



EMC TEST REPORT

Test Report No. : KES-EM-20T0425-R2
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : PNM-9002VQ
Variant Mode : -
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)
Equipment authorization : **Supplier's Declaration of Conformity**
Date of Receipt : Jun. 19, 2020
Test date : Jun. 28, 2020 ~ Jun. 29, 2020
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.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 09, 2020	KES-EM-20T0425	Issued
Nov. 19, 2021	KES-EM-20T0425-R1	- IC Regulation ICES-003 Issue 7 Update ANSI C63.4-2014 or ANSI C63.4-2014 amended as per ANSI C63.4a-2017
Feb. 24, 2023	KES-EM-20T0425-R2	Change the Applicant and manufacturer at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation
Lens	
Optional Lens	SLA-2M2400Q(2MP 2.4mm) SLA-2M2800Q(2MP 2.8mm) SLA-2M3600Q(2MP 3.6mm) SLA-2M6000Q(2MP 6.0mm) SLA-5M3700Q(5MP 3.7mm) SLA-5M4600Q(5MP 4.6mm) SLA-5M7000Q(5MP 7.0mm)
Operational	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(Electrical)
Backlight Compensation	BLC, HLC, WDR, SSDR
Wide Dynamic Range	2MP 150dB, 5MP 120dB
Digital Noise Reduction	SSNR V
Digital Image Stabilization	Support
Defog	Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	32ea, polygonal zones - Color: Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Color palettes	None
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, Face detection, Fog detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line
Alarm Triggers	Analytics, Network disconnect
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC recording at event triggers
Network	
Ethernet	RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/Baseline/High, MJPEG

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Resolution	[5MP] 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 320x240 [2MP] 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: 2MP Max. 60fps/50fps(60Hz/50Hz), 5MP Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
Smart Codec	Manual(Sea 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)
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, SRTP, 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 4slot 256GB(Each CH)
Application Programming Interface	ONVIF Profile S/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 Browser: MS Explore11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari(Mac OS X only)
Memory	5GB RAM, 1280MB Flash
Environmental	
Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66, IK10
Electrical	
Input Voltage	PoE+(IEEE802.3at, Class4)
Power Consumption	Max 25.5W
Mechanical	
Color / Material	White / Aluminum
Product dimensions / weight	Ø253mmx130mm, 3000g

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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	PNM-9002VQ	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	P95G001	8KM8HT2	Wistron Infocom (Chengdu) Company Limited	-
Notebook Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY(CHANG ZHOU)CO.,LTD.	-
Micro SD Card	-	-	SanDisk	-
PoE Adapter	PT-PSE109GBPO- AH	EP06-003756A	Dongguan PROCET Network Technology Co.,Ltd	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	PoE Adapter	RJ-45	4.0	U
	SLOT	Micro SD Card	SLOT	-	-
PoE Adapter	RJ-45	Notebook	RJ-45	3.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

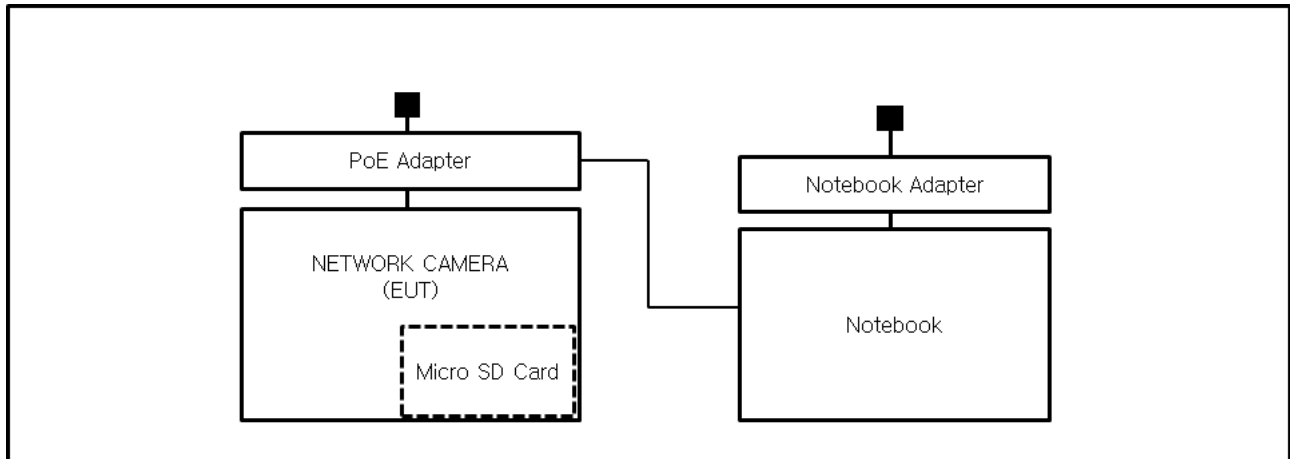
Test mode	operating
Operation mode	checked that the camera video output was working properly in the web viewer and used the ping test to verify that the network behavior was working properly.

