TEST REPORT

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1. Client

Applicant : Parks Medical Electronics, Inc

Applicant Address : 19460 SW Shaw, Aloha, OR 97007

2. Sample Description

Product name : Parks Flo-Lab USB Receiver

Model/Type No. : RFR-1

Variant Model : -

Manufacturer : Hyun Seung I&C Co., Ltd

Manufacturer Address : 1301,402Dong Bucheon Techno-Park, 655, Pyeongcheon-ro, Bucheon-si, Gyeonggi-do, Republic of Korea

3. FCC ID : 2BE53-USBRFR1

4. Date of Receipt : Aug. 13, 2024

5. Test date : Sep. 20, 2024

6. Date of Issue : Dct. 04, 2024

7. Test Results : In Compliance

Tested by

[이재원]2024/10/04

Jae Won, Lee
EMC Test Engineer

Reviewed by

[최대중]2024/10/04

Dae Jung, Choi
EMC Technical Manager

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dct. 04, 2024	KES-EM243244	Issued

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1.0 General Product Description

Main Specifications of EUT are:

The Flo-Lab 2100-SX2 uses Doppler and plethysmography to test blood flow in the arteries in the arms and the legs. The non-invasive tests include continuous wave Doppler, pulse, volume recordings, and segmental limb pressures. This device is used in the hospital setting or doctor's office and is operated by a technologist.

The remote control, model number 22-BR, will work in conjunction with the remote receiver, model number, RFR-1, to operate the Parks Flo-Lab 2100SX2. The remote control will transmit a 2.4GHz radio signal to the remote receiver. The remote receiver will decode the data from the remote control and send control data through a standard USB 2.0/3.0 port to the Flo-Lab, which uses a standard PC-based architecture.

The use of the remote eliminates the need for the end-user to interface with the front panel of the diagnostic module. It will allow the user to control such functions as volume, inflating and deflating during testing, freezing, and saving waveforms and pressures. They will also have the ability to navigate through the software using the arrow keys as well as escape and enter.

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

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
Parks Flo-Lab USB Receiver	RFR-1	-	Hyun Seung I&C Co., Ltd	EUT
Remote Control	-	-	Hyun Seung I&C Co., Ltd	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	Latitude 5300	8C47BE45C060	DELL INC.	-
Notebook Adapter	LA90PM130	-	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**
Parks Flo-Lab USB Receiver (EUT)	Wireless	Remote Control (EUT)	Wireless	-	-
	USB Type-A	Notebook	USB Type-A	1.5	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.3	U

