



TEST REPORT



Report No. : KES-EM243481

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KES Co., Ltd.

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1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Sample Description

Product name : Barcode Reader

Model/Type No. : TNS-9050IBC

Variant Model : TNS-9040IBC, TNS-9060IBC

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 Ward, Bac Ninh City, Bac Ninh Province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)

3. Date of Receipt : Oct. 10, 2024

4. Test date : Nov. 07, 2024

5. Date of Issue : Nov. 15, 2024

6. Test Results : In Compliance

Tested by

Reviewed by

Dong In, Kim
EMC Test Engineer

Dong Hun, Jang
EMC Technical Manager

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

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr)



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 15, 2024	KES-EM243481	Issued

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1.0 General Product Description

Main Specifications of EUT are:

영상	Video	
촬영 소자	Imaging Device	Global Shutter Mono 1" CMOS Global Shutter Color 1" CMOS
해상도	Resolution	Mono: Max 4096x2160 Color: Max 4096x2160
최대 프레임레이트	Max. Framerate	Mono : Max 15fps Color : Max 15fps
픽셀 사이즈	Pixel Size	3.45μm(H)×3.45μm(V)
렌즈	Lens	
초점거리	Focal Length (Zoom Ratio)	25mm
최대 구경비	Max. Aperture Ratio	MONO : F2.8 ~ F16.0 COLOR : F2.8 ~ F16.0
화각	Angular Field of View	Mono: H30.4° / V16.6° / D34.2° Color: H30.4° / V16.6° / D34.2°
최소 지근 거리	Min. Object Distance	0.15m (0.492126ft)
포커스 제어	Focus Control	Manual
렌즈 타입	Lens Type	Manual
마운트 타입	Mount Type	C Mount
카메라 기능	Operational	
카메라 타이틀	Camera Title	Displayed up to 85 characters
노이즈 제거	Digital Noise Reduction	SSNR-V
Gain Control	Gain Control	- Manual - 0~48dB
화이트밸런스	White Balance	AWC / Manual
전자셔터	Electronic Shutter Speed	- Manual - 1/10,000~1/30s (100us ~ 33.33ms)
영상 회전	Video Rotation	Flip, Mirror
지능형 분석	Analytics	Barcode recognition - Barcode type: 1D Code, Code128 / Codabar / ITF(Interleaved 2 of 5)
조명 타입	Light Type	White LED 32ea (4ea expandable) Support Anti-blinking mode
네트워크	Network	
이더넷	Ethernet	M12 8pin connector (10/100/1000BASE-T)
비디오 압축	Video Compression	H.265/H.264: Main/High, MJPEG
화질 제어	Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Quality Level control
비트레이트 제어	Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
		Unicast(6 users) / Multicast
스트리밍	Streaming	Mono (1) 4096x2160 @ 15fps all codec Color (1) 4096x2160 @ 15fps all codec (2) 1920x1080 @ 15fps all codec (3) 640x360 @ 15fps all codec
프로토콜	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, SRTP (TCP, UDP Unicast)
응용 인터페이스	Application Programming Interface	SUNAPI(HTTP API) Wisenet Open Platform
보안	Security	
OS / 펌웨어 보호	OS / Firmware Protect	Secure boot, Signed firmware, Firmware encryption
사용자 인증	User authentication	Digest Authentication, Privent brute-force attack
네트워크 인증	Network authentication	802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)
암호통신	Secure Communication	HTTPS, SRTP, WSS(Websocket secure)
접근제어	Access Control	IP address filtering
데이터 보호	Data Protect	Authentication information encryption, ZIP compression encryption
감사(audit)	Audit	User Access/System/Event log
Device ID	Device ID	Device Certificate(Hanwha Techwin Root CA, pre-installed)
Secure Storage	Secure Storage	HTPM (Hanwha Trusted Platform Module)
보안 인증	Security Certificate	Secure by default
일반	General	
웹페이지 언어	Webpage Language	English, Korean
웹뷰어	Web Viewer	Support
메모리	Memory	4GB RAM, 512MB Flash
동작 환경 및 전원	Environmental & Electrical	
동작 온도 / 습도	Operating Temperature / Humidity	-40°C~+55°C(-40°F ~ +131°F) / 0~95% RH * Start up should be done at above -30°C NEMA TS-2: 74°C - / 0~95% RH
보관 온도 / 습도	Storage Temperature / Humidity	-40°C ~ +60°C(-40°F ~ +140°F) / Less than 95% RH
규격 인증	Certification	IP67, IK10, NAME 4X
전원	Input Voltage	24VDC
소비 전력	Power Consumption	Max 28.6W, typical 13.7W * Typical: LED Off * Max: LED On
외관	Mechanical	
색상 / 재질	Color / Material	Black / Aluminum
RAL 코드	RAL Code	RAL9005
제품 사이즈 / 무게	Product Dimensions / Weight	Camera : 218 x 123.8 x 101.3 mm, 1900 g LED : 256 x 73.8 x 50 mm, 750 g Total : 256 x 180 x 123.8 mm, 2900 g (with install bracket)
Certifications & Standards	Certifications & Standards	
EMC (전자파)	EMC	FCC 47 CFR 15 Subpart B Class A ICES-3(A)/NMB-3(A) CE/UKCA - EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3 KS C 9832 Class A, KS C 9835
안전	Safety	UL 62368-1, CAN/CSA C22.2 NO. 62368-1 IEC/EN 62471
환경	Environment	EN 60068-2-6 (variation resistance) EN 60068-2-27 (shock resistance) IEC/EN 60529 IP67 IEC/EN 62262 IK10



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 (AC/DC Adapter Input Power)

1.2 Variant Model Differences

- TNS-9040IBC : 16 mm Fixed Lens

- TNS-9060IBC: 35 mm Fixed Lens

(Added derivative model due to difference in fixed lens built into the camera / No electronics in the lens)

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
Barcode Reader	TNS-9050IBC	-	HANWHA VISION VIETNAM COMPANY LIMITED.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	XLG-320-V-A	-	MEAN WELL ENTERPRISES CO.,LTD.	-
Notebook	LG15N54	509NZSJ043910	LG	-
Notebook Adapter	PA-1650-43(65W)	OF8DS63849302K 347(1.2)	LITE-ON TECHNOLOGY (CHANGZHOU) CO.,LTD.	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Barcode Reader (EUT)	12 Pin	AC/DC Adapter	2 Pin	0.6	U
	8 Pin	Notebook	RJ-45	5.0	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.4	U