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

1.8 Configuration

■ AC Main

□ DC Main



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

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

1.12 Laboratory Accreditations and Listings

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

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1

☐ Group 2

☐ Class A

☐ 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



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- | | | |
|---|---|----------------------------------|
| ☐ 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 C63.4a-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 |
| ☐ 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 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 28, 2020

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, 20, 2021
☒	LISN	ENV216	R & S	101787	01, 02, 2021
☒	LISN	ESH2-Z5	R & S	100450	01, 02, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	01, 02, 2021

Test Conditions

Temperature: 23,3 °C
Relative Humidity: 51,7 % 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 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 28, 2020

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, 01, 2021
☒	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2020
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2021

Test Conditions

Temperature: 23,1 °C
Relative Humidity: 51,2 % 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.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 29, 2020

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, 01, 2021
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 02, 2021
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2021
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 13, 2020

Test Conditions

Temperature: 23,2 °C
Relative Humidity: 51,4 % R.H.

Frequency Range of Measurement

1 GHz to 5 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.



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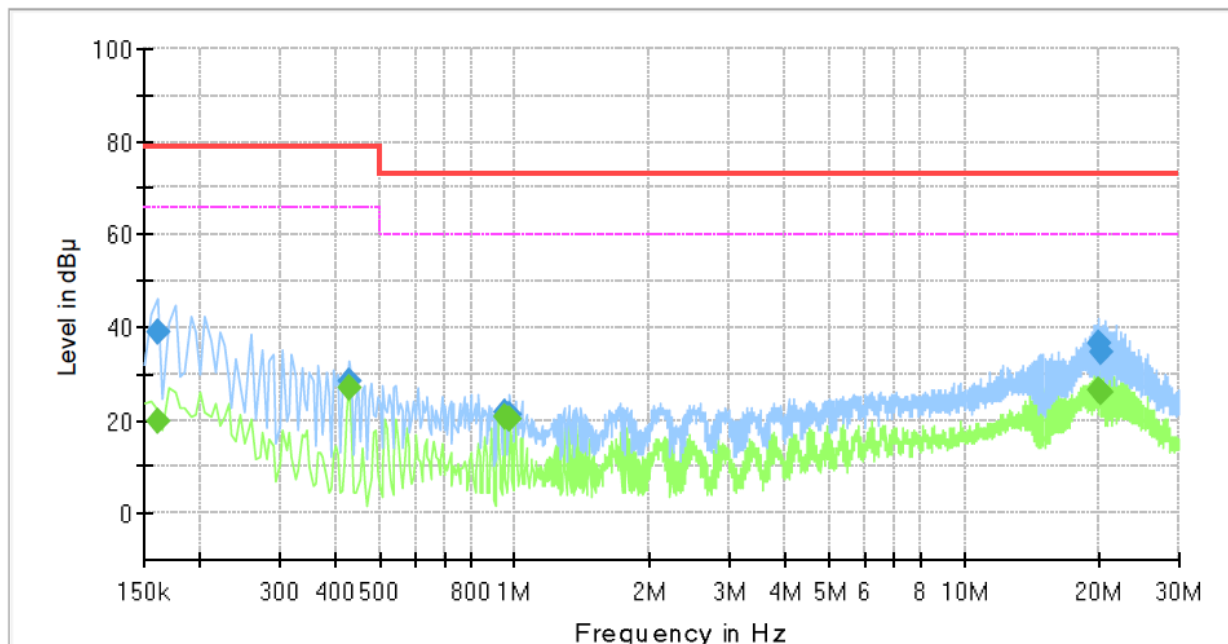
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: PNM-9002VQ
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)
0.160000	---	19.56	66.00	46.44	1000.0	9.000	L1	19.5
0.160000	39.01	---	79.00	39.99	1000.0	9.000	L1	19.5
0.430000	---	26.86	66.00	39.14	1000.0	9.000	L1	19.6
0.430000	28.47	---	79.00	50.53	1000.0	9.000	L1	19.6
0.945000	---	20.64	60.00	39.36	1000.0	9.000	L1	19.7
0.945000	21.49	---	73.00	51.51	1000.0	9.000	L1	19.7
0.975000	---	20.33	60.00	39.67	1000.0	9.000	L1	19.7
0.975000	21.00	---	73.00	52.00	1000.0	9.000	L1	19.7
19.810000	---	26.59	60.00	33.41	1000.0	9.000	L1	20.2
19.810000	36.56	---	73.00	36.44	1000.0	9.000	L1	20.2
20.045000	---	26.16	60.00	33.84	1000.0	9.000	L1	20.2
20.045000	34.87	---	73.00	38.13	1000.0	9.000	L1	20.2