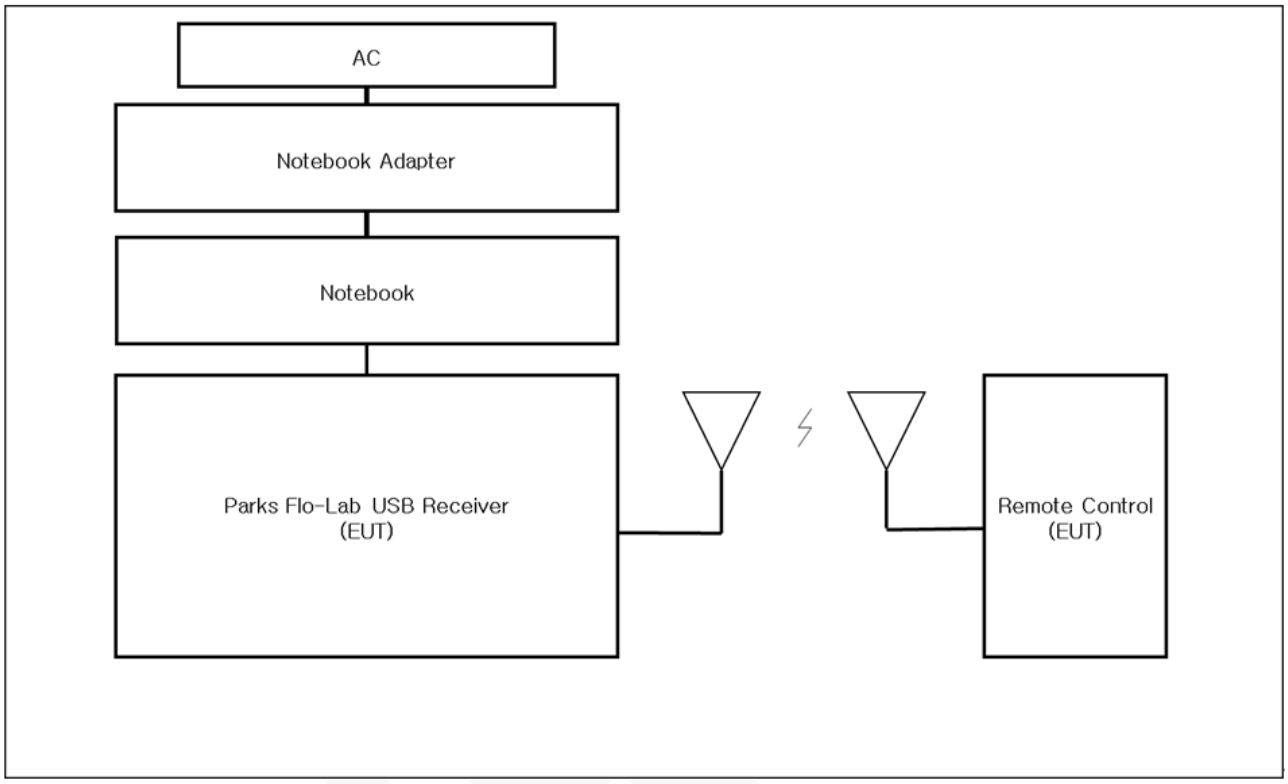
* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

Mode Name	Operating status
operate	After connecting the EUT and the laptop with USB Type-A, running the program, connecting it to the remote control wirelessly (Bluetooth), and pressing the button on the remote control to check whether normal data was uploaded to the program and tested.

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
ComMaster	-	-

1.8 Configuration



EUT – Remote Control : Bluetooth 2.4 GHz

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 Measurement Procedure

- Conducted Emissions

The conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emission exceed the average limit with the instrument set to the quasi-peak mode, the measurements are made in the average mode. The emission spectrum was scanned from 150 ㎑ to 30 ㎒. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded. Quasi-peak readings are distinguished with a "QP".

- Radiated Electric Field Emissions

The test was done at a SEMI ANECHOIC CHAMBER with quasi-peak detector. The final test data was measured using a Quasi-Peak detector below 1㎓ at 10 m or 3 m distance and a Peak and Average detector above 1 ㎓ at 3 m distance. Test was proceeded worst case test mode and cable configuration.
Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

Measurement procedures was In accordance with ANSI C63.4-2014 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2

