EMC TEST REPORT

Test Report No.	:	KES-EM-22T0123-R1
Date of Issue	:	Feb. 24, 2023
Product name	:	NETWORK CAMERA
Model/Type No.	:	LNV-6012R
Variant Model	:	LNV-6022R, LNV-6032R, ANV-L6012R
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	:	Jan. 13, 2022
Test date	:	Jan. 17, 2022 ~ Jan. 19, 2022
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Yun, Lee
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.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jan. 27, 2022	KES-EM-22T0123	Issued
Feb. 24, 2023	KES-EM-22T0123-R1	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
Effective Pixels	1945(H)x1097(V)
Minimum Illumination	Color: 0.1Lux(F2.0, 1/30sec) BW : 0Lux (IR LED on)
Lens	
Focal Length (Zoom Ratio)	2.8mm fixed focal
Maximum Aperture Ratio	F2.0
Angular Field of View	H: 113.7° / V: 61.5° / D: 134.4°
Minimum Object Distance	0.5m(1.64ft)
Focus Control	Fixed
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0°~350° / 0°~67° / 0°~355°
Operational	
IR Viewable Length	30m(98.43ft)
Camera Title	Displayed up to 15 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SSDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR
Motion Detection	4ea, rectangular zones
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	Motion detection, Tampering
Alarm Triggers	Analytics
Alarm Events	File upload via FTP and e-mail Notification via e-mail
Network	SD/SDHC recording at event triggers
Ethernet	RJ-45(10/100BASE-T)
Video Compression	H.264: Main/Baseline/High, MJPEG
Resolution	1920x1080, 1280x960, 1280x720, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360
Maximum Framerate	H.264: Maximum 30fps MJPEG : Maximum 2fps at 1920x1080, Maximum, 3fps at 1280x960, 1280x720, Maximum 10fps at other resolution
Smart Codec	WiseStreamII
Bitrate Control	H.264: 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, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour
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 1 slot 32GB
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API)
Web Viewer	Supported OS: Windows 7, 8.1, 10, Mac OS X 10.12, 10.13, 10.14 Recommended Browser: Google Chrome Supported Browser: MS Explorer 11, MS Edge, Mozilla Firefox (Window 64bit only), Apple Safari (Mac OS X only)
Memory	512MB RAM, 256MB Flash
Environmental	
Operating Temperature / Humidity	-30°C ~ +55°C(-22°F ~ +131°F) / Less than 90% 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 90% RH
Certification	IP66, IK10
Electrical	
Input Voltage	PoE(IEEE802.3af, Class2)
Power Consumption	Maximum 6.4W, Typical 5.0W
Mechanical	
Color / Material	White / Plastic, Aluminum
RAL Code	RAL9003
Product dimensions / weight	Ø120.3x91.7mm(Ø4.74x3.61"), 410g
Gangbox compatibility	Single, Double, 4" Octagon with included plate
DORI	
Detect	25.1m(82.28ft)
Observe	10.0m(32.91ft)
Recognize	5.0m(16.46ft)
Identify	2.5m(8.23ft)

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

Addition of derivative models for place of sale management

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	LNV-6012R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Injector	GS728TPP	-	NETGEAR	-
Notebook	LG15N54	411NZJV044052	LG Electronics	-
Notebook Adapter	PA-1900-14	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD	-
Micro SD Card	-	-	SanDisk	16 GB

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	RJ-45 (PoE)	3.0	U
	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-
Notebook	RJ-45 (LAN)	PoE Injector	RJ-45 (LAN)	2.0	U
	DC Jack	Notebook Adapter	DC Jack	1.3	U

* Unshielded=U, Shielded=S

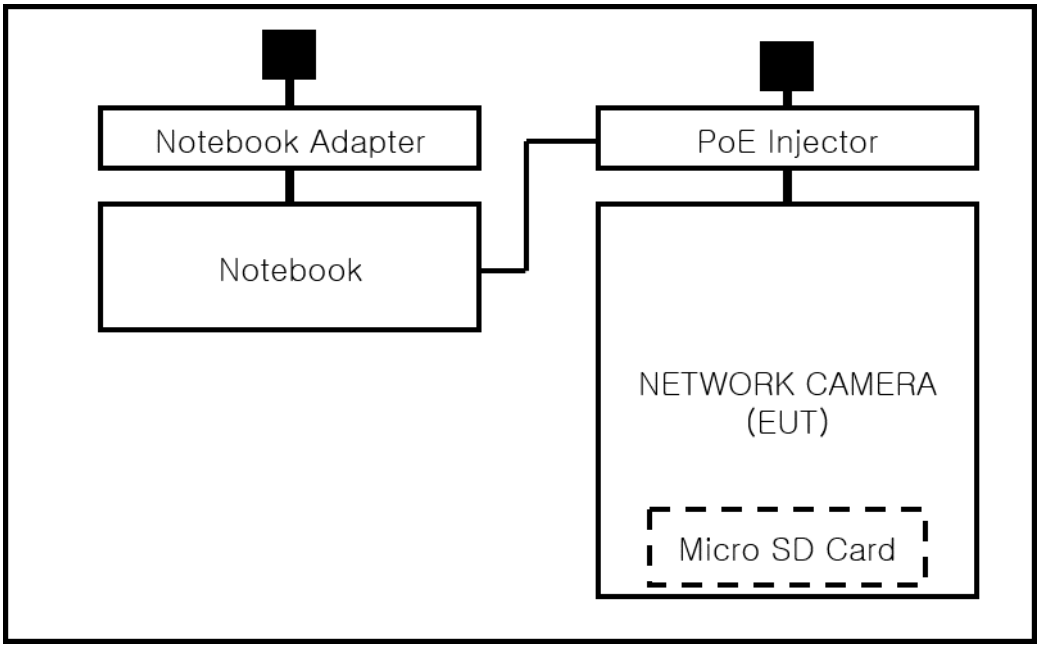
1.7 EUT Operating Mode(s)

Test Mode	operating
Operation	- Check if the camera video output works properly in the web viewer. - Check if the network operation is working properly through the ping test. -After the test, the Micro SD Card was checked to see if it was recorded normally.

