RADIO PERFORMANCE TEST REPORT

Test Report No.	**: OT-235-RWD-022**
Reception No.	**: 2304001248**
Applicant	**: Fitogether**
Address	**: #302, 95 Hangang-daero, Yongsan-gu, Seoul, 04378, South Korea**
Manufacturer	**: Fitogether**
Address	**: #302, 95 Hangang-daero, Yongsan-gu, Seoul, 04378, South Korea**
Type of Equipment	**: Real Time Tracking System**
FCC ID.	**: 2BAGE-FITOLIVEHUBP2**
Model Name	**: OHCOACH Live Hub**
Multiple Model Name	**: LHP2-1A**
Serial number	**: N/A**
Total page of Report	**: 29 pages (including this page)**
Date of Incoming	**: May 16, 2023**
Date of issue	**: May 26, 2023**

SUMMARY

The equipment complies with the regulation; ***FCC PART 15 SUBPART C Section 15.247***

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.



Tested by	Reviewed by	Approved by
Myeong-Hwa, Jang / Sr. Engineer	Tae-Ho, Kim / Chief Engineer	Jae-Ho, Lee / Chief Engineer
ONETECH Corp.	ONETECH Corp.	ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

CONTENTS

PAGE

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※ Please refer to the Annex section for All test plots

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-235-RWD-022	May 26, 2023	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : Fitogether

Address : #302, 95 Hangang-daero, Yongsan-gu, Seoul, 04378, South Korea

Contact Person : Bobby, Shin / Senior Engineer

Telephone No. : +82-10-6263-8930

FCC ID : 2BAGE-FITOLIVEHUBP2

Model Name : OHCOACH Live Hub

Brand Name : -

Serial Number : N/A

Date : May 26, 2023

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Real Time Tracking System
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 KDB 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-20122/ C-14617/ G-10666/ T-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

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3. GENERAL INFORMATION

3.1 Product Description

The Fitogether, Model OHCOACH Live Hub (referred to as the EUT in this report) is a Real Time Tracking System. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Real Time Tracking System
OPERATING FREQUENCY	2 412 MHz ~ 2 462 MHz (802.11g)
MODULATION TYPE	802.11g: OFDM Modulation (BPSK/QPSK/16QAM/64QAM)
RF OUTPUT POWER	Antenna 0: 6.33 dBm Antenna 1: 5.76 dBm Antenna 2: 5.78 dBm Multiple Antenna: 10.66 dBm
ANTENNA TYPE	Antenna 0: PCB Antenna Antenna 1: Patch Antenna Antenna 2: Patch Antenna
ANTENNA GAIN	Antenna 0: 3.72 dBi Antenna 1: 9.13 dBi Antenna 2: 9.13 dBi Multiple Antenna: 12.72 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	25 MHz, 40 MHz
RATED SUPPLY VOLTAGE	DC 7.40 V

3.2 Alternative type(s)/model(s); also covered by this test report.

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
OHCOACH Live Hub	Basic Model	☑
LHP2-1A	The model is identical to basic model except for the model name only.	☐

Note: 1. Applicant consigns only basic model to test. Therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacturer is responsible for the compliance of all variants.

4. EUT MODIFICATIONS

-. None

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5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Fitogether	LiveHub ES4	N/A
SUB Board	Fitogether	LiveHub RTK	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
OHCOACH Live Hub	Fitogether	Real Time Tracking System (EUT)	-
Ideapad L340	Lenovo	Notebook PC	EUT

5.3 Mode of operation during the test

-. Channel List (WLAN 2.4 GHz)

Channel	Frequency[MHz]	Channel	Frequency[MHz]	Channel	Frequency[MHz]
1	2 412.00	6	2 437.00	11	2 462.00
2	2 417.00	7	2 442.00		
3	2 422.00	8	2 447.00		
4	2 427.00	9	2 452.00		
5	2 432.00	10	2 457.00		

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-. Duty Cycle (Antenna 0)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
WLAN 2.4 GHz	802.11 g	6	0.052	0.159	32.70	4.85
		9	0.052	0.159	32.70	4.85
		12	0.036	0.143	24.91	6.04
		18	0.036	0.143	24.91	6.04
		24	0.028	0.135	20.82	6.82
		36	0.028	0.135	20.82	6.82
		48	0.028	0.135	20.82	6.82
		54	0.028	0.135	20.82	6.82

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

-. Duty Cycle (Antenna 1)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
WLAN 2.4 GHz	802.11 g	6	0.052	0.159	32.70	4.85
		9	0.052	0.159	32.70	4.85
		12	0.036	0.143	24.91	6.04
		18	0.036	0.143	24.91	6.04
		24	0.028	0.135	20.82	6.82
		36	0.028	0.135	20.82	6.82
		48	0.028	0.135	20.82	6.82
		54	0.028	0.135	20.82	6.82