1.13 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**

☒ ANSI C63.4a-2017 ☒ Class A ☐ Class B

2.1 Conducted Emissions at Mains Power Ports

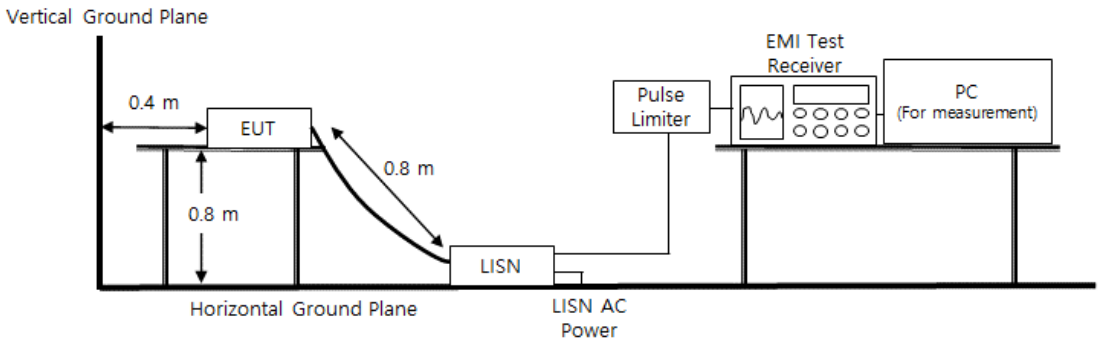
Test Date
Sep. 20, 2024

Test Location
SHIELD ROOM #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	EMC32	R & S	9.12.00	-	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024	1 Year
☒	LISN	ENV216	R & S	101787	11, 08, 2024	1 Year
☐	LISN	ESH2-Z5	R & S	100450	11, 08, 2024	1 Year
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024	1 Year

Diagram of test setup



Test Conditions

Temperature: (23,2 ± 0,1) ℃
Relative Humidity: (47,1 ± 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 ㎓)

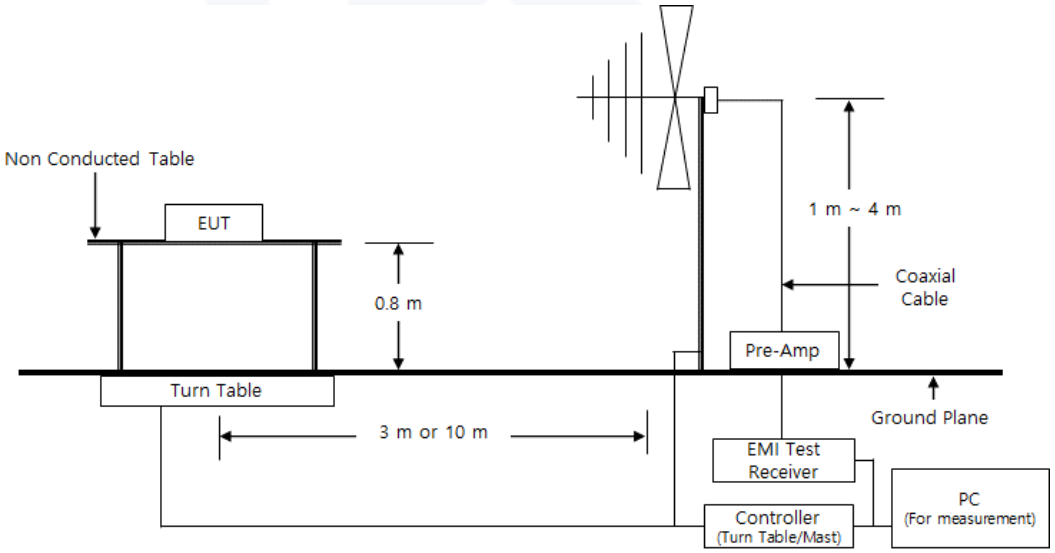
Test Date
Sep. 20, 2024

Test Location
SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	02, 13, 2025	1 Year
☒	AMPLIFIER	SCU 01	R & S	100603	11, 08, 2024	1 Year
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024	2 Year
☒	ATTENUATOR	8491A	HP	32173	02, 13, 2025	1 Year

Diagram of test setup



Test Conditions

Temperature: (23,1 ± 0,1) ℃
Relative Humidity: (46,5 ± 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.
The fundamental of the EUT was investigated in thre orthogonal orientations X, Y and Z.
It was determined that X orientationwas worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