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NEUTRAL LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

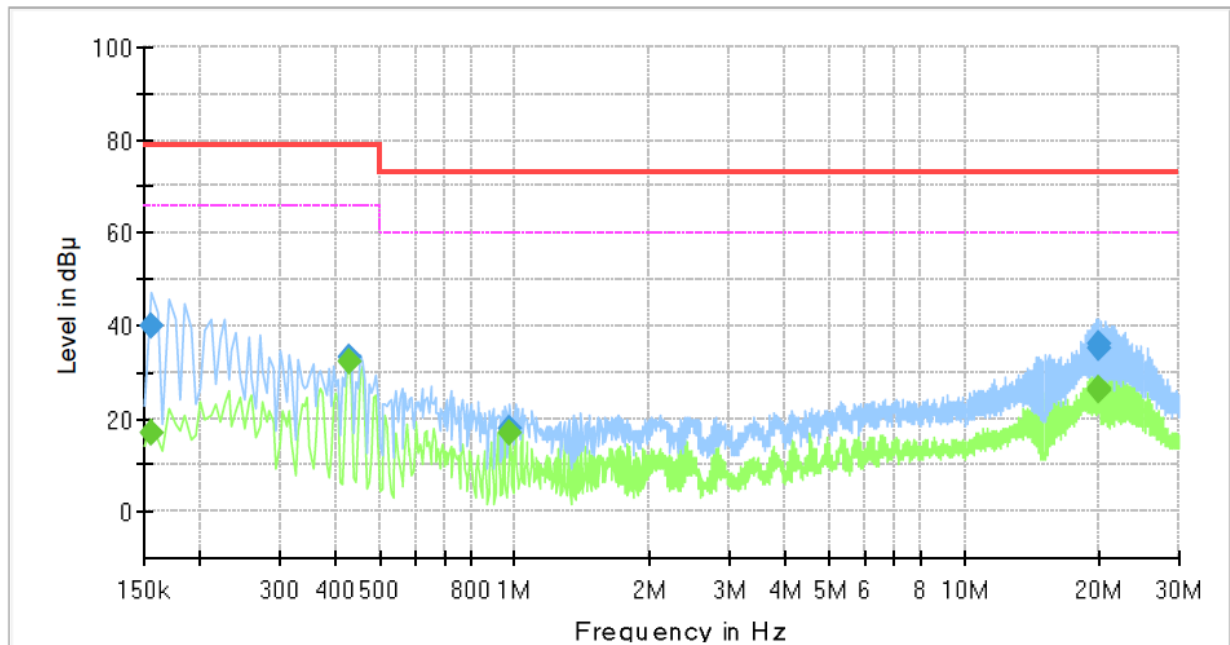
Operator Name:

Conducted Emission

PNM-9002VQ

N

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	16.93	66.00	49.07	1000.0	9.000	N	19.5
0.155000	39.83	---	79.00	39.17	1000.0	9.000	N	19.5
0.430000	---	32.40	66.00	33.60	1000.0	9.000	N	19.6
0.430000	33.40	---	79.00	45.60	1000.0	9.000	N	19.6
0.975000	---	17.00	60.00	43.00	1000.0	9.000	N	19.7
0.975000	18.10	---	73.00	54.90	1000.0	9.000	N	19.7
19.945000	---	26.24	60.00	33.76	1000.0	9.000	N	20.3
19.945000	35.01	---	73.00	37.99	1000.0	9.000	N	20.3
19.975000	---	26.50	60.00	33.50	1000.0	9.000	N	20.3
19.975000	36.20	---	73.00	36.80	1000.0	9.000	N	20.3

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

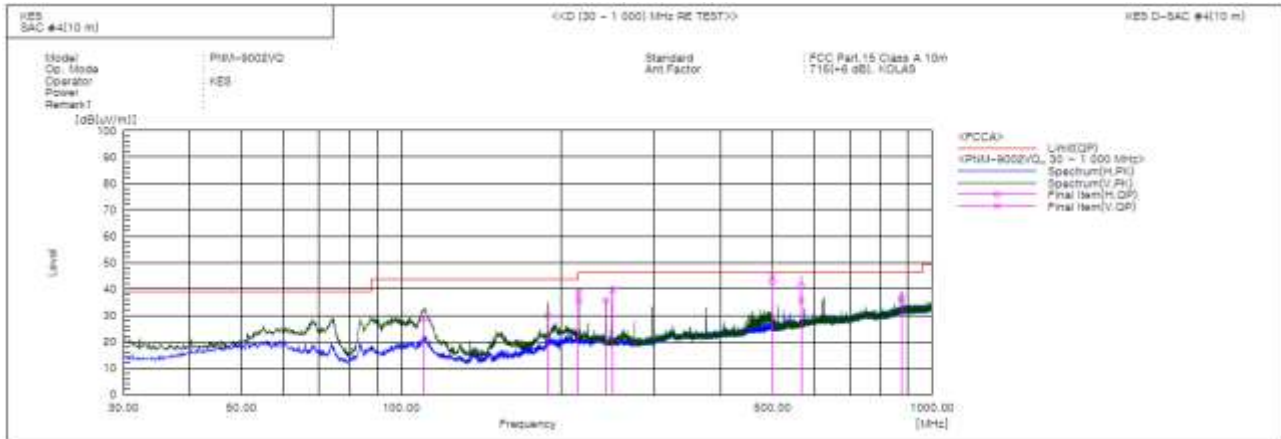
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Radiated Electric Field Emissions(Below 1 GHz)



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	110.312	V	51.7	-22.8	28.9	43.5	14.6	110.0	168.0	
2	188.959	H	53.0	-23.1	29.9	43.5	13.6	362.0	6.0	
3	215.992	H	56.5	-20.9	35.6	43.5	7.9	389.0	320.0	
4	216.016	V	59.7	-20.9	38.8	46.5	7.7	105.0	247.0	
5	243.036	H	55.8	-20.2	35.6	46.5	10.9	356.0	2.0	
6	250.069	V	59.8	-20.1	39.7	46.5	6.8	125.0	270.0	
7	499.965	V	57.4	-12.9	44.5	46.5	2.0	348.0	140.0	
8	500.086	H	55.6	-12.9	42.7	46.5	3.8	400.0	203.0	
9	567.016	V	46.8	-11.1	35.7	46.5	10.8	121.0	320.0	
10	567.016	H	52.4	-11.1	41.3	46.5	5.2	326.0	18.0	
11	874.993	V	41.7	-6.1	35.6	46.5	10.9	358.0	235.0	
12	875.113	H	42.6	-6.1	36.5	46.5	10.0	249.0	168.0	

◆ Calculation - SAC #4(10 m)

