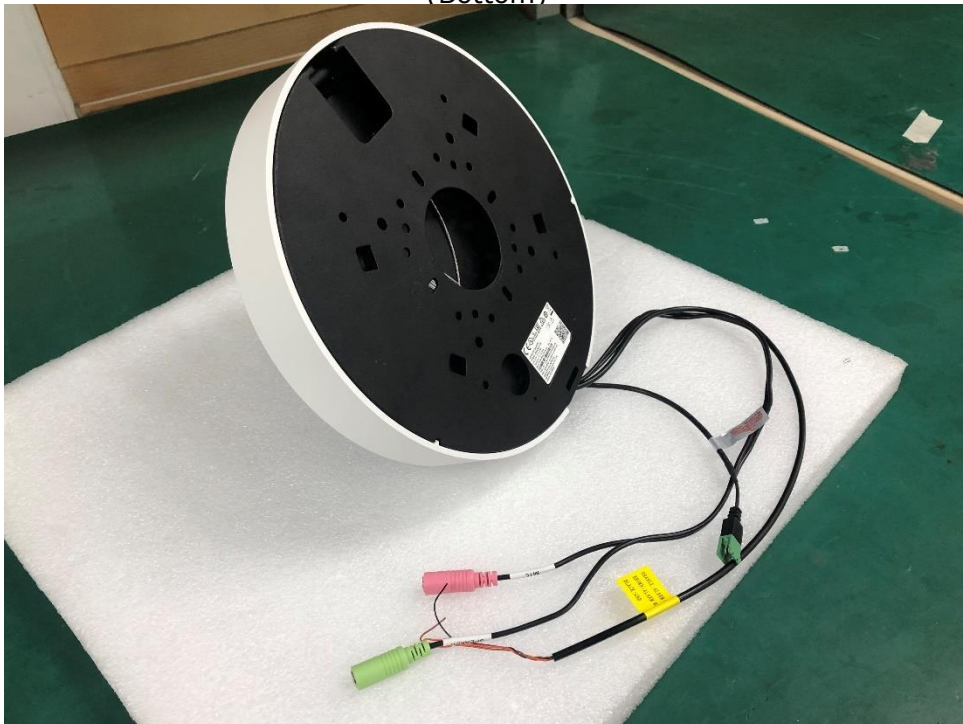
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT External Photographs

(Top)



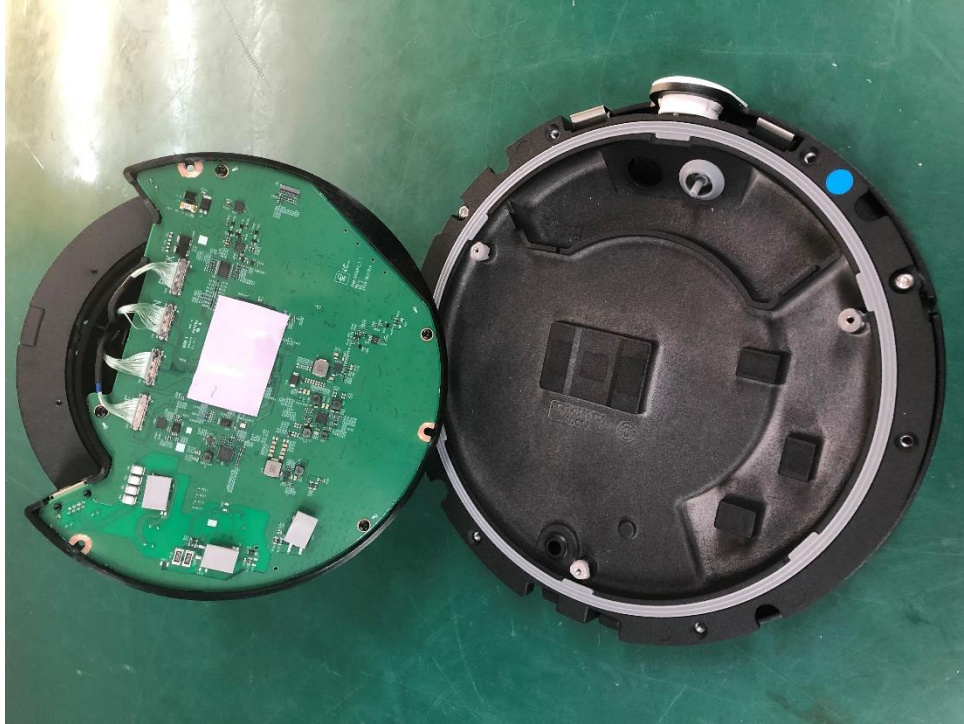
(Bottom)