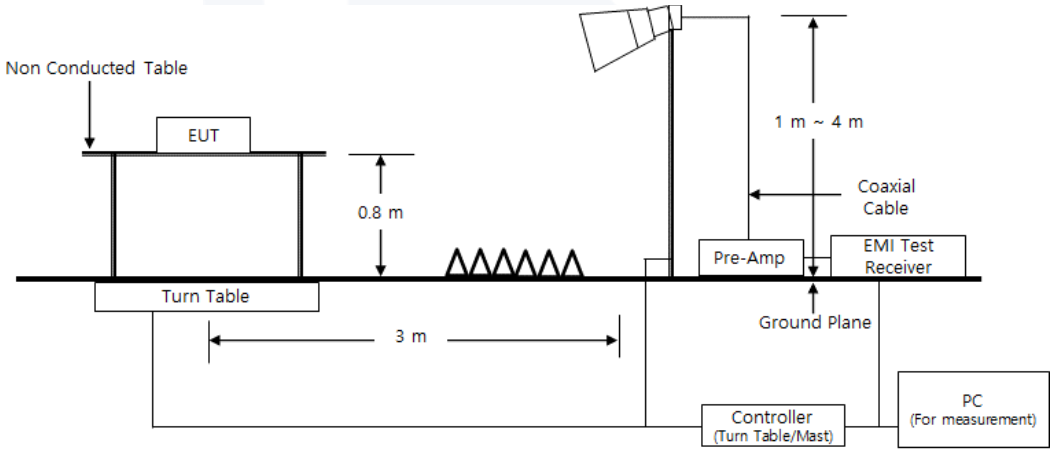
Test Date
Sep. 20, 2024

Test Location
SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	02, 13, 2025	1 Year
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 03, 2024	1 Year
☒	PREAMPLIFIER	8449B	HP	3008A00538	04, 30, 2025	1 Year
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2025	1 Year

Diagram of test setup



Test Conditions

Temperature: (22,8 ± 0,1) ℃

Relative Humidity: (47,5 ± 0,1) % R.H.

Frequency Range of Measurement

1 ㎓ to 12,5 ㎓

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.
It was determined that X orientationwas worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

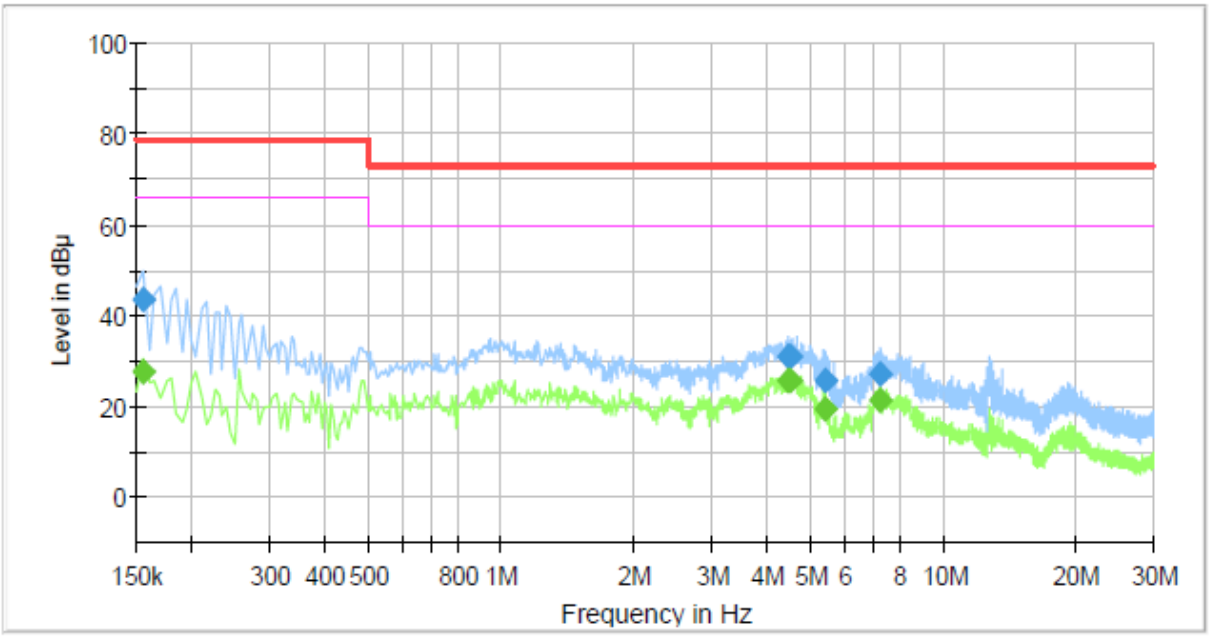
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Job No.:	KES-EM243244
Phase:	L
Mode:	
Operator Name:	KES