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

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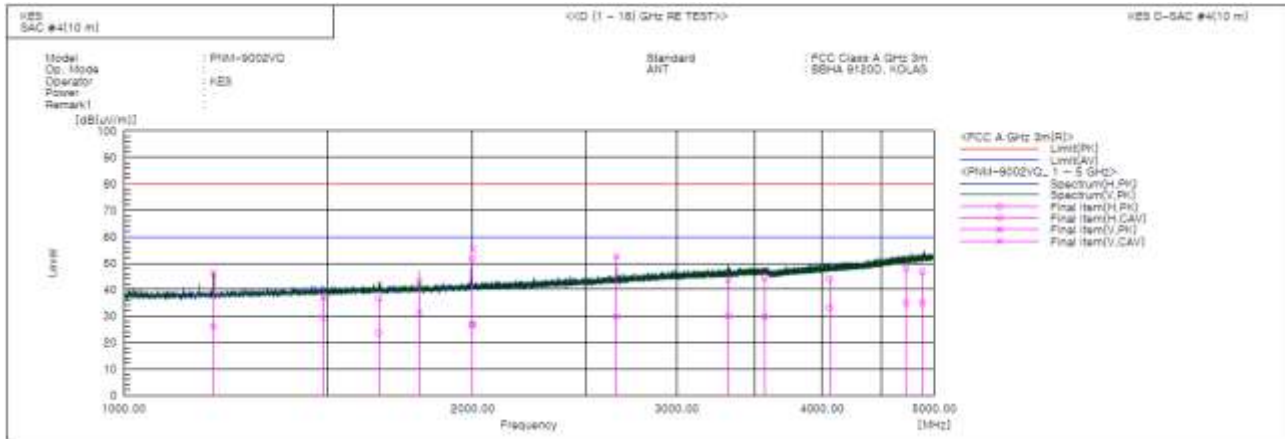
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Report No.:

KES-EM-20T0425-R2

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Radiated Electric Field Emissions(Above 1 GHz)



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	1194.800	V	50.3	30.1	-4.0	46.3	26.1	80.0	60.0	33.7	33.9	319.0	235.0	
2	1486.000	V	39.5	31.9	-2.4	37.1	29.5	80.0	60.0	42.9	30.5	119.0	226.0	
3	1659.500	H	38.5	25.3	-1.7	36.8	23.6	80.0	60.0	43.2	36.4	259.0	304.0	
4	1798.000	V	44.0	32.4	-1.0	43.0	31.4	80.0	60.0	37.0	28.6	124.0	164.0	
5	1997.205	H	51.7	26.7	-0.1	51.6	26.6	80.0	60.0	28.4	33.4	397.0	233.0	
6	1999.900	V	55.4	27.1	-0.1	55.3	27.0	80.0	60.0	24.7	33.0	382.0	203.0	
7	2659.675	V	49.5	26.7	3.1	52.6	29.8	80.0	60.0	27.4	30.2	315.0	132.0	
8	3322.000	V	37.8	24.4	5.8	43.6	30.2	80.0	60.0	36.4	29.8	400.0	15.0	
9	3569.500	H	38.4	23.6	6.2	44.6	29.8	80.0	60.0	35.4	30.2	356.0	183.0	
10	4060.500	H	35.6	24.5	8.6	44.2	33.1	80.0	60.0	35.8	26.9	327.0	256.0	
11	4727.455	H	36.0	22.9	12.0	48.0	34.9	80.0	60.0	32.0	25.1	217.0	106.0	
12	4883.000	H	34.2	22.3	12.7	46.9	35.0	80.0	60.0	33.1	25.0	381.0	269.0	

◆ Calculation

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

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

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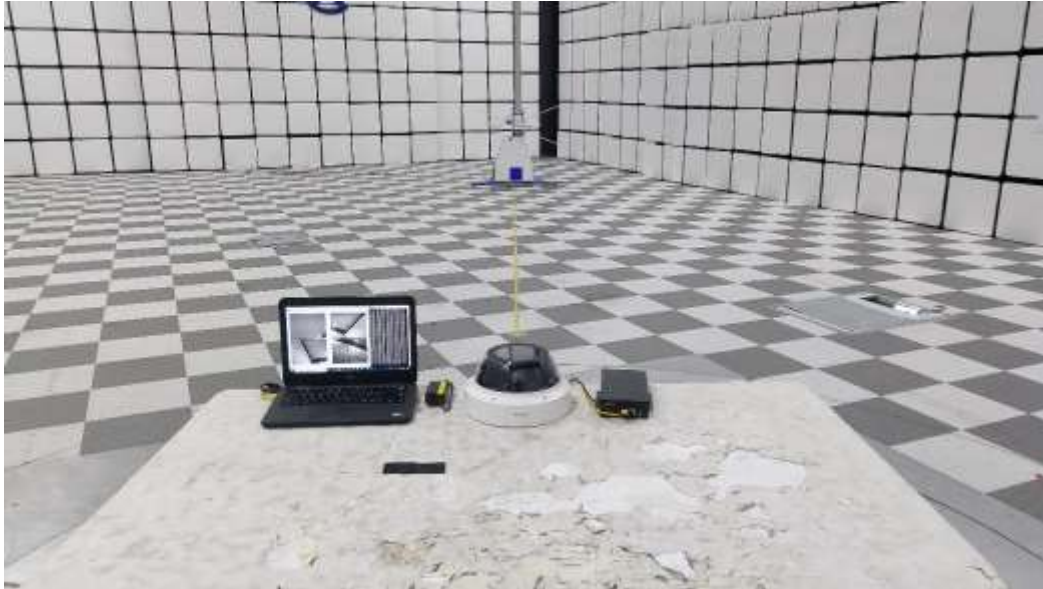
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



