RADIO PERFORMANCE TEST REPORT

Test Report No. : **OT-237-RWD-049**

Reception No. : **2301000279**

Applicant : **LG Electronics USA, Inc.**

Address : **111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, 07632, United States**

Manufacturer : **LG Electronics Inc.**

Address : **222 LG-ro, Jinwi-Myeon, Pyeongtaek -Si, Gyeonggi-Do, 451-713, Korea**

Type of Equipment : **Silverbox RADIO ASM-RECEIVER**

FCC ID. : **BEJVCUEB-N**

Model Name : **VCUEB-N**

Multiple Model Name : **N/A**

Serial number : **N/A**

Total page of Report : **86 pages (including this page)**

Date of Incoming : **January 31, 2023**

Date of issue : **July 26, 2023**

SUMMARY

The equipment complies with the regulation; ***FCC PART 15 SUBPART E Section 15.407***

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
Sieon Lee / 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

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

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

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-237-RWD-049	July 26, 2023	Initial Release	All

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

1. VERIFICATION OF COMPLIANCE

Applicant : LG Electronics USA, Inc.

Address : 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, 07632, United States

Contact Person : Sung Soo Kim / Director, Regulatory and Environmental Affairs

Telephone No. : +201-266-2215

FCC ID : BEJVCUEB-N

Model Name : VCUEB-N

Brand Name : -

Serial Number : N/A

Date : July 26, 2023

EQUIPMENT CLASS	Unlicensed National Information infrastructure(UNII)
E.U.T. DESCRIPTION	Silverbox RADIO ASM-RECEIVER
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 E Section 15.407 789033 D02 General UNII Test Procedures New Rules v02r01
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.

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

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.407(a)	26 dB Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	Met the Limit / PASS
15.407(a)	Peak Power Spectral Density	Met the Limit / PASS
15.407(e)	6 dB Bandwidth	Met the Limit / PASS
15.407(g)	Frequency Stability	Met the Limit / PASS
15.407(b)	Undesirable Emissions	Met the Limit / PASS
15.205, 15.407(b)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Met the Limit / PASS
15.207	Conducted Limits	N/A (See Note)

Note: This test is not performed because the EUT is operated by DC Power.

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 E Section 15.407

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

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

3. GENERAL INFORMATION

3.1 Product Description

The LG Electronics USA, Inc., Model VCUEB-N (referred to as the EUT in this report) is a Silverbox RADIO ASM-RECEIVER. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Silverbox RADIO ASM-RECEIVER		
Temperature Range	-30 °C ~ 85 °C		
OPERATING FREQUENCY	Bluetooth	2 402 MHz ~ 2 480 MHz	
	WLAN 2.4 GHz	2 412 MHz ~ 2 462 MHz (802.11b/g/n(HT20))	
	5 150 MHz ~ 5 250 MHz Band	5 180 MHz ~ 5 240 MHz (802.11a/n(HT20)/ac(VHT20))	
		5 190 MHz ~ 5 230 MHz (802.11n(HT40)/ac(VHT40))	
		5 210 MHz (802.11ac(VHT80))	
	5 725 MHz ~ 5 850 MHz Band	5 745 MHz ~ 5 825 MHz (802.11a/n(HT20)/ac(VHT20))	
		5 755 MHz ~ 5 795 MHz (802.11n(HT40)/ac(VHT40))	
		5 775 MHz (802.11ac(VHT80))	
MODULATION TYPE	Bluetooth	GFSK for 1 Mbps, π/4-DQPSK for 2 Mbps, 8-DPSK for 3 Mbps	
	WLAN 2.4 GHz	802.11b: DSSS Modulation(DBPSK/DQPSK/CCK) 802.11g/n(HT20): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)	
	WLAN 5 GHz	802.11a/n(HT20)/n(HT40)/ac(VHT80): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)	
RF OUTPUT POWER	Bluetooth	1 Mbps	0.75 dBm
		2 Mbps	2.78 dBm
		3 Mbps	2.82 dBm
	WLAN 2.4 GHz	10.04 dBm(802.11b) 10.49 dBm(802.11g) 11.34 dBm(802.11n_HT20)	

