



TEST REPORT



Report No. : KES-EM244153

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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 : IP Controller

Model/Type No. : NHP-P100

Variant Model : -

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 : Nov. 27, 2024

4. Test date : Dec. 16, 2024 ~ Dec. 18, 2024

5. Date of Issue : Jan. 09, 2025

6. Test Results : In Compliance

Tested by

Reviewed by

Jae Won, Lee
EMC Test Engineer

Dae Jung, Choi
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
Jan. 09, 2025	KES-EM244153	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Internal clock frequency : 1.1 GHz

Hardware	
Readers	1 OSDP/Wiegand Reader Port (capable of supporting 2 OSDP Readers or 1 Wiegand Reader)
Reader Port Specs	OSDP Protocol (v2.2), Legacy Wiegand Support 500mA @ 12VDC
General Purpose Inputs	5ea : 3 input (1ea Door Position , 1ea REX, 1ea Aux In) + 2 additional input (when OSDP is used) *3 supervised input port ((Door Position Switch, REX, Aux In)
General Purpose Outputs	1 (Door Lock)
Door Output Specs	Dry/12VDC/24VDC Field selectable 30VDC @ Max 2A DRY, 12VDC @ Max 500mA WET, 24VDC @ Max 250mA WET
Dedicated Inputs	Housing tamper (built-in; removal of housing cover, removal from wall) 1 FAI for Power Drop
REX Power Output	12VDC @ Max 100mA (Power output for PIR sensor, REX button, etc.)
Memory	1GB DDR4, 8GB eMMC
Access	
Doors	1 Door
Credentials	50,000
Access Levels	50,000
Event History	250,000 (offline cache event)
Network	
Ethernet	RJ-45(10/100BASE-T)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, NTP, HTTP, HTTPS, SSL/TLS, SMTP, ICMP, IGMP, SNMP V3(MIB-2), ARP, DDNS, DNS, UPnP, Bonjour, LLDP
Data Security	SecureOS/Boot, Firmware verification, TPM with FIPS 140-2 Level 2
System Integration	
Application Programming Interface	ONVIF Profile A/C, SUNAPI (HTTP API), Wisenet OpenPlatform
Environmental & Electrical	
Operating Temperature / Humidity	-20°C~+60°C / 20-85% RH (non-condensing)
Storage Temperature / Humidity	-50°C~+60°C / Less than 95% RH
Input Voltage	PoE+, 12VDC / 24VDC
Power Consumption	PoE+ : 53V @ Max 0.44A, 12VDC @ Max 1.67A / 24VDC IN @ Max 0.84A
Mechanical	
Color / Material	White / Aluminum
Product dimensions / weight	184 x 184x 43(mm), 1.1kg
General	
Webpage Language	English, Korean
Included Accessories	Quick Guide, Wiring Guide
Warranty	5 years



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(DC Adapter Input Power, DC 12 V)
- ☒ AC 120 V, 60 Hz(DC Adapter Input Power, DC 24 V)
- ☒ AC 120 V, 60 Hz(PoE Adapter Input Power)

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
IP Controller	NHP-P100	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT



1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter1	2ACB022F	-	ChAnnel Well Technology (Guangzhou) Co.,Ltd.	-
AC/DC Adapter2	GLS-150	-	-	-
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Laptop	LG15U47	-	Tech-Front (Chongqing) Computer Co., Ltd.	-
Laptop Adapter	A13-040N3A	-	CHICONY POWER TECHNOLOGY (Chongqing) CO., LTD.	-
Switch1	-	-	-	-
Switch2	-	-	-	-
Lock	-	-	Super Rock Co., Ltd.	-
Button	-	-	-	-
Card Reader	20K	-	ANATEL	-
Card	-	-	-	-



1.6 External I/O Cabling

■ #1

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
IP Controller (EUT)	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.5	U
	FAI	Switch1	FAI	3.5	U
	AUX IN	Switch2	AUX IN	3.5	U
	DPS+OUT (4 Pin)	Lock	DPS+OUT (4 Pin)	3.5	U
	REX (4 Pin)	Button	REX (4 Pin)	3.5	U
	READER(6 Pin)	Card Reader	READER(6 Pin)	3.5	U
	DC IN(2 Pin)	AC/DC Adapter1	DC IN(2 Pin)	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
Card Reader	RFID	Card	RFID	-	-

* Unshielded=U, Shielded=S

■ #2

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
IP Controller (EUT)	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.5	U
	FAI	Switch1	FAI	3.5	U
	AUX IN	Switch2	AUX IN	3.5	U
	DPS+OUT (4 Pin)	Lock	DPS+OUT (4 Pin)	3.5	U
	REX (4 Pin)	Button	REX (4 Pin)	3.5	U
	READER(6 Pin)	Card Reader	READER(6 Pin)	3.5	U
	DC IN(2 Pin)	AC/DC Adapter2	DC IN(2 Pin)	1.6	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
Card Reader	RFID	Card	RFID	-	-

* Unshielded=U, Shielded=S



■ #3

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
IP Controller (EUT)	RJ-45(PoE)	PoE Adapter	RJ-45(PoE)	3.5	U
	FAI	Switch1	FAI	3.5	U
	AUX IN	Switch2	AUX IN	3.5	U
	DPS+OUT (4 Pin)	Lock	DPS+OUT (4 Pin)	3.5	U
	REX (4 Pin)	Button	REX (4 Pin)	3.5	U
	READER(6 Pin)	Card Reader	READER(6 Pin)	3.5	U
PoE Adapter	RJ-45(LAN)	Laptop	RJ-45(LAN)	3.5	U
Laptop	DC Jack	Laptop Adapter	DC Jack	1.3	U
Card Reader	RFID	Card	RFID	-	-

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

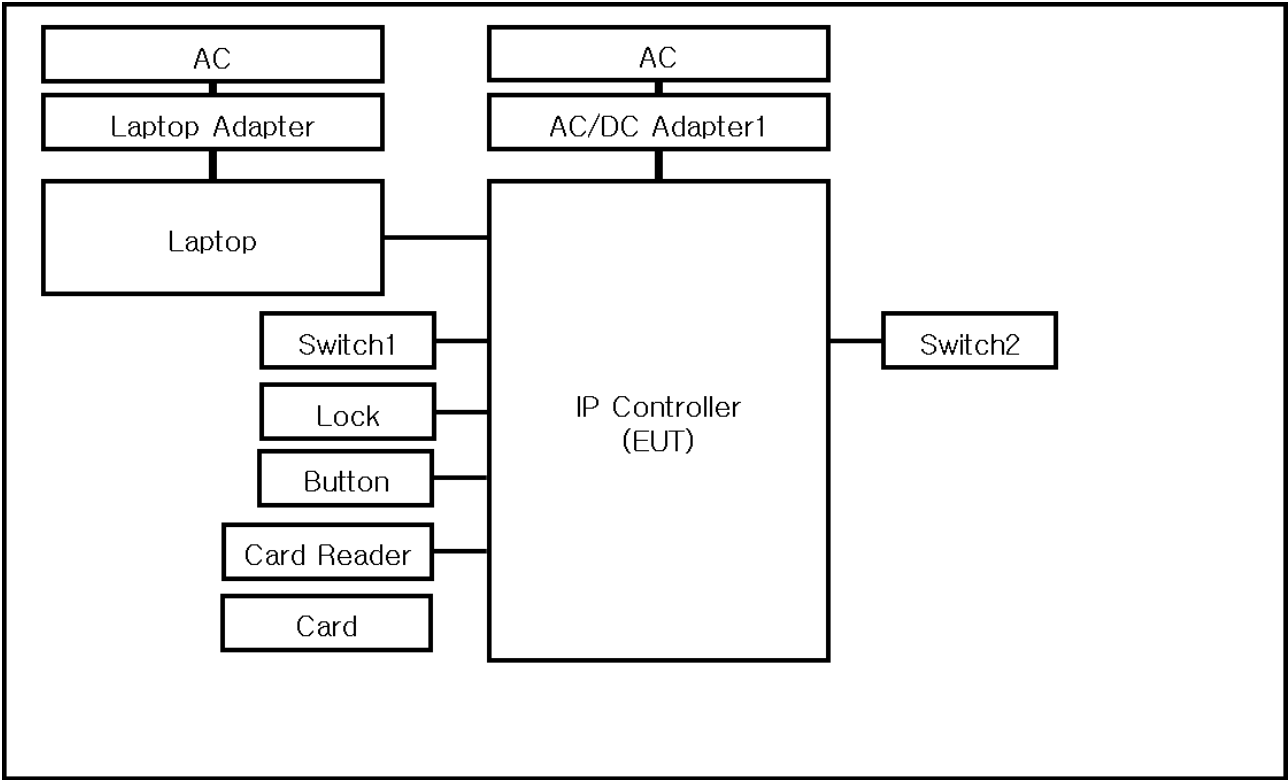
Dision	Mode name	Operating status
#1	DC 12 V	-After connecting the test equipment and DC power supply 1, 1. Run the web viewer on your laptop to check normal operation. 2. Check the network status by performing PingTest on your laptop. 3. Press the button to check normal operation and lock operation in the web viewer. 4. Recognize the card in the card reader and check normal operation and lock operation in the web viewer. 5. Open the switch and check normal operation and lock operation in the web viewer.
#2	DC 24 V	-After connecting the test equipment and DC power supply 2, 1. Run the web viewer on your laptop to check normal operation. 2. Check the network status by performing PingTest on your laptop. 3. Press the button to check normal operation and lock operation in the web viewer. 4. Recognize the card in the card reader and check normal operation and lock operation in the web viewer. 5. Open the switch and check normal operation and lock operation in the web viewer.
#3	PoE	- After connecting the test equipment and PoE adapter 1. Run the web viewer on your laptop to check normal operation. 2. Check the network status by performing PingTest on your laptop. 3. Press the button to check normal operation and lock operation in the web viewer. 4. Recognize the card in the card reader and check normal operation and lock operation in the web viewer. 5. Open the switch and check normal operation and lock operation in the web viewer.

