



EMC TEST REPORT

Test Report No. : KES-EM-22T0023-R2
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : PNM-9084QZ
Variant Model : PNM-9084QZ1
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 : Dec. 22, 2021
Test date : Dec. 24, 2021
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Seon Ho, Choi
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jan. 07, 2022	KES-EM-22T0023	Issued
Feb. 17, 2022	KES-EM-22T0023-R1	Re-issue due to variant model addition
Feb. 24, 2023	KES-EM-22T0023-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	
Imaging Device	1/2.8" 2MP CMOS: each CH
Effective Pixels	1945(H)x1097(V): each CH
Min. Illumination	Color: 0.08lux(F2.2, 1/30sec) BW: 0.008lux(F2.2, 1/30sec)
Lens	
Focal Length (Zoom Ratio)	3~6mm(2x) motorized varifocal
Max. Aperture Ratio	F2.2(W)-F3.1(T)
Angular Field of View	H: 107°(W)~56.3°(T) / V: 57°(W)~31.5°(T) / D: 126°(W)~64.3°(T)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus
Lens Type	DC auto iris
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	Motorized PTRZ Pan: 0~360° / Tilt: 0~90° / Rotate: 0~90°
Operational	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNRV
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
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, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection
Alarm I/O	Input 1ea / Output 1ea
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 Handover
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms

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Network	
Ethernet	RJ-45(10/100/1000BASE-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)
Smart Codec	Manual(5ea area), WiseStreamII
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(10 users) / Multicast Multiple streaming(Up to 10 profiles)
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
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 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 13 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 *Start up should be above at -35°C
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66, IK10, NEMA4X
Electrical	
Input Voltage	HPoE(IEEE802.3bt)
Power Consumption	Max.35W
Mechanical	
Color / Material	White / Aluminum
RAL Code	RAL9003
Product dimensions / weight	φ251x116.5mm / 3Kg

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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.

☒ AC 120 V, 60 Hz (PoE Adapter Input Power)

1.2 Variant Model Differences

GYRO SENSOR Delete

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-9084QZ	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT
PoE INJECTOR	PD-9501GR/AC	-	CHANGZHOU WUJIN HONGGUANG RADIO CO., LTD.	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	LG15N54	411NZJV044052	LG Electronics Co., Ltd.	-
Notebook Adaptor	PA-1900-14	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD	-
MIC	MP1000	-	-	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
Alarm IN	PRO-SL	-	SENSOR PRO	-
Alarm OUT	-	-	-	-
Micro SD Card	-	-	Sandisk	8 GB
Smart Phone	SM-A720S	-	SAMSUNG	-



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)	PoE INJECTOR (EUT)	RJ-45 (PoE)	2.0	S
	3.5 mm	MIC	3.5 mm	2.0	U
	3.5 mm	Speaker	3.5 mm	1.5	U
	Alarm IN	Alarm IN	Alarm OUT	3.5	U
	Alarm OUT	Alarm OUT	Alarm IN	3.0	U
	Card Slot	Micro SD Card	Card Slot	-	-
Notebook	RJ-45 (LAN)	PoE INJECTOR (EUT)	RJ-45 (LAN)	3.0	S
	3.5 mm	Smart Phone	3.5 mm	2.0	U
	DC Jack	Notebook Adaptor	DC Jack	1.5	U

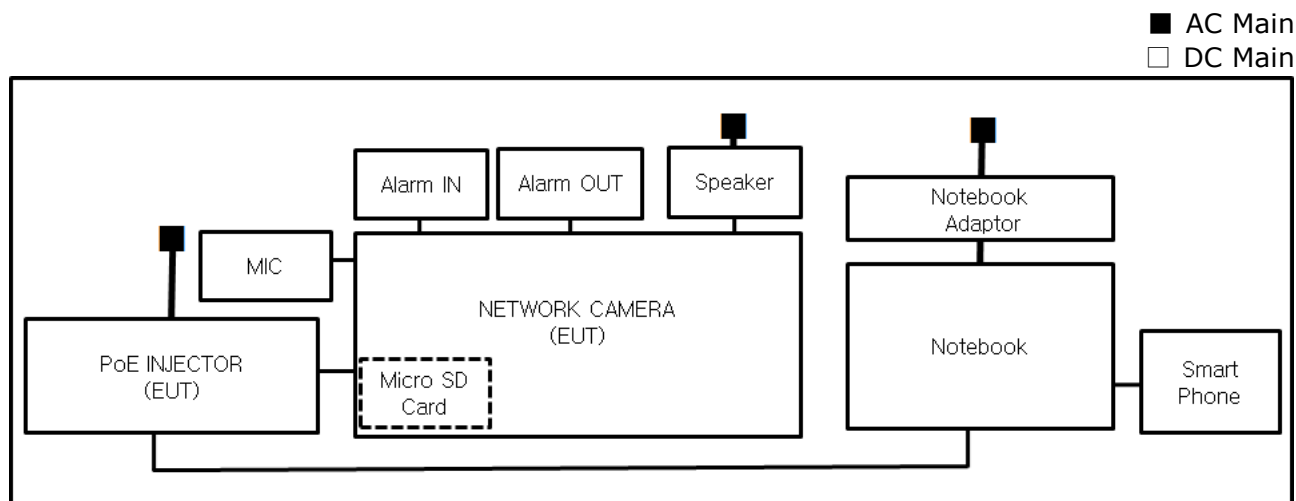
* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

Test Mode	operating
Operation mode	EUT Monitoring, Ping Test

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

1.8 Configuration



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:

☒ **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



2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 24, 2021

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESU26	R & S	100517	08, 05, 2022
☒	LISN	ENV216	R & S	101786	01, 19, 2022
☒	LISN	ENV216	R & S	101137	01, 19, 2022

Test Conditions

Temperature: (22,6 ± 0,2) °C

Relative Humidity: (42,7 ± 0,2) % 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

Dec. 24, 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, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions

Temperature: (22,4 ± 0,4) °C

Relative Humidity: (42,9 ± 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.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Dec. 24, 2021

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
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

Test Conditions

Temperature: (22,2 ± 0,4) °C

Relative Humidity: (43,7 ± 0,3) % 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.

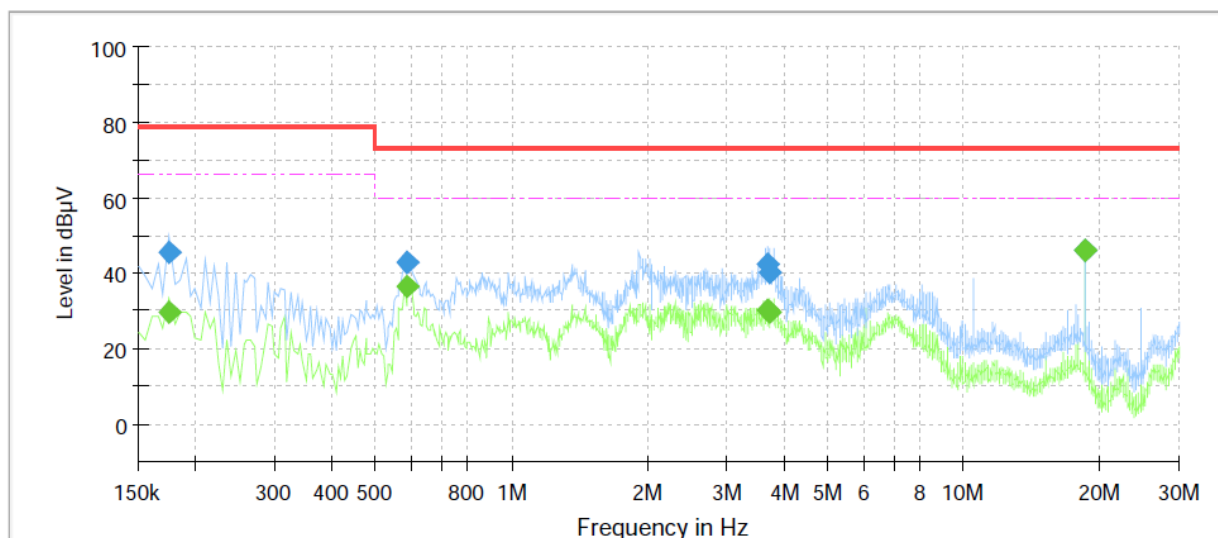
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9084QZ
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)
0.175000	---	29.55	66.00	36.45	1000.0	9.000	L1	9.6
0.175000	45.68	---	79.00	33.32	1000.0	9.000	L1	9.6
0.590000	---	36.40	60.00	23.60	1000.0	9.000	L1	9.7
0.590000	43.11	---	73.00	29.89	1000.0	9.000	L1	9.7
3.695000	---	30.20	60.00	29.80	1000.0	9.000	L1	10.1
3.695000	42.15	---	73.00	30.85	1000.0	9.000	L1	10.1
3.705000	---	29.89	60.00	30.11	1000.0	9.000	L1	10.1
3.705000	40.28	---	73.00	32.72	1000.0	9.000	L1	10.1
18.500000	---	46.18	60.00	13.82	1000.0	9.000	L1	10.0
18.500000	46.13	---	73.00	26.87	1000.0	9.000	L1	10.0

NEUTRAL LINE

Common Information

Test Description:

Model No.:

Mode

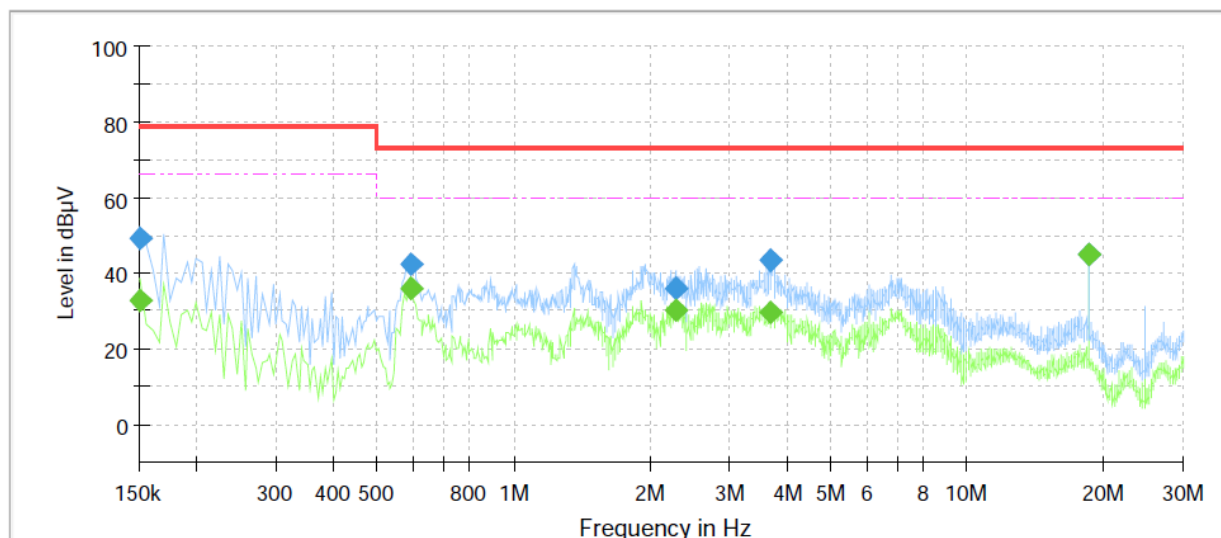
Operator Name:

Conducted Emission

PNM-9084QZ

N

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	32.86	66.00	33.14	1000.0	9.000	N	9.5
0.150000	48.99	---	79.00	30.01	1000.0	9.000	N	9.5
0.595000	---	35.91	60.00	24.09	1000.0	9.000	N	9.7
0.595000	42.32	---	73.00	30.68	1000.0	9.000	N	9.7
2.275000	---	30.13	60.00	29.87	1000.0	9.000	N	10.1
2.275000	36.21	---	73.00	36.79	1000.0	9.000	N	10.1
3.695000	---	29.74	60.00	30.26	1000.0	9.000	N	10.0
3.695000	43.64	---	73.00	29.36	1000.0	9.000	N	10.0
18.500000	---	44.76	60.00	15.24	1000.0	9.000	N	10.0
18.500000	44.76	---	73.00	28.24	1000.0	9.000	N	10.0

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

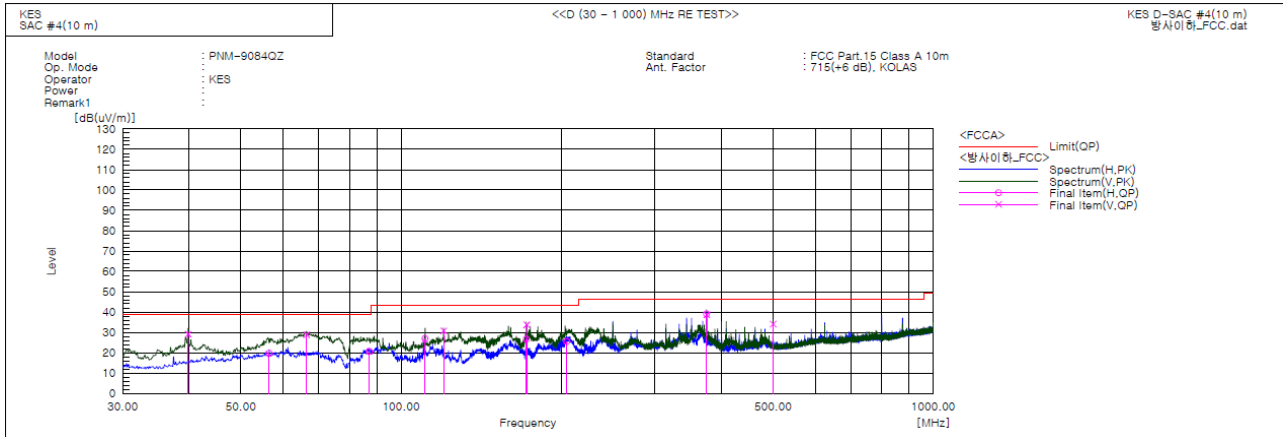
Reading Value : Not shown in the table.

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



Radiated Electric Field Emissions(Below 1 GHz)

- 47 CFR Part 15, Subpart B



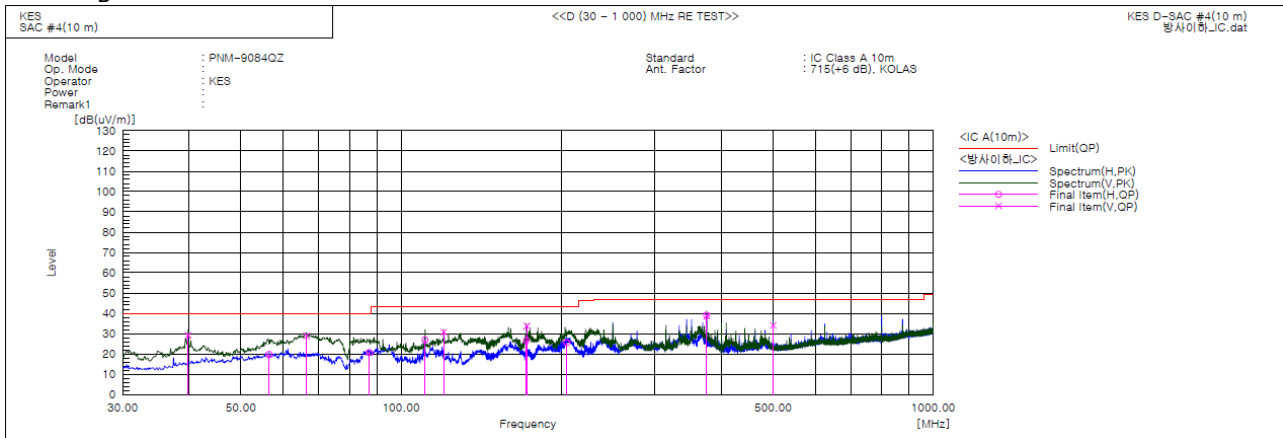
Final Result

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	39.821	V	51.6	-22.5	29.1	39.0	9.9	192.0	158.0	
2	56.554	H	41.2	-21.4	19.8	39.0	19.2	391.0	210.0	
3	66.496	V	52.5	-23.6	28.9	39.0	10.1	100.0	237.0	
4	87.230	H	45.6	-25.0	20.6	39.0	18.4	387.0	47.0	
5	110.874	H	49.1	-22.2	26.9	43.5	16.6	400.0	307.0	
6	120.210	V	54.9	-24.1	30.8	43.5	12.7	157.0	315.0	
7	171.984	H	50.7	-24.0	26.7	43.5	16.8	305.0	66.0	
8	172.165	V	57.7	-24.0	33.7	43.5	9.8	109.0	4.0	
9	204.843	H	46.2	-20.7	25.5	43.5	18.0	308.0	175.0	
10	374.956	H	53.7	-14.6	39.1	46.5	7.4	396.0	5.0	
11	375.160	V	53.2	-14.6	38.6	46.5	7.9	119.0	54.0	
12	499.965	V	45.4	-11.3	34.1	46.5	12.4	152.0	233.0	

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- 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	39.821	V	51.6	-22.5	29.1	40.0	10.9	192.0	158.0	
2	56.554	H	41.2	-21.4	19.8	40.0	20.2	391.0	210.0	
3	66.496	V	52.5	-23.6	28.9	40.0	11.1	100.0	237.0	
4	87.230	H	45.6	-25.0	20.6	40.0	19.4	387.0	47.0	
5	110.874	H	49.1	-22.2	26.9	43.5	16.6	400.0	307.0	
6	120.210	V	54.9	-24.1	30.8	43.5	12.7	157.0	315.0	
7	171.984	H	50.7	-24.0	26.7	43.5	16.8	305.0	66.0	
8	172.165	V	57.7	-24.0	33.7	43.5	9.8	109.0	4.0	
9	204.843	H	46.2	-20.7	25.5	43.5	18.0	308.0	175.0	
10	374.956	H	53.7	-14.6	39.1	47.0	7.9	396.0	5.0	
11	375.160	V	53.2	-14.6	38.6	47.0	8.4	119.0	54.0	
12	499.965	V	45.4	-11.3	34.1	47.0	12.9	152.0	233.0	

◆ Calculation - SAC #4(10 m)

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

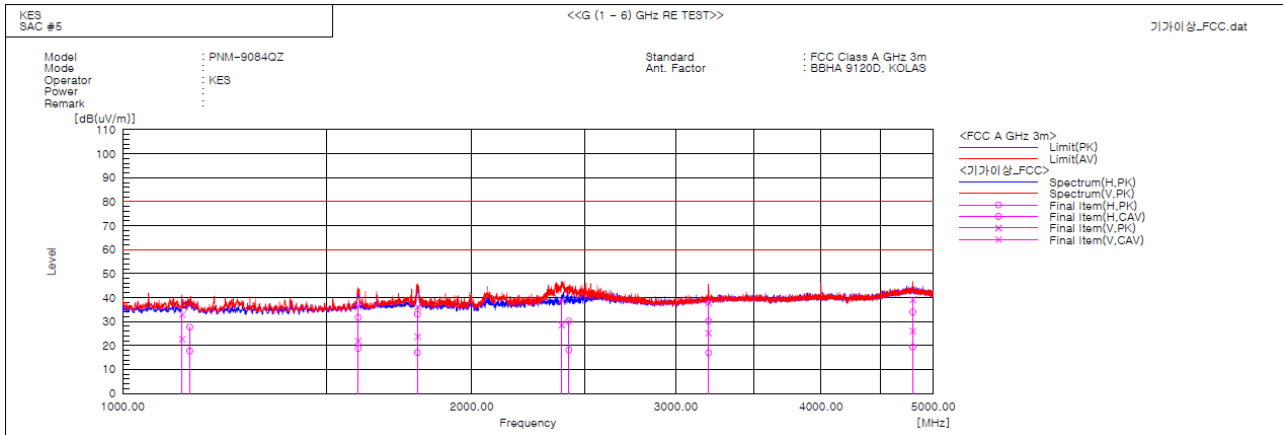
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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



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	1125.376	V	40.2	29.9	-7.3	32.9	22.6	80.0	60.0	47.1	37.4	189.0	190.9	
2	1142.512	H	34.9	24.9	-7.2	27.7	17.7	80.0	60.0	52.3	42.3	391.0	140.2	
3	1595.512	V	41.3	26.9	-5.0	36.3	21.9	80.0	60.0	43.7	38.1	103.0	205.9	
4	1596.250	H	36.7	23.8	-5.0	31.7	18.8	80.0	60.0	48.3	41.2	352.0	31.5	
5	1795.625	H	37.2	21.2	-4.1	33.1	17.1	80.0	60.0	46.9	42.9	395.0	46.3	
6	1796.875	V	40.2	27.8	-4.1	36.1	23.7	80.0	60.0	43.9	36.3	109.0	201.2	
7	2390.120	V	40.9	30.5	-2.0	38.9	28.5	80.0	60.0	41.1	31.5	118.0	190.9	
8	2424.375	H	32.1	20.1	-1.9	30.2	18.2	80.0	60.0	49.8	41.8	400.0	179.2	
9	3200.453	V	37.2	24.6	0.5	37.7	25.1	80.0	60.0	42.3	34.9	194.0	176.1	
10	3200.539	H	29.8	16.5	0.5	30.3	17.0	80.0	60.0	49.7	43.0	301.0	102.4	
11	4800.320	V	34.0	20.8	5.2	39.2	26.0	80.0	60.0	40.8	34.0	146.0	129.0	
12	4800.452	H	28.8	14.2	5.2	34.0	19.4	80.0	60.0	46.0	40.6	303.0	356.5	

◆ 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

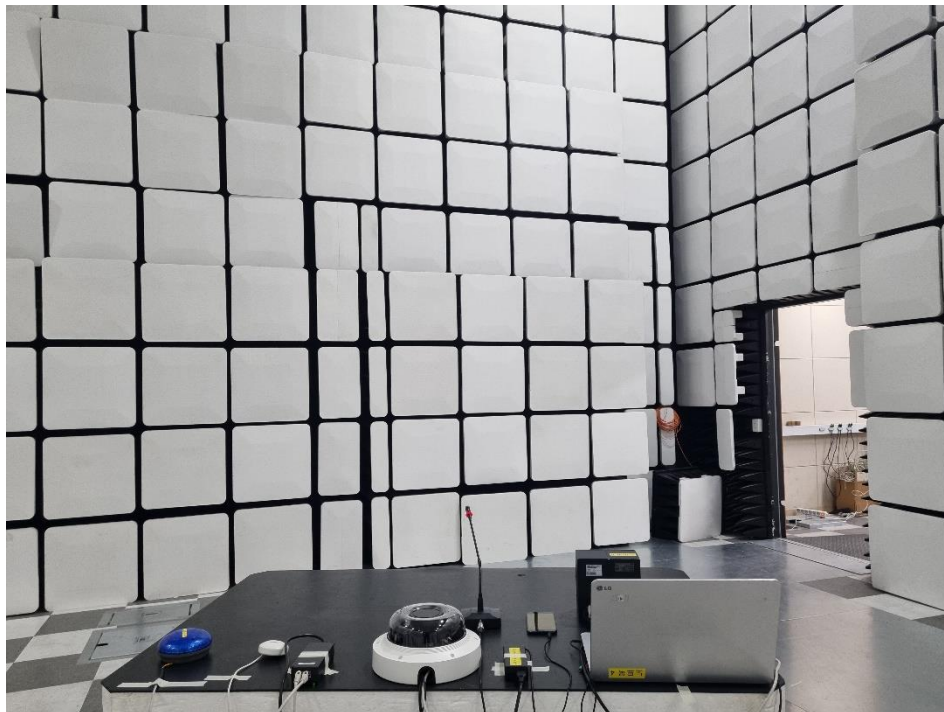
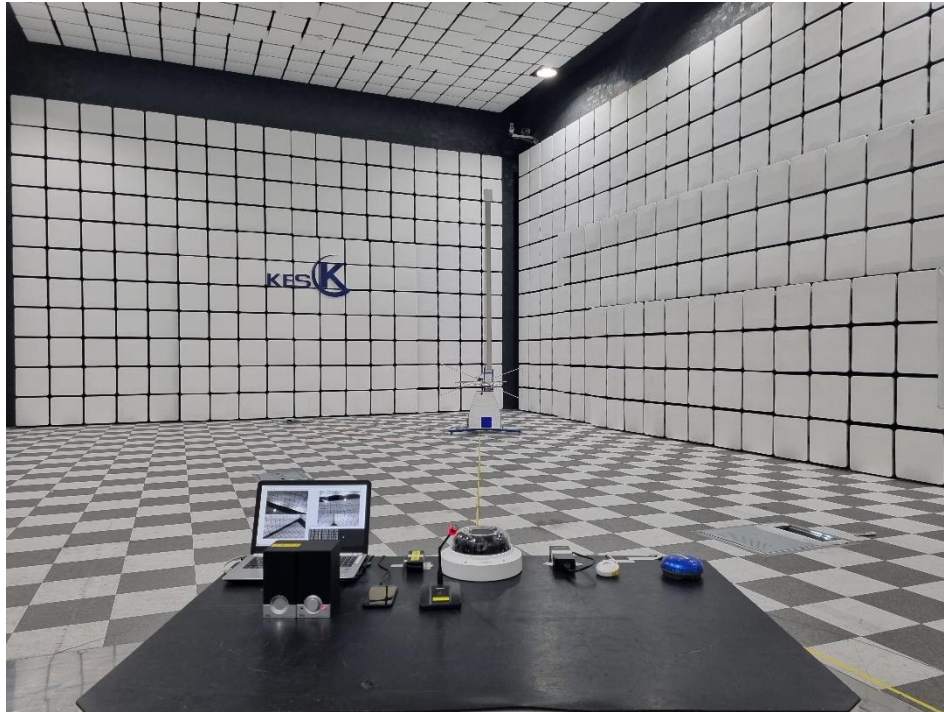
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



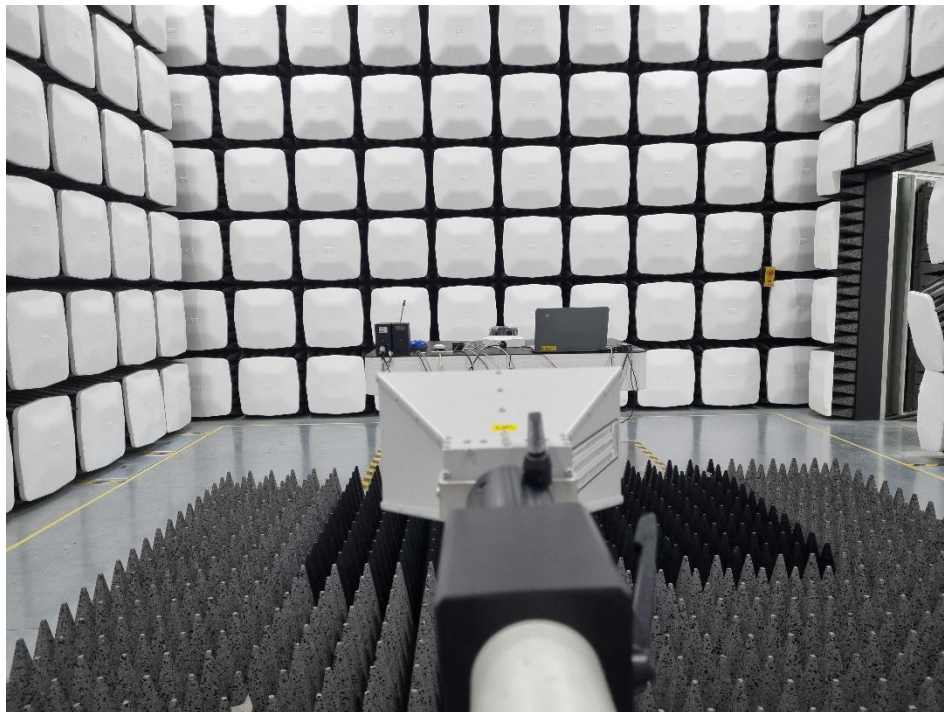
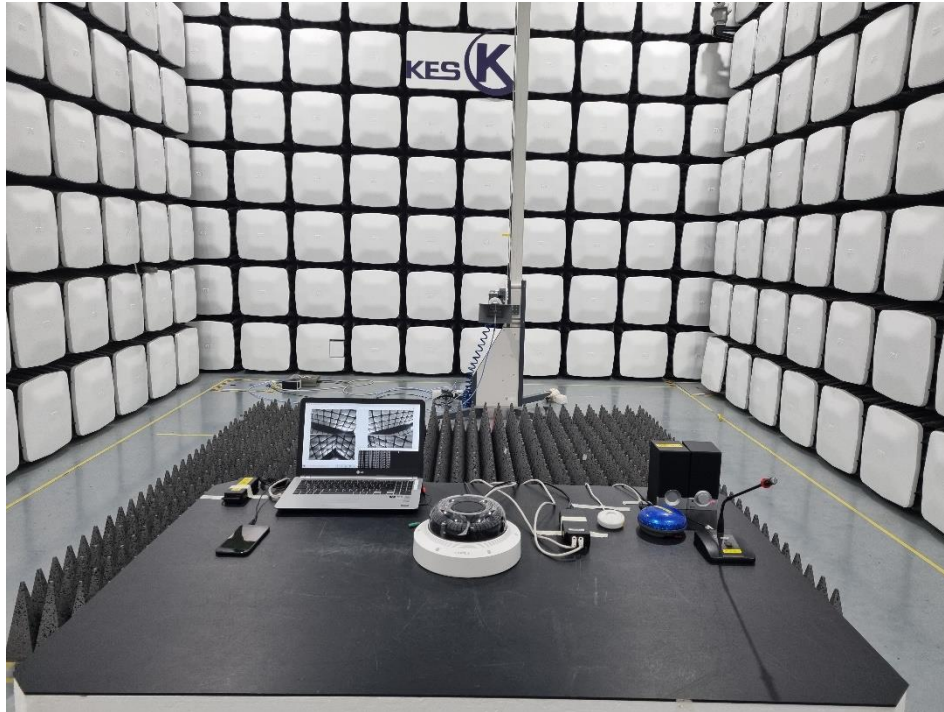
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Radiated Electric Field Emissions(Below 1 GHz)



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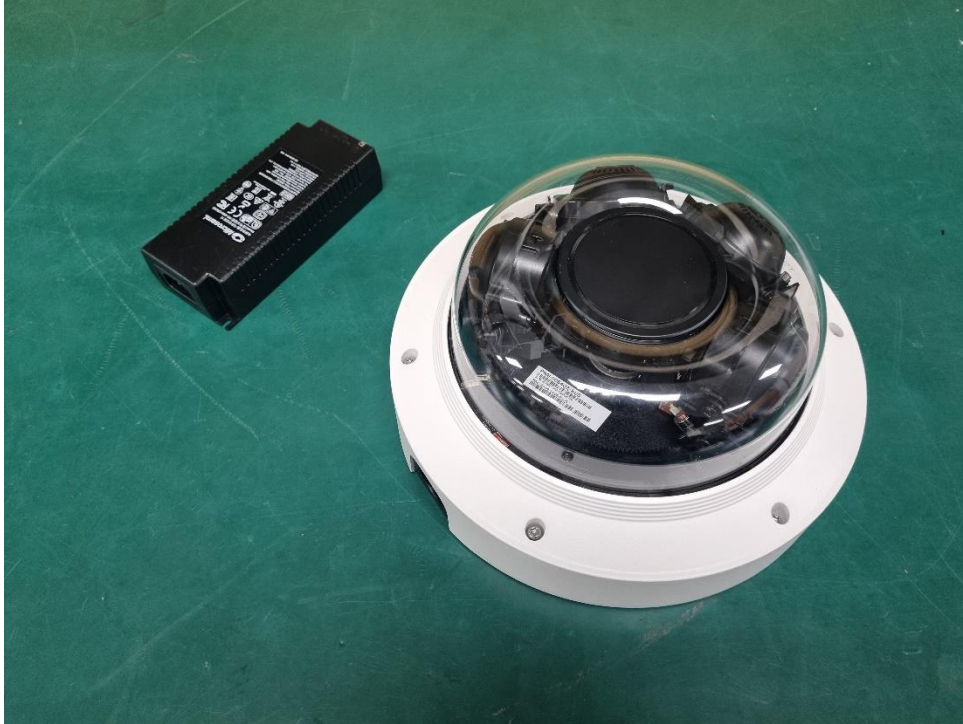
Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

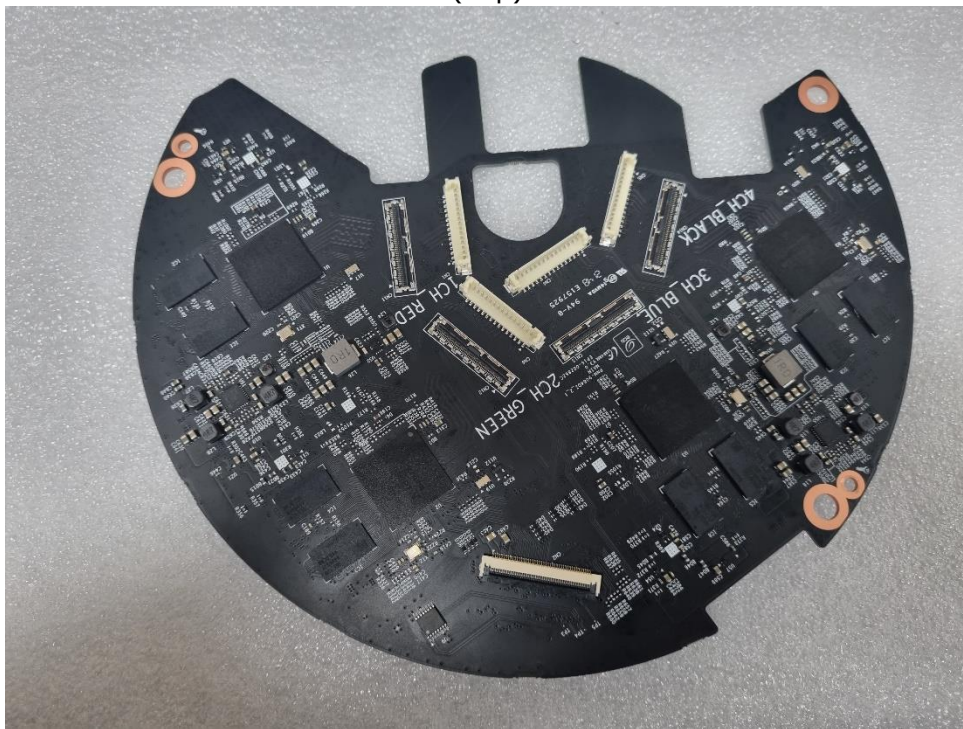
(Internal View)



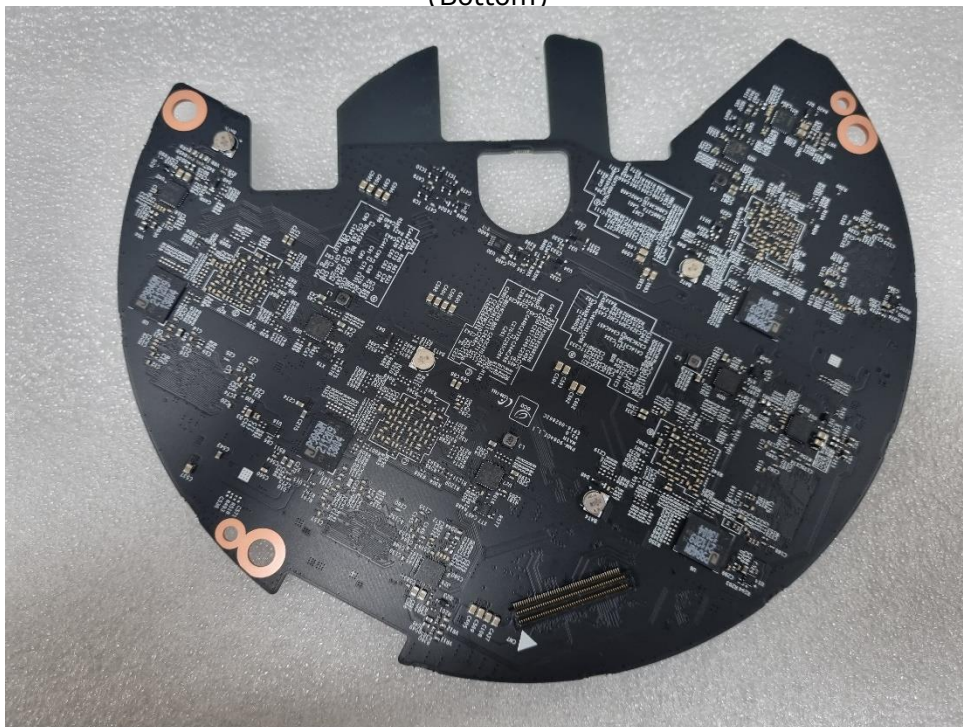
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EUT Internal View – Board 1

(Top)



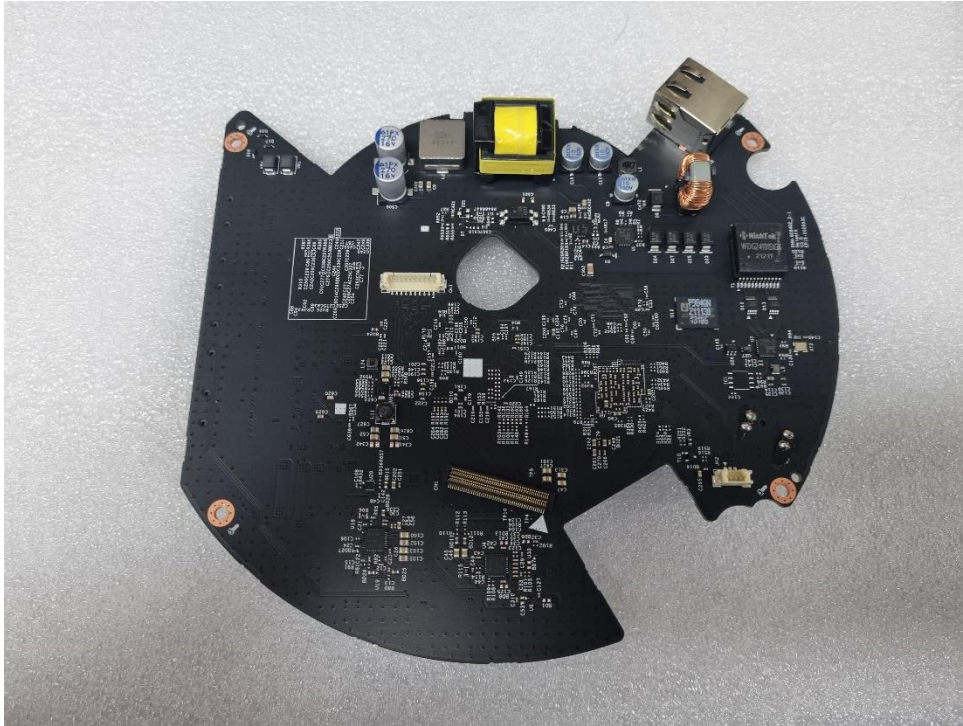
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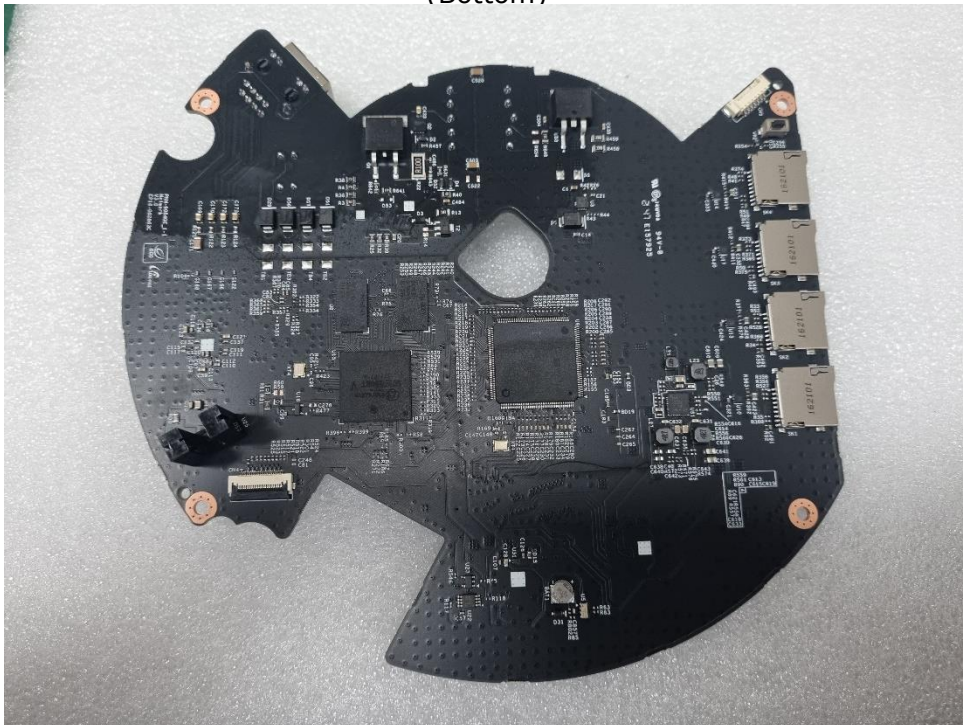
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EUT Internal View – Board 2

(Top)



(Bottom)



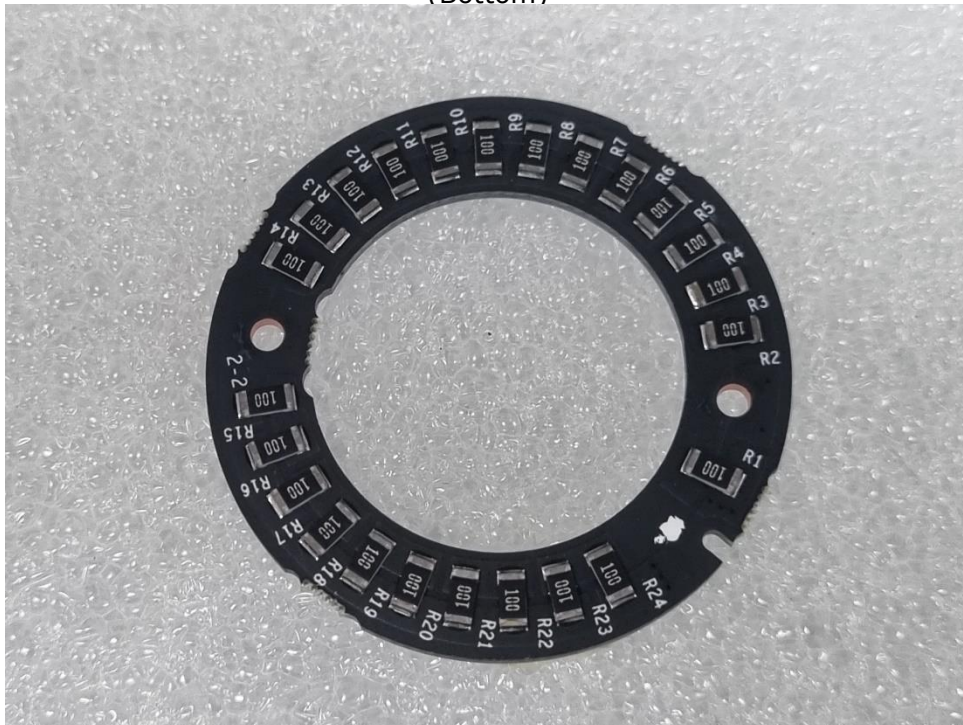
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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – Board 4

(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.