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

-. Duty Cycle (Antenna 2)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
WLAN 2.4 GHz	802.11 g	6	0.052	0.159	32.70	4.85
		9	0.052	0.159	32.70	4.85
		12	0.036	0.143	24.91	6.04
		18	0.036	0.143	24.91	6.04
		24	0.028	0.135	20.82	6.82
		36	0.028	0.135	20.82	6.82
		48	0.028	0.135	20.82	6.82
		54	0.028	0.135	20.82	6.82

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

-. Data Rate applied to all test items

A data rate of 6 Mbps is applied.

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5.4 Configuration of Test System

Line Conducted Test: The EUT was connected to adaptor and the power of adaptor was connected to LISN. All supporting equipment were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a Patch Antenna and PCB Antenna on the main board in the EUT, so no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

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7. MIMIMUM 6 dB BANDWIDTH

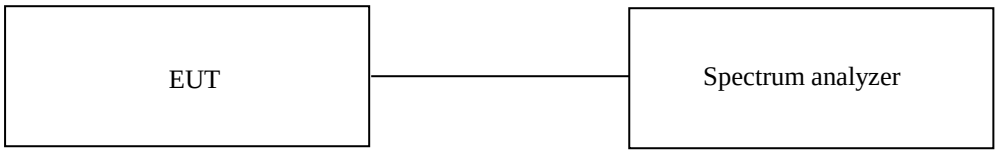
7.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



7.3 Measurement uncertainty

The uncertainty for Minimum 6 dB bandwidth is ± 8 623.60 Hz

7.4 Test date

May 16, 2023 ~ May 26, 2023

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7.5 Test data for Antenna 0

-. Test Result : Pass

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
Low	2 412.00	15.53	0.50	15.03
Middle	2 437.00	15.53	0.50	15.03
High	2 462.00	15.53	0.50	15.03

Remark. Margin = Measured Value – Limit

7.6 Test data for Antenna 1

-. Test Result : Pass

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
Low	2 412.00	15.53	0.50	15.03
Middle	2 437.00	15.53	0.50	15.03
High	2 462.00	15.53	0.50	15.03

Remark. Margin = Measured Value – Limit

7.7 Test data for Antenna 2

-. Test Result : Pass

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
Low	2 412.00	15.78	0.50	15.28
Middle	2 437.00	15.53	0.50	15.03
High	2 462.00	15.53	0.50	15.03

Remark. Margin = Measured Value – Limit

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8. MAXIMUM CONDUCTED(AVERAGE) OUTPUT POWER

8.1 Operating environment

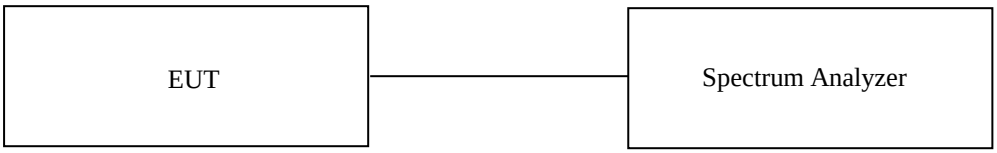
Temperature : 24 °C

Relative humidity : 52 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to 1 MHz, the video bandwidth is set to 3 times the resolution bandwidth.



8.3 Measurement uncertainty

The uncertainty for Maximum conducted(average) output power is ± 1.51 dBm

8.4 Test date

May 16, 2023 ~ May 26, 2023

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8.5 Test data for Antenna 0

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm)	Margin (dB)
LOW	2 412.00	1.41	4.85	6.26	30.00	23.74
MIDDLE	2 437.00	1.48	4.85	6.33	30.00	23.67
HIGH	2 462.00	1.39	4.85	6.24	30.00	23.76

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

8.6 Test data for Antenna 1

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm)	Margin (dB)
LOW	2 412.00	0.91	4.85	5.76	26.87	21.11
MIDDLE	2 437.00	0.83	4.85	5.68	26.87	21.19
HIGH	2 462.00	0.76	4.85	5.61	26.87	21.26

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

8.7 Test data for Antenna 2

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm)	Margin (dB)
LOW	2 412.00	0.43	4.85	5.28	26.87	21.59
MIDDLE	2 437.00	0.66	4.85	5.51	26.87	21.36
HIGH	2 462.00	0.93	4.85	5.78	26.87	21.09