* Unshielded=U, Shielded=S

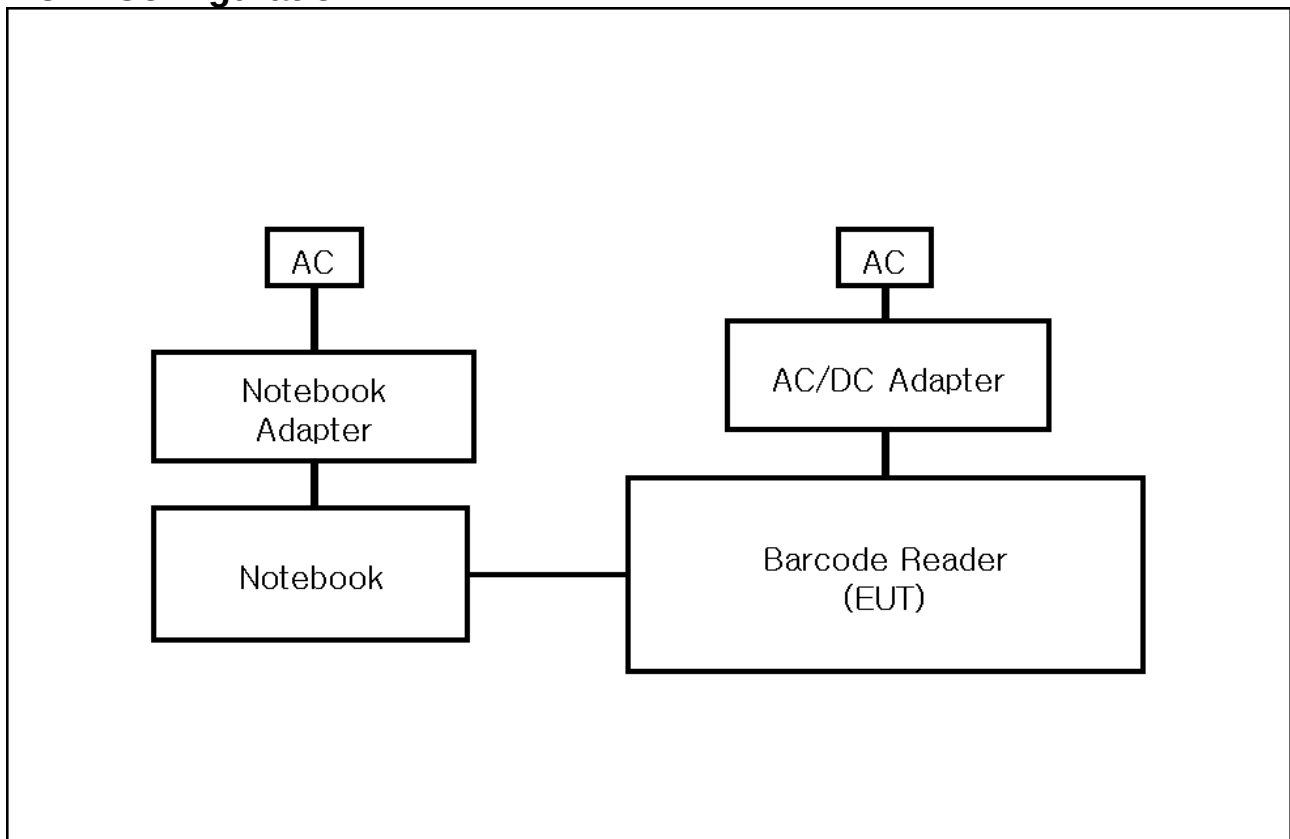


1.7 EUT Operating Mode(s)

1. Connect the EUT to the laptop and check the operation status of the EUT with the Web Viewer.
2. Scan barcodes continuously with EUT and check barcodes information with Web Viewer.
3. Check network communication status with 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 0008



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

Nov. 07, 2024

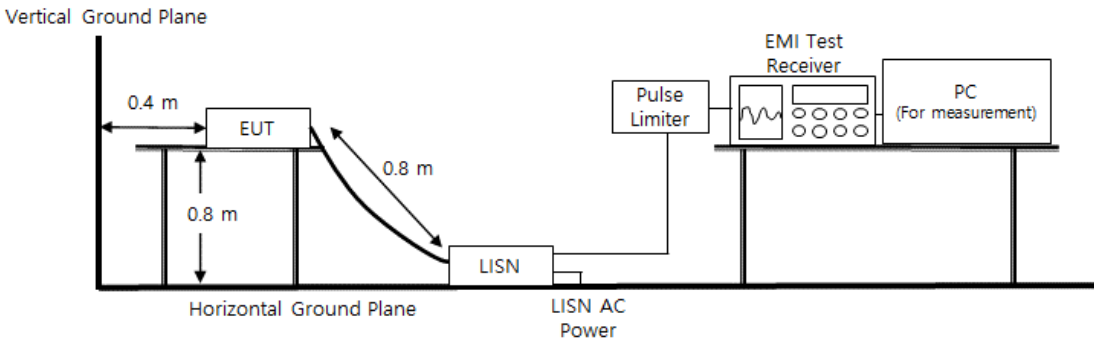
Test Location

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, 06, 2025
☒	LISN	ENV216	R & S	101786	01, 10, 2025
☒	LISN	ESH2-Z5	R & S	100450	11, 06, 2025
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 06, 2025

Diagram of test setup





Test Conditions

Temperature: (22,7 ± 0,0) °C
Relative Humidity: (45,9 ± 0,0) % 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

Nov. 07, 2024

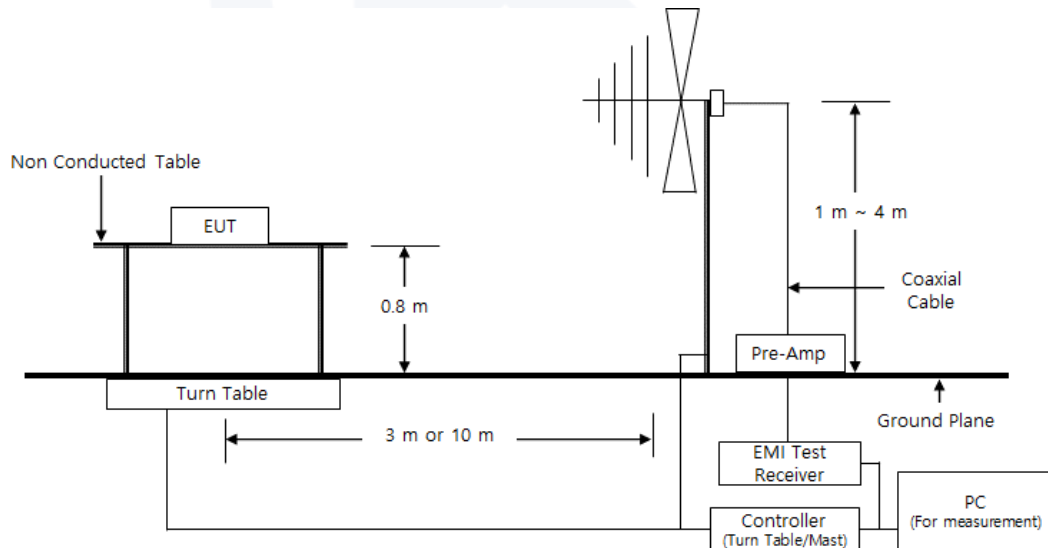
Test Location

☐ 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	02, 13, 2025
☒	AMPLIFIER	SCU 01	R & S	100603	11, 06, 2025
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	05, 09, 2026
☒	ATTENUATOR	8491A	HP	32173	02, 13, 2025