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

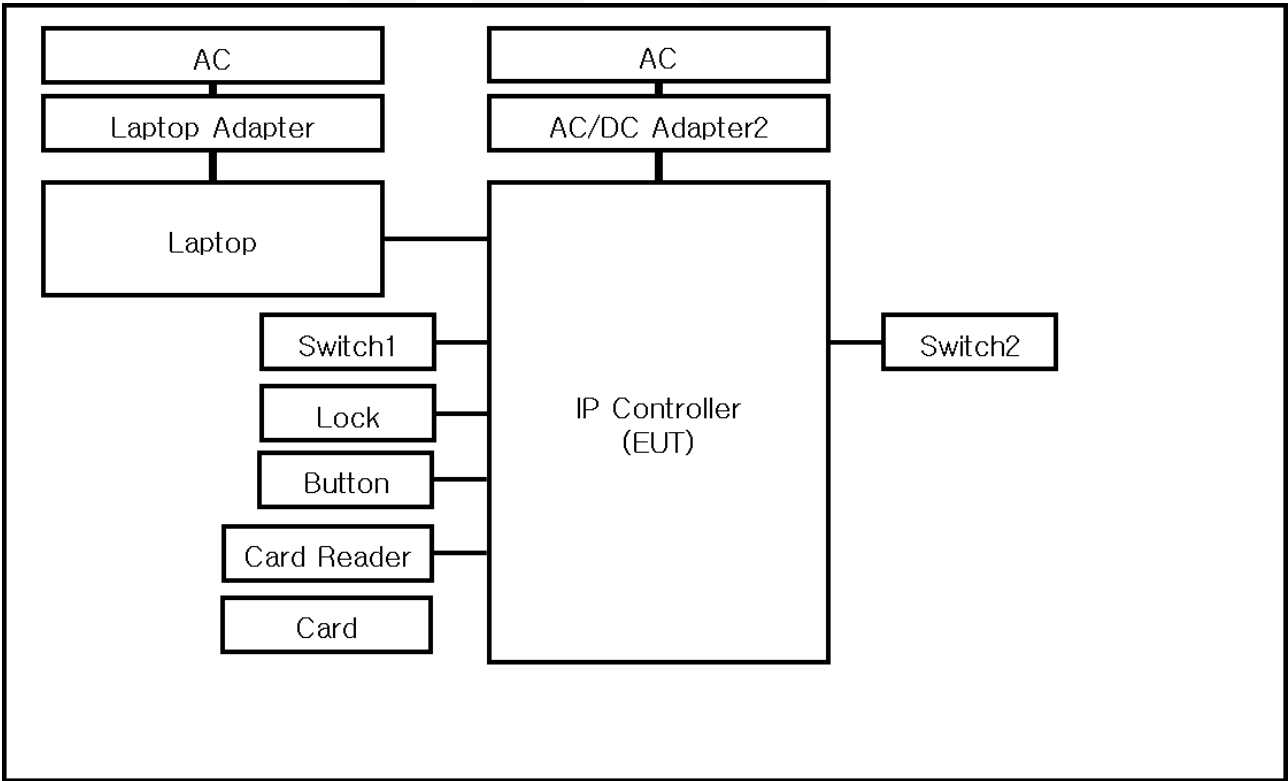


1.8 Configuration

■ #1

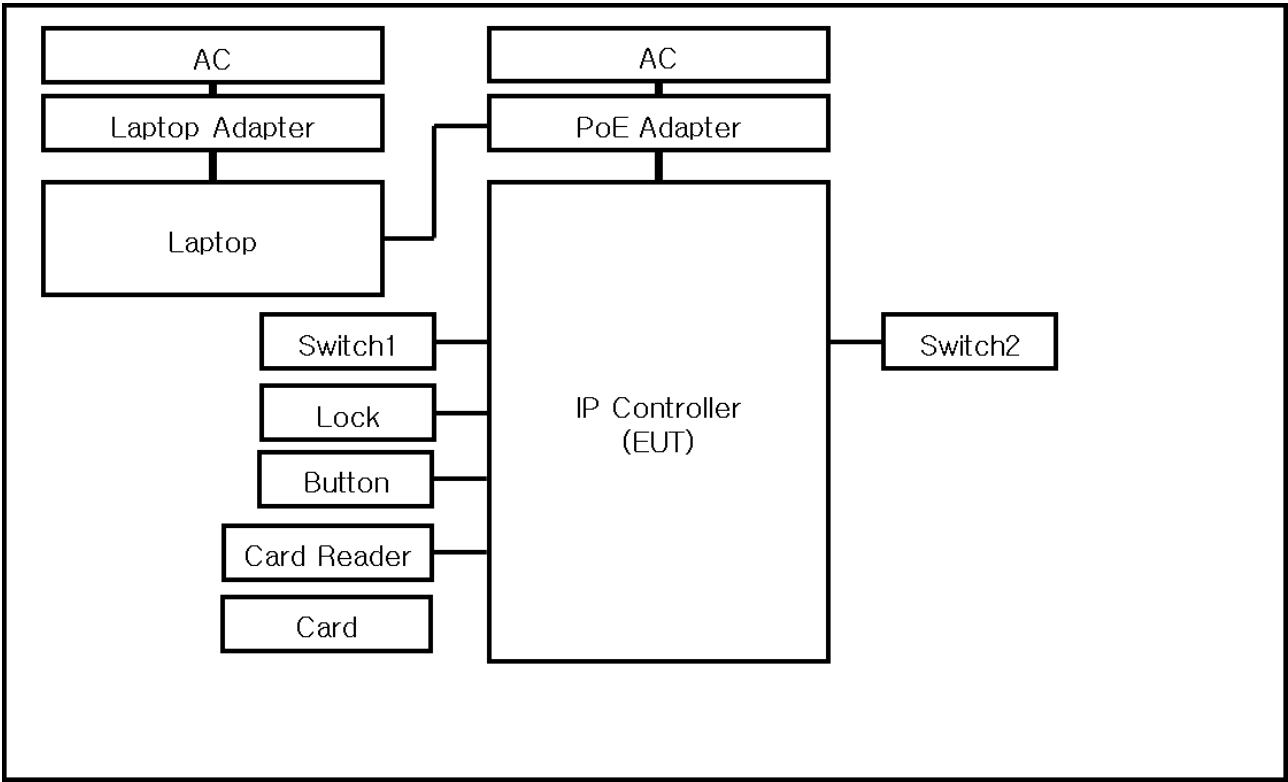


■ #2





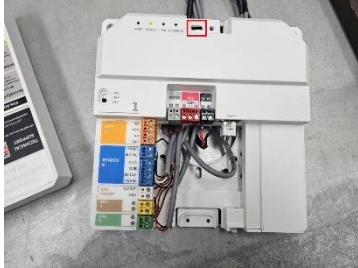
■ #3





1.9 Remarks when standards applied

- USB Type-C port is not tested because it is for administrators.
- port picture for admin



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

Dec. 17, 2024

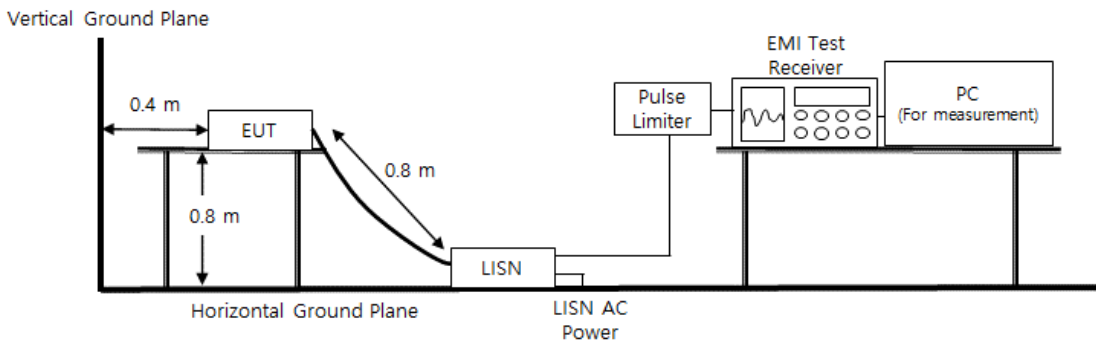
Test Location

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: (22,5 ± 0,1) °C
Relative Humidity: (46,1 ± 0,1) % 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)

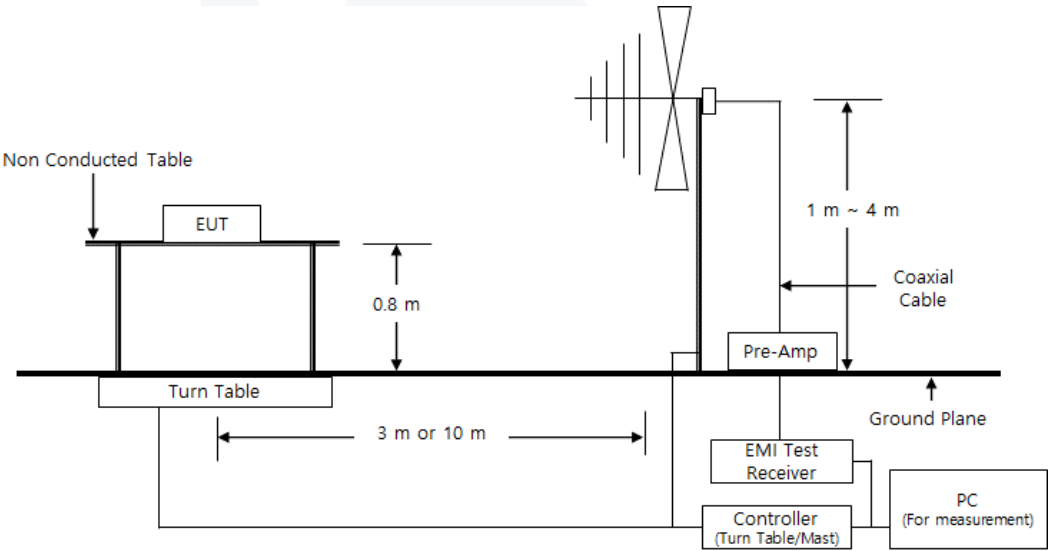
Test Date
Dec. 16, 2024

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
☒	BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	05, 09, 2026
☒	ATTENUATOR	6806.17.A	HUBER+SUHNER	-	02, 13, 2025

Diagram of test setup





Test Conditions

Temperature: (22,3 ± 0,1) °C
Relative Humidity: (46,1 ± 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

Dec. 18, 2024

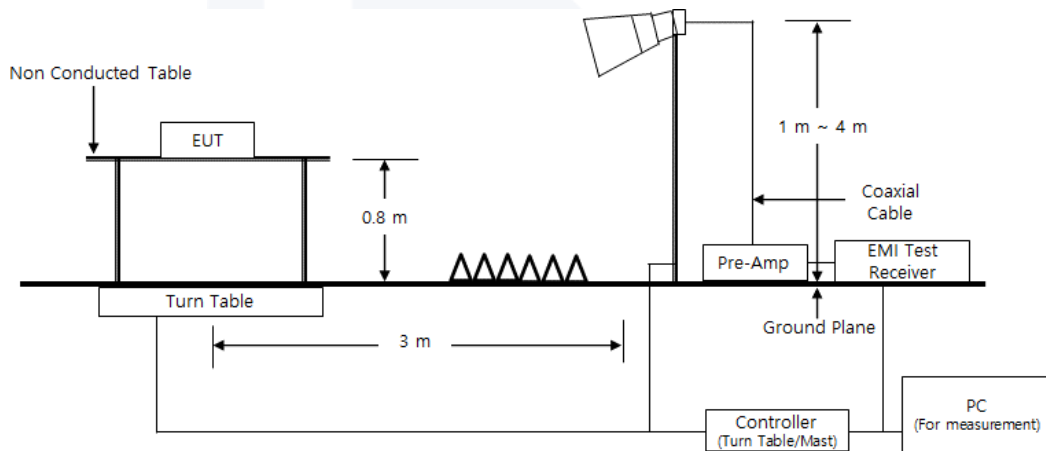
Test Location

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	02, 13, 2025
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 04, 2025
☒	PREAMPLIFIER	8449B	HP	3008A00538	04, 30, 2025
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2025

Diagram of test setup





Test Conditions

Temperature: $(22,8 \pm 0,1)^{\circ}\text{C}$
Relative Humidity: $(45,9 \pm 0,1) \% \text{ R.H.}$

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

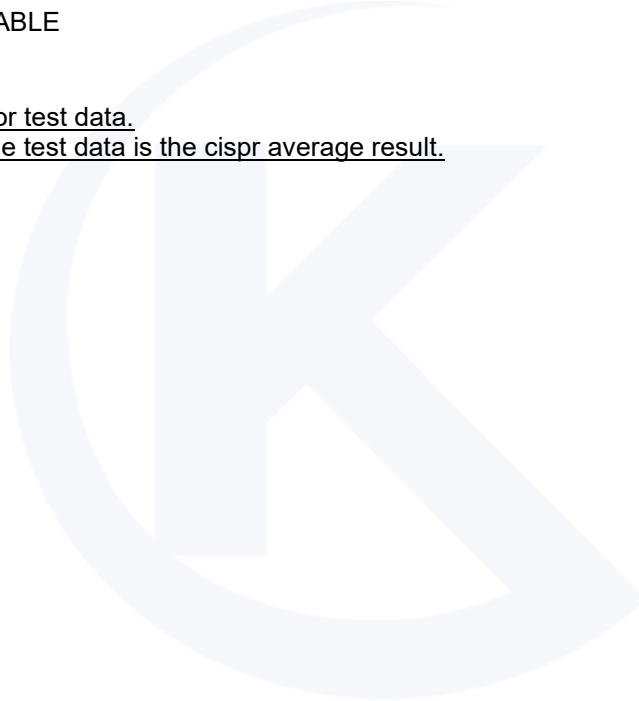
The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

The Average of the test data is the cispr average result.





APPENDIX A – TEST DATA

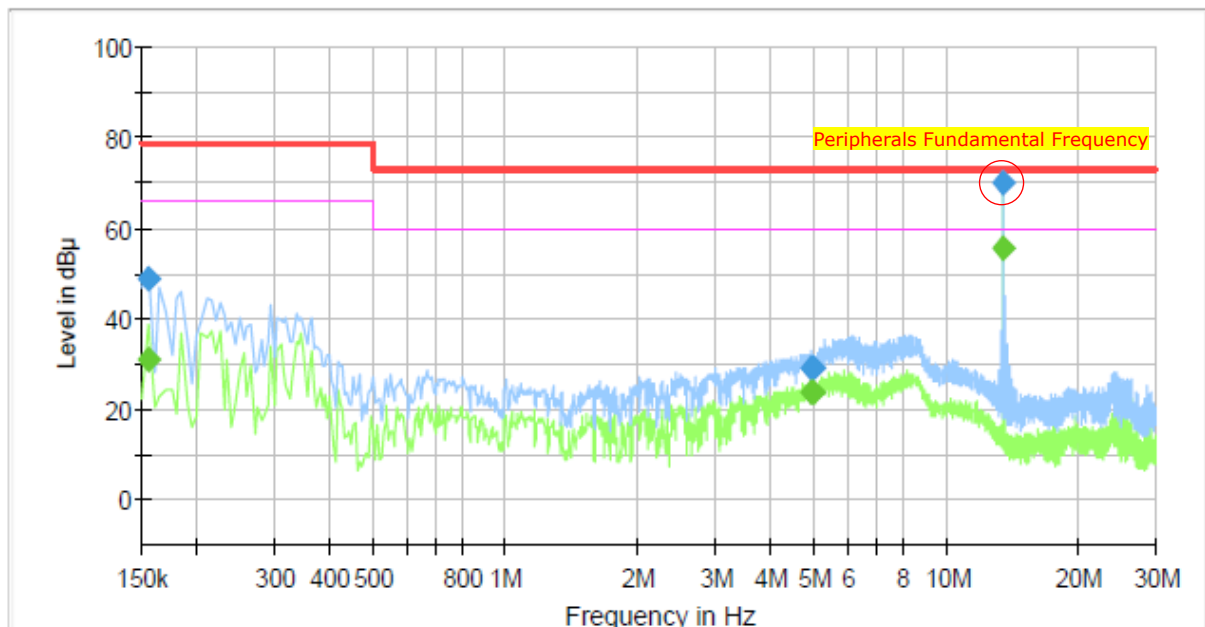
Conducted Emissions at Mains Power Ports