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

8.8 Test data for Multiple Antenna

-. Test Result : Pass

Channel	Frequency (MHz)	ANT0 + ANT1 + ANT2 Total Value (dBm)	Limit (dBm)	Margin (dB)
LOW	2 412.00	10.56	23.28	12.72
MIDDLE	2 437.00	10.63	23.28	12.65
HIGH	2 462.00	10.66	23.28	12.62

Remark. Margin = Limit – Total Value

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9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

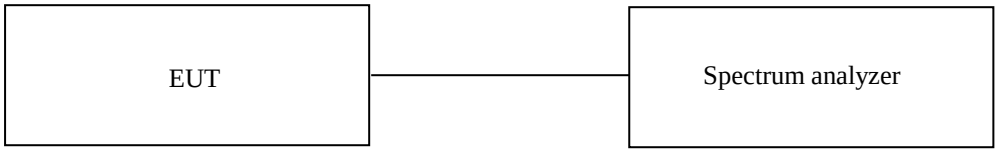
9.1 Operating environment

Temperature : 24 ℃

Relative humidity : 52 % R.H.

9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz and video bandwidth is set to 300 kHz, and peak detection was used.



9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

9.4 Measurement uncertainty

The uncertainty for 100 kHz bandwidth outside the frequency band is ± 1.56 dBm

9.5 Test date

May 16, 2023 ~ May 26, 2023

9.6 Test data for conducted emission

Please refer to the Annex

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9.7 Test data for radiated emission

9.7.1 Radiated Emission which fall in the Restricted Band

9.7.1.1 Test data for 802.11g WLAN Mode

-. Transmitting mode : Multiple Antenna Transmit

-. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode

1 MHz and RMS Detector for Average Mode

-. Video bandwidth : 3 MHz for Peak and Average Mode

-. Measurement distance : 3 m

-. Duty Cycle : 32.70 %

-. Result : PASSED

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	ATT (dB)	Duty Factor (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Test Data for Low Channel											
2 389.638	67.52	Peak	H	27.30	5.35	45.10	5.68	-	60.75	74.00	13.25
2 389.914	53.26	Average	H	27.30	5.35	45.10	5.68	4.85	51.34	54.00	2.66
2 390.000	59.14	Peak	V	27.30	5.35	45.10	5.68	-	52.37	74.00	21.63
2 389.840	44.39	Average	V	27.30	5.35	45.10	5.68	4.85	42.47	54.00	11.53
Test Data for High Channel											
2 483.500	68.51	Peak	H	27.40	5.82	44.90	5.73	-	62.56	74.00	11.44
2 483.543	53.24	Average	H	27.40	5.82	44.90	5.73	4.85	52.14	54.00	1.86
2 484.113	60.19	Peak	V	27.40	5.82	44.90	5.73	-	54.24	74.00	19.76
2 483.543	46.91	Average	V	27.40	5.82	44.90	5.73	4.85	45.81	54.00	8.19

Remark: “H”: Horizontal, “V”: Vertical

Margin (dB) = Limits (dBµV/m) - Total Level (dBµV/m)

Total Level = Reading + Antenna Factor + Cable Loss + ATT + Duty Factor– AMP Gain

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9.7.2 Spurious & Harmonic Radiated Emission

9.7.2.1 Test data for 802.11g WLAN Mode

-. Transmitting mode : Multiple Antenna Transmit

-. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 3 MHz for Peak and Average Mode

-. Frequency range : 1 GHz ~ 26.5 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 32.70 %

-. Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 824.000	49.08	Peak	H	31.30	8.23	44.60	-	44.01	74.00	29.99
4 824.000	37.47	Average	H	31.30	8.23	44.60	4.85	37.25	54.00	16.75
4 824.000	48.37	Peak	V	31.30	8.23	44.60	-	43.30	74.00	30.70
4 824.000	37.52	Average	V	31.30	8.23	44.60	4.85	37.30	54.00	16.70
Test Data for Middle Channel										
4 874.000	48.41	Peak	H	31.30	8.23	44.60	-	43.34	74.00	30.66
4 874.000	37.50	Average	H	31.30	8.23	44.60	4.85	37.28	54.00	16.72
4 874.000	47.67	Peak	V	31.30	8.23	44.60	-	42.60	74.00	31.40
4 874.000	37.19	Average	V	31.30	8.23	44.60	4.85	36.97	54.00	17.03
Test Data for High Channel										
4 924.000	49.37	Peak	H	31.40	8.35	44.70	-	44.42	74.00	29.58
4 924.000	37.49	Average	H	31.40	8.35	44.70	4.85	37.39	54.00	16.61
4 924.000	48.89	Peak	V	31.40	8.35	44.70	-	43.94	74.00	30.06
4 924.000	37.53	Average	V	31.40	8.35	44.70	4.85	37.43	54.00	16.57