Diagram of test setup





Test Conditions

Temperature: (23,1 ± 0,0) °C
Relative Humidity: (46,0 ± 0,1) % 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

Nov. 07, 2024

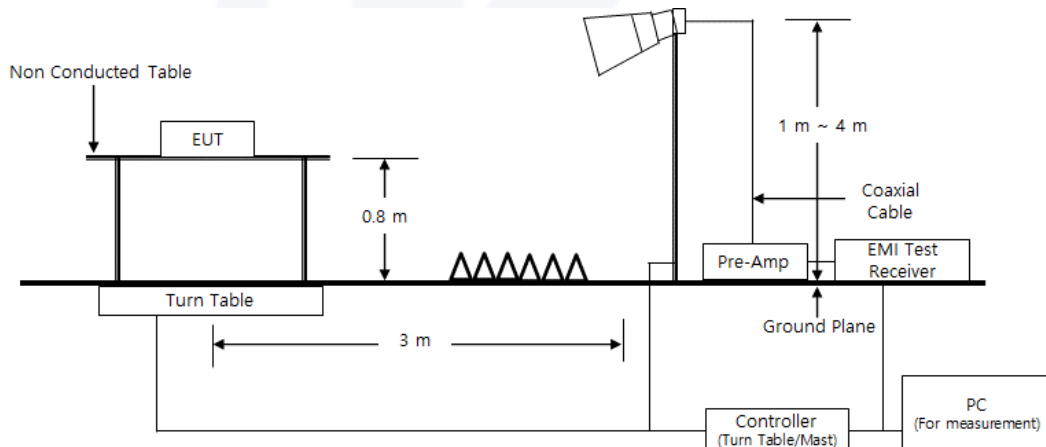
Test Location

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	02, 13, 2025
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	10, 23, 2025
☒	HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	414	01, 16, 2025

Diagram of test setup





Test Conditions

Temperature: (22,7 ± 0,0) °C
Relative Humidity: (46,2 ± 0,1) % 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.





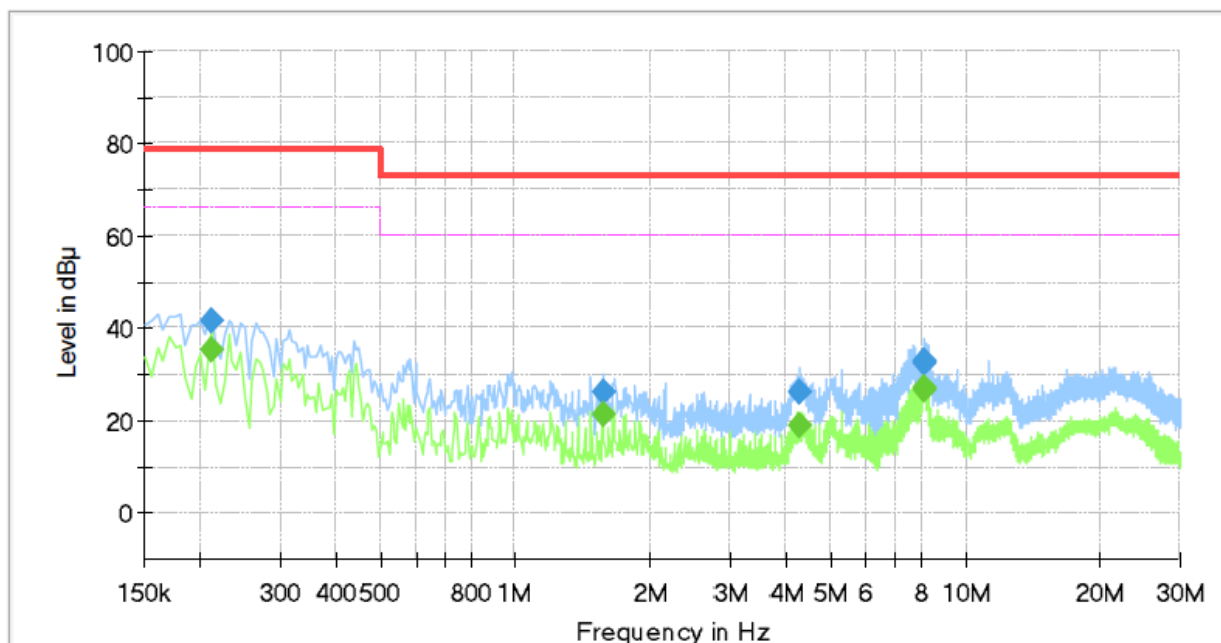
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM243481
Phase: L
Mode:
Operator Name: KES



Final Result

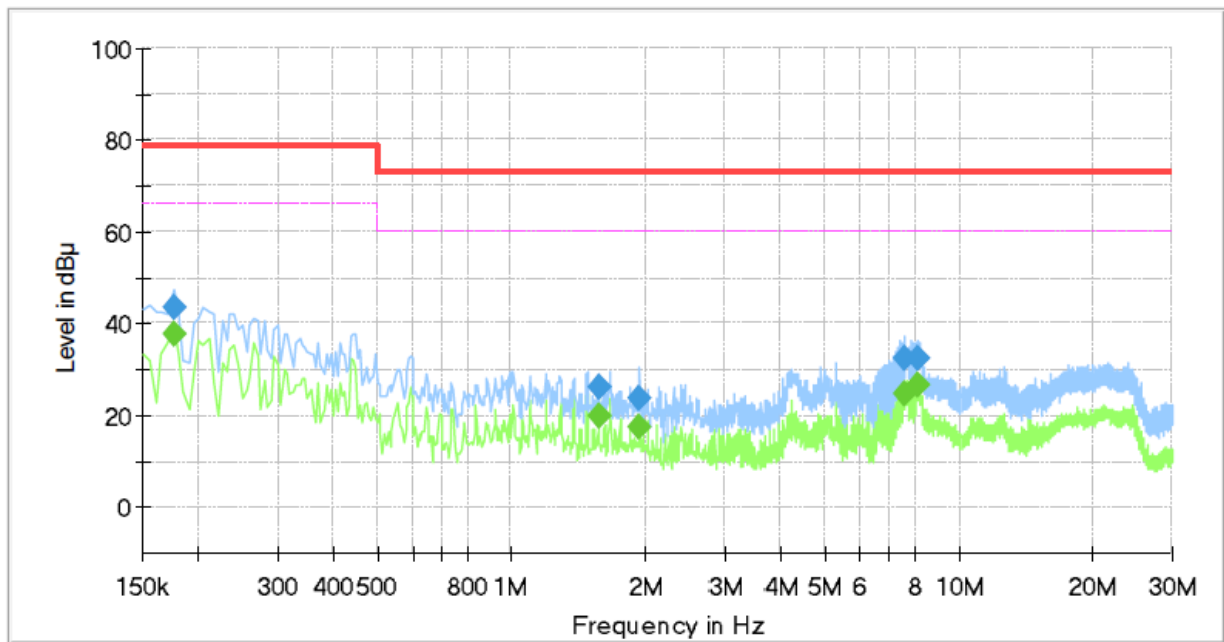
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	35.26	66.00	30.74	1000.0	9.000	L1	19.6
0.210000	41.72	---	79.00	37.28	1000.0	9.000	L1	19.6
1.560000	---	21.47	60.00	38.53	1000.0	9.000	L1	19.7
1.560000	26.21	---	73.00	46.79	1000.0	9.000	L1	19.7
4.270000	---	19.11	60.00	40.89	1000.0	9.000	L1	19.9
4.270000	26.14	---	73.00	46.86	1000.0	9.000	L1	19.9
8.105000	---	26.66	60.00	33.34	1000.0	9.000	L1	20.1
8.105000	32.41	---	73.00	40.59	1000.0	9.000	L1	20.1
8.130000	---	27.15	60.00	32.85	1000.0	9.000	L1	20.1
8.130000	33.04	---	73.00	39.96	1000.0	9.000	L1	20.1