RF OUTPUT POWER	5 150 MHz ~ 5 250 MHz Band (UNII I)	Internal Antenna	14.87 dBm(802.11a) 15.79 dBm(802.11n_HT20) 15.06 dBm(802.11n_HT40) 11.28 dBm(802.11ac_VHT80)
		External Antenna	8.16 dBm(802.11a) 9.13 dBm(802.11n_HT20) 8.03 dBm(802.11n_HT40) 4.37 dBm(802.11ac_VHT80)
	5 725 MHz ~ 5 850 MHz Band (UNII 3)	Internal Antenna	15.10 dBm(802.11a) 16.11 dBm(802.11n_HT20) 14.73 dBm(802.11n_HT40) 10.98 dBm(802.11ac_VHT80)
		External Antenna	8.20 dBm(802.11a) 9.16 dBm(802.11n_HT20) 7.77 dBm(802.11n_HT40) 4.08 dBm(802.11ac_VHT80)
ANTENNA TYPE	Bluetooth	PCB Antenna	
	WLAN 2.4 GHz	PCB Antenna	
	WLAN 5 GHz	Internal Antenna	PCB Antenna
		External Antenna	PCB Antenna
ANTENNA GAIN	Bluetooth	0.89 dBi	
	WLAN 2.4 GHz	2.18 dBi	
	5 150 MHz ~ 5 250 MHz Band	Internal Antenna	0.63 dBi
		External Antenna	2.37 dBi
	5 725 MHz ~ 5 850 MHz Band	Internal Antenna	-1.04 dBi
		External Antenna	3.61 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)		20 MHz, 24 MHz, 25 MHz, 27 MHz, 40 MHz, 55.46667 MHz	

* The product is a client device.

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

-. None

4. EUT MODIFICATIONS

-. None

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	N/A	N/A	N/A
Module	N/A	N/A	N/A
Antenna	N/A	N/A	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
VCUEB-N	LG Electronics Inc.	Silverbox RADIO ASM-RECEIVER (EUT)	-
GP-4303D	LG Precision Co.,Ltd	DC Power Supply (DC 30 V 3 A)	-
Ideapad320	LENOVO	NoteBook	EUT

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting mode is programmed.

The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis, but the worst data was recorded in this report.

-. Channel List (5 150 MHz ~ 5 250 MHz Band)

802.11a / n_HT20 / ac_VHT20		802.11n_HT40 / ac_VHT40		802.11ac_VHT80	
Channel	Frequency[MHz]	Channel	Frequency[MHz]	Channel	Frequency[MHz]
36	5 180.00	38	5 190.00	42	5 210.00
40	5 200.00	46	5 230.00		
44	5 220.00				
48	5 240.00				

-. Channel List (5 725 MHz ~ 5 850 MHz Band)

802.11a / n_HT20 / ac_VHT20		802.11n_HT40 / ac_VHT40		802.11ac_VHT80	
Channel	Frequency[MHz]	Channel	Frequency[MHz]	Channel	Frequency[MHz]
149	5 745.00	151	5 755.00	155	5 775.00
153	5 765.00	159	5 795.00		
157	5 785.00				
165	5 825.00				