Remark: “H”: Horizontal, “V”: Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss + Duty Factor – AMP Factor

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10. POWER SPECTRAL DENSITY

10.1 Operating environment

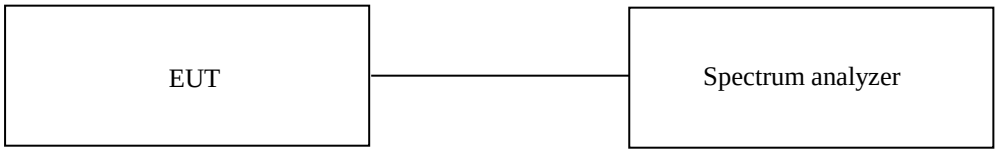
Temperature : 24 °C

Relative humidity : 52 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to 3 kHz ≤ RBW ≤ 100 kHz , the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Measurement uncertainty

The uncertainty for Power spectral density is ± 1.51 dB

10.4 Test date

May 16, 2023 ~ May 26, 2023

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10.5 Test data for Antenna 0

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm / 3 kHz)	Margin (dB)
LOW	2 412.00	-28.29	4.85	-23.44	8.00	31.44
MIDDLE	2 437.00	-28.14	4.85	-23.29	8.00	31.29
HIGH	2 462.00	-28.22	4.85	-23.37	8.00	31.37

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

10.6 Test data for Antenna 1

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm / 3 kHz)	Margin (dB)
LOW	2 412.00	-28.59	4.85	-23.74	4.87	28.61
MIDDLE	2 437.00	-28.67	4.85	-23.82	4.87	28.69
HIGH	2 462.00	-28.62	4.85	-23.77	4.87	28.64

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

10.7 Test data for Antenna 2

-. Test Result : Pass

-. Duty Cycle : 32.70 %

Channel	Frequency (MHz)	Measured Value (dBm)	Duty Factor(dB)	Total Value(dBm)	Limit (dBm / 3 kHz)	Margin (dB)
LOW	2 412.00	-28.70	4.85	-23.85	4.87	28.72
MIDDLE	2 437.00	-28.57	4.85	-23.72	4.87	28.59
HIGH	2 462.00	-28.24	4.85	-23.39	4.87	28.26

Remark. Margin = Limit – Total Value (=Measured Value + Duty Factor)

10.8 Test data for Multiple Antenna

-. Test Result : Pass

Channel	Frequency (MHz)	ANT0 + ANT1 + ANT2 Total Value (dBm)	Limit (dBm)	Margin (dB)
LOW	2 412.00	-18.90	1.28	20.18
MIDDLE	2 437.00	-18.83	1.28	20.11
HIGH	2 462.00	-18.73	1.28	20.01

Remark. Margin = Limit – Total Value

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11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

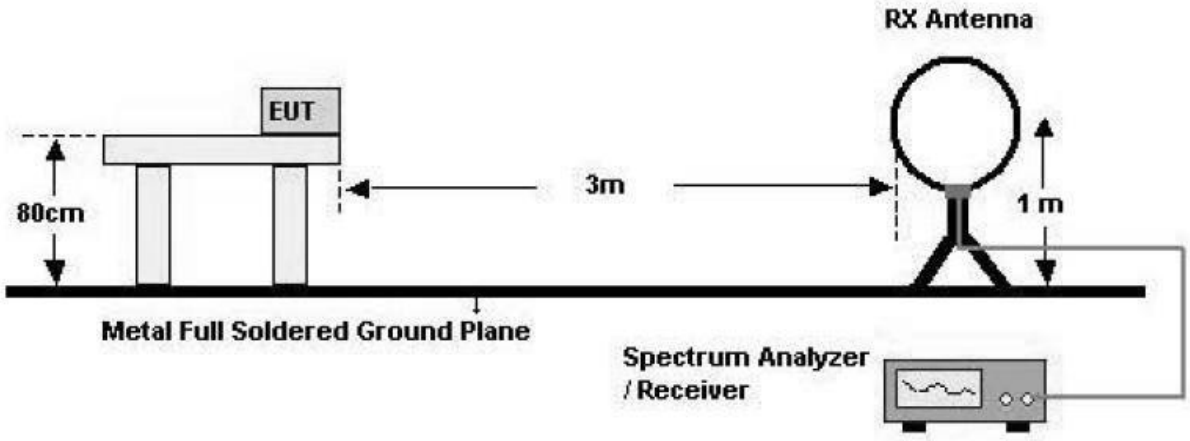
11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