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

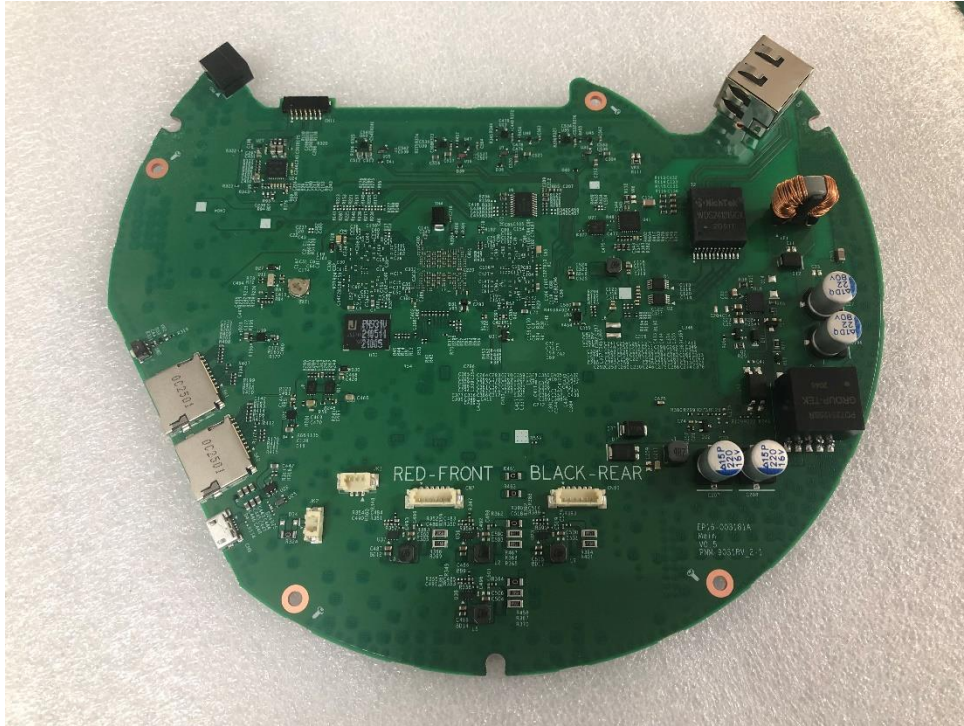
(Internal View)