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM243481
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)
0.175000	---	37.64	66.00	28.36	1000.0	9.000	N	19.5
0.175000	43.70	---	79.00	35.30	1000.0	9.000	N	19.5
1.570000	---	19.83	60.00	40.17	1000.0	9.000	N	19.6
1.570000	25.95	---	73.00	47.05	1000.0	9.000	N	19.6
1.935000	---	17.72	60.00	42.28	1000.0	9.000	N	19.7
1.935000	23.91	---	73.00	49.09	1000.0	9.000	N	19.7
7.565000	---	24.52	60.00	35.48	1000.0	9.000	N	20.0
7.565000	32.50	---	73.00	40.50	1000.0	9.000	N	20.0
8.115000	---	26.76	60.00	33.24	1000.0	9.000	N	20.0
8.115000	32.49	---	73.00	40.51	1000.0	9.000	N	20.0

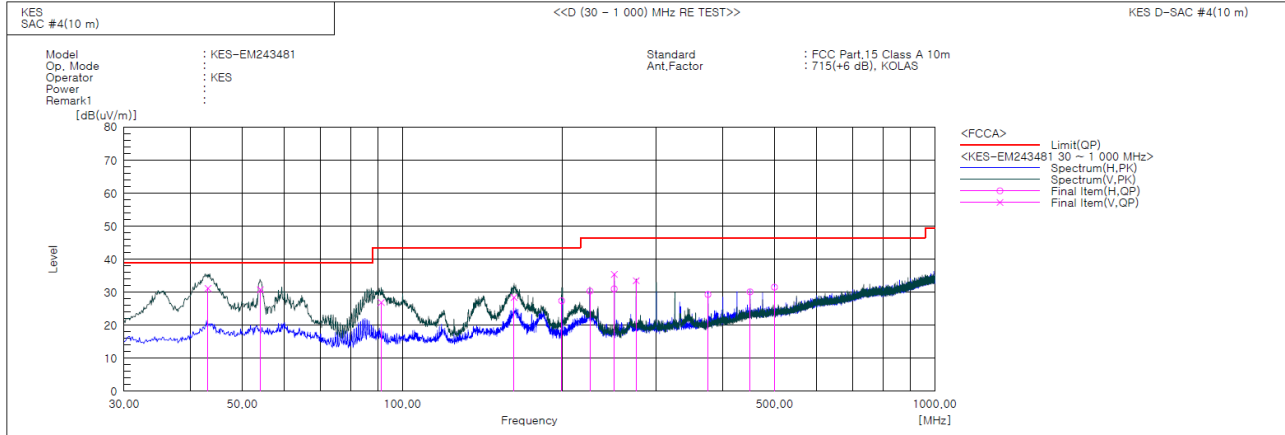
◆ Calculation

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))

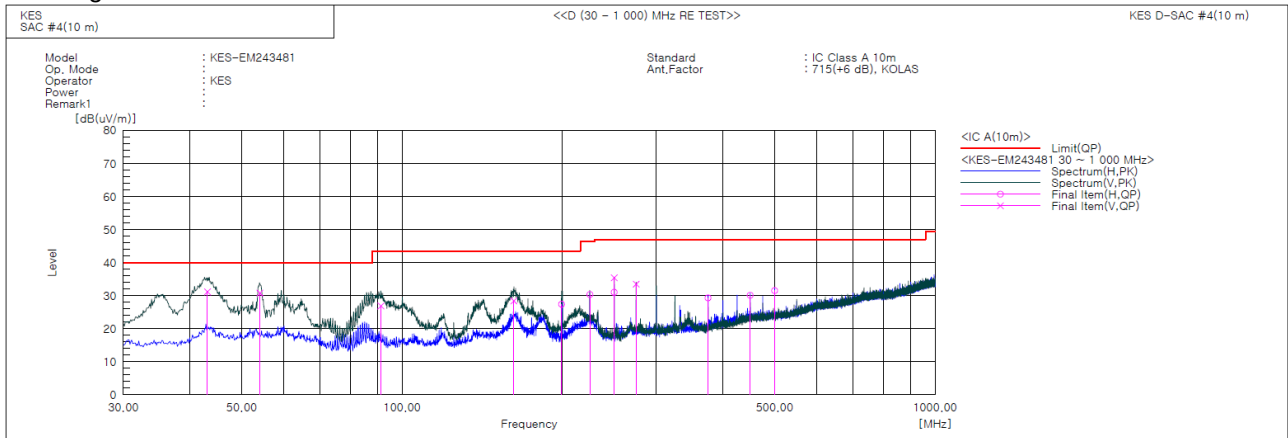
**Radiated Electric Field Emissions(Below 1 GHz)****- 47 CFR Part 15, Subpart B****Final Result**

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	43.104	V	52.8	-21.6	31.2	39.0	7.8	100.0	168.0	
2	54.096	V	51.9	-21.1	30.8	39.0	8.2	106.0	97.0	
3	91.242	V	53.1	-26.2	26.9	43.5	16.6	150.0	353.0	
4	161.963	V	48.1	-19.7	28.4	43.5	15.1	116.0	191.0	
5	199.185	H	49.5	-22.1	27.4	43.5	16.1	388.0	300.0	
6	224.999	H	51.4	-21.1	30.3	46.5	16.2	388.0	68.0	
7	250.005	V	55.0	-19.6	35.4	46.5	11.1	118.0	244.0	
8	250.009	H	50.6	-19.6	31.0	46.5	15.5	389.0	43.0	
9	274.996	V	51.8	-18.3	33.5	46.5	13.0	124.0	232.0	
10	375.001	H	44.0	-14.7	29.3	46.5	17.2	374.0	30.0	
11	449.999	H	41.7	-11.6	30.1	46.5	16.4	388.0	195.0	
12	499.982	H	41.8	-10.3	31.5	46.5	15.0	379.0	60.0	



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- IC Regulation ICES-003 Issue 7