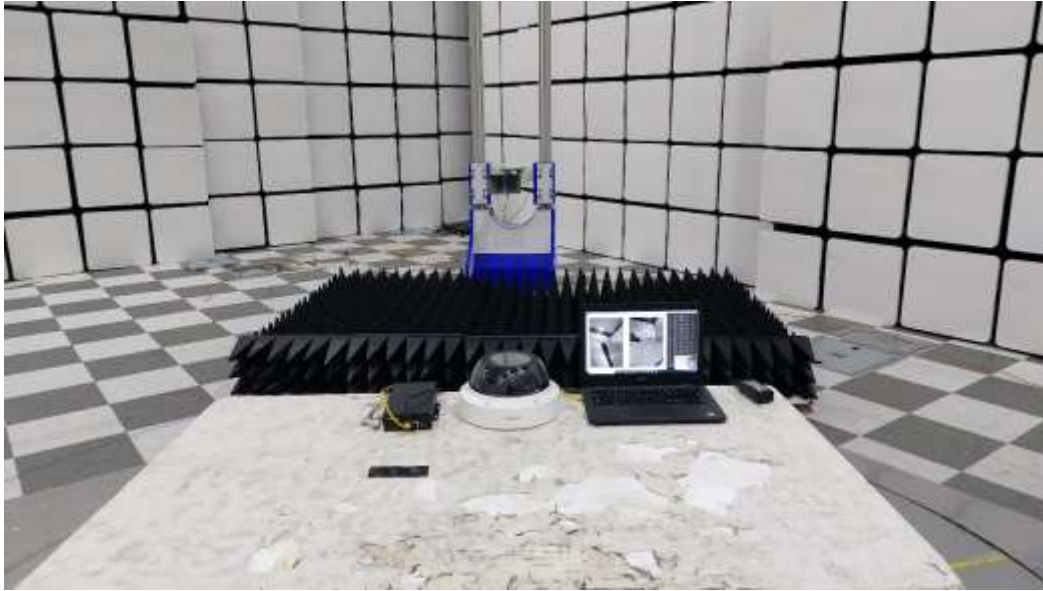
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



(Bottom)



EUT Internal Photographs

(Internal View)