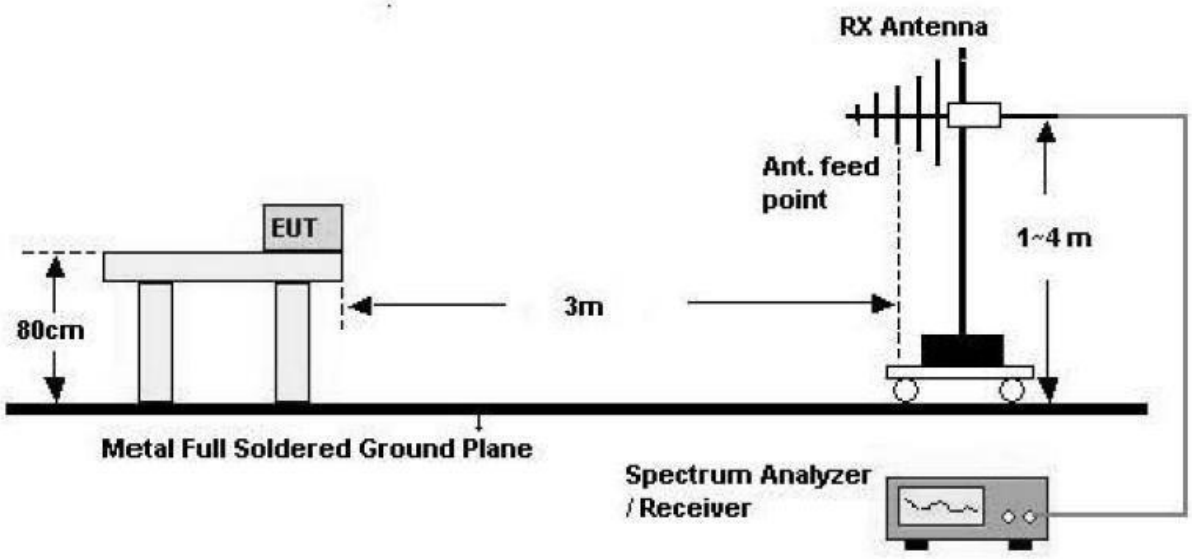
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

- Test Configuration

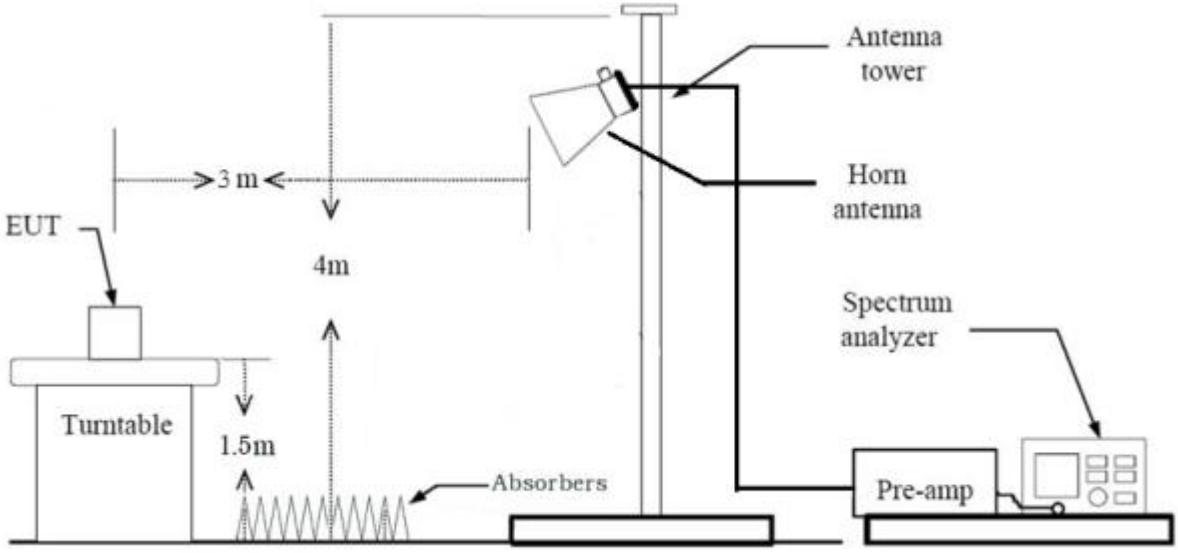
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