■ #1

HOT LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244153
Phase: #1_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)
0.155000	---	30.85	66.00	35.15	1000.0	9.000	L1	19.6
0.155000	48.82	---	79.00	30.18	1000.0	9.000	L1	19.6
4.950000	---	23.87	60.00	36.13	1000.0	9.000	L1	19.9
4.950000	29.01	---	73.00	43.99	1000.0	9.000	L1	19.9
5.030000	---	24.00	60.00	36.00	1000.0	9.000	L1	19.9
5.030000	28.89	---	73.00	44.11	1000.0	9.000	L1	19.9
13.560000	---	55.60	60.00	4.40	1000.0	9.000	L1	20.2
13.560000	70.02	---	73.00	2.98	1000.0	9.000	L1	20.2

* Exclusion bands

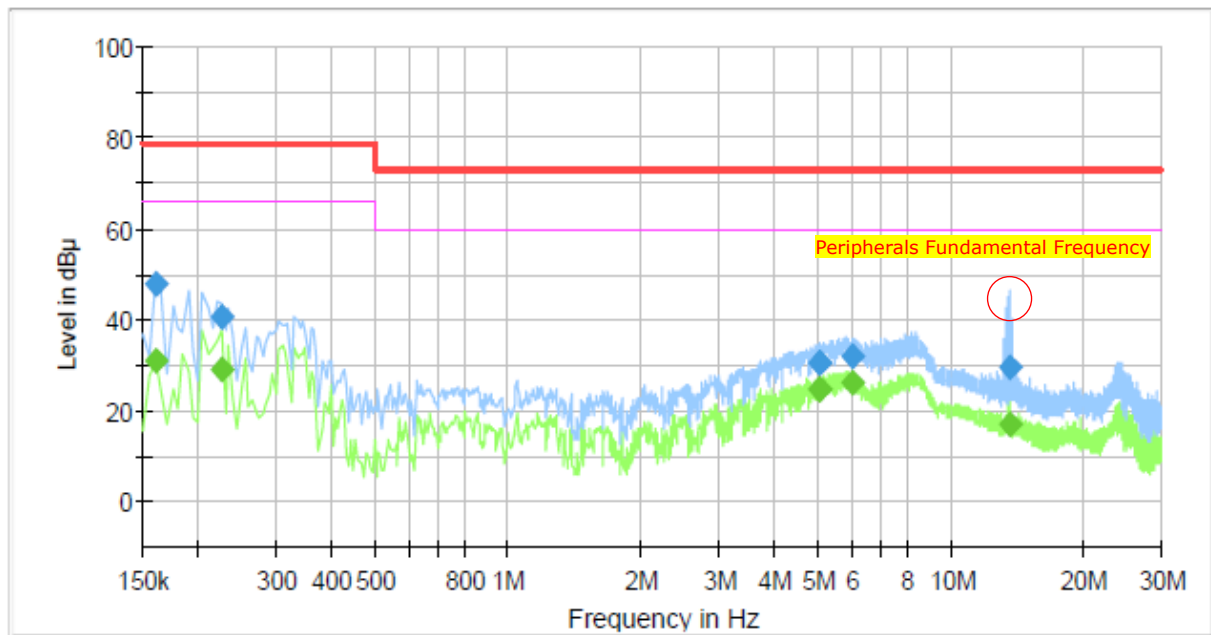
- Peripherals Fundamental Frequency: 13.56 MHz



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244153
Phase: #1_N
Mode:
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	31.23	66.00	34.77	1000.0	9.000	N	19.5
0.160000	47.86	---	79.00	31.14	1000.0	9.000	N	19.5
0.225000	---	28.87	66.00	37.13	1000.0	9.000	N	19.5
0.225000	40.64	---	79.00	38.36	1000.0	9.000	N	19.5
5.060000	---	24.86	60.00	35.14	1000.0	9.000	N	19.9
5.060000	30.31	---	73.00	42.69	1000.0	9.000	N	19.9
5.095000	---	24.83	60.00	35.17	1000.0	9.000	N	19.9
5.095000	30.47	---	73.00	42.53	1000.0	9.000	N	19.9
6.005000	---	26.24	60.00	33.76	1000.0	9.000	N	20.0
6.005000	31.97	---	73.00	41.03	1000.0	9.000	N	20.0
13.560000	---	16.99	60.00	43.01	1000.0	9.000	N	20.2
13.560000	29.35	---	73.00	43.65	1000.0	9.000	N	20.2

* Exclusion bands

- Peripherals Fundamental Frequency: 13.56 MHz



■ #2

HOT LINE

Common Information

Test Description:

Conducted Emission

Job No.:

KES-EM244153

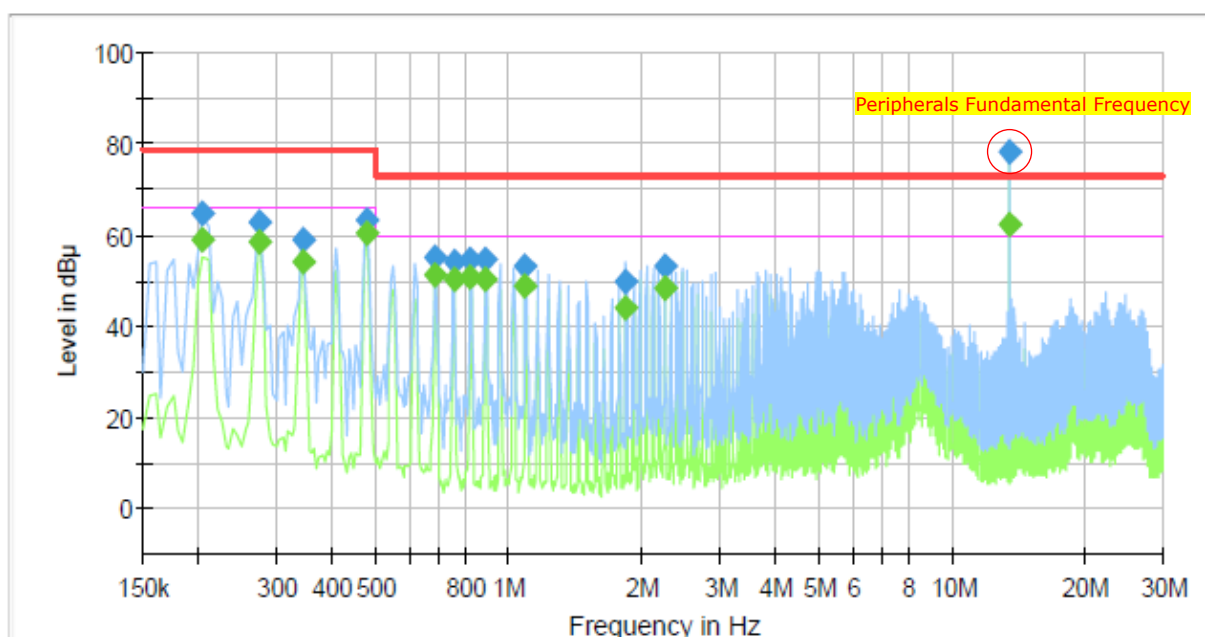
Phase:

#2_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)
0.205000	64.82	---	79.00	14.18	1000.0	9.000	L1	19.6
0.205000	---	59.16	66.00	6.84	1000.0	9.000	L1	19.6
0.275000	62.72	---	79.00	16.28	1000.0	9.000	L1	19.6
0.275000	---	58.44	66.00	7.56	1000.0	9.000	L1	19.6
0.345000	59.20	---	79.00	19.80	1000.0	9.000	L1	19.6
0.345000	---	54.03	66.00	11.97	1000.0	9.000	L1	19.6
0.480000	---	60.46	66.00	5.54	1000.0	9.000	L1	19.6
0.480000	63.54	---	79.00	15.46	1000.0	9.000	L1	19.6
0.685000	---	51.10	60.00	8.90	1000.0	9.000	L1	19.6
0.685000	55.29	---	73.00	17.71	1000.0	9.000	L1	19.6
0.755000	54.22	---	73.00	18.78	1000.0	9.000	L1	19.6
0.755000	---	50.44	60.00	9.56	1000.0	9.000	L1	19.6
0.820000	54.88	---	73.00	18.12	1000.0	9.000	L1	19.6
0.820000	---	50.75	60.00	9.25	1000.0	9.000	L1	19.6
0.890000	54.75	---	73.00	18.25	1000.0	9.000	L1	19.6
0.890000	---	50.54	60.00	9.46	1000.0	9.000	L1	19.6
1.095000	---	49.04	60.00	10.96	1000.0	9.000	L1	19.6
1.095000	53.42	---	73.00	19.58	1000.0	9.000	L1	19.6
1.850000	---	44.21	60.00	15.79	1000.0	9.000	L1	19.7
1.850000	50.04	---	73.00	22.96	1000.0	9.000	L1	19.7
2.260000	53.08	---	73.00	19.92	1000.0	9.000	L1	19.7
2.260000	---	48.53	60.00	11.47	1000.0	9.000	L1	19.7
13.560000	---	62.25	60.00	-2.25	1000.0	9.000	L1	20.2
13.560000	78.29	---	73.00	-5.29	1000.0	9.000	L1	20.2

* Exclusion bands

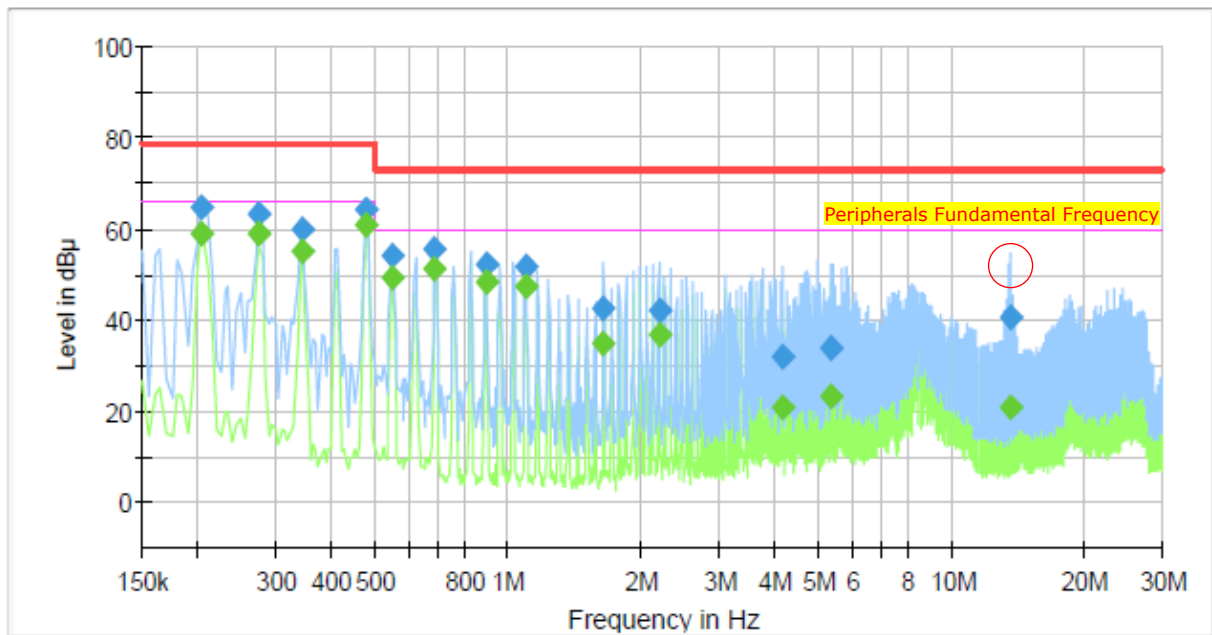
- Peripherals Fundamental Frequency: 13.56 MHz



NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Job No.:	KES-EM244153
Phase:	#2_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)
0.205000	64.80	---	79.00	14.20	1000.0	9.000	N	19.5
0.205000	---	59.21	66.00	6.79	1000.0	9.000	N	19.5
0.275000	---	59.00	66.00	7.00	1000.0	9.000	N	19.5
0.275000	63.24	---	79.00	15.76	1000.0	9.000	N	19.5
0.345000	---	55.14	66.00	10.86	1000.0	9.000	N	19.6
0.345000	60.16	---	79.00	18.84	1000.0	9.000	N	19.6
0.480000	64.13	---	79.00	14.87	1000.0	9.000	N	19.6
0.480000	---	60.99	66.00	5.01	1000.0	9.000	N	19.6
0.550000	54.25	---	73.00	18.75	1000.0	9.000	N	19.6
0.550000	---	49.32	60.00	10.68	1000.0	9.000	N	19.6
0.685000	---	51.45	60.00	8.55	1000.0	9.000	N	19.6
0.685000	55.38	---	73.00	17.62	1000.0	9.000	N	19.6
0.895000	---	48.26	60.00	11.74	1000.0	9.000	N	19.6
0.895000	52.36	---	73.00	20.64	1000.0	9.000	N	19.6
1.100000	51.71	---	73.00	21.29	1000.0	9.000	N	19.6
1.100000	---	47.31	60.00	12.69	1000.0	9.000	N	19.6
1.650000	42.70	---	73.00	30.30	1000.0	9.000	N	19.7
1.650000	---	35.10	60.00	24.90	1000.0	9.000	N	19.7
2.200000	---	36.93	60.00	23.07	1000.0	9.000	N	19.7
2.200000	42.19	---	73.00	30.81	1000.0	9.000	N	19.7
4.190000	---	21.10	60.00	38.90	1000.0	9.000	N	19.9
4.190000	32.05	---	73.00	40.95	1000.0	9.000	N	19.9
5.360000	33.67	---	73.00	39.33	1000.0	9.000	N	19.9
5.360000	---	23.33	60.00	36.67	1000.0	9.000	N	19.9
13.560000	40.72	---	73.00	32.28	1000.0	9.000	N	20.2
13.560000	---	20.80	60.00	39.20	1000.0	9.000	N	20.2