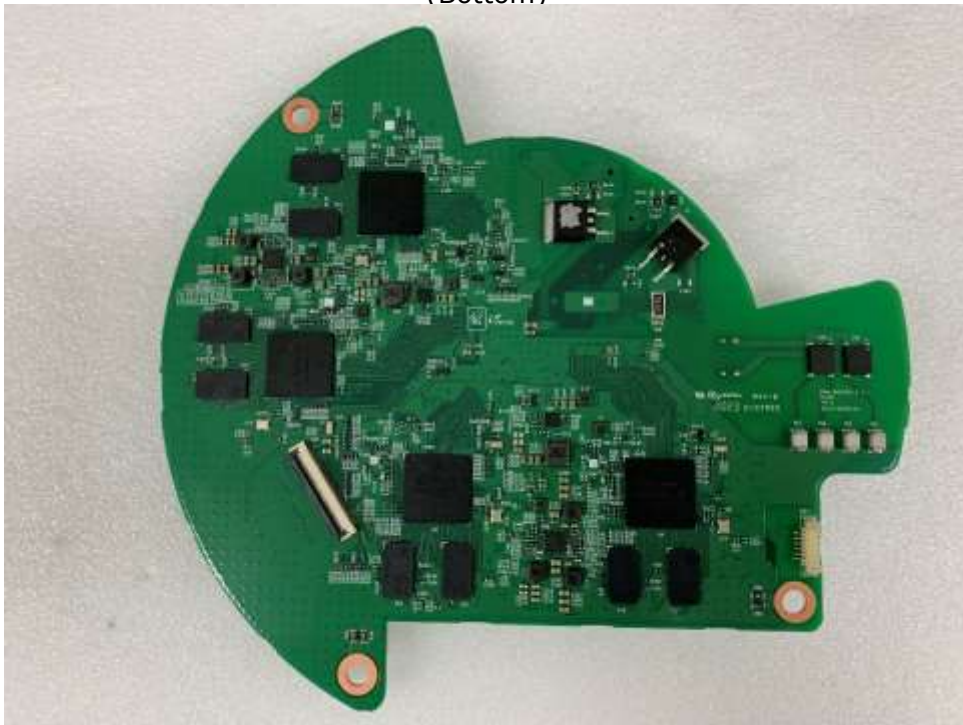


EUT Internal View – Board 1

(Top)



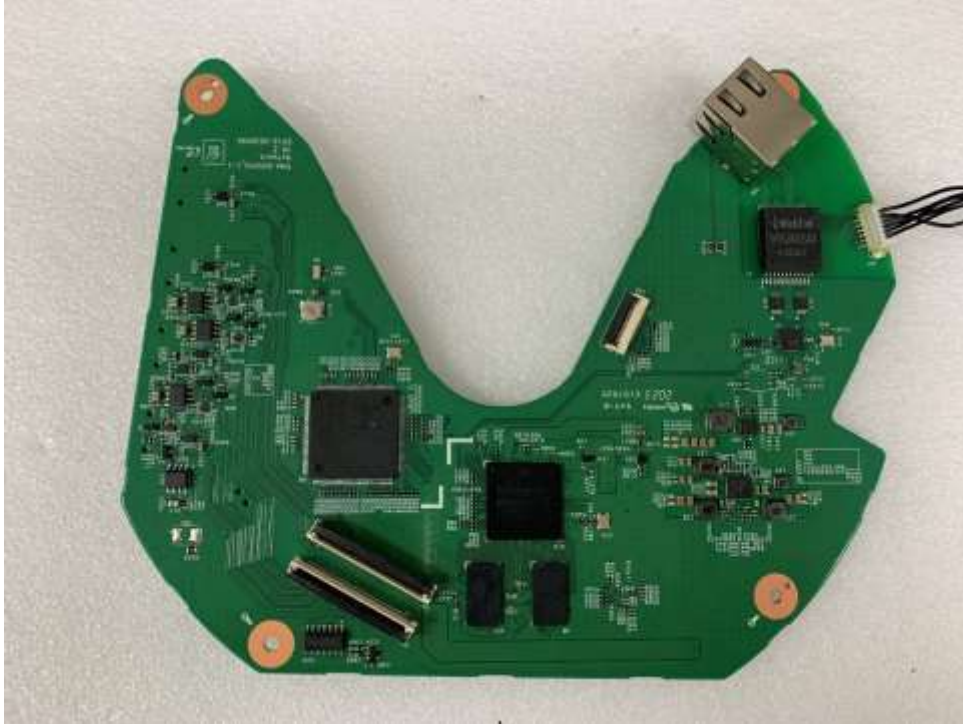
(Bottom)



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EUT Internal View – Board 2

(Top)



(Bottom)



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EUT Internal View – Camera Lens

(Top)



(Bottom)