11.3 Measurement uncertainty

The uncertainty for Radiated emission test is ± 3.83 dB below 30 MHz

The uncertainty for Radiated emission test is ± 3.71 dB in 30 MHz ~ 1GHz

The uncertainty for Radiated emission test is ± 4.86 dB above 1 GHz

11.4 Test date

May 16, 2023 ~ May 26, 2023

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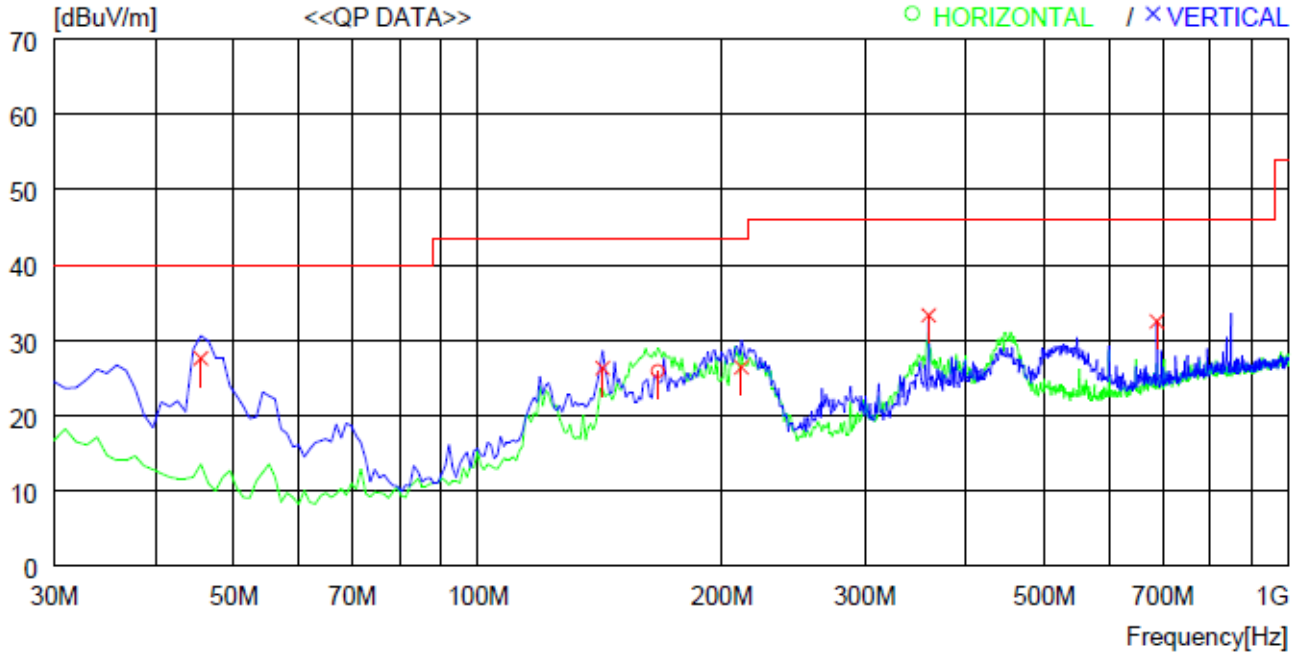
11.5 Test data for 30 MHz ~ 1 000 MHz

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Real Time Tracking System

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	166.770	39.0	17.3	1.6	32.0	25.9	43.5	17.6	200	0
----- Vertical ------										
2	45.520	44.1	14.6	0.9	32.0	27.6	40.0	12.4	100	95
3	142.520	37.8	19.0	1.5	32.0	26.3	43.5	17.2	100	72
4	211.390	40.6	15.9	1.9	32.0	26.4	43.5	17.1	100	95
5	359.800	42.9	20.0	2.4	32.0	33.3	46.0	12.7	200	40
6	687.655	36.2	25.2	3.4	32.3	32.5	46.0	13.5	100	359

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11.6 Test data for Below 30 MHz

-. Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)

-. Frequency range : 9 kHz ~ 30 MHz

-. Measurement distance : 3 m

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBµV/m)	Limits (dBµV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

11.7 Test data for above 1 GHz

-. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode

1 MHz and RMS Detector for Average Mode

-. Video bandwidth : 3 MHz for Peak and Average Mode

-. Frequency range : 1 GHz ~ 26.5 GHz

-. Measurement distance : 3 m

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBµV/m)	Limits (dBµV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

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12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μH + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