Final Result

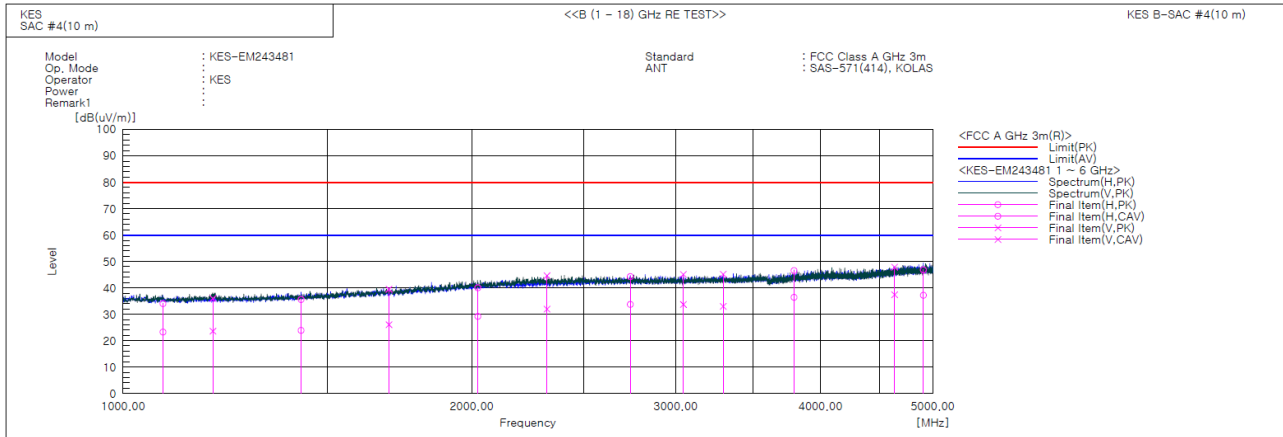
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	43.104	V	52.8	-21.6	31.2	40.0	8.8	100.0	168.0	
2	54.096	V	51.9	-21.1	30.8	40.0	9.2	106.0	97.0	
3	91.242	V	53.1	-26.2	26.9	43.5	16.6	150.0	353.0	
4	161.963	V	48.1	-19.7	28.4	43.5	15.1	116.0	191.0	
5	199.185	H	49.5	-22.1	27.4	43.5	16.1	388.0	300.0	
6	224.999	H	51.4	-21.1	30.3	46.4	16.1	388.0	68.0	
7	250.005	V	55.0	-19.6	35.4	47.0	11.6	118.0	244.0	
8	250.009	H	50.6	-19.6	31.0	47.0	16.0	389.0	43.0	
9	274.996	V	51.8	-18.3	33.5	47.0	13.5	124.0	232.0	
10	375.001	H	44.0	-14.7	29.3	47.0	17.7	374.0	30.0	
11	449.999	H	41.7	-11.6	30.1	47.0	16.9	388.0	195.0	
12	499.982	H	41.8	-10.3	31.5	47.0	15.5	379.0	60.0	

◆ Calculation

$$\text{Result(QP)} [\text{dB}(\mu\text{V/m})] = (\text{Reading(QP)} [\text{dB}(\mu\text{V})] + \text{c.f} [\text{dB(1/m)}])$$
$$\text{Margin(QP)} [\text{dB}] = \text{Limit} [\text{dB}(\mu\text{V/m})] - \text{Result(QP)} [\text{dB}(\mu\text{V/m})]$$

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	1082.433	H	40.0	29.3	-6.0	34.0	23.3	80.0	60.0	46.0	36.7	319.0	204.0	
2	1195.443	V	41.3	28.9	-5.3	36.0	23.6	80.0	60.0	44.0	36.4	119.0	200.0	
3	1424.192	H	39.3	27.6	-3.7	35.6	23.9	80.0	60.0	44.4	36.1	333.0	34.0	
4	1696.333	V	40.7	27.3	-1.2	39.5	26.1	80.0	60.0	40.5	33.9	156.0	6.0	
5	2024.413	H	38.1	27.3	1.9	40.0	29.2	80.0	60.0	40.0	30.8	311.0	186.0	
6	2322.116	V	41.1	28.5	3.5	44.6	32.0	80.0	60.0	35.4	28.0	253.0	341.0	
7	2740.286	H	39.5	28.9	4.8	44.3	33.7	80.0	60.0	35.7	26.3	254.0	204.0	
8	3045.444	V	39.5	28.1	5.6	45.1	33.7	80.0	60.0	34.9	26.3	166.0	256.0	
9	3296.840	V	39.1	26.9	6.1	45.2	33.0	80.0	60.0	34.8	27.0	201.0	92.0	
10	3795.189	H	38.0	27.9	8.5	46.5	36.4	80.0	60.0	33.5	23.6	356.0	268.0	
11	4635.186	V	36.3	25.8	11.6	47.9	37.4	80.0	60.0	32.1	22.6	191.0	170.0	
12	4908.413	H	33.9	24.3	12.9	46.8	37.2	80.0	60.0	33.2	22.8	281.0	123.0	