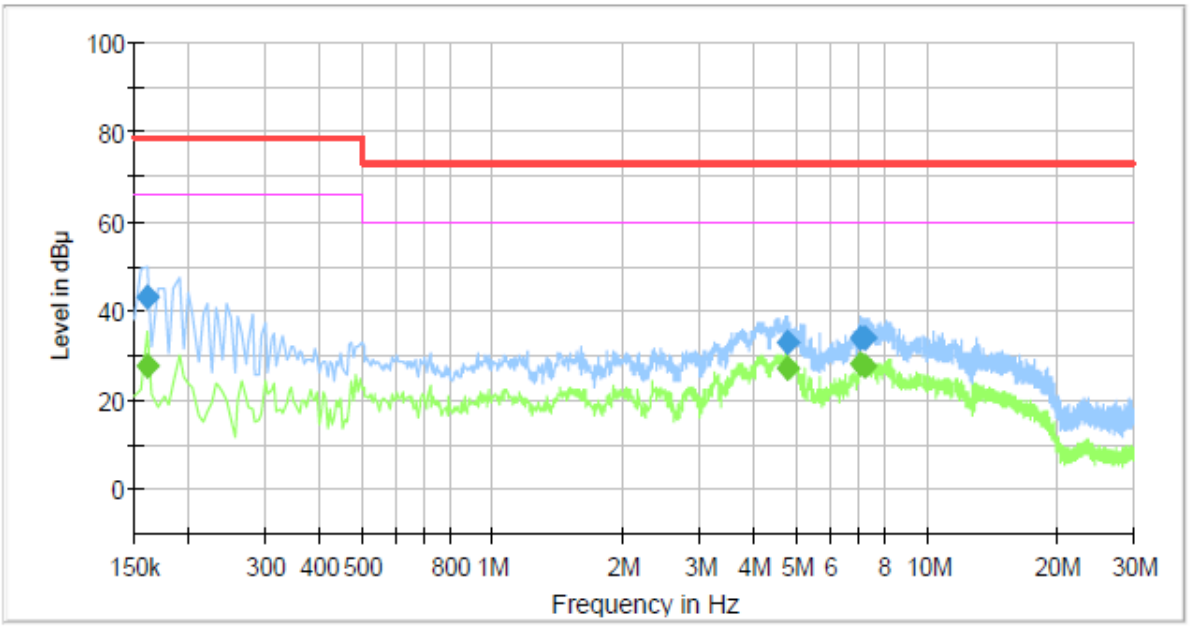
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.58	66.00	38.42	1000.0	9.000	L1	19.6
0.155000	43.62	---	79.00	35.38	1000.0	9.000	L1	19.6
4.475000	---	25.65	60.00	34.35	1000.0	9.000	L1	19.9
4.475000	30.95	---	73.00	42.05	1000.0	9.000	L1	19.9
4.540000	---	25.83	60.00	34.17	1000.0	9.000	L1	19.9
4.540000	30.89	---	73.00	42.11	1000.0	9.000	L1	19.9
5.400000	---	19.58	60.00	40.42	1000.0	9.000	L1	20.0
5.400000	25.47	---	73.00	47.53	1000.0	9.000	L1	20.0
7.260000	---	21.51	60.00	38.49	1000.0	9.000	L1	20.1
7.260000	27.02	---	73.00	45.98	1000.0	9.000	L1	20.1

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Job No.:	KES-EM243244
Phase:	N
Mode:	
Operator Name:	KES