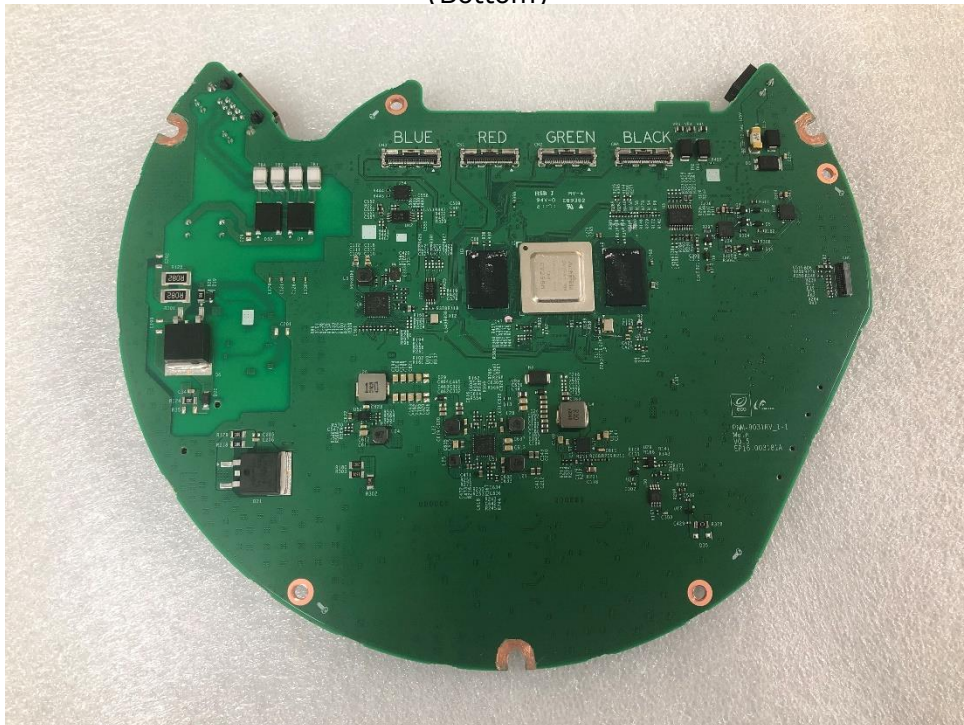
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 1

(Top)



(Bottom)



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

EUT Internal View – Board 2

(Top)



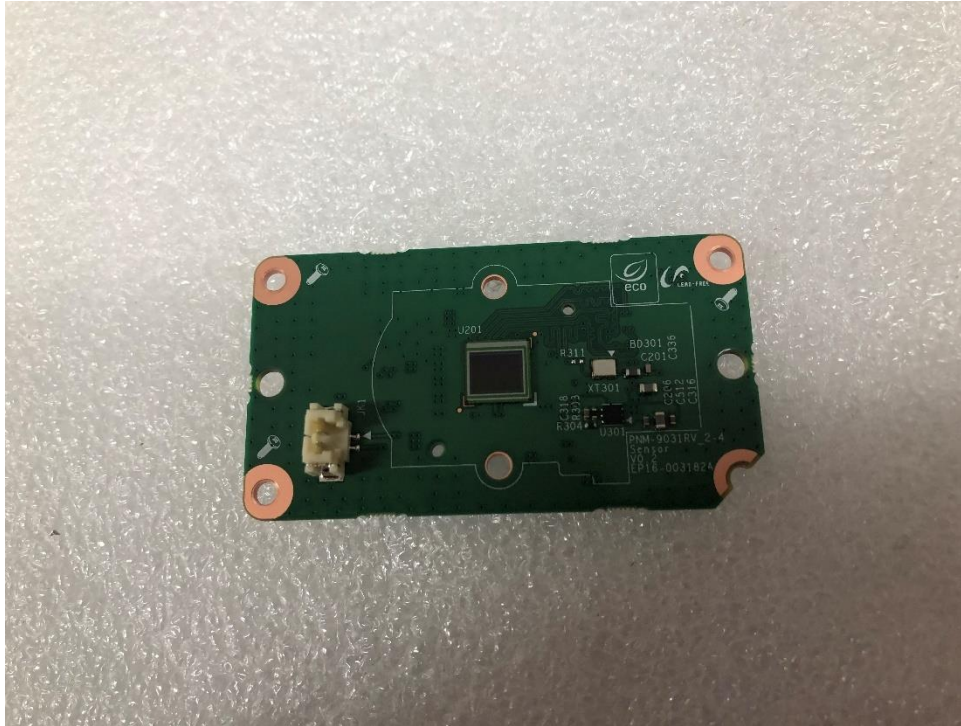
(Bottom)



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

EUT Internal View – Board 3

(Top)



(Bottom)



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

EUT Internal View – Board 4

(Top)



(Bottom)



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