◆ 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



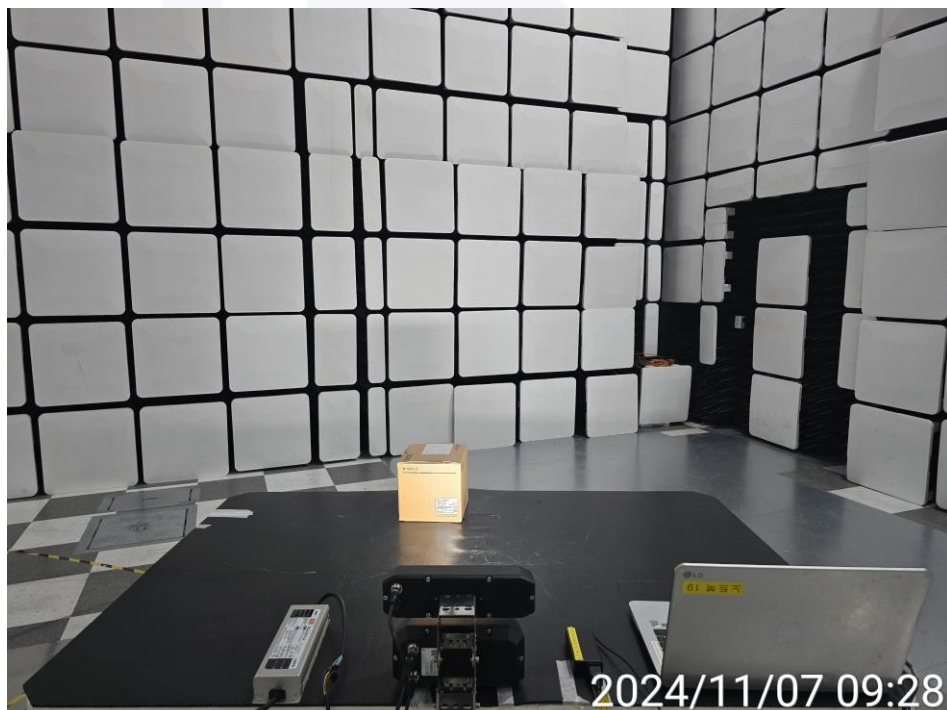
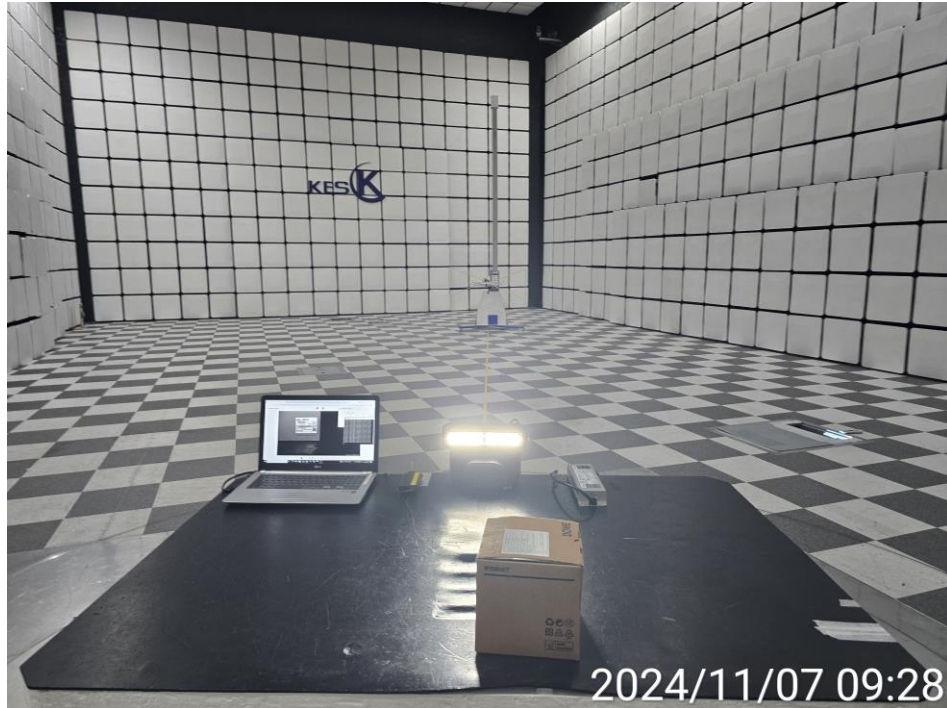
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



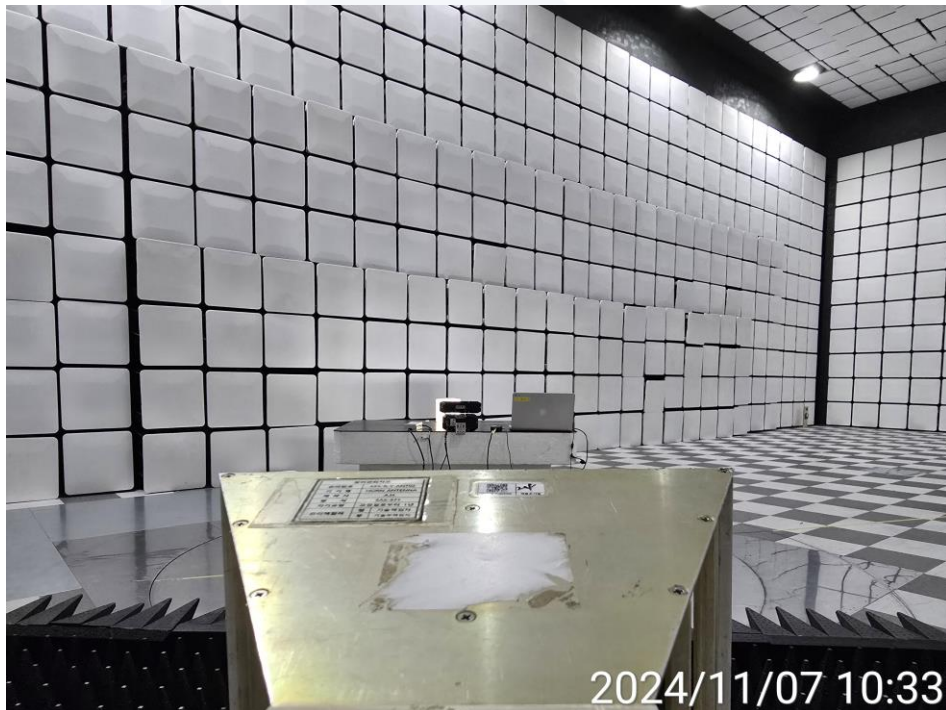


Radiated Electric Field Emissions(Below 1 GHz)





Radiated Electric Field Emissions(Above 1 GHz)





EUT External Photographs

(Top)



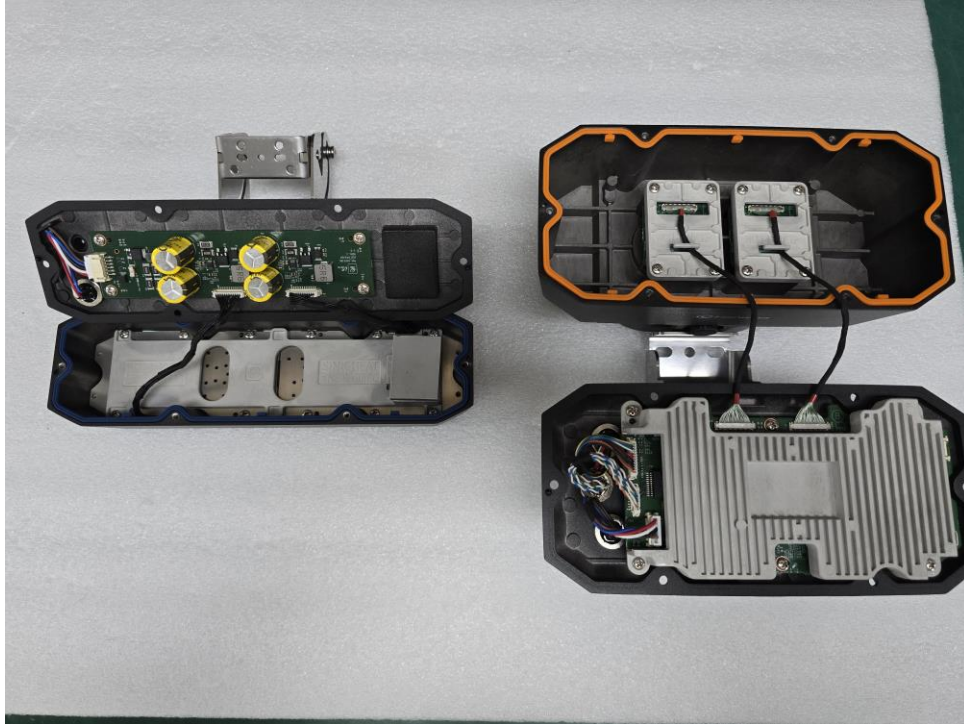
(Bottom)