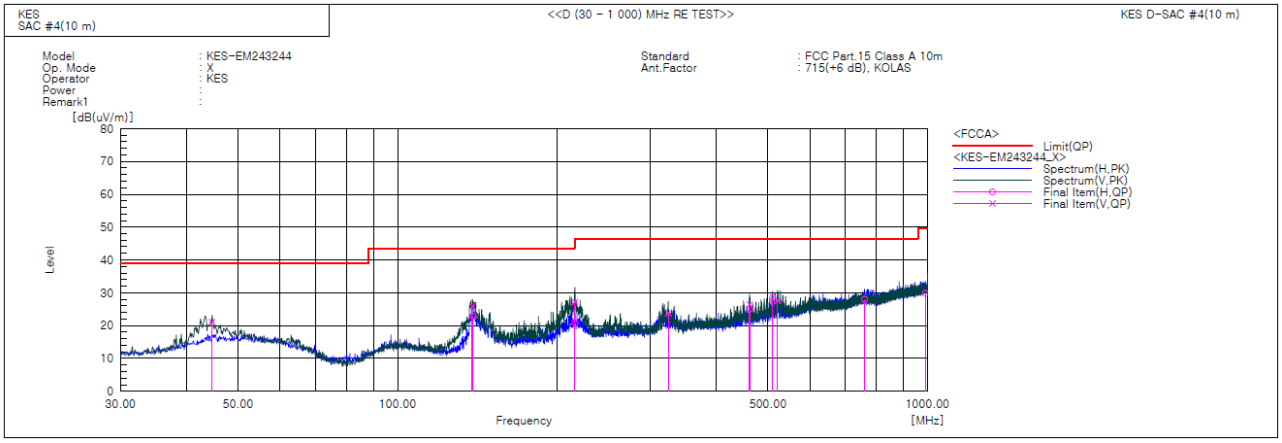


Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	27.56	66.00	38.44	1000.0	9.000	N	19.5
0.160000	43.26	---	79.00	35.74	1000.0	9.000	N	19.5
4.775000	---	27.03	60.00	32.97	1000.0	9.000	N	20.0
4.775000	33.02	---	73.00	39.98	1000.0	9.000	N	20.0
7.085000	---	28.28	60.00	31.72	1000.0	9.000	N	20.1
7.085000	33.77	---	73.00	39.23	1000.0	9.000	N	20.1
7.220000	---	27.72	60.00	32.28	1000.0	9.000	N	20.1
7.220000	33.75	---	73.00	39.25	1000.0	9.000	N	20.1

♦ 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 ㎓)