* Exclusion bands

- Peripherals Fundamental Frequency: 13.56 MHz

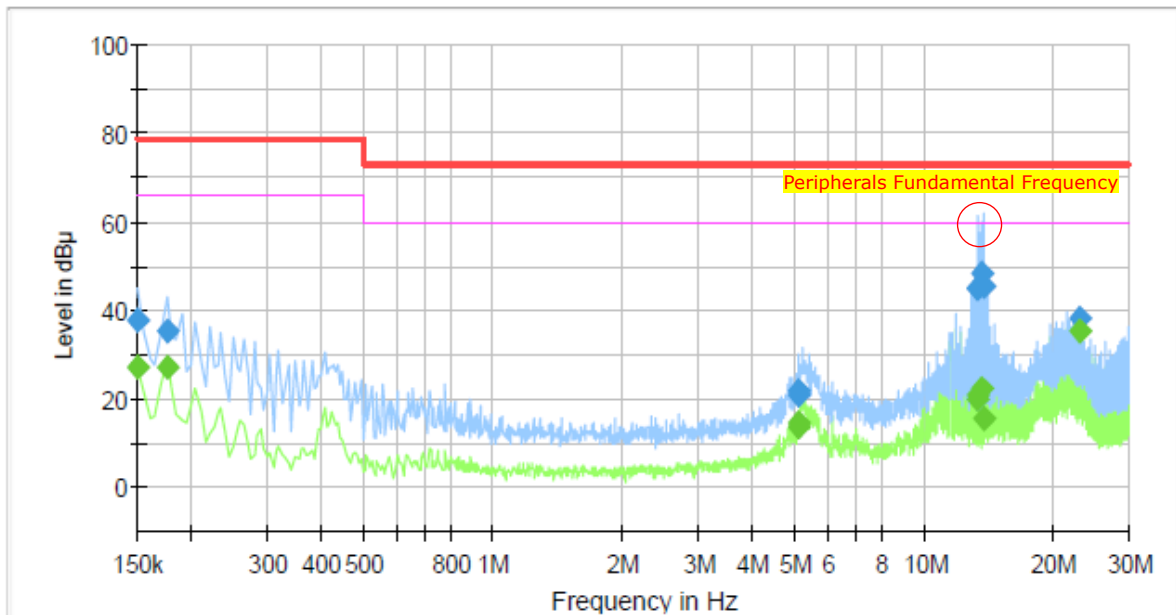


#3

HOT LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244153
Phase: #3_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)
0.150000	37.73	---	79.00	41.27	1000.0	9.000	L1	19.6
0.150000	---	27.06	66.00	38.94	1000.0	9.000	L1	19.6
0.175000	35.38	---	79.00	43.62	1000.0	9.000	L1	19.6
0.175000	---	27.29	66.00	38.71	1000.0	9.000	L1	19.6
5.105000	20.82	---	73.00	52.18	1000.0	9.000	L1	19.9
5.105000	---	13.83	60.00	46.17	1000.0	9.000	L1	19.9
5.120000	21.63	---	73.00	51.37	1000.0	9.000	L1	19.9
5.120000	---	14.55	60.00	45.45	1000.0	9.000	L1	19.9
13.345000	45.19	---	73.00	27.81	1000.0	9.000	L1	20.2
13.345000	---	19.88	60.00	40.12	1000.0	9.000	L1	20.2
13.430000	44.85	---	73.00	28.15	1000.0	9.000	L1	20.2
13.430000	---	20.85	60.00	39.15	1000.0	9.000	L1	20.2
13.560000	---	22.22	60.00	37.78	1000.0	9.000	L1	20.2
13.560000	48.18	---	73.00	24.82	1000.0	9.000	L1	20.2
13.770000	45.45	---	73.00	27.55	1000.0	9.000	L1	20.3
13.770000	---	15.62	60.00	44.38	1000.0	9.000	L1	20.3
23.125000	38.41	---	73.00	34.59	1000.0	9.000	L1	20.5
23.125000	---	35.35	60.00	24.65	1000.0	9.000	L1	20.5

* Exclusion bands

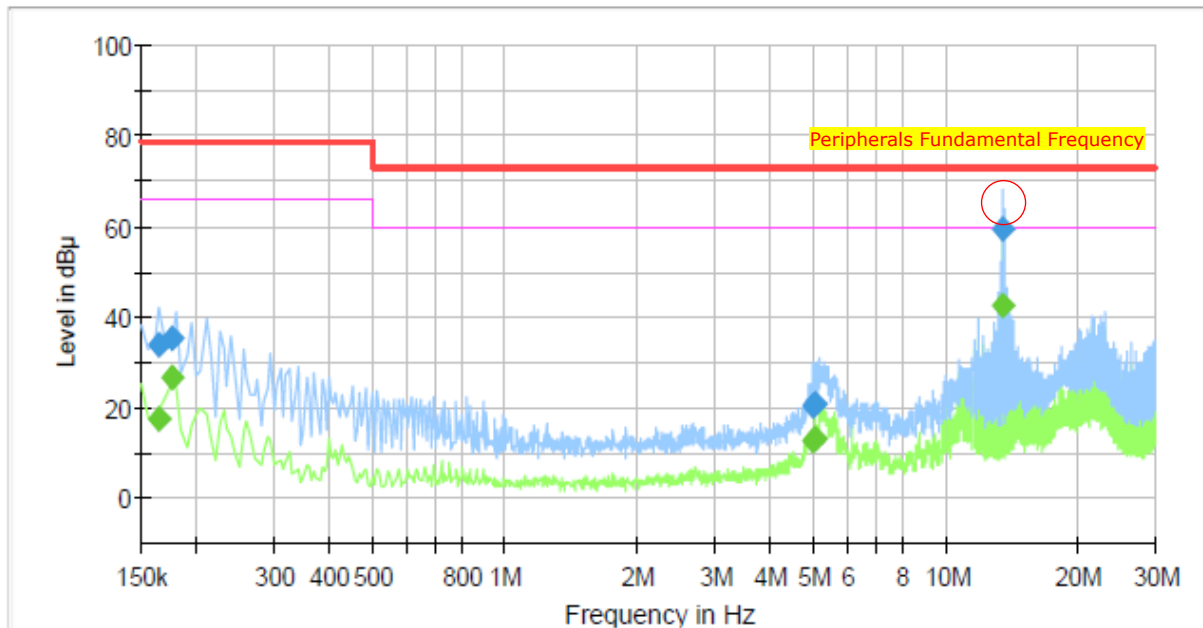
- Peripherals Fundamental Frequency: 13.56 MHz



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM244153
Phase: #3_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)
0.165000	---	17.36	66.00	48.64	1000.0	9.000	N	19.5
0.165000	34.07	---	79.00	44.93	1000.0	9.000	N	19.5
0.175000	---	26.60	66.00	39.40	1000.0	9.000	N	19.5
0.175000	35.24	---	79.00	43.76	1000.0	9.000	N	19.5
5.040000	---	12.75	60.00	47.25	1000.0	9.000	N	19.9
5.040000	20.25	---	73.00	52.75	1000.0	9.000	N	19.9
5.075000	---	13.22	60.00	46.78	1000.0	9.000	N	19.9
5.075000	20.88	---	73.00	52.12	1000.0	9.000	N	19.9
13.560000	---	42.38	60.00	17.62	1000.0	9.000	N	20.2
13.560000	59.36	---	73.00	13.64	1000.0	9.000	N	20.2

* Exclusion bands

- Peripherals Fundamental Frequency: 13.56 MHz

♦ 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))

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

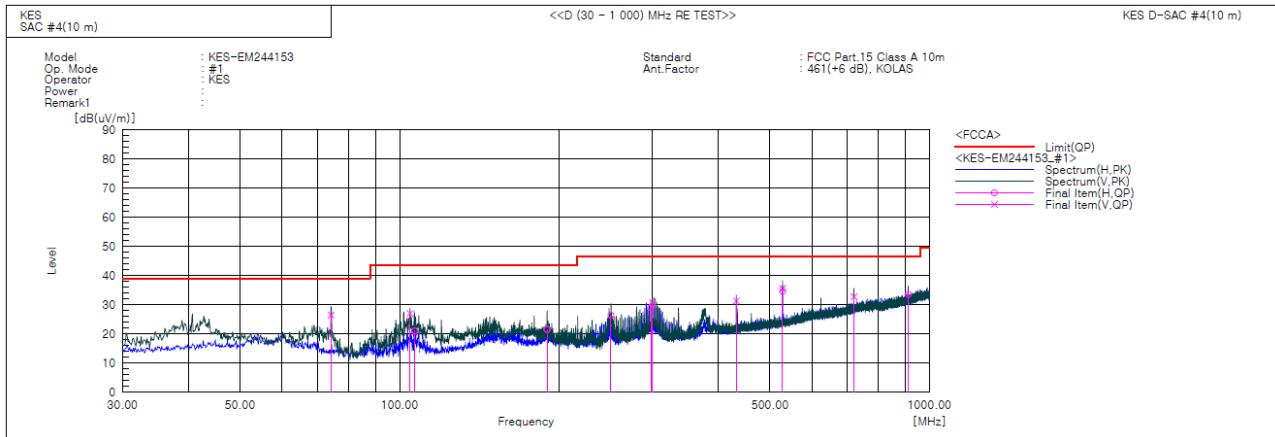
KES Co., Ltd.

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

**Radiated Electric Field Emissions(Below 1 GHz)**

■ #1

- 47 CFR Part 15, Subpart B

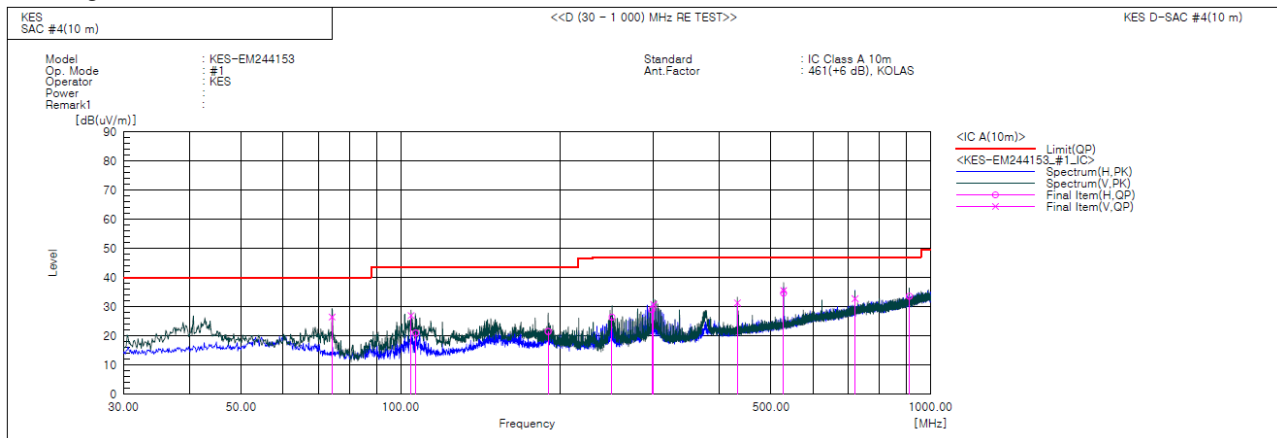
**Final Result**

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	74.256	V	50.6	-24.1	26.5	39.0	12.5	114.0	124.0	
2	104.690	V	51.3	-24.3	27.0	43.5	16.5	145.0	98.0	
3	106.751	H	45.0	-24.0	21.0	43.5	22.5	195.0	70.0	
4	189.808	H	43.3	-21.8	21.5	43.5	22.0	396.0	62.0	
5	250.554	H	46.0	-19.6	26.4	46.5	20.1	199.0	152.0	
6	297.963	H	46.3	-17.3	29.0	46.5	17.5	397.0	348.0	
7	300.024	V	48.0	-17.2	30.8	46.5	15.7	114.0	117.0	
8	432.065	V	43.6	-12.3	31.3	46.5	15.2	146.0	345.0	
9	527.974	V	45.3	-9.7	35.6	46.5	10.9	141.0	244.0	
10	527.974	H	44.3	-9.7	34.6	46.5	11.9	194.0	219.0	
11	720.034	V	37.3	-4.5	32.8	46.5	13.7	100.0	289.0	
12	912.094	H	35.1	-1.5	33.6	46.5	12.9	396.0	141.0	