EUT Internal Photographs

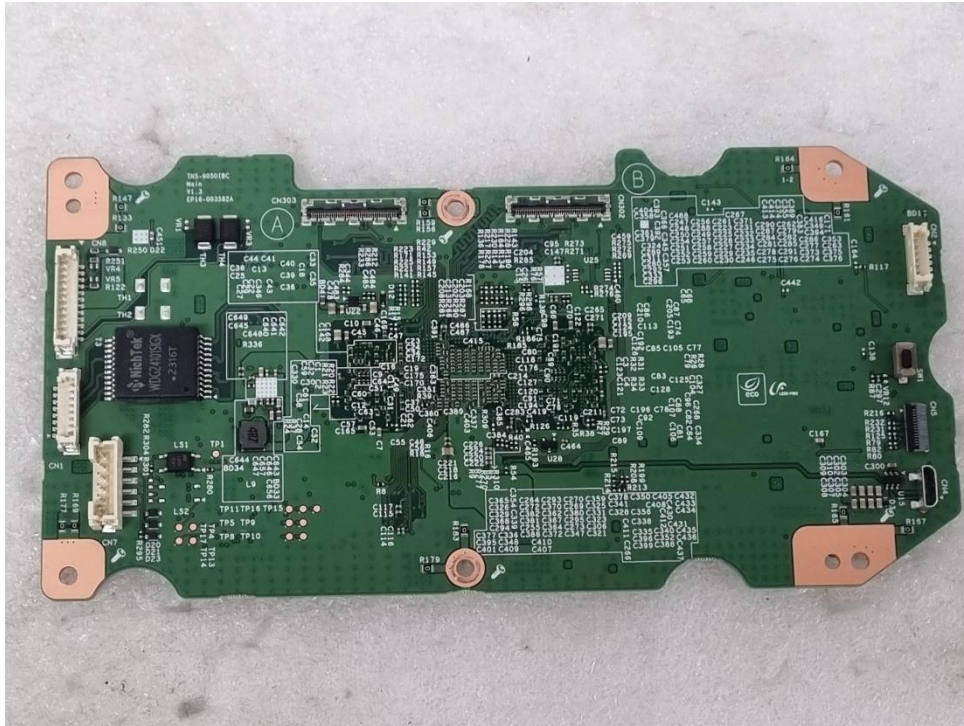
(Internal View)



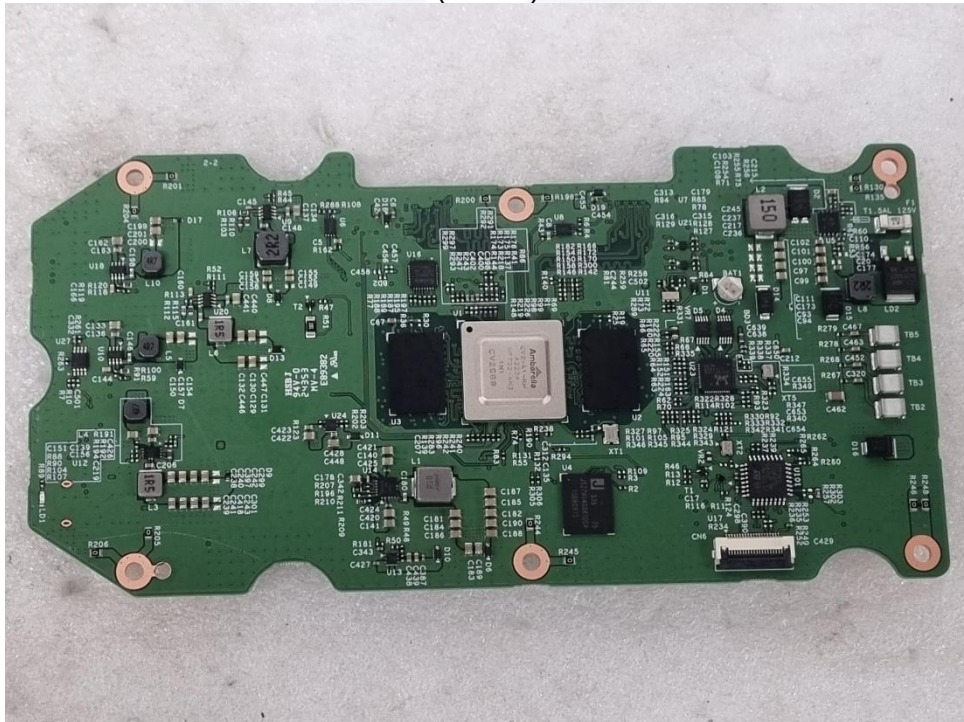


EUT Internal View – Main Board

(Top)



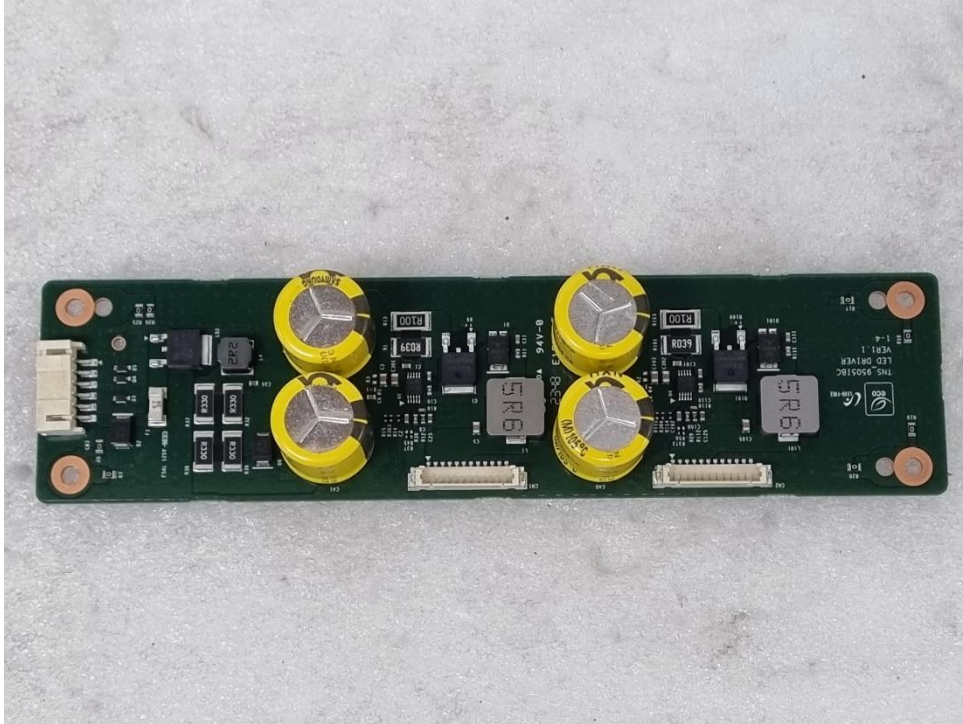
(Bottom)