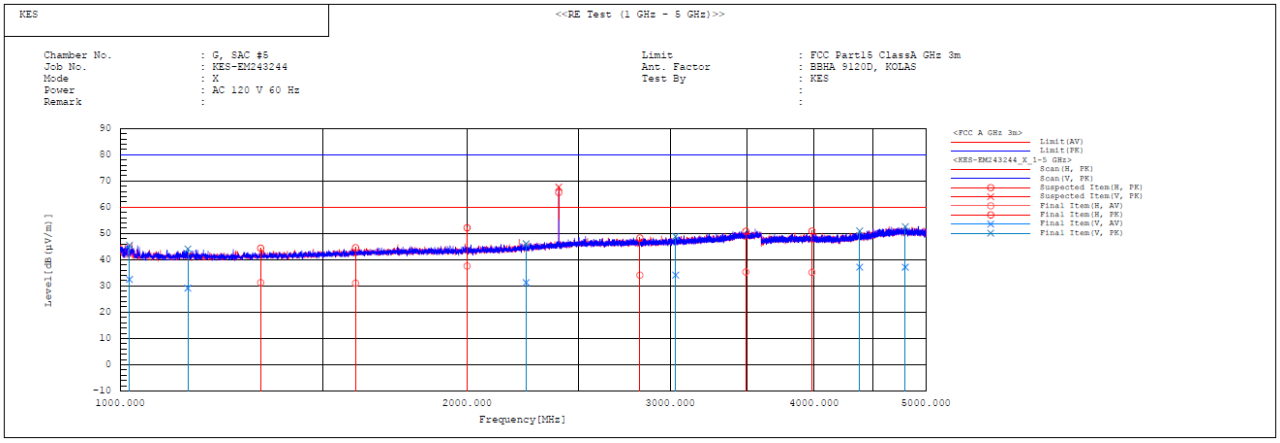
Final Result

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	44.671	V	42.7	-21.6	21.1	39.0	17.9	114.0	276.0	
2	138.276	V	51.2	-25.3	25.9	43.5	17.6	145.0	76.0	
3	138.883	H	48.1	-25.3	22.8	43.5	20.7	195.0	284.0	
4	216.119	H	40.4	-19.6	20.8	46.5	25.7	389.0	280.0	
5	216.240	V	46.8	-19.6	27.2	46.5	19.3	147.0	13.0	
6	324.274	V	40.0	-16.2	23.8	46.5	22.7	112.0	157.0	
7	461.529	V	38.7	-12.3	26.4	46.5	20.1	106.0	202.0	
8	462.499	H	37.4	-12.3	25.1	46.5	21.4	195.0	340.0	
9	510.514	H	39.4	-10.8	28.6	46.5	17.9	399.0	43.0	
10	521.548	V	38.2	-10.6	27.6	46.5	18.9	105.0	13.0	
11	761.138	H	33.2	-5.2	28.0	46.5	18.5	197.0	214.0	
12	990.664	H	31.7	-1.9	29.8	49.5	19.7	397.0	188.0	

♦ Calculation
Result(QP) [㏈(㎶/m)] = (Reading(QP)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(QP)[㏈] = Limit[㏈(㎶/m)] - Result(QP) [㏈(㎶/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 ㎓)

- (1 ~ 5) ㎓



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	1019.354	V	34.3	47.3	-1.8	32.5	45.5	60.0	80.0	27.5	34.5	100.0	216.1	
2	1145.388	V	30.2	45.1	-1.0	29.2	44.1	60.0	80.0	30.8	35.9	145.0	65.5	
3	1324.399	H	31.4	44.5	-0.1	31.3	44.4	60.0	80.0	28.7	35.6	105.0	4.0	
4	1600.808	H	30.0	43.5	1.1	31.1	44.6	60.0	80.0	28.9	35.4	197.0	275.1	
5	1999.699	H	34.8	49.4	2.8	37.6	52.2	60.0	80.0	22.4	27.8	387.0	231.8	
6	2250.312	V	27.5	42.3	3.8	31.3	46.1	60.0	80.0	28.7	33.9	148.0	348.4	
7	2824.648	H	28.4	42.6	5.7	34.1	48.3	60.0	80.0	25.9	31.7	196.0	305.3	
8	3033.537	V	27.8	42.6	6.3	34.1	48.9	60.0	80.0	25.9	31.1	142.0	70.5	
9	3490.775	H	28.3	43.8	7.0	35.3	50.8	60.0	80.0	24.7	29.2	102.0	142.4	
10	3983.688	H	26.9	42.6	8.3	35.2	50.9	60.0	80.0	24.8	29.1	387.0	78.7	
11	4382.358	V	27.3	41.1	9.9	37.2	51.0	60.0	80.0	22.8	29.0	148.0	349.6	
12	4800.545	V	25.6	41.0	11.6	37.2	52.6	60.0	80.0	22.8	27.4	109.0	201.2	
13	2402.000	V	---	---	4.4	---	---	---	---	---	---	100.0	173.4	
14	2402.000	H	---	---	4.4	---	---	---	---	---	---	100.0	292.3	

* Exclusion bands
- Fundamental Frequency : 2 402 ㎒

- (5 ~ 12,5) GHz

- PK

Frequency (MHz)	Reading PK (dBuV)	Polarization	Height (m)	ANT Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
6 457.347	39.300	V	1.000	35.150	8.840	34.690	48.600	80.000	31.400
10 952.778	40.000	H	1.000	40.350	11.960	33.100	59.210	80.000	20.790

- CISPR AV

Frequency (MHz)	Reading CISPR AV (dBuV)	Polarization	Height (m)	ANT Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
6 457.347	25.800	V	1.000	35.150	8.840	34.690	35.100	60.000	24.900
10 952.778	26.700	H	1.000	40.350	11.960	33.100	45.910	60.000	14.090

♦ 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