Report No. : KES-EM244153

- IC Regulation ICES-003 Issue 7



Final Result

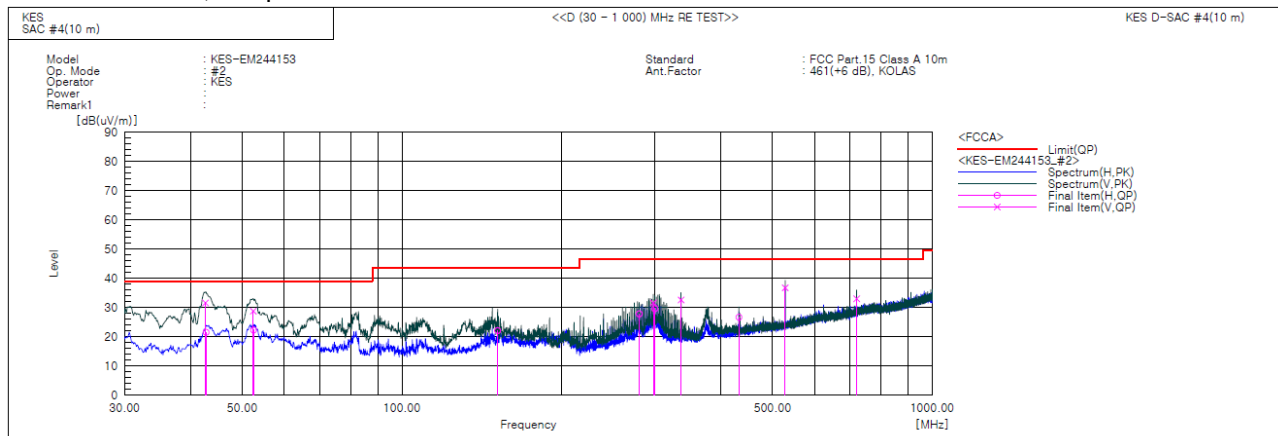
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	74.256	V	50.6	-24.1	26.5	40.0	13.5	114.0	124.0	
2	104.690	V	51.3	-24.3	27.0	43.5	16.5	145.0	98.0	
3	106.751	H	45.0	-24.0	21.0	43.5	22.5	195.0	70.0	
4	189.808	H	43.3	-21.8	21.5	43.5	22.0	396.0	62.0	
5	250.554	H	46.0	-19.6	26.4	47.0	20.6	199.0	152.0	
6	297.963	H	46.3	-17.3	29.0	47.0	18.0	397.0	348.0	
7	300.024	V	48.0	-17.2	30.8	47.0	16.2	114.0	117.0	
8	432.065	V	43.6	-12.3	31.3	47.0	15.7	146.0	345.0	
9	527.974	V	45.3	-9.7	35.6	47.0	11.4	141.0	244.0	
10	527.974	H	44.3	-9.7	34.6	47.0	12.4	194.0	219.0	
11	720.034	V	37.3	-4.5	32.8	47.0	14.2	100.0	289.0	
12	912.094	H	35.1	-1.5	33.6	47.0	13.4	396.0	141.0	



Report No. : KES-EM244153

■ #2

- 47 CFR Part 15, Subpart B

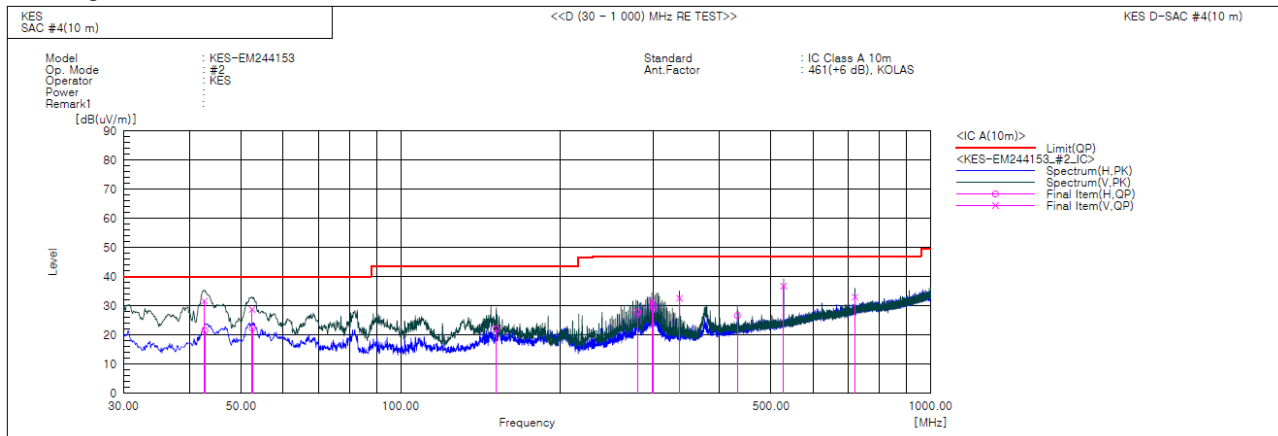


Final Result

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	42.610	V	53.3	-21.7	31.6	39.0	7.4	114.0	298.0	
2	42.731	H	43.2	-21.7	21.5	39.0	17.5	194.0	26.0	
3	52.431	V	49.9	-21.1	28.8	39.0	10.2	146.0	24.0	
4	52.553	H	43.4	-21.1	22.3	39.0	16.7	395.0	160.0	
5	151.493	H	41.5	-19.4	22.1	43.5	21.4	194.0	63.0	
6	280.260	H	45.8	-18.0	27.8	46.5	18.7	397.0	15.0	
7	297.963	V	48.9	-17.3	31.6	46.5	14.9	114.0	357.0	
8	299.903	H	46.8	-17.2	29.6	46.5	16.9	195.0	51.0	
9	336.035	V	48.6	-16.0	32.6	46.5	13.9	141.0	13.0	
10	431.944	H	39.0	-12.3	26.7	46.5	19.8	194.0	187.0	
11	527.974	V	46.4	-9.7	36.7	46.5	9.8	112.0	160.0	
12	720.034	V	37.5	-4.5	33.0	46.5	13.5	148.0	256.0	



- IC Regulation ICES-003 Issue 7



Final Result

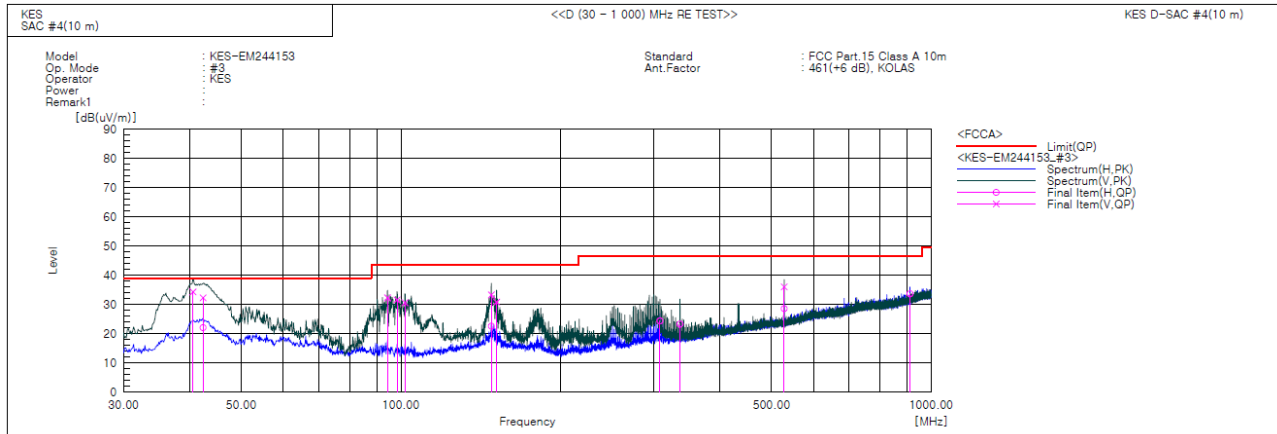
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	42.610	V	53.3	-21.7	31.6	40.0	8.4	114.0	298.0	
2	42.731	H	43.2	-21.7	21.5	40.0	18.5	194.0	26.0	
3	52.431	V	49.9	-21.1	28.8	40.0	11.2	146.0	24.0	
4	52.553	H	43.4	-21.1	22.3	40.0	17.7	395.0	160.0	
5	151.493	H	41.5	-19.4	22.1	43.5	21.4	194.0	63.0	
6	280.260	H	45.8	-18.0	27.8	47.0	19.2	397.0	15.0	
7	297.963	V	48.9	-17.3	31.6	47.0	15.4	114.0	357.0	
8	299.903	H	46.8	-17.2	29.6	47.0	17.4	195.0	51.0	
9	336.035	V	48.6	-16.0	32.6	47.0	14.4	141.0	13.0	
10	431.944	H	39.0	-12.3	26.7	47.0	20.3	194.0	187.0	
11	527.974	V	46.4	-9.7	36.7	47.0	10.3	112.0	160.0	
12	720.034	V	37.5	-4.5	33.0	47.0	14.0	148.0	256.0	



Report No. : KES-EM244153

■ #3

- 47 CFR Part 15, Subpart B

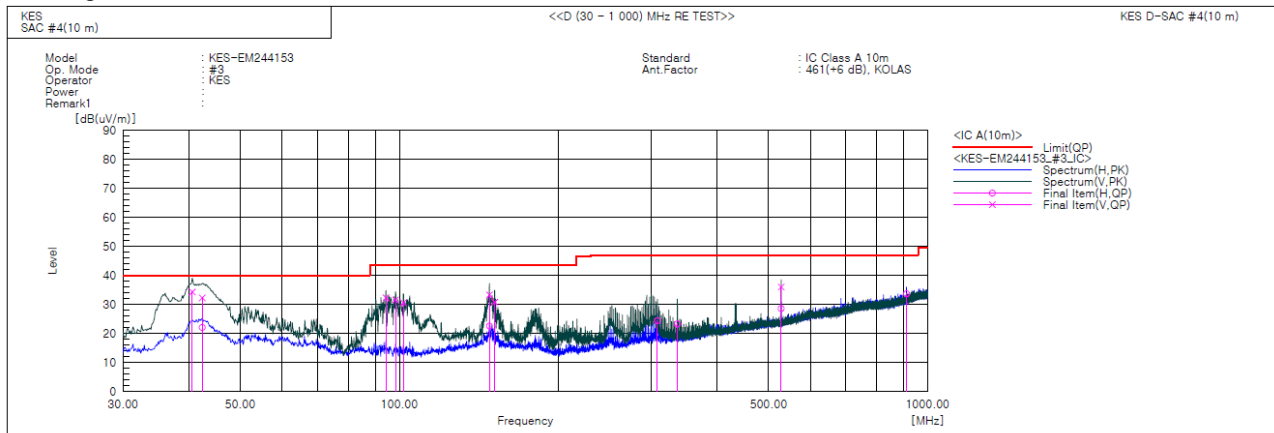


Final Result

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	40.549	V	56.2	-21.9	34.3	39.0	4.7	141.0	12.0	
2	42.368	V	54.0	-21.7	32.3	39.0	6.7	146.0	225.0	
3	42.368	H	43.8	-21.7	22.1	39.0	16.9	112.0	275.0	
4	94.384	V	58.2	-25.9	32.3	43.5	11.2	106.0	157.0	
5	98.385	V	56.9	-25.3	31.6	43.5	11.9	108.0	153.0	
6	101.780	V	55.3	-24.7	30.6	43.5	12.9	146.0	149.0	
7	148.098	V	52.8	-19.5	33.3	43.5	10.2	112.0	64.0	
8	148.098	H	42.1	-19.5	22.6	43.5	20.9	194.0	51.0	
9	151.493	V	50.2	-19.4	30.8	43.5	12.7	147.0	68.0	
10	307.905	H	41.3	-16.9	24.4	46.5	22.1	396.0	267.0	
11	336.035	H	39.3	-16.0	23.3	46.5	23.2	398.0	316.0	
12	527.974	V	45.7	-9.7	36.0	46.5	10.5	141.0	195.0	
13	527.974	H	38.3	-9.7	28.6	46.5	17.9	194.0	114.0	
14	912.094	H	35.2	-1.5	33.7	46.5	12.8	398.0	9.0	



- IC Regulation ICES-003 Issue 7



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	40.549	V	56.2	-21.9	34.3	40.0	5.7	141.0	12.0	
2	42.368	V	54.0	-21.7	32.3	40.0	7.7	146.0	225.0	
3	42.368	H	43.8	-21.7	22.1	40.0	17.9	112.0	275.0	
4	94.384	V	58.2	-25.9	32.3	43.5	11.2	106.0	157.0	
5	98.385	V	56.9	-25.3	31.6	43.5	11.9	108.0	153.0	
6	101.780	V	55.3	-24.7	30.6	43.5	12.9	146.0	149.0	
7	148.098	V	52.8	-19.5	33.3	43.5	10.2	112.0	64.0	
8	148.098	H	42.1	-19.5	22.6	43.5	20.9	194.0	51.0	
9	151.493	V	50.2	-19.4	30.8	43.5	12.7	147.0	68.0	
10	307.905	H	41.3	-16.9	24.4	47.0	22.6	396.0	267.0	
11	336.035	H	39.3	-16.0	23.3	47.0	23.7	398.0	316.0	
12	527.974	V	45.7	-9.7	36.0	47.0	11.0	141.0	195.0	
13	527.974	H	38.3	-9.7	28.6	47.0	18.4	194.0	114.0	
14	912.094	H	35.2	-1.5	33.7	47.0	13.3	398.0	9.0	