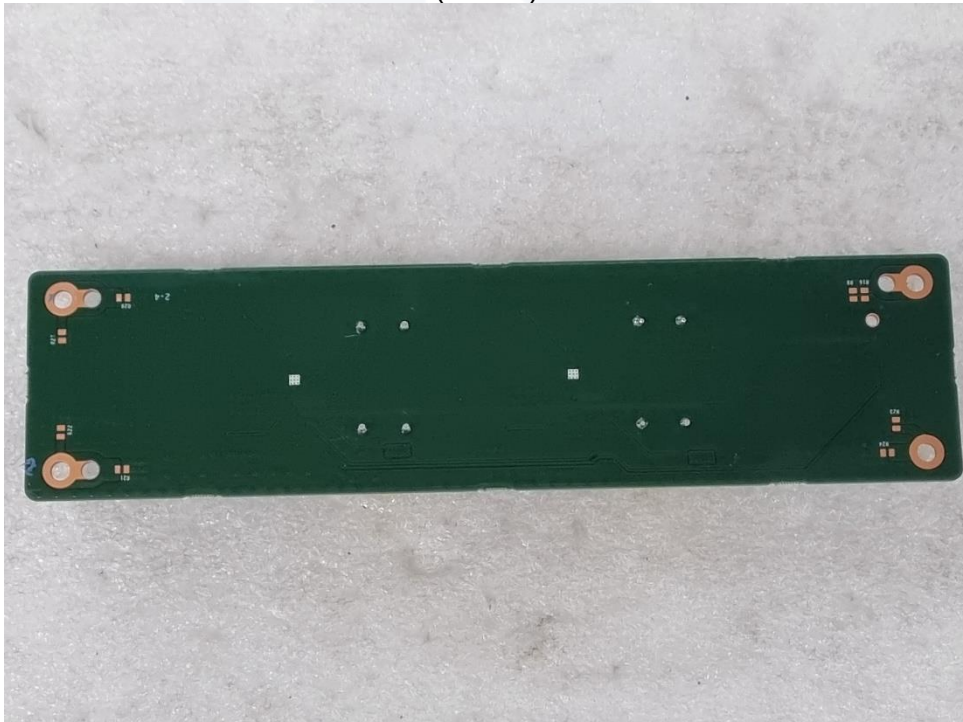


EUT Internal View – Sub Board

(Top)



(Bottom)



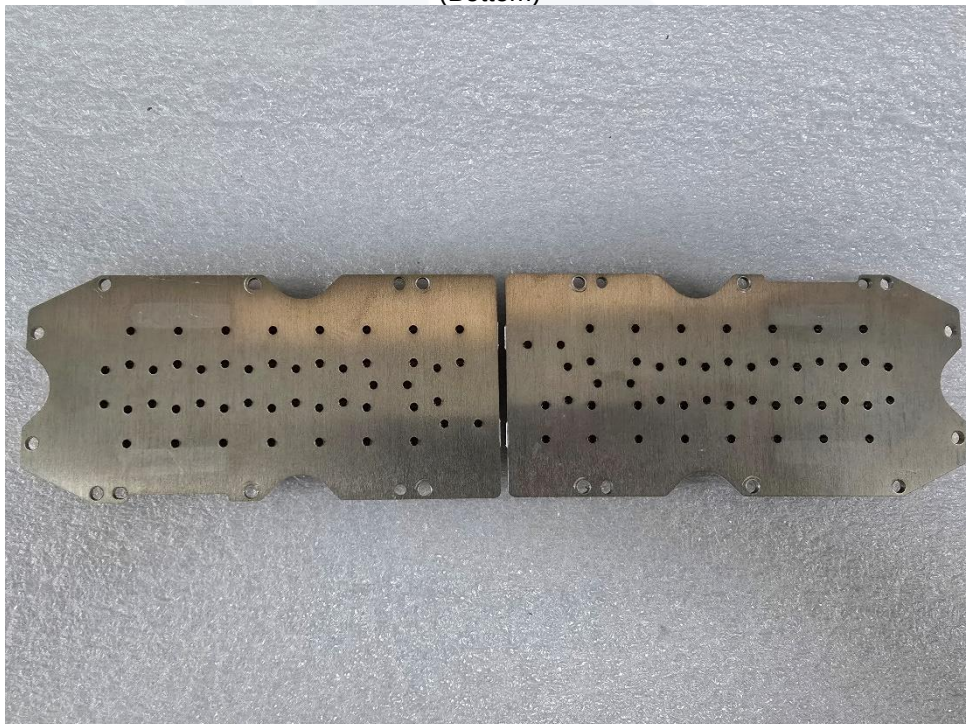


EUT Internal View – LED Board

(Top)



(Bottom)



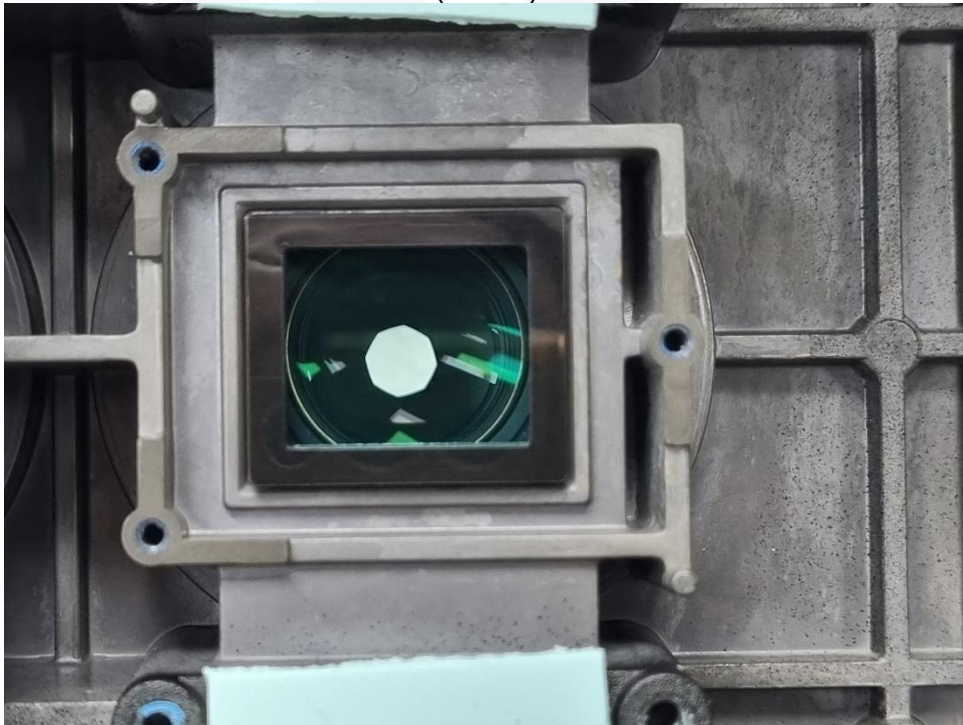


EUT Internal View – Lens

(Top)



(Bottom)





Label Photographs

FCC Label



Barcode Reader

TNS-9050IBC

IC Label

CAN ICES-003(A) / NMB-003(A)

This device complies with ICES-003 Canada Rules 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.

The End.