12.3 Measurement uncertainty

The uncertainty for Conducted emission test is ± 1.6 dB

12.4 Test date

May 16, 2023 ~ May 26, 2023

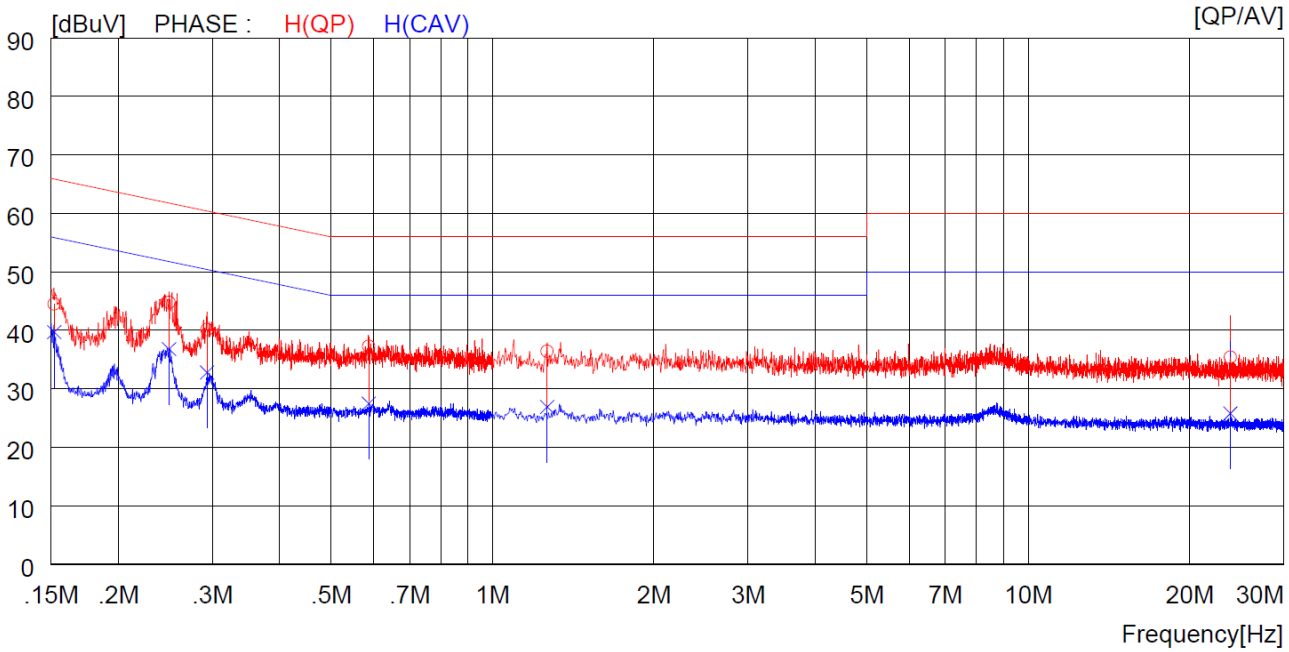
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

12.4 Test data

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.15200	22.7	----	21.8	44.5	----	65.9	----	21.4	----	H(QP)
2	0.24900	23.0	----	21.8	44.8	----	61.8	----	17.0	----	H(QP)
3	0.29300	18.4	----	21.7	40.1	----	60.4	----	20.3	----	H(QP)
4	0.58700	15.5	----	21.8	37.3	----	56.0	----	18.7	----	H(QP)
5	1.26400	14.7	----	21.7	36.4	----	56.0	----	19.6	----	H(QP)
6	23.84000	14.0	----	21.4	35.4	----	60.0	----	24.6	----	H(QP)
7	0.15200	----	17.9	21.8	----	39.7	----	55.9	----	16.2	H(CAV)
8	0.24900	----	15.0	21.8	----	36.8	----	51.8	----	15.0	H(CAV)
9	0.29300	----	11.1	21.7	----	32.8	----	50.4	----	17.6	H(CAV)
10	0.58700	----	5.7	21.8	----	27.5	----	46.0	----	18.5	H(CAV)
11	1.26400	----	5.2	21.7	----	26.9	----	46.0	----	19.1	H(CAV)
12	23.84000	----	4.4	21.4	----	25.8	----	50.0	----	24.2	H(CAV)