◆ Calculation

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

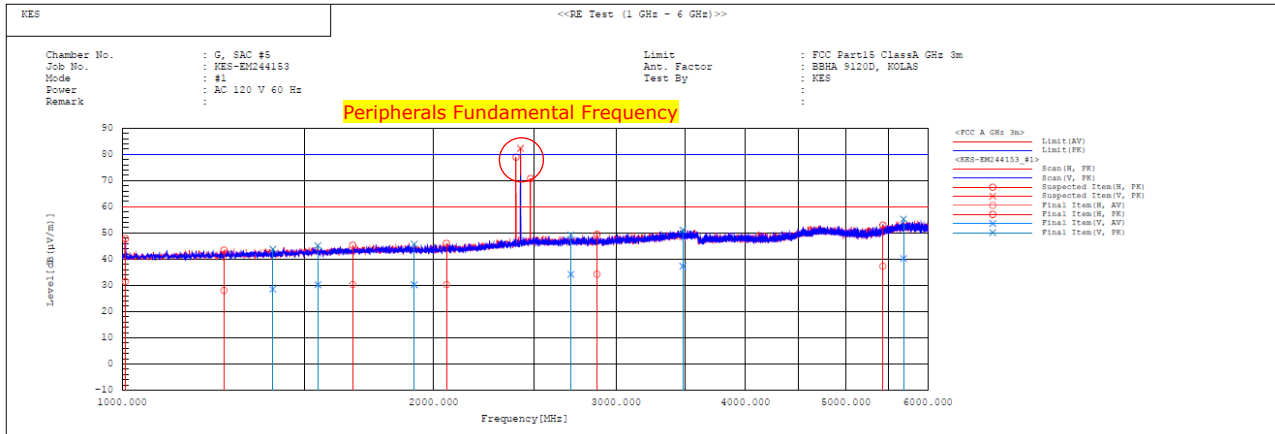
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

#1



Final Result

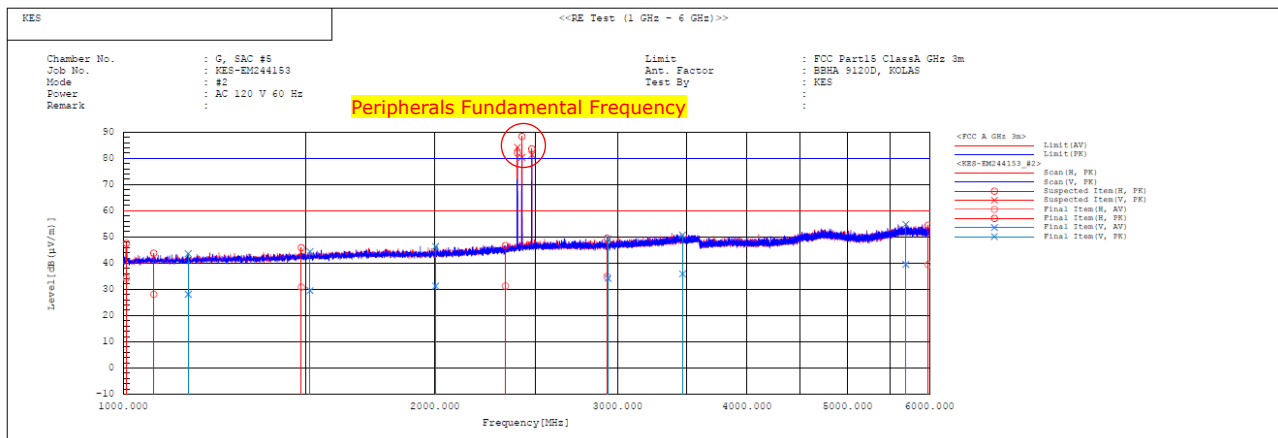
No.	Frequency [MHz]	Pol	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1007.505	H	33.2	49.5	-1.7	31.5	47.8	60.0	80.0	28.5	32.2	196.0	56.2	
2	1254.597	H	28.4	43.8	-0.3	28.1	43.5	60.0	80.0	31.9	36.5	103.0	170.2	
3	1398.498	V	28.0	43.3	0.5	28.5	43.8	60.0	80.0	31.5	36.2	105.0	186.2	
4	1545.978	V	29.0	44.0	1.2	30.2	45.2	60.0	80.0	29.8	34.8	145.0	124.7	
5	1670.136	H	28.7	43.7	1.6	30.3	45.3	60.0	80.0	29.7	34.7	196.0	350.2	
6	1915.469	V	27.7	43.2	2.5	30.2	45.7	60.0	80.0	29.8	34.3	105.0	346.7	
7	2057.155	H	27.2	42.9	3.1	30.3	46.0	60.0	80.0	29.7	34.0	398.0	184.9	
8	2713.875	V	28.7	43.7	5.5	34.2	49.2	60.0	80.0	25.8	30.8	145.0	277.3	
9	2874.452	H	28.4	43.6	5.9	34.3	49.5	60.0	80.0	25.7	30.5	397.0	246.2	
10	3480.493	V	30.4	44.2	6.9	37.3	51.1	60.0	80.0	22.7	28.9	108.0	152.6	
11	5430.012	H	24.3	40.0	13.0	37.3	53.0	60.0	80.0	22.7	27.0	396.0	204.6	
12	5685.127	V	26.8	41.9	13.4	40.2	55.3	60.0	80.0	19.8	24.7	105.0	167.7	
13	2402.000	H	-----	-----	4.5	-----	-----	-----	-----	-----	-----	100.0	238.7	
14	2426.000	V	-----	-----	4.6	-----	-----	-----	-----	-----	-----	100.0	133.9	
15	2480.000	H	-----	-----	4.8	-----	-----	-----	-----	-----	-----	100.0	198.6	

* Exclusion bands

- Peripherals Fundamental Frequency: (2 402 ~ 2 480) MHz



■ #2



Final Result

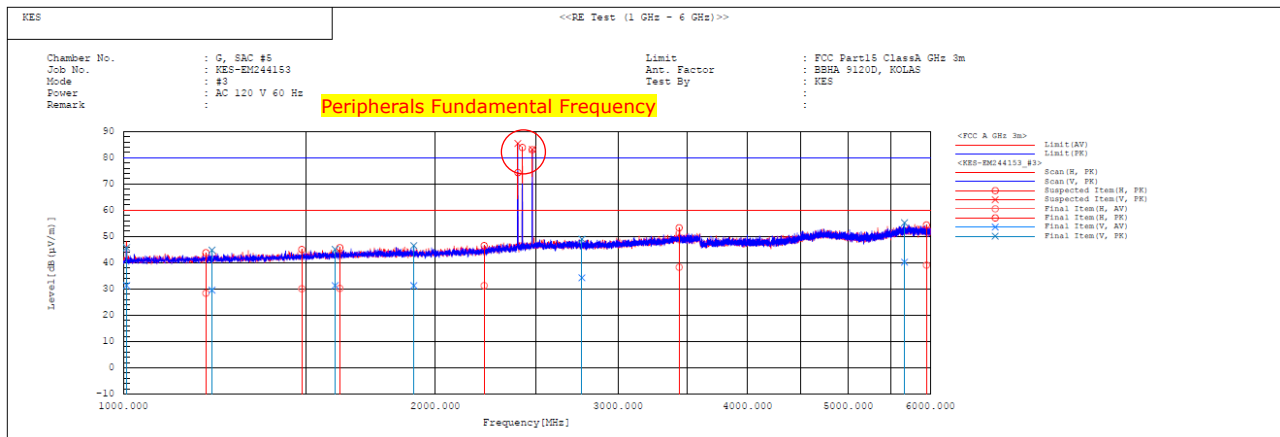
No.	Frequency [MHz]	Pol	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1007.597	H	35.9	49.3	-1.7	34.2	47.6	60.0	60.0	25.8	32.4	109.0	19.4	
2	1070.597	H	29.4	45.1	-1.3	28.1	43.8	60.0	60.0	31.9	36.2	108.0	224.2	
3	1155.976	V	28.9	44.4	-0.8	28.1	43.6	60.0	60.0	31.9	36.4	146.0	359.1	
4	1486.134	H	30.0	45.0	0.9	30.9	45.9	60.0	60.0	29.1	34.1	196.0	316.6	
5	1515.254	V	28.5	43.4	1.0	29.5	44.4	60.0	60.0	30.5	35.6	149.0	84.2	
6	2003.362	V	28.5	43.6	2.8	31.3	46.4	60.0	60.0	28.7	33.6	145.0	87.8	
7	2338.505	H	27.1	42.5	4.2	31.3	46.7	60.0	60.0	28.7	33.3	196.0	168.1	
8	2930.458	H	28.8	43.4	6.1	34.9	49.5	60.0	60.0	25.1	30.5	196.0	158.8	
9	2936.348	V	28.1	43.2	6.1	34.2	49.3	60.0	60.0	25.8	30.7	397.0	359.1	
10	3467.139	V	29.0	43.8	6.9	35.9	50.7	60.0	60.0	24.1	29.3	108.0	259.2	
11	5693.599	V	26.0	41.3	13.5	39.5	54.8	60.0	60.0	20.5	25.2	148.0	7.3	
12	5981.578	H	25.4	40.4	14.1	39.5	54.5	60.0	60.0	20.5	25.5	397.0	15.9	
13	2402.000	H	-----	-----	4.5	-----	-----	-----	-----	-----	-----	100.0	301.6	
14	2402.000	V	-----	-----	4.5	-----	-----	-----	-----	-----	-----	100.0	315.1	
15	2425.500	H	-----	-----	4.6	-----	-----	-----	-----	-----	-----	100.0	0.5	
16	2425.500	V	-----	-----	4.6	-----	-----	-----	-----	-----	-----	100.0	305.9	
17	2479.500	H	-----	-----	4.8	-----	-----	-----	-----	-----	-----	100.0	22.0	
18	2480.000	V	-----	-----	4.8	-----	-----	-----	-----	-----	-----	100.0	80.3	

* Exclusion bands

- Peripherals Fundamental Frequency: (2 402 ~ 2 480) MHz



#3



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	1007.458	V	33.0	47.4	-1.7	31.3	45.7	60.0	80.0	28.7	34.3	145.0	109.2	
2	1201.597	H	29.0	44.4	-0.6	28.4	43.8	60.0	80.0	31.6	36.2	198.0	125.4	
3	1218.009	V	30.0	45.3	-0.5	29.5	44.8	60.0	80.0	30.5	35.2	148.0	106.7	
4	1486.595	H	29.2	44.1	0.9	30.1	45.0	60.0	80.0	29.9	35.0	194.0	92.4	
5	1600.785	V	29.9	43.7	1.4	31.3	45.1	60.0	80.0	28.7	34.9	148.0	224.5	
6	1617.458	H	28.8	44.3	1.4	30.2	45.7	60.0	80.0	29.8	34.3	197.0	335.4	
7	1906.452	V	28.8	44.0	2.5	31.3	46.5	60.0	80.0	28.7	33.5	142.0	239.2	
8	2228.851	H	27.5	42.7	3.8	31.3	46.5	60.0	80.0	28.7	33.5	198.0	258.7	
9	2768.398	V	28.7	43.4	5.6	34.3	49.0	60.0	80.0	25.7	31.0	148.0	172.2	
10	3435.502	H	31.5	46.5	6.8	38.3	53.3	60.0	80.0	21.7	26.7	398.0	161.2	
11	5666.682	V	26.8	41.8	13.4	40.2	55.2	60.0	80.0	19.8	24.8	397.0	287.1	
12	5949.139	H	25.0	40.3	14.1	39.1	54.4	60.0	80.0	20.9	25.6	197.0	354.6	
13	2402.000	V	-----	-----	4.5	-----	-----	-----	-----	-----	-----	100.0	211.3	
14	2402.000	H	-----	-----	4.5	-----	-----	-----	-----	-----	-----	100.0	152.0	
15	2425.500	H	-----	-----	4.6	-----	-----	-----	-----	-----	-----	100.0	44.0	
16	2479.500	H	-----	-----	4.8	-----	-----	-----	-----	-----	-----	100.0	44.0	
17	2480.000	V	-----	-----	4.8	-----	-----	-----	-----	-----	-----	100.0	336.2	