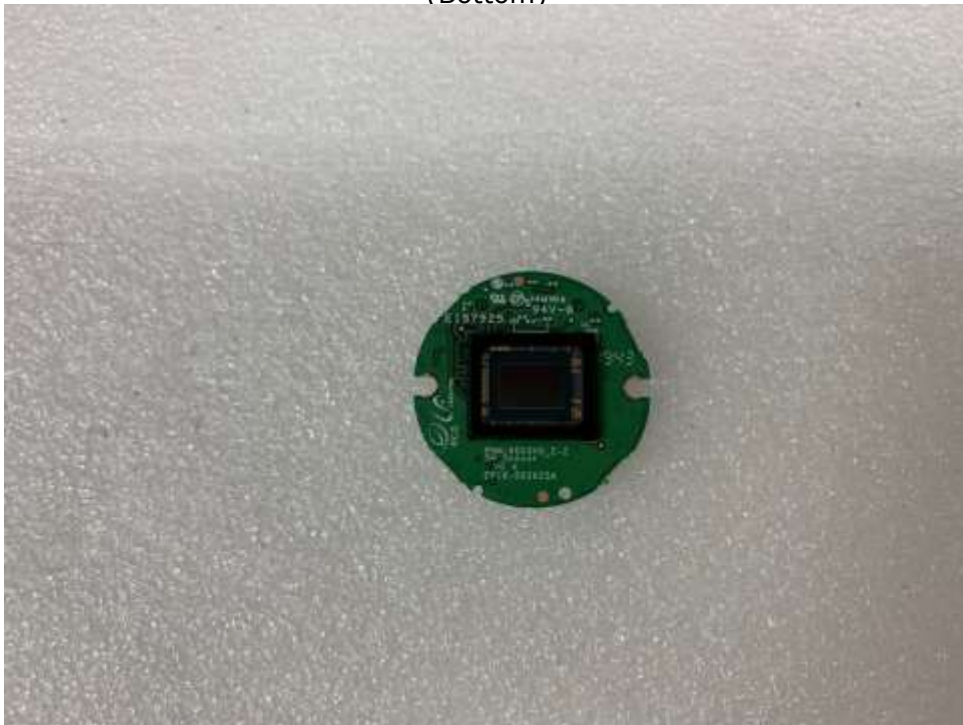
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EUT Internal View – Camera Board 1

(Top)



(Bottom)



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EUT Internal View – Camera Board 2

(Top)

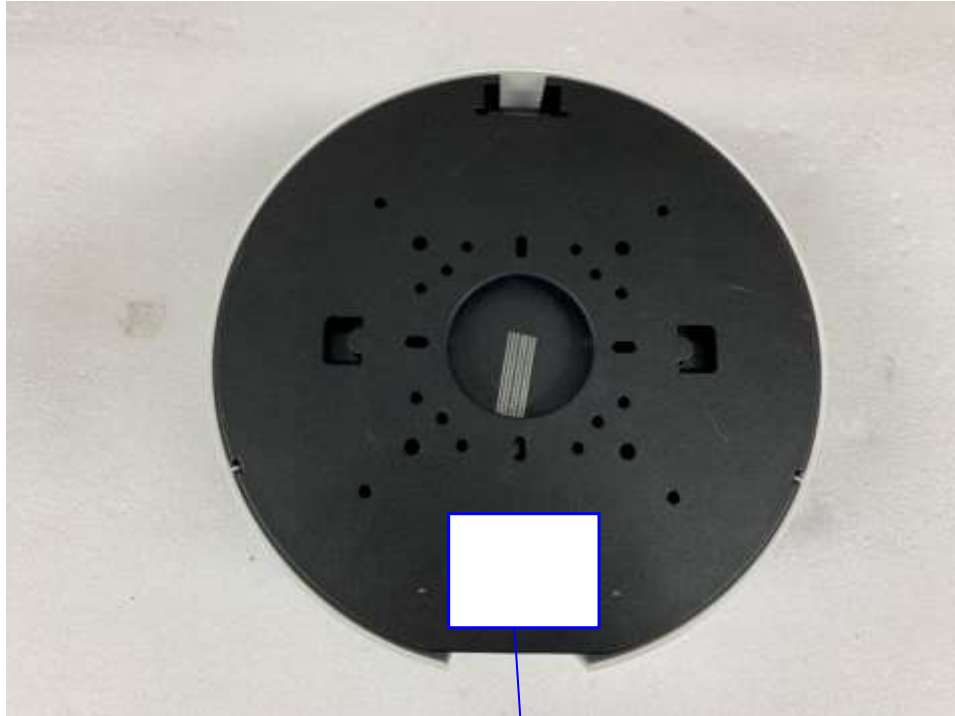


(Bottom)



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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.