-. Duty Cycle (Internal Antenna)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
UNII 1	802.11 a	6	0.00143	0.00145	98.97	0.04
		9	0.00096	0.00098	98.48	0.07
		12	0.00073	0.00074	98.00	0.09
		18	0.00049	0.00051	97.07	0.13
		24	0.00038	0.00039	96.20	0.17
		36	0.00026	0.00027	94.52	0.24
		48	0.00020	0.00022	93.09	0.31
		54	0.00018	0.00020	92.38	0.34
	802.11 n(HT20)	MCS0	0.00134	0.00136	98.90	0.05
		MCS1	0.00069	0.00070	97.89	0.09
		MCS2	0.00047	0.00049	96.95	0.13
		MCS3	0.00036	0.00038	96.04	0.18
		MCS4	0.00026	0.00027	94.52	0.24
		MCS5	0.00020	0.00022	93.09	0.31
		MCS6	0.00018	0.00020	92.54	0.34
		MCS7	0.00017	0.00018	91.88	0.37
	802.11 n(HT40)	MCS0	0.00066	0.00068	97.84	0.10
		MCS1	0.00035	0.00037	95.95	0.18
		MCS2	0.00025	0.00026	94.41	0.25
		MCS3	0.00020	0.00021	93.03	0.31
		MCS4	0.00014	0.00016	90.65	0.43
		MCS5	0.00012	0.00013	88.65	0.52
		MCS6	0.00011	0.00012	88.03	0.55
		MCS7	0.00010	0.00012	87.21	0.59
	802.11 ac(VHT80)	MCS0	0.00033	0.00035	95.47	0.20
		MCS1	0.00019	0.00020	92.27	0.35
		MCS2	0.00014	0.00016	90.18	0.45
		MCS3	0.00012	0.00013	88.05	0.55
		MCS4	0.00010	0.00011	85.91	0.66
		MCS5	0.00008	0.00010	83.56	0.78
		MCS6	0.00008	0.00009	82.85	0.82
		MCS7	0.00007	0.00009	82.06	0.86
		MCS8	0.00007	0.00008	81.21	0.90
		MCS9	0.00006	0.00008	80.34	0.95

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

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

-. Duty Cycle (Internal Antenna)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
UNII 3	802.11 a	6	0.00143	0.00145	98.97	0.04
		9	0.00096	0.00098	98.48	0.07
		12	0.00073	0.00074	98.00	0.09
		18	0.00049	0.00051	97.07	0.13
		24	0.00038	0.00039	96.20	0.17
		36	0.00026	0.00027	94.52	0.24
		48	0.00020	0.00022	93.09	0.31
		54	0.00018	0.00020	92.31	0.35
	802.11 n(HT20)	MCS0	0.00134	0.00136	98.90	0.05
		MCS1	0.00069	0.00070	97.89	0.09
		MCS2	0.00047	0.00049	96.95	0.13
		MCS3	0.00036	0.00038	96.04	0.18
		MCS4	0.00026	0.00027	94.46	0.25
		MCS5	0.00020	0.00022	93.09	0.31
		MCS6	0.00018	0.00020	92.54	0.34
		MCS7	0.00017	0.00018	91.89	0.37
	802.11 n(HT40)	MCS0	0.00066	0.00068	97.83	0.10
		MCS1	0.00035	0.00037	95.99	0.18
		MCS2	0.00025	0.00026	94.36	0.25
		MCS3	0.00020	0.00021	93.02	0.31
		MCS4	0.00014	0.00016	90.73	0.42
		MCS5	0.00012	0.00013	88.67	0.52
		MCS6	0.00011	0.00012	88.02	0.55
		MCS7	0.00010	0.00012	87.10	0.60
	802.11 ac(VHT80)	MCS0	0.00033	0.00035	95.47	0.20
		MCS1	0.00019	0.00020	92.27	0.35
		MCS2	0.00014	0.00016	90.18	0.45
		MCS3	0.00012	0.00013	88.05	0.55
		MCS4	0.00010	0.00011	85.97	0.66
		MCS5	0.00008	0.00010	83.56	0.78
		MCS6	0.00008	0.00009	82.85	0.82
		MCS7	0.00007	0.00009	82.14	0.85
		MCS8	0.00007	0.00008	81.21	0.90
		MCS9	0.00006	0.00008	80.27	0.95