* Exclusion bands

- Peripherals Fundamental Frequency: (2 402 ~ 2 480) MHz

◆ Calculation

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

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

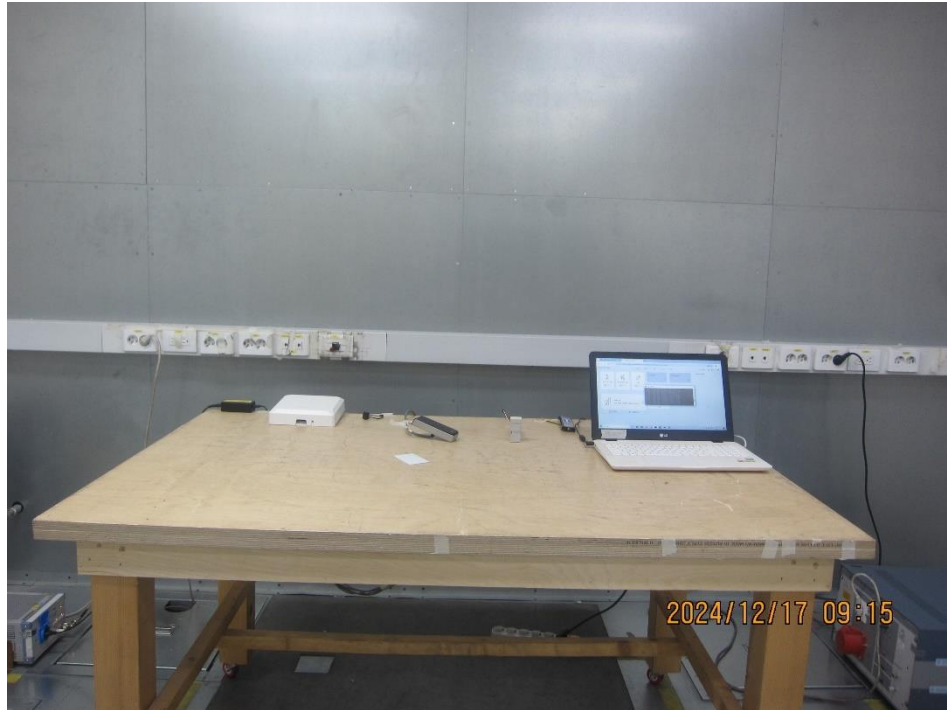
Limit(PK/CAV) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value



Test Setup Photos and Configuration

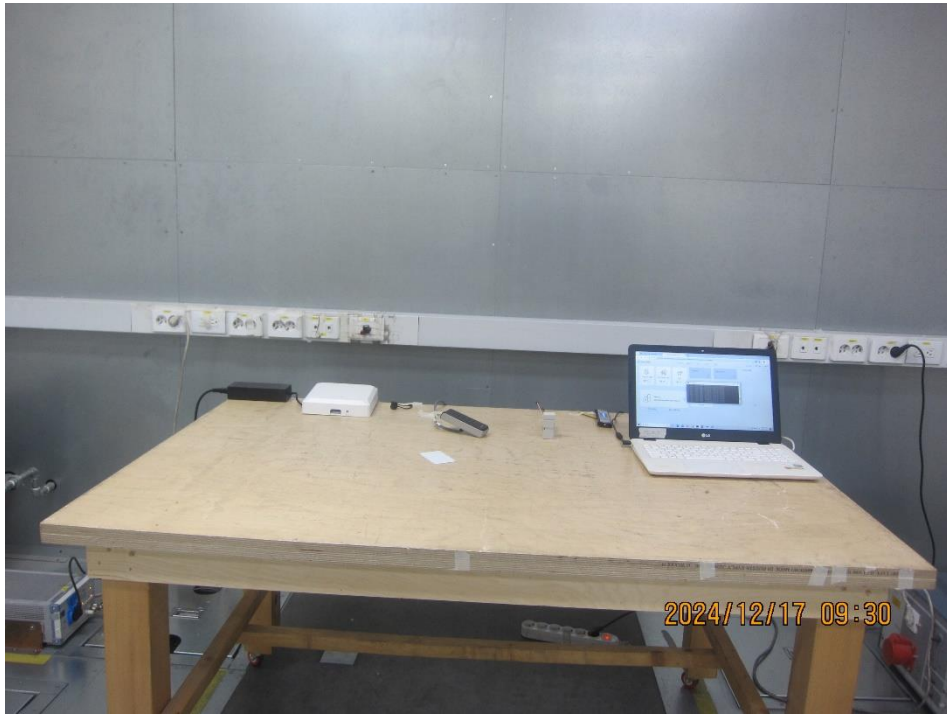
Conducted Emissions at Mains Power Ports

■ #1



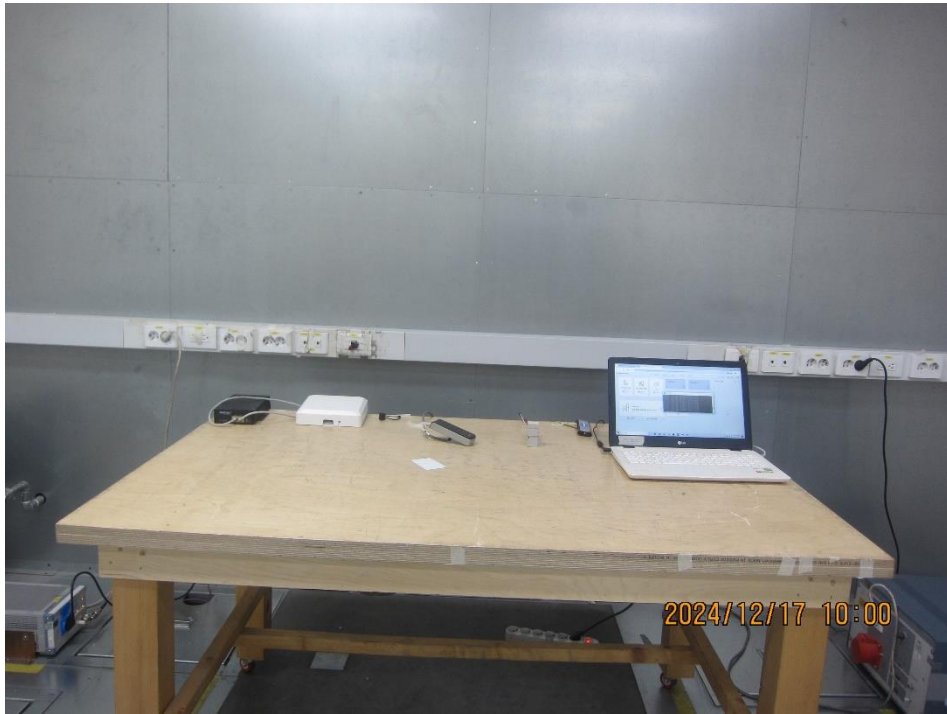


■ #2





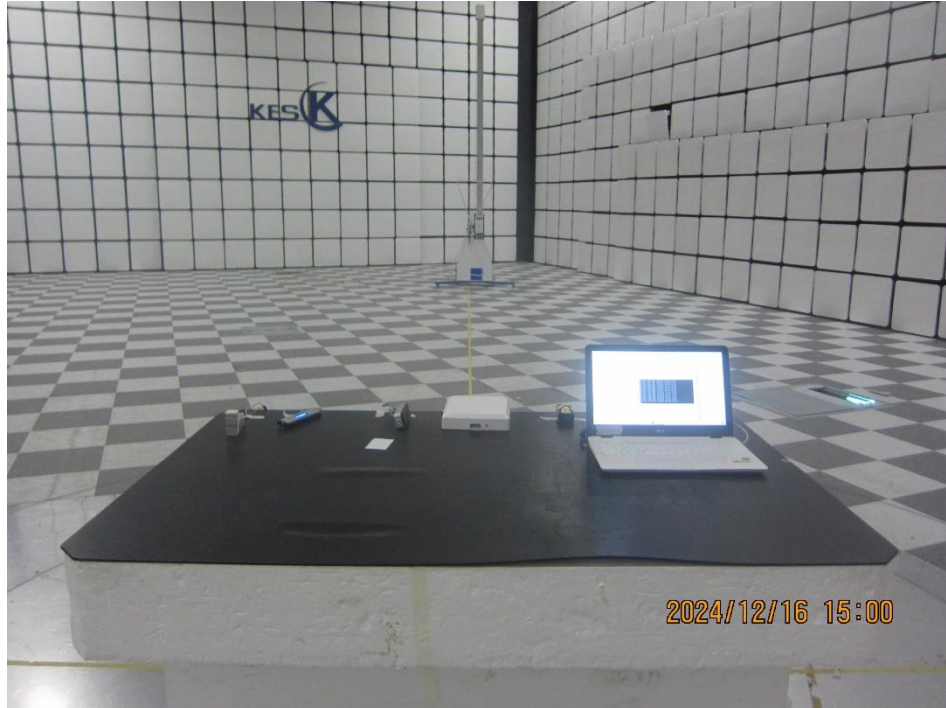
■ #3





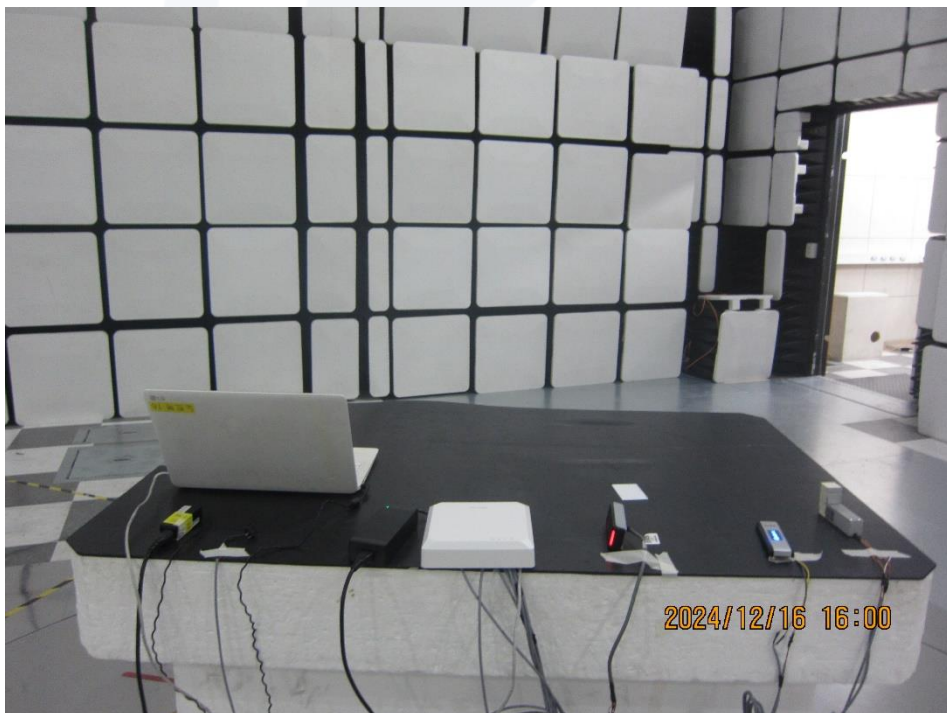
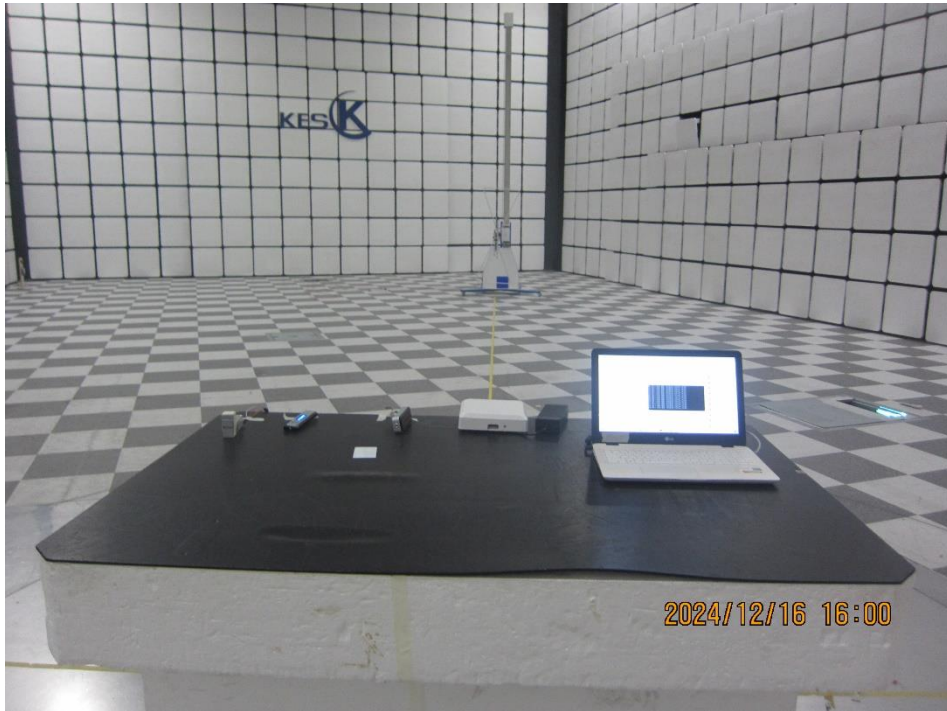
Radiated Electric Field Emissions(Below 1 GHz)

■ #1



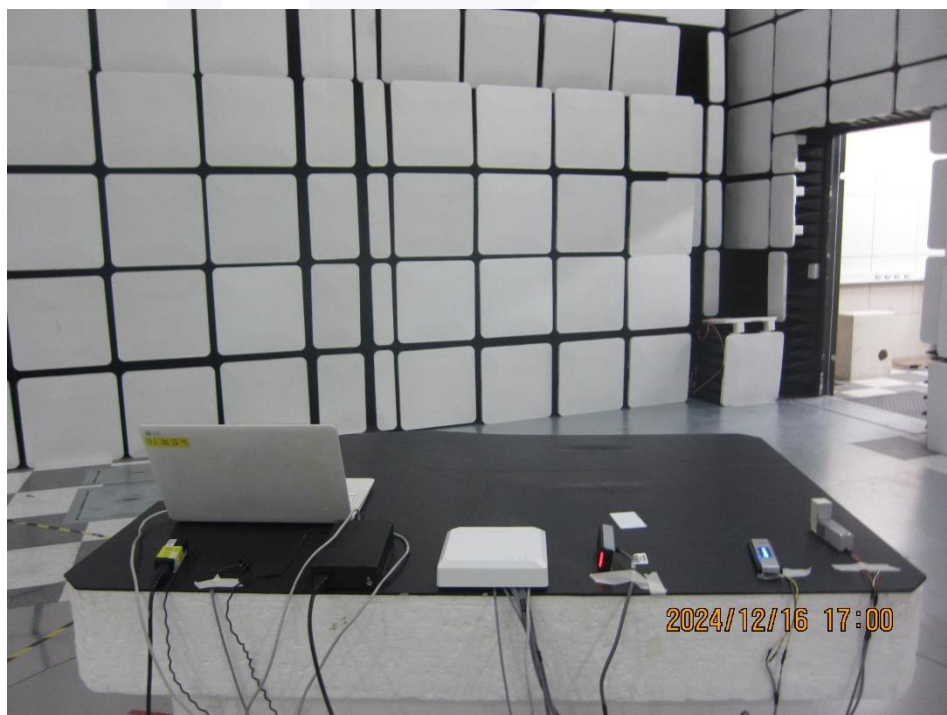
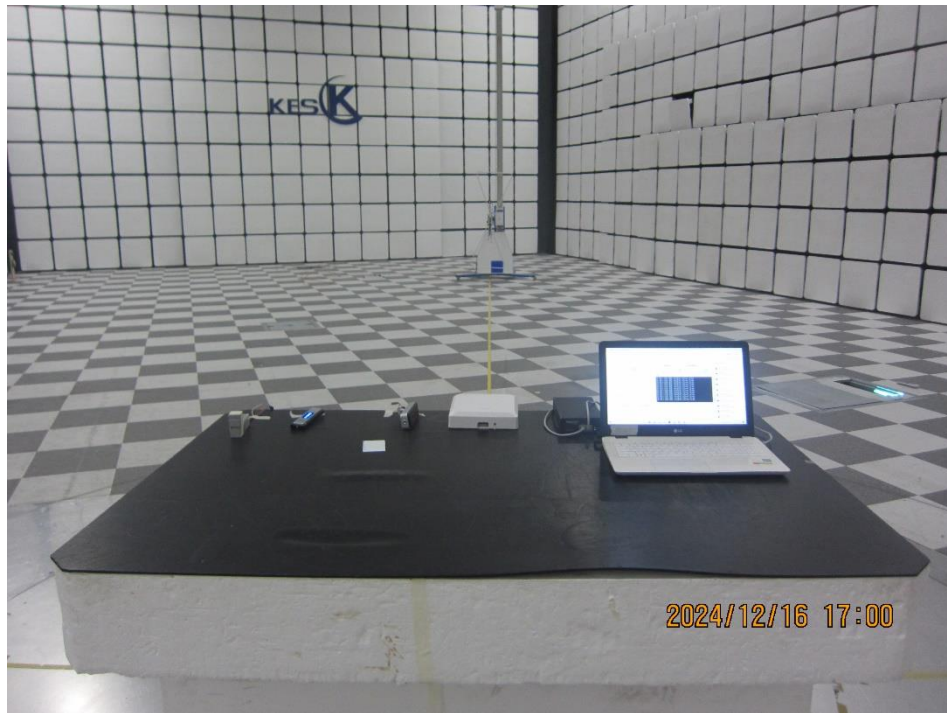


■ #2





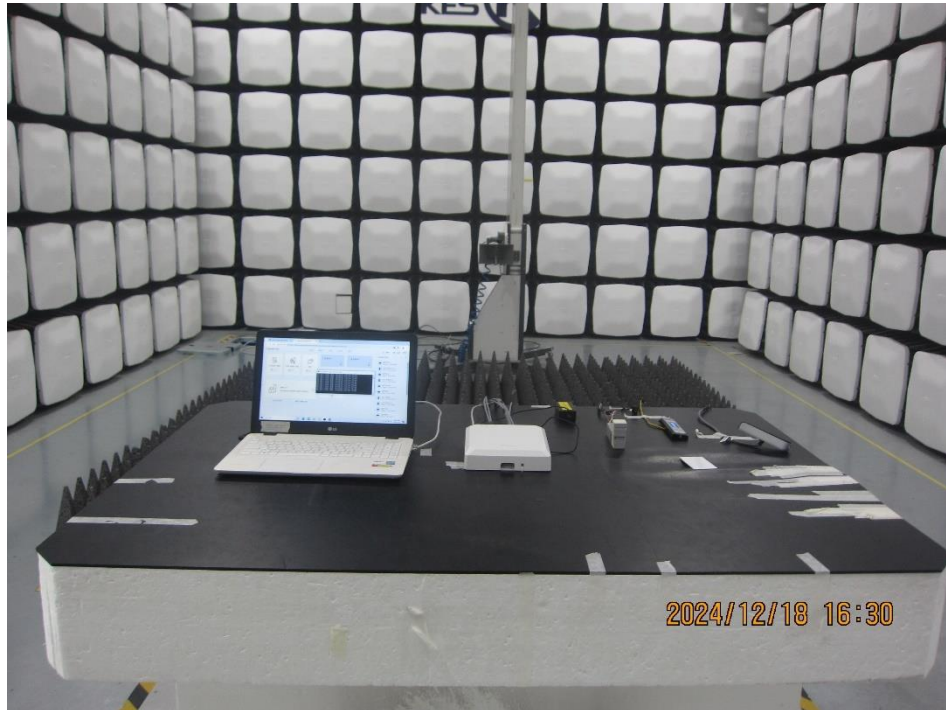
■ #3





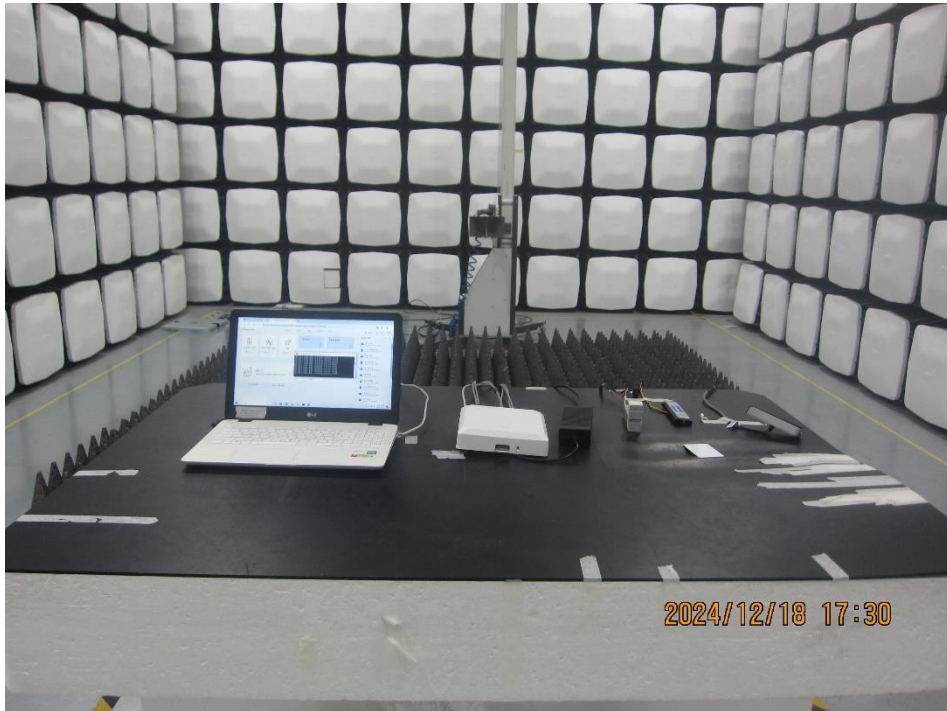
Radiated Electric Field Emissions(Above 1 GHz)

■ #1





■ #2





■ #3





EUT External Photographs

(Top)



(Bottom)





EUT Internal Photographs

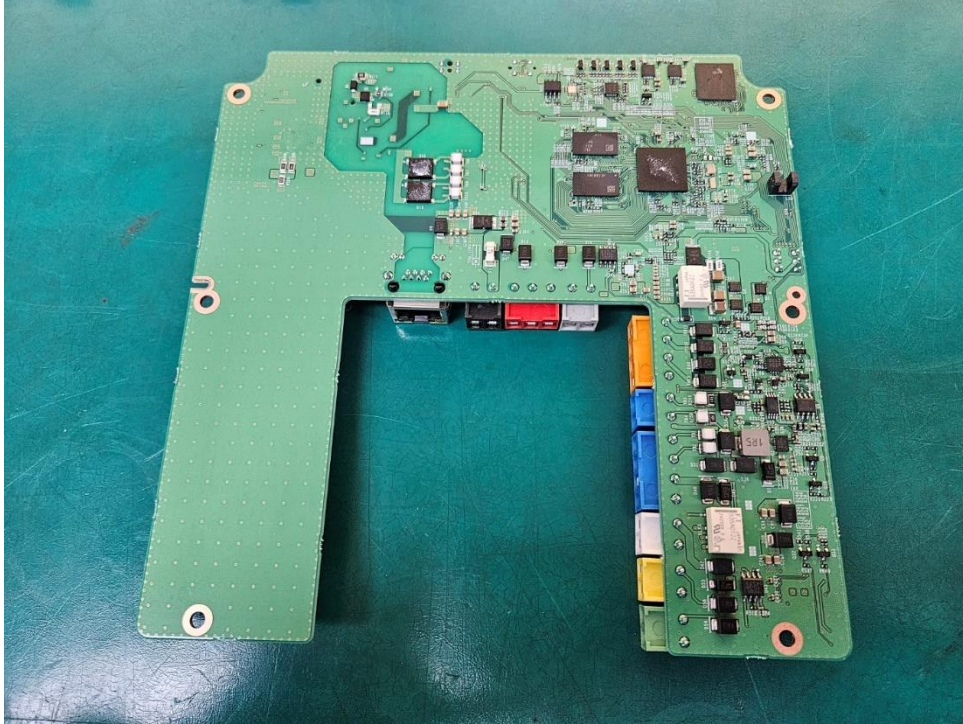
(Internal View)



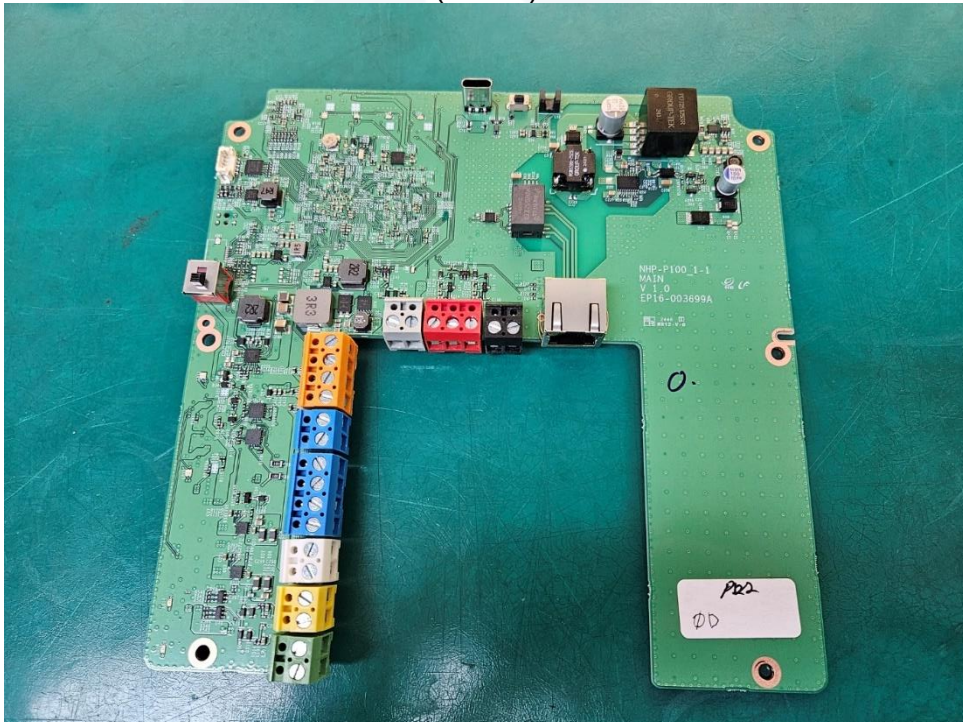


EUT Internal View – Board

(Top)



(Bottom)





Label Photographs

FCC Label



IP Controller

NHP-P100

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.