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, 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:

☒ **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
Jan. 19, 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: (22,4 ± 0,1) ℃
Relative Humidity: (42,5 ± 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.

2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Jan. 17, 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, 10, 2022

Test Conditions
Temperature: (22,9 ± 0,1) ℃
Relative Humidity: (43,6 ± 0,2) % 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.

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Jan. 18, 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: (22,6 ± 0,1) ℃
Relative Humidity: (43,0 ± 0,2) % 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.

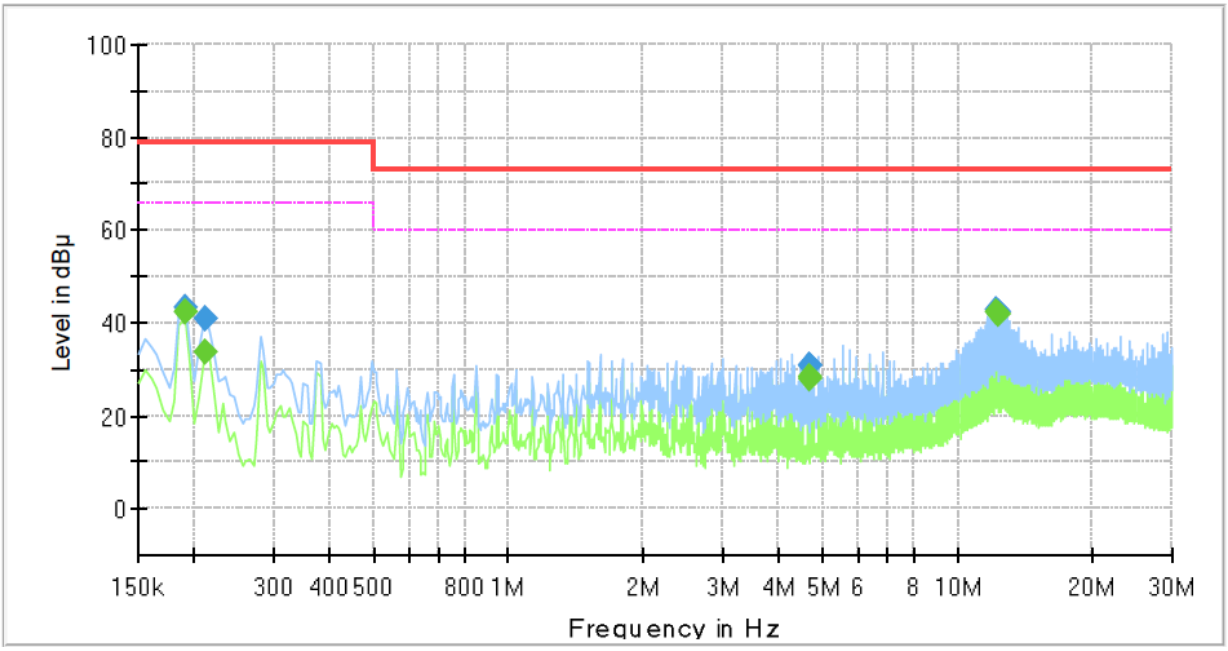
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	LNV-6012R
Phase:	L1
Mode:	
Operator Name:	KES