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

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

-. Duty Cycle (External Antenna)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
UNII 1	802.11 a	6	0.00143	0.00145	98.97	0.04
		9	0.00096	0.00098	98.48	0.07
		12	0.00073	0.00074	98.00	0.09
		18	0.00049	0.00051	97.07	0.13
		24	0.00038	0.00039	96.20	0.17
		36	0.00026	0.00027	94.52	0.24
		48	0.00020	0.00022	93.09	0.31
		54	0.00018	0.00020	92.38	0.34
	802.11 n(HT20)	MCS0	0.00134	0.00136	98.90	0.05
		MCS1	0.00069	0.00070	97.89	0.09
		MCS2	0.00047	0.00049	96.95	0.13
		MCS3	0.00036	0.00038	96.04	0.18
		MCS4	0.00026	0.00027	94.52	0.24
		MCS5	0.00020	0.00022	93.09	0.31
		MCS6	0.00018	0.00020	92.54	0.34
		MCS7	0.00017	0.00018	91.89	0.37
	802.11 n(HT40)	MCS0	0.00066	0.00068	97.82	0.10
		MCS1	0.00035	0.00037	95.99	0.18
		MCS2	0.00025	0.00026	94.36	0.25
		MCS3	0.00020	0.00021	92.97	0.32
		MCS4	0.00014	0.00016	90.73	0.42
		MCS5	0.00012	0.00013	88.75	0.52
		MCS6	0.00011	0.00012	87.94	0.56
		MCS7	0.00010	0.00012	87.10	0.60
	802.11 ac(VHT80)	MCS0	0.00033	0.00035	95.49	0.20
		MCS1	0.00019	0.00020	92.30	0.35
		MCS2	0.00014	0.00016	90.14	0.45
		MCS3	0.00012	0.00013	88.05	0.55
		MCS4	0.00010	0.00011	85.91	0.66
		MCS5	0.00008	0.00010	83.63	0.78
		MCS6	0.00008	0.00009	82.85	0.82
		MCS7	0.00007	0.00009	82.12	0.86
		MCS8	0.00007	0.00008	81.28	0.90
		MCS9	0.00006	0.00008	80.27	0.95

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

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

-. Duty Cycle (External Antenna)

Band	TEST Mode	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
UNII 3	802.11 a	6	0.00143	0.00145	98.97	0.04
		9	0.00096	0.00098	98.48	0.07
		12	0.00073	0.00074	98.00	0.09
		18	0.00049	0.00051	97.04	0.13
		24	0.00038	0.00039	96.20	0.17
		36	0.00026	0.00027	94.52	0.24
		48	0.00020	0.00022	93.09	0.31
		54	0.00018	0.00020	92.38	0.34
	802.11 n(HT20)	MCS0	0.00134	0.00136	98.90	0.05
		MCS1	0.00069	0.00070	97.89	0.09
		MCS2	0.00047	0.00049	96.95	0.13
		MCS3	0.00036	0.00038	96.08	0.17
		MCS4	0.00026	0.00027	94.52	0.24
		MCS5	0.00020	0.00022	93.09	0.31
		MCS6	0.00018	0.00020	92.54	0.34
		MCS7	0.00017	0.00018	91.80	0.37
	802.11 n(HT40)	MCS0	0.00066	0.00068	97.83	0.10
		MCS1	0.00035	0.00037	95.96	0.18
		MCS2	0.00025	0.00026	94.37	0.25
		MCS3	0.00020	0.00021	93.02	0.31
		MCS4	0.00014	0.00016	90.73	0.42
		MCS5	0.00012	0.00013	88.75	0.52
		MCS6	0.00011	0.00012	87.94	0.56
		MCS7	0.00010	0.00012	87.10	0.60
	802.11 ac(VHT80)	MCS0	0.00033	0.00035	95.49	0.20
		MCS1	0.00019	0.00020	92.30	0.35
		MCS2	0.00014	0.00016	90.18	0.45
		MCS3	0.00012	0.00013	88.09	0.55
		MCS4	0.00010	0.00011	85.96	0.66
		MCS5	0.00008	0.00010	83.63	0.78
		MCS6	0.00008	0.00009	82.90	0.81
		MCS7	0.00007	0.00009	82.06	0.86
		MCS8	0.00007	0.00008	81.27	0.90
		MCS9	0.00006	0.00008	80.25	0.96

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

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

5.4 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by DC Power.

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 PCB Antenna is located on the main board of EUT and the PCB antenna is connected to the outside of the EUT by a special connector type, 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)
It is not need to test this requirement, because the power of the EUT is supplied by DC Power.	

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

7. MIMIMUM 26 dB BANDWIDTH

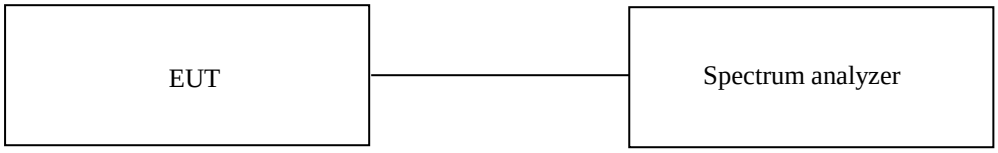
7.1 Operating environment

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 approximately 1% of the emission bandwidth, and peak detection was used. The 26 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26 dB.



7.3 Test Date

February 01, 2023 ~ March 06, 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)

7.4 Test data for 802.11a RLAN Mode

7.4.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 180.00	19.48
	Middle	5 220.00	19.68
	High	5 240.00	19.68
5 725 ~ 5 850	Low	5 745.00	19.53
	Middle	5 785.00	19.58
	High	5 825.00	19.68

7.4.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 180.00	19.58
	Middle	5 220.00	19.68
	High	5 240.00	19.68
5 725 ~ 5 850	Low	5 745.00	19.63
	Middle	5 785.00	19.58
	High	5 825.00	19.63

7.5 Test data for 802.11n_HT20 RLAN Mode

7.5.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 180.00	20.13
	Middle	5 220.00	19.93
	High	5 240.00	19.93
5 725 ~ 5 850	Low	5 745.00	19.88
	Middle	5 785.00	20.28
	High	5 825.00	19.83

7.5.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 180.00	20.13
	Middle	5 220.00	19.83
	High	5 240.00	19.98
5 725 ~ 5 850	Low	5 745.00	19.93
	Middle	5 785.00	20.48
	High	5 825.00	19.88

7.6 Test data for 802.11n_HT40 RLAN Mode

7.6.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 190.00	40.66
	High	5 230.00	40.56
5 725 ~ 5 850	Low	5 755.00	40.66
	High	5 795.00	40.06

7.6.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Low	5 190.00	40.66
	High	5 230.00	40.66
5 725 ~ 5 850	Low	5 755.00	40.66
	High	5 795.00	40.66

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

7.7 Test data for 802.11ac_VHT80 RLAN Mode

7.7.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Middle	5 210.00	81.72
5 725 ~ 5 850	Middle	5 775.00	81.92

7.7.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	26 dB Bandwidth (MHz)
5 150 ~ 5 250	Middle	5 210.00	81.92
5 725 ~ 5 850	Middle	5 775.00	81.72

8. 6 dB BANDWIDTH

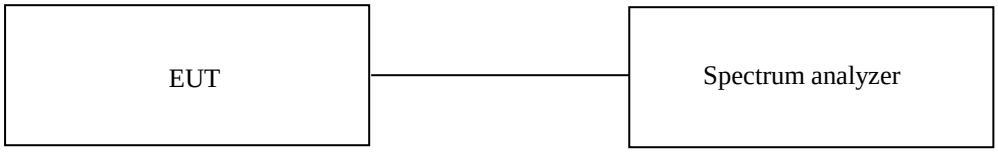
8.1 Operating environment

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 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.



8.3 Test Date

February 01, 2023 ~ March 06, 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)

8.4 Test data for 802.11a RLAN Mode

8.4.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 745.00	16.38	0.50	15.88
	Middle	5 785.00	16.33	0.50	15.83
	High	5 825.00	16.38	0.50	15.88

8.4.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 745.00	16.33	0.50	15.83
	Middle	5 785.00	16.38	0.50	15.88
	High	5 825.00	16.33	0.50	15.83

8.5 Test data for 802.11n_HT20 RLAN Mode

8.5.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 745.00	17.48	0.50	16.98
	Middle	5 785.00	16.88	0.50	16.38
	High	5 825.00	16.83	0.50	16.33

8.5.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 745.00	16.93	0.50	16.43
	Middle	5 785.00	16.88	0.50	16.38
	High	5 825.00	16.88	0.50	16.38

8.6 Test data for 802.11n_HT40 RLAN Mