EMC TEST REPORT For RCM

Test Report No.	:	KES-EM-23T0293
Date of Issue	:	Apr. 06, 2023
Product name	:	Network Camera
Model/Type No.	:	ANO-L7082R
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	:	Mar. 30, 2023
Test date	:	Apr. 03, 2023
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Hyun, Kim
EMC Test Engineer

Reviewed by

Dong Il, Lee
EMC Technical Manager

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

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Apr. 06, 2023	KES-EM-23T0293	Issued

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1.0 General Product Description

Main Specifications of EUT are:

	ANO-L7082R
Video	
Imaging Device	1/2.8" CMOS
Resolution	2560 x 1440, 1920 x 1080, 1280 x 960, 1280 x 720, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360, 320 x 240
Max. Framerate	H.265/H.264 : Max. 30fps at 4M all resolutions MJPEG : Max. 15fps
NETD	None
Pixel Size	None
Min. Illumination	Color : 0.1Lux (F1.6, 1/30sec) B/W : 0Lux (IR LED On)
Video Out	None
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	3.3~10.3mm(3.1x) motorized varifocal
Max. Aperture Ratio	F1.6(Wide) ~ F3.3(Tele)
Angular Field of View	H: 94.8°(Wide) ~ 28.1°(Tele) V: 50.2°(Wide) ~ 15.8°(Tele) D: 112.9°(Wide) ~ 32.2°(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus
Lens Type	DC auto iris
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	None
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, WDR, SSDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR
Digital Image Stabilization	None
Defog	None
Motion Detection	4ea, polygonal zones
Privacy Masking	6ea, rectangular zones
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum/Maximum/Anti flicker (1/5~1/12,000sec)
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Defocus detection, Directional detection, Motion detection, Enter/Exit, Tampering, Virtual line
Business Intelligence	None
Serial Interface	None
Alarm I/O	None
Alarm Triggers	Analytics, Network disconnect
Alarm Events	File upload via FTP and e-mail, Notification via e-mail, SD/SDHC/SDXC or NAS recording at event triggers, Handover
Audio Streaming	None
Audio In	None
Audio Out	None
IR Viewable Length	30m(98.43ft)
IR Illuminator (Optional)	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

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression	H.265/H.264 : Main/High, MJPEG
Audio Compression	None
Smart Codec	Manual (Sea area), WiseStream II
Video Quality Adjustment	H.265/H.264 : Target bitrate level control, MJPEG : Quality level control
Bitrate Control	H.264/H.265 : CBR or VBR MJPEG : VBR
Streaming	Unicast (6 users) / Multicast Multiple streaming (Up to 3 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP
SIP support (VoIP, Peer-to-peer, SIP/P	None
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP)
Application Programming Interface	ONVIF Profile S/G/T, SUNAPI (HTTP API)
General	
Webpage Language	English
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 1slot 128GB
Memory	512MB RAM, 256MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-30°C ~ +55°C(-22°F ~ +131°F) / Less than 95% RH * Start up should be done at above -20°C(-4°F)
Storage Temperature / Humidity	-30°C ~ +55°C (-22°F~+131°F) / Less than 95% RH
Certification	IP66
Input Voltage	PoE(IEEE802.3af, Class3)
Power Consumption	Max 8.0W, typical 6.0W
Mechanical	
Color / Material	White / Plastic
RAL Code	RAL9003
Product Dimensions / Weight	Ø78.0x262.0mm(Ø3.07x10.31"), 390g(0.86lb)
Compatible Conduit hole / Gangbox	None
Hanging Mount (Dome)	None
Skin Cover	None
Skin Cover (Dome)	None
Weather Cap (Dome)	None

Power Module	None
Backbox	None
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 47.1m(154.46ft) / Tele: 204.6m(671.23ft)
Observe (63PPM/ 19PPF)	Wide: 18.8m(61.79ft) / Tele: 81.8m(92.24ft)
Recognize (125PPM/ 38PPF)	Wide: 9.4m(30.89ft) / Tele: 40.9m(134.25ft)
Identify (250PPM/ 76PPF)	Wide: 4.7m(15.45ft) / Tele: 20.5m(67.12ft)
LPR/ANPR/MMCR	
Speed Description	None
Speed limit	None
Min. Forward Distance	None
Max. Forward Distance	None
Max. Horizontal Angle	None
Max. Vertical Angle	None
Horizontal Offset	None
Camera Height	None
Lane Coverage	None
Vehicle Recognition	None
Available Countries	None
Wisenet Road AI LPR/ANPR/MMCR	
Solution	None
Speed Description	None
Lane Coverage	None
Speed limit	None
Min. Forward Distance	None
Max. Forward Distance	None
Max. Horizontal Angle	None
Max. Vertical Angle	None
Horizontal Offset	None
Camera Height	None
Vehicle Recognition	None
Available Countries	None

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
Network Camera	ANO-L7082R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Micro SD Card	-	-	SanDisk	-
Notebook	Latitude 5300	8C47BE45C060	DELL INC.	-
Notebook Adapter	HA65NM130	-	Chicony Power Technology(Suzhou)Co.,Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH-S	-	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)	PoE Adapter	RJ-45 (PoE)	3.5	U
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	RJ-45 (LAN)	PoE Adapter	RJ-45 (LAN)	1.5	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.7	U

* Unshielded = U, Shielded = S

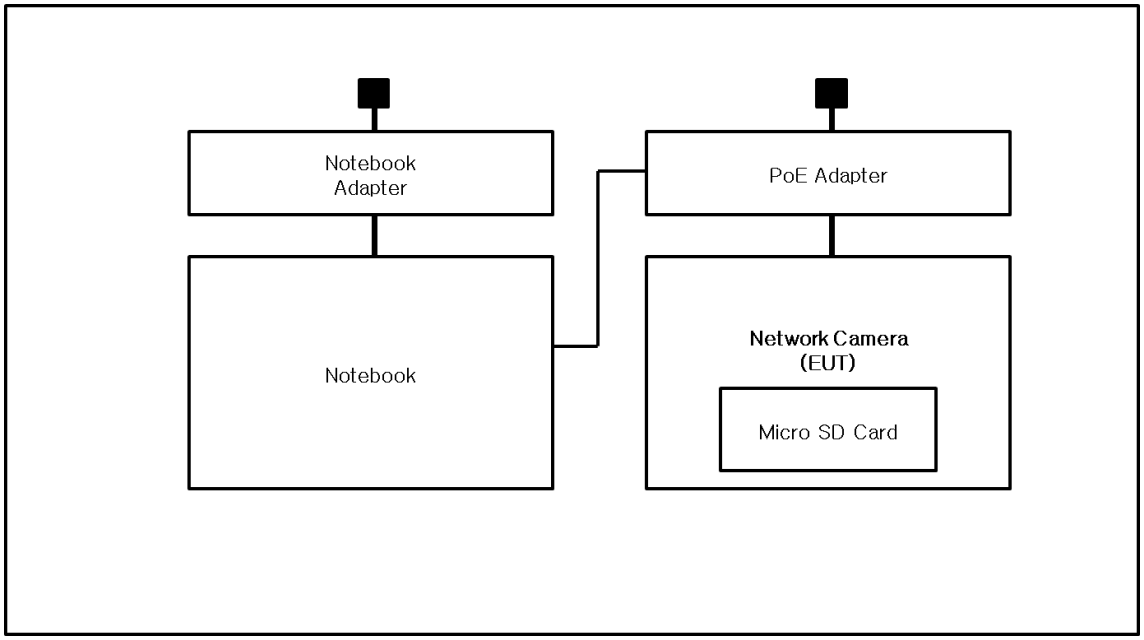
1.7 EUT Operating Mode(s)

Test mode	operating
Operation	1. Check if the EUT image is output to the laptop normally. 2. Check if the network is operating normally through a ping test. 3. After the test, check if the EUT video has been recorded normally.

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

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, Yeoju-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:

☒ **AS/NZS CISPR 32:2015 AMD 1:2020** ☒ Class A ☐ Class B

2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

Test Location
Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☐	LISN	ENV216	R & S	101787	11, 10, 2023
☐	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Test Conditions
Temperature: (±) ℃
Relative Humidity: (±) % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
It is not tested apply because it is powered by PoE

2.2 Conducted Emissions at Telecommunication Ports

Test Date
Apr. 03, 2023

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	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 22, 2023
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 22, 2023
☐	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

Test Conditions
Temperature: (22,9 ± 0,0) ℃
Relative Humidity: (42,6 ± 0,0) % 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Apr. 03, 2023

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	03, 21, 2024
☒	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions
Temperature: (21,7 ± 0,1) ℃
Relative Humidity: (42,9 ± 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.

2.4 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Apr. 03, 2023

Test Location
SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	03, 21, 2024
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 08, 2023
☒	PREAMPLIFIER	8449B	HP	3008A00538	06, 02, 2023
☒	ATTENUATOR	8491B	HP	23094	03, 21, 2024

Test Conditions
Temperature: (24,5 ± 0,1) ℃
Relative Humidity: (43,1 ± 0,0) % R.H.

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
- See Appendix A for test data.
- The Average of the test data is the cispr average result.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

N/A

NEUTRAL LINE

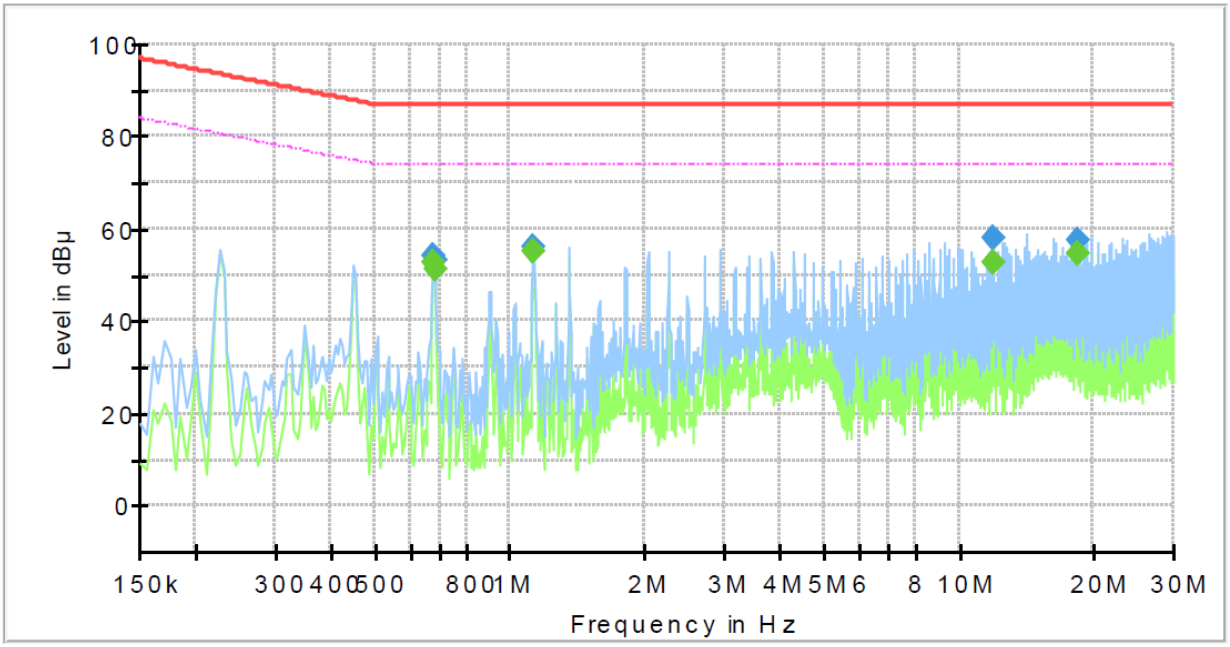
N/A

♦ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Conducted Emissions at Telecommunication Ports
[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	ANO-L7082R
Mode :	
Speed :	100 Mbps
Operator Name:	KES

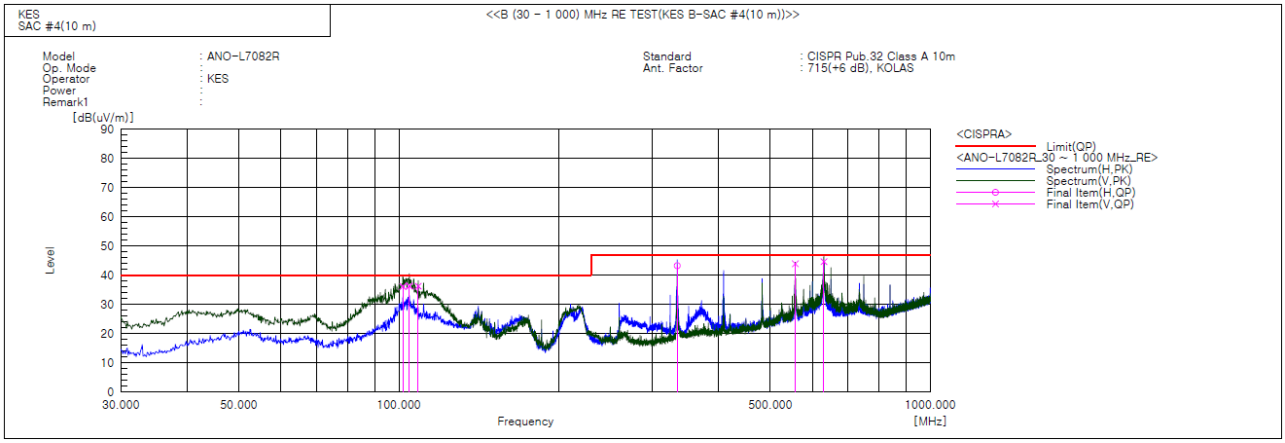


Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.675000	---	52.73	74.00	21.27	1000.0	9.000	Single Line	19.8
0.675000	54.40	---	87.00	32.60	1000.0	9.000	Single Line	19.8
0.680000	---	51.18	74.00	22.82	1000.0	9.000	Single Line	19.8
0.680000	53.09	---	87.00	33.91	1000.0	9.000	Single Line	19.8
1.130000	---	55.14	74.00	18.86	1000.0	9.000	Single Line	20.1
1.130000	55.97	---	87.00	31.03	1000.0	9.000	Single Line	20.1
11.955000	---	52.50	74.00	21.50	1000.0	9.000	Single Line	19.7
11.955000	57.95	---	87.00	29.05	1000.0	9.000	Single Line	19.7
18.305000	---	54.88	74.00	19.12	1000.0	9.000	Single Line	19.9
18.305000	57.60	---	87.00	29.40	1000.0	9.000	Single Line	19.9

♦ 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))

Radiated Electric Field Emissions(Below 1 ㎓)



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	101.780	V	58.5	-22.4	36.1	40.0	3.9	115.0	222.0	
2	104.690	V	58.8	-22.5	36.3	40.0	3.7	100.0	241.0	
3	108.813	V	59.0	-22.8	36.2	40.0	3.8	135.0	289.0	
4	334.095	H	59.2	-16.0	43.2	47.0	3.8	400.0	127.0	
5	556.831	V	53.4	-9.5	43.9	47.0	3.1	100.0	184.0	
6	630.430	V	52.6	-8.0	44.6	47.0	2.4	250.0	222.0	

♦ Calculation

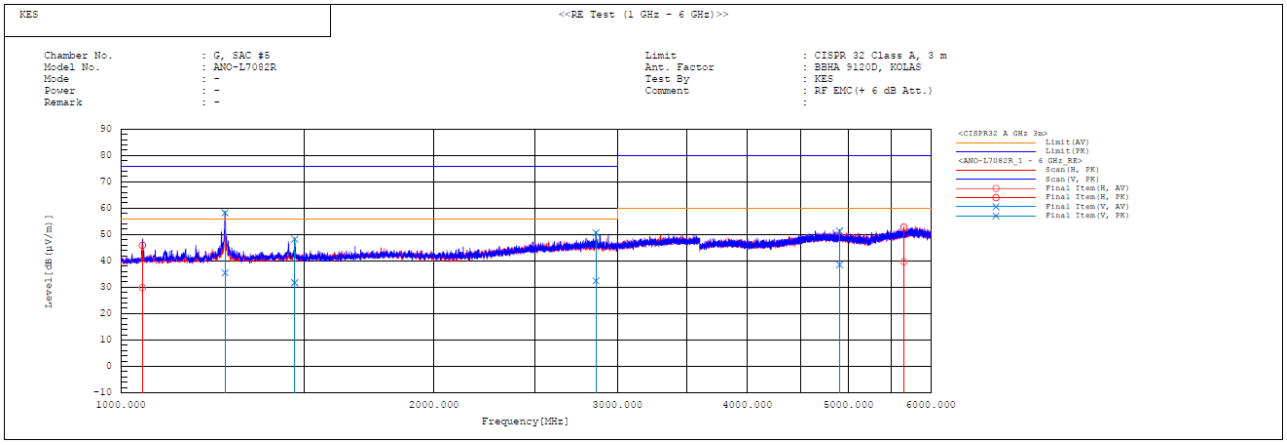
Result(QP) [dB(㎶/m)] = (Reading(QP)[dB(㎶)] + c.f[dB(1/m)]

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

Radiated Electric Field Emissions(Above 1 ㎓)



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1049.168	H	31.9	47.9	-2.0	29.9	45.9	56.0	76.0	26.1	30.1	100.0	333.1	
2	1259.779	V	36.3	59.0	-0.8	35.5	58.2	56.0	76.0	20.5	17.8	100.0	184.8	
3	1469.505	V	31.5	48.0	0.2	31.7	48.2	56.0	76.0	24.3	27.8	100.0	184.8	
4	2862.068	V	27.6	45.8	4.8	32.4	50.6	56.0	76.0	23.6	25.4	100.0	0.0	
5	4904.999	V	28.0	40.8	10.5	38.5	51.3	60.0	80.0	21.5	28.7	100.0	28.5	
6	5652.740	H	27.8	40.9	11.9	39.7	52.8	60.0	80.0	20.3	27.2	100.0	197.1	

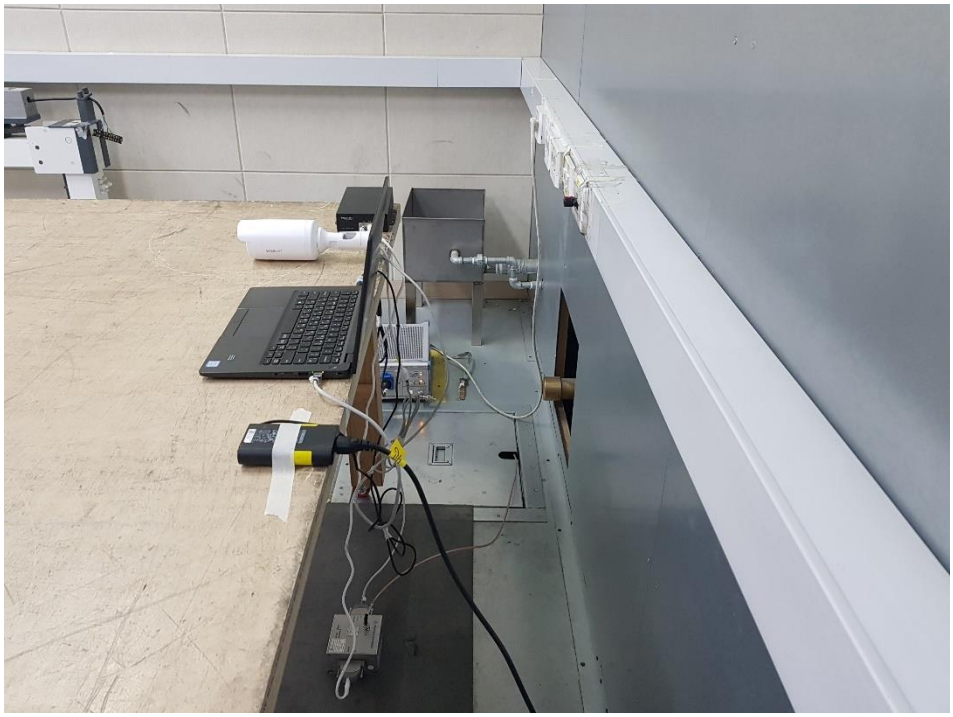
♦ Calculation
Result(PK/CAV) [dB(㎶/m)] = (Reading(PK/CAV)[dB(㎶)] + c.f[dB(1/m)]
Margin(PK/CAV)[dB] = Limit[dB(㎶/m)] - Result(PK/CAV) [dB(㎶/m)]
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Test Setup Photos and Configuration

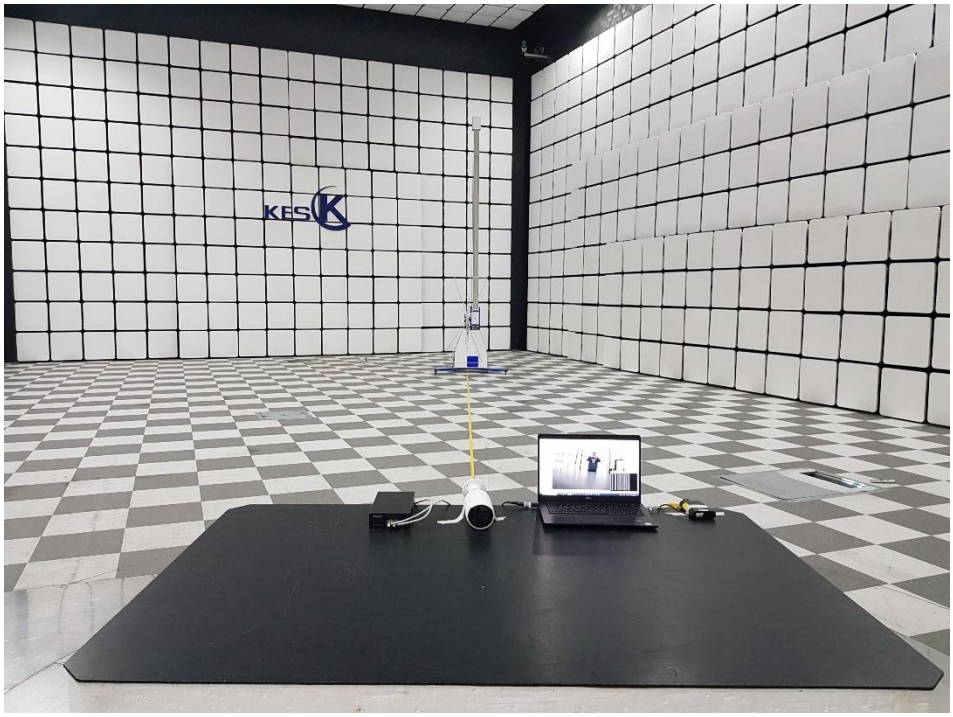
Conducted Emissions at Mains Power Ports

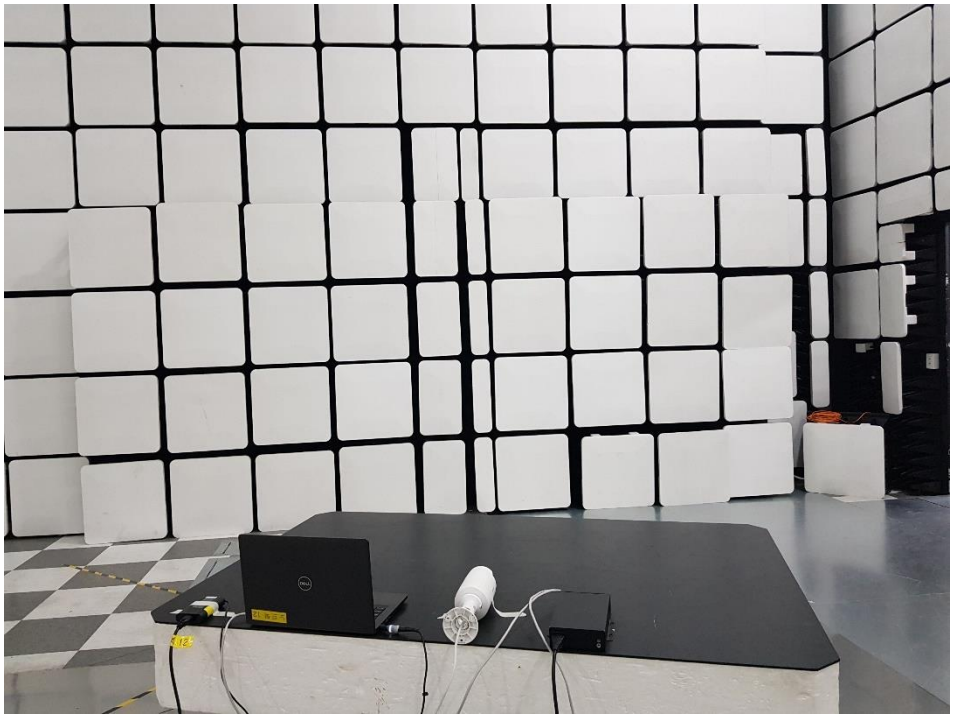
N/A

Conducted Emissions at Telecommunication Ports

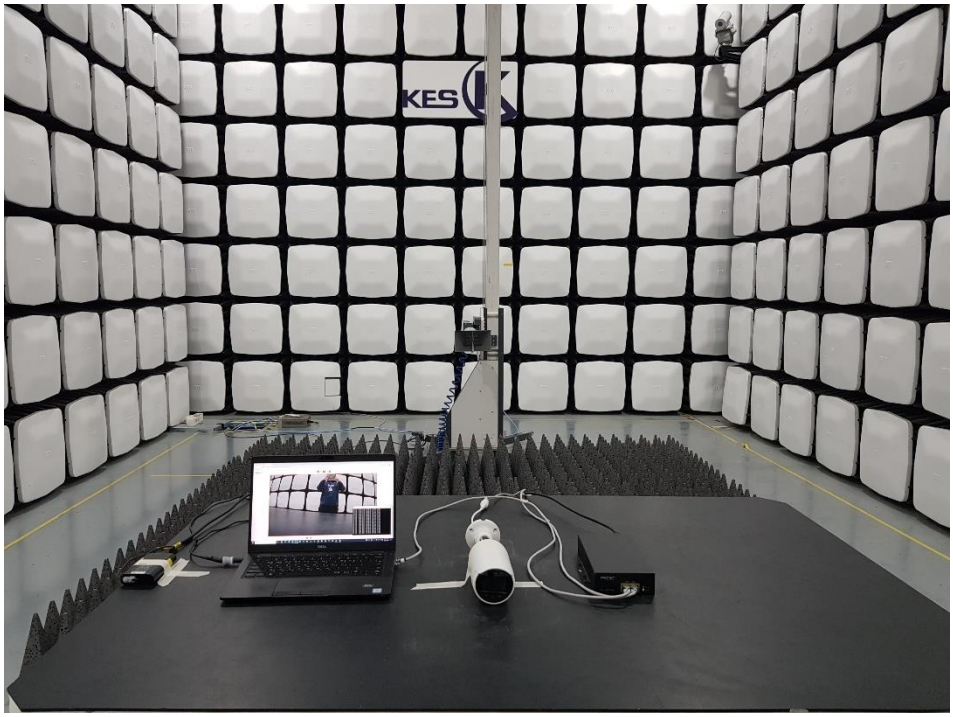


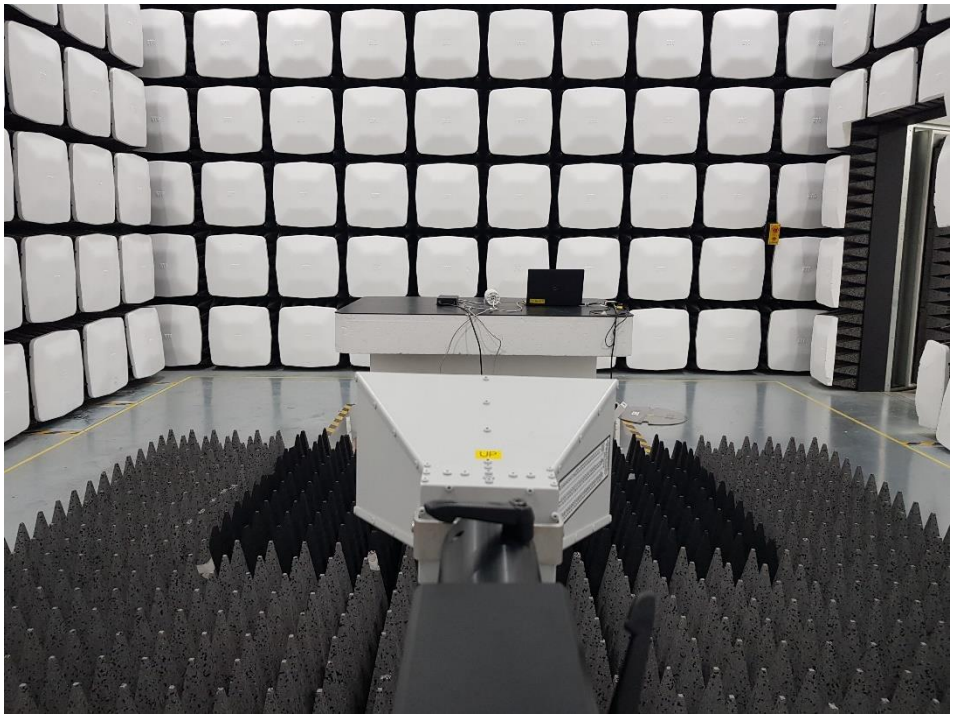
Radiated Electric Field Emissions(Below 1 ㎓)





Radiated Electric Field Emissions(Above 1 ㎓)





EUT External Photographs

(Top)

(Bottom)

EUT Internal Photographs

(Internal View)

EUT Internal View – Board 1

(Top)

(Bottom)

EUT Internal View –Board 2

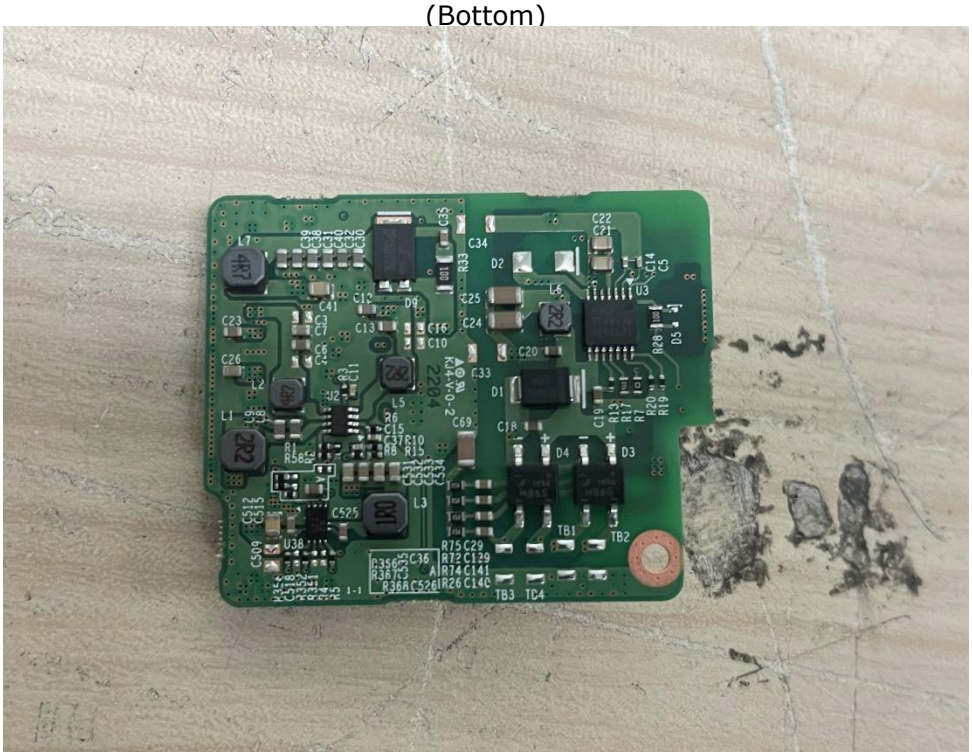
(Top)

(Bottom)

EUT Internal View – Board 3

(Top)

(Bottom)



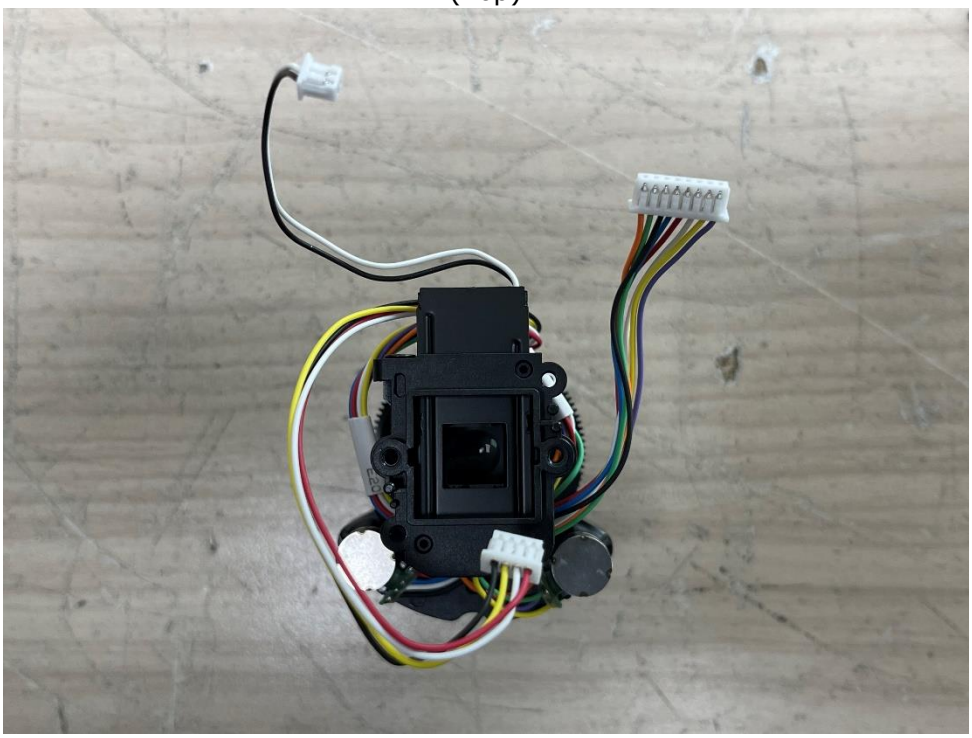
EUT Internal View – Board 4

(Top)

(Bottom)

EUT Internal View – Lens

(Top)



(Bottom)