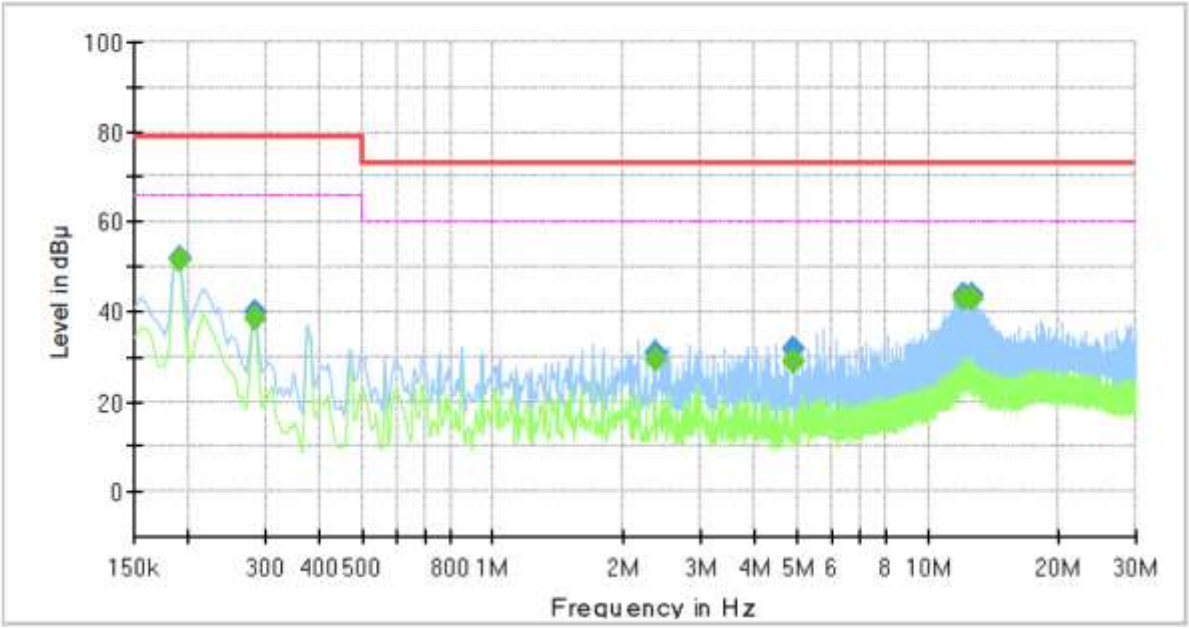
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	43.49	---	79.00	35.51	1000.0	9.000	L1	19.5
0.190000	---	42.17	66.00	23.83	1000.0	9.000	L1	19.5
0.210000	---	33.66	66.00	32.34	1000.0	9.000	L1	19.5
0.210000	40.74	---	79.00	38.26	1000.0	9.000	L1	19.5
4.690000	---	28.60	60.00	31.40	1000.0	9.000	L1	19.8
4.690000	31.06	---	73.00	41.94	1000.0	9.000	L1	19.8
4.695000	---	28.02	60.00	31.98	1000.0	9.000	L1	19.8
4.695000	30.60	---	73.00	42.40	1000.0	9.000	L1	19.8
12.250000	---	42.48	60.00	17.52	1000.0	9.000	L1	20.0
12.250000	43.05	---	73.00	29.95	1000.0	9.000	L1	20.0
12.345000	---	41.87	60.00	18.13	1000.0	9.000	L1	20.0
12.345000	42.53	---	73.00	30.47	1000.0	9.000	L1	20.0

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	LNV-6012R
Phase:	N
Mode:	
Operator Name:	KES



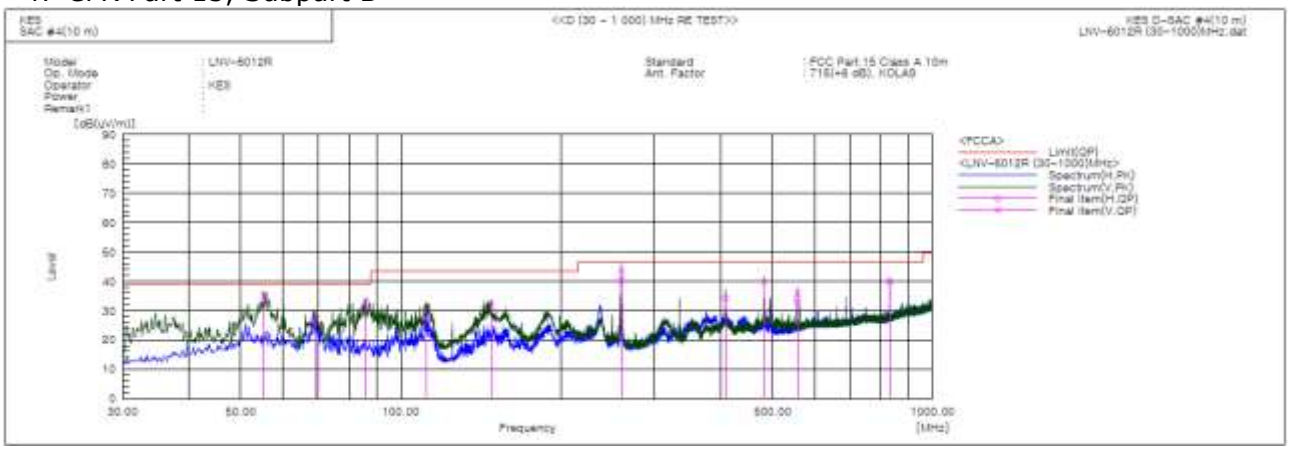
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	51.99	---	79.00	27.01	1000.0	9.000	N	19.5
0.190000	---	51.38	66.00	14.62	1000.0	9.000	N	19.5
0.285000	---	38.49	66.00	27.51	1000.0	9.000	N	19.5
0.285000	39.91	---	79.00	39.09	1000.0	9.000	N	19.5
2.355000	---	29.32	60.00	30.68	1000.0	9.000	N	20.3
2.355000	30.70	---	73.00	42.30	1000.0	9.000	N	20.3
4.905000	---	29.03	60.00	30.97	1000.0	9.000	N	19.7
4.905000	31.98	---	73.00	41.02	1000.0	9.000	N	19.7
12.060000	---	43.06	60.00	16.94	1000.0	9.000	N	20.0
12.060000	43.56	---	73.00	29.44	1000.0	9.000	N	20.0
12.625000	---	42.66	60.00	17.34	1000.0	9.000	N	20.0
12.625000	43.69	---	73.00	29.31	1000.0	9.000	N	20.0

◆ 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))

Radiated Electric Field Emissions(Below 1 ㎓)

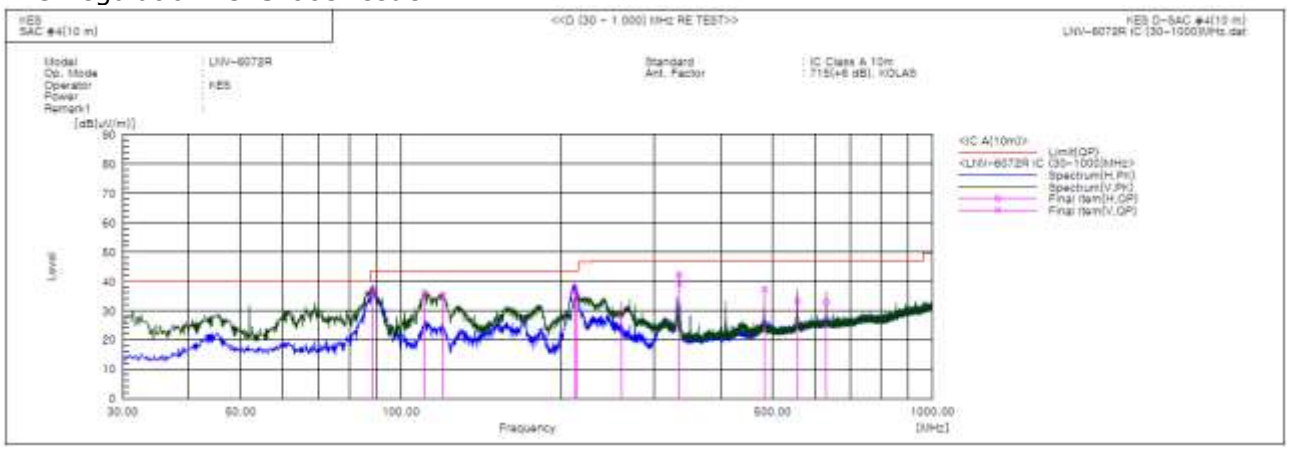
- 47 CFR Part 15, Subpart B



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	55.220	V	56.5	-21.3	35.2	39.0	3.8	162.0	277.0	
2	68.921	H	51.2	-24.3	26.9	39.0	12.1	187.0	353.0	
3	86.018	V	58.6	-25.6	33.0	39.0	6.0	155.0	243.0	
4	111.601	H	51.0	-22.3	28.7	43.5	14.8	396.0	188.0	
5	148.098	V	57.1	-25.2	31.9	43.5	11.6	113.0	308.0	
6	259.890	H	59.2	-18.9	40.3	46.5	6.2	390.0	143.0	
7	259.890	V	62.6	-18.9	43.7	46.5	2.8	109.0	218.0	
8	408.300	H	48.3	-13.9	34.4	46.5	12.1	219.0	161.0	
9	482.626	V	51.5	-11.8	39.7	46.5	6.8	108.0	180.0	
10	556.831	H	42.9	-9.9	33.0	46.5	13.5	181.0	161.0	
11	556.831	V	45.7	-9.9	35.8	46.5	10.7	384.0	340.0	
12	829.886	H	46.0	-6.2	39.8	46.5	6.7	105.0	234.0	

- IC Regulation ICES-003 Issue 7

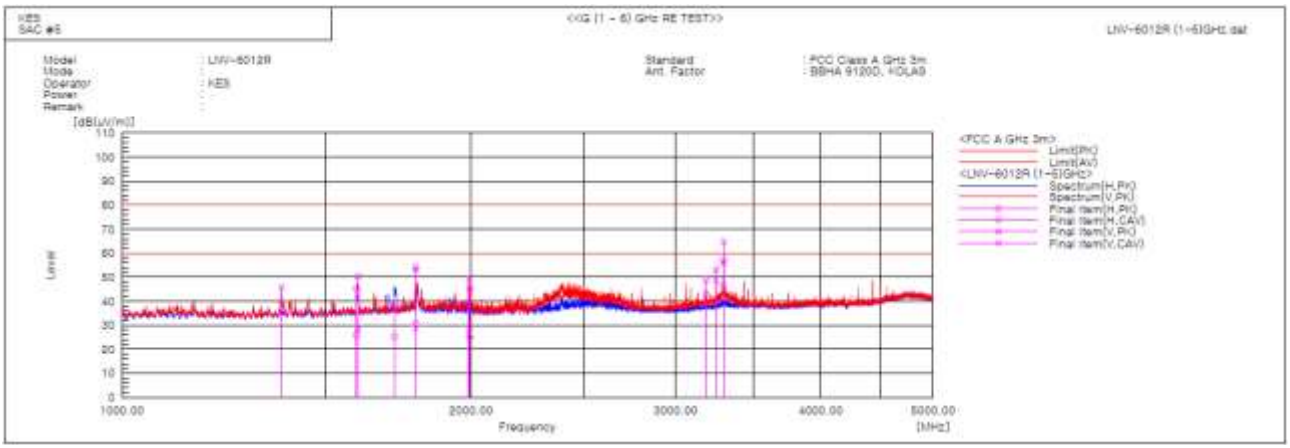


Final Result

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	88.806	V	61.5	-24.4	37.1	43.5	6.4	178.0	91.0	
2	88.806	H	59.9	-24.4	35.5	43.5	8.0	388.0	355.0	
3	110.753	V	58.4	-22.2	36.2	43.5	7.3	100.0	213.0	
4	120.089	V	59.4	-24.1	35.3	43.5	8.2	113.0	202.0	
5	212.481	H	58.2	-20.5	37.7	43.5	5.8	379.0	224.0	
6	214.300	V	55.7	-20.5	35.2	43.5	8.3	105.0	2.0	
7	259.890	H	47.6	-18.9	28.7	47.0	18.3	394.0	253.0	
8	334.095	V	54.8	-15.8	39.0	47.0	8.0	106.0	202.0	
9	334.095	H	57.9	-15.8	42.1	47.0	4.9	392.0	136.0	
10	482.626	V	49.2	-11.8	37.4	47.0	9.6	110.0	187.0	
11	556.831	H	43.2	-9.9	33.3	47.0	13.7	186.0	176.0	
12	631.158	H	41.1	-8.2	32.9	47.0	14.1	213.0	176.0	

♦ 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

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	1373.125	V	51.9	41.4	-6.0	45.9	35.4	80.0	60.0	34.1	24.6	162.0	229.2	
2	1592.500	H	50.2	30.9	-5.0	45.2	25.9	80.0	60.0	34.8	34.1	105.8	53.0	
3	1598.125	V	55.5	33.5	-5.0	50.5	28.5	80.0	60.0	29.5	31.5	107.0	190.6	
4	1716.875	H	43.5	29.7	-4.5	39.0	25.2	80.0	60.0	41.0	34.8	115.0	217.9	
5	1791.875	H	58.2	35.0	-4.2	54.0	30.8	80.0	60.0	26.0	29.2	103.0	8.9	
6	1792.500	V	57.4	33.1	-4.2	53.2	28.9	80.0	60.0	26.8	31.1	106.2	183.1	
7	1991.250	V	53.0	30.3	-3.6	49.4	26.7	80.0	60.0	30.6	33.3	113.0	212.4	
8	1994.375	H	48.6	28.5	-3.5	45.1	25.0	80.0	60.0	34.9	35.0	106.4	267.0	
9	3187.500	H	48.3	42.4	0.5	48.8	42.9	80.0	60.0	31.2	17.1	109.1	102.7	
10	3250.781	V	52.6	47.9	0.6	53.2	48.5	80.0	60.0	26.8	11.5	110.3	167.2	
11	3300.081	V	64.3	55.2	0.6	64.9	55.8	80.0	60.0	15.1	4.2	121.0	348.1	
12	3300.300	H	56.5	45.9	0.6	57.1	46.5	80.0	60.0	22.9	13.5	101.2	3.8	

♦ 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)]

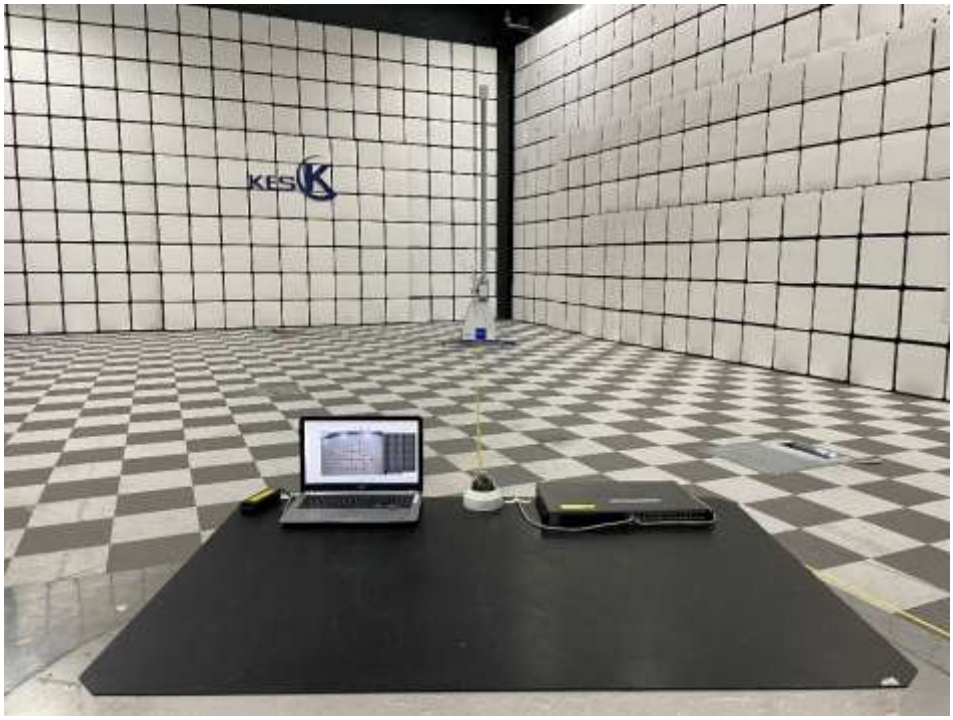
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

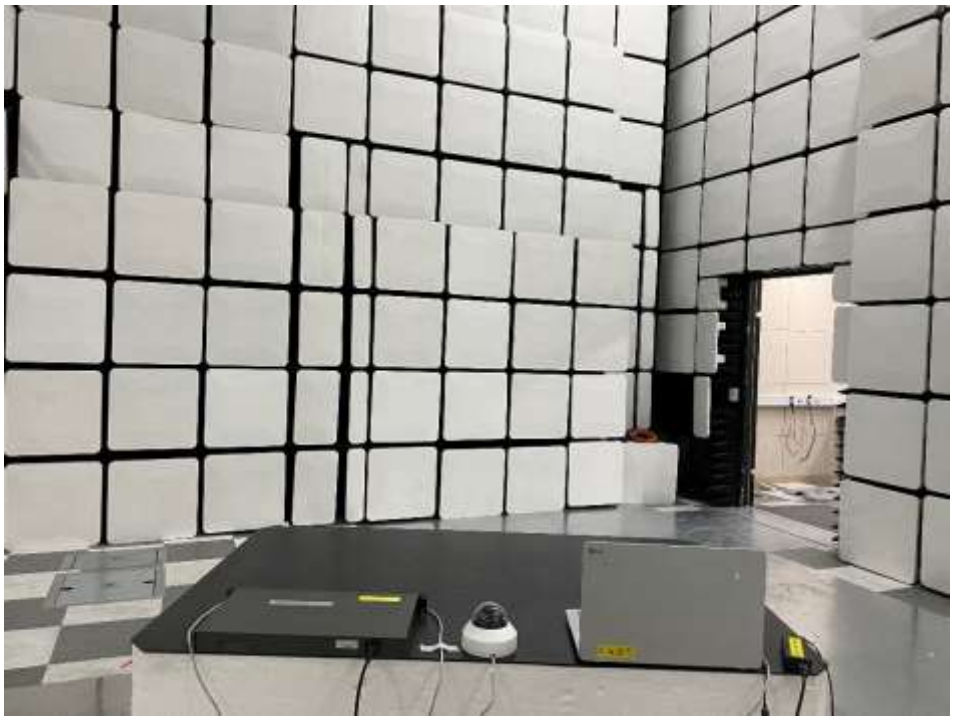
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Test Setup Photos and Configuration

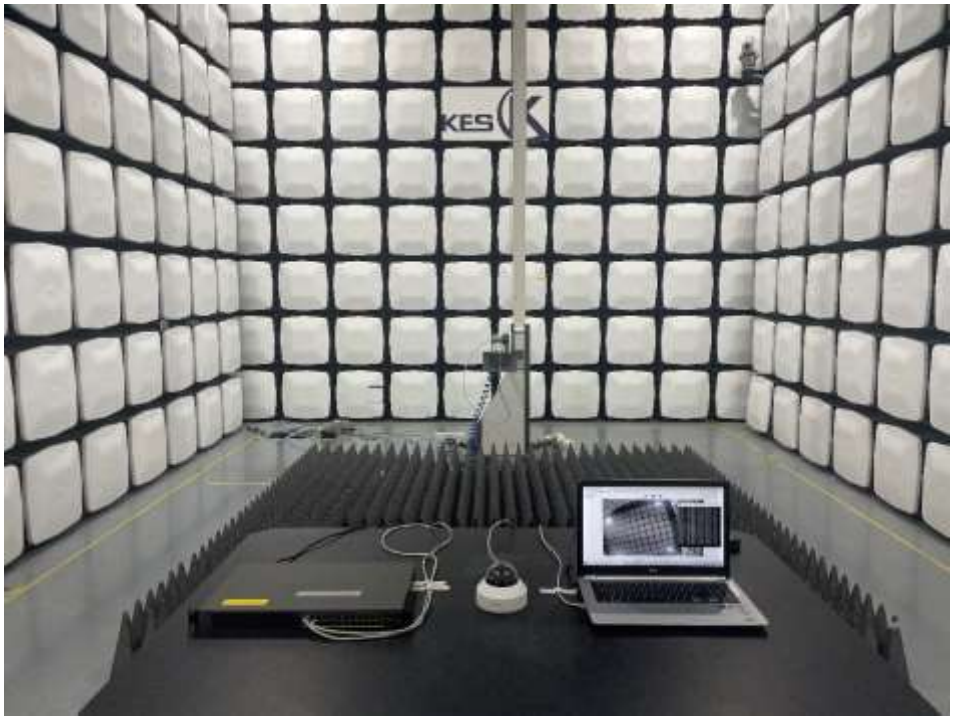
Conducted Emissions at Mains Power Ports

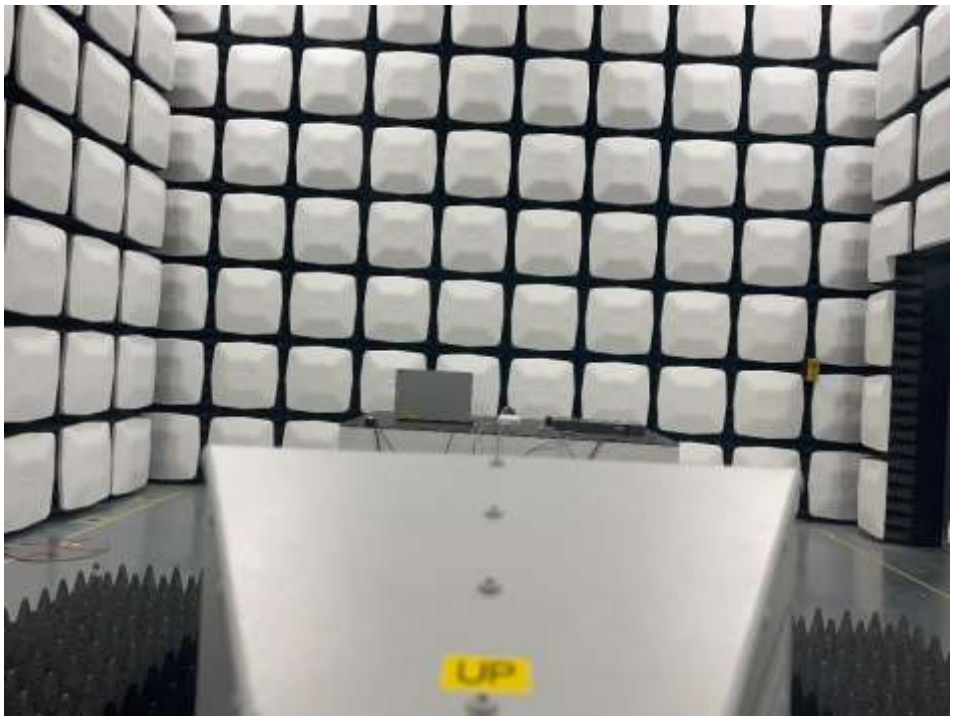
Radiated Electric Field Emissions(Below 1 ㎓)





Radiated Electric Field Emissions(Above 1 ㎓)





EUT External Photographs

(Top)

(Bottom)

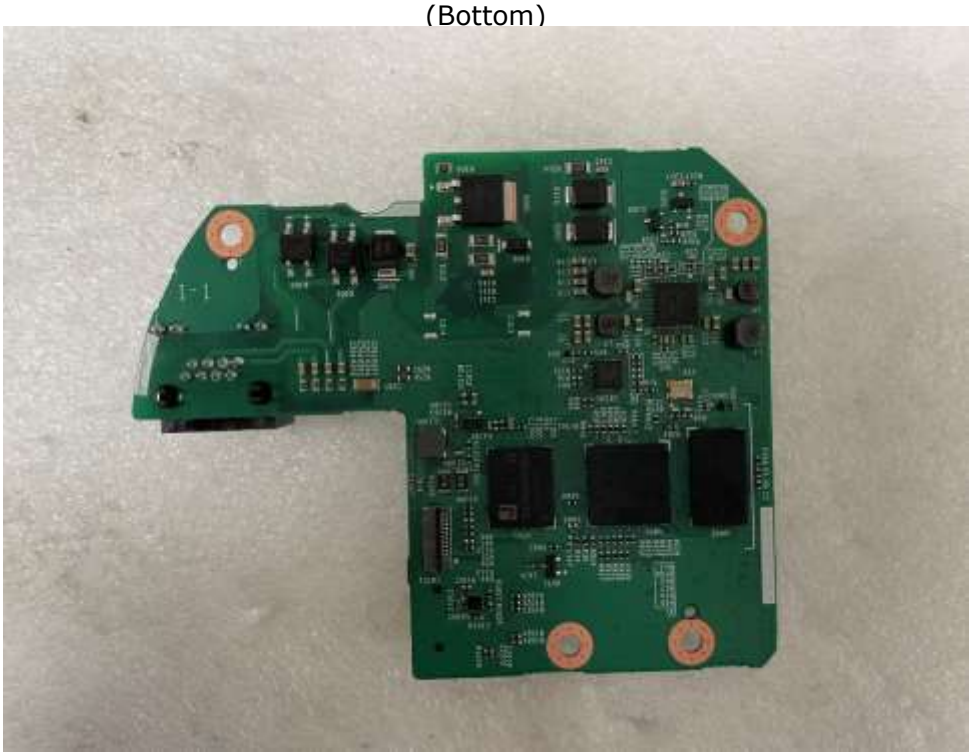
EUT Internal Photographs

(Internal View)

EUT Internal View – Main Board

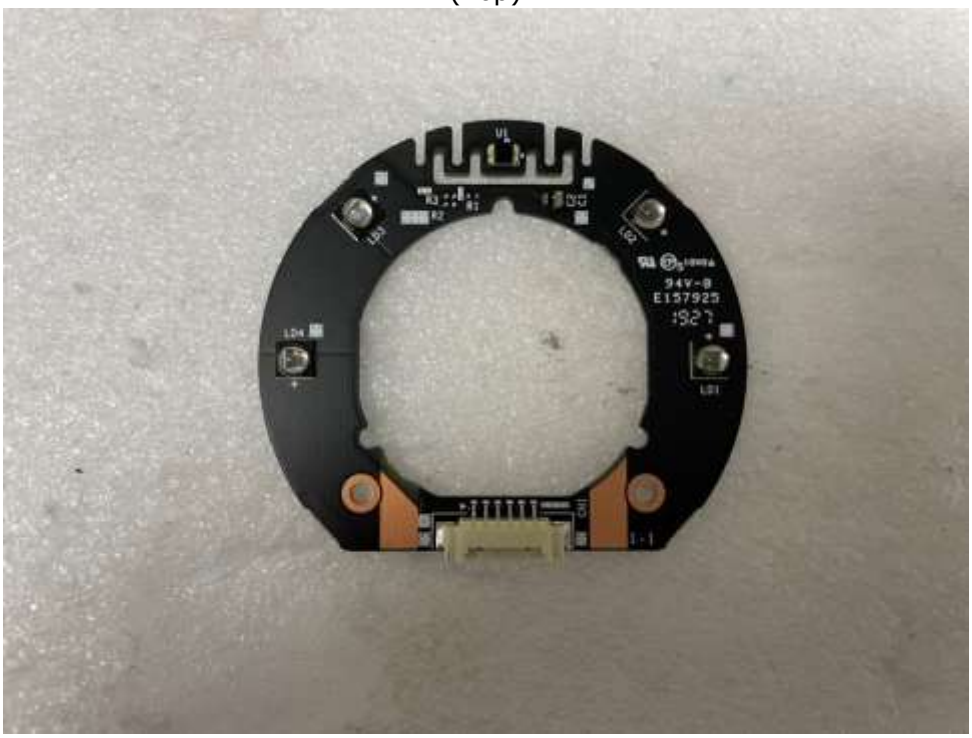
(Top)

(Bottom)



EUT Internal View – LED Board

(Top)

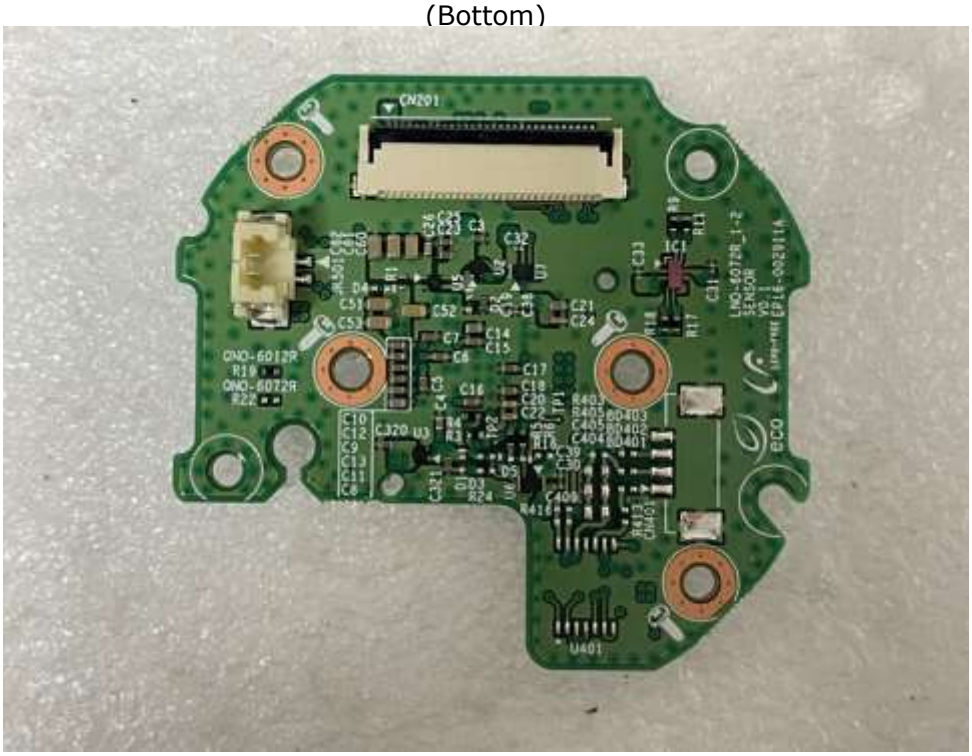


(Bottom)

EUT Internal View – Camera Board

(Top)

(Bottom)

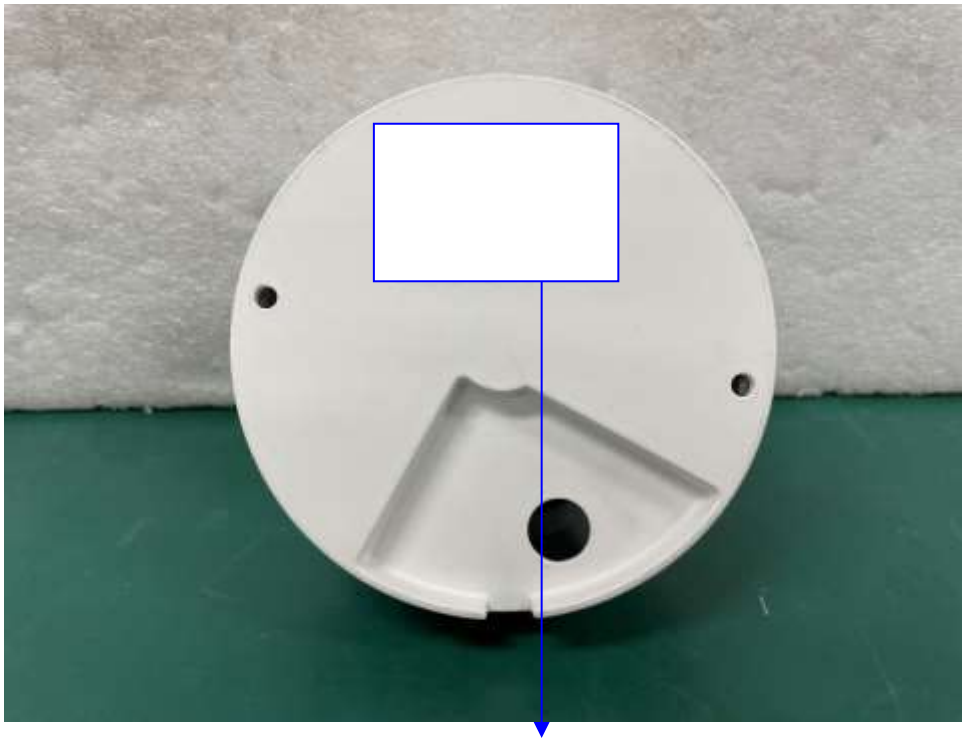


EUT Internal View – Camera Module

(Top)

(Bottom)

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.