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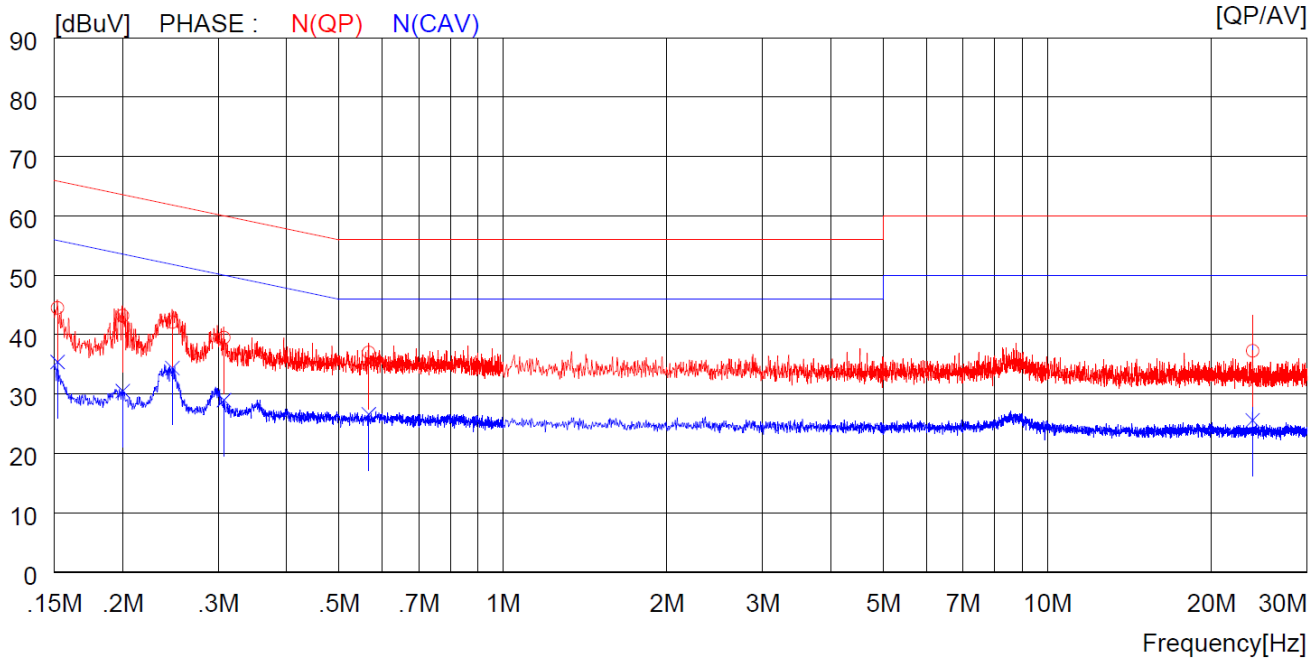
-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.15200	22.7	----	21.8	44.5	----	65.9	----	21.4	----	N(QP)
2	0.20000	21.4	----	21.8	43.2	----	63.6	----	20.4	----	N(QP)
3	0.24700	20.3	----	21.8	42.1	----	61.9	----	19.8	----	N(QP)
4	0.30700	17.8	----	21.7	39.5	----	60.1	----	20.6	----	N(QP)
5	0.56700	15.2	----	21.8	37.0	----	56.0	----	19.0	----	N(QP)
6	23.83000	15.9	----	21.4	37.3	----	60.0	----	22.7	----	N(QP)
7	0.15200	----	13.6	21.8	----	35.4	----	55.9	----	20.5	N(CAV)
8	0.20000	----	8.7	21.8	----	30.5	----	53.6	----	23.1	N(CAV)
9	0.24700	----	12.6	21.8	----	34.4	----	51.9	----	17.5	N(CAV)
10	0.30700	----	7.3	21.7	----	29.0	----	50.1	----	21.1	N(CAV)
11	0.56700	----	4.8	21.8	----	26.6	----	46.0	----	19.4	N(CAV)
12	23.83000	----	4.2	21.4	----	25.6	----	50.0	----	24.4	N(CAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

13. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 14, 2022 (1Y)
SMB100A	Rohde & Schwarz	Signal Generator	177648	Jan. 18, 2023 (1Y)
ESR	Rohde & Schwarz	EMI Test Receiver	101470	Oct. 18, 2022 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 14, 2023 (1Y)
SCU18	Rohde & Schwarz	Signal Conditioning unit	102266	Jul. 12, 2022 (1Y)
SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Jan. 18, 2023 (1Y)
GP-4303D	LG Precision Co.,Ltd	DC Power Supply	5071069	Jan. 04, 2023 (1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter (1-3 GHz)	N/A	Jan. 17, 2023 (1Y)
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2022 (2Y)
HLP-2008	TDK	Hybrid Antenna	131316	Mar. 07, 2022 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1349	Jul. 08, 2022 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 25, 2023 (1Y)
ESCI	Rohde & Schwarz	EMI Test Receiver	101420	Mar. 06, 2023 (1Y)
11947A	Rohde & Schwarz	Pulse Limiter	3107A02762	Mar. 07, 2023 (1Y)
LT32C/10	Afj Instruments	LISN	32032039322	Mar. 07, 2023 (1Y)
DT2000-2t	Innco System	Turn Table	N/A	N/A
MA-4640-XPET	Innco System	Antenna Master	MA4640/652/43100318/P	N/A
CO3000	Innco System	Controller	1026/40960617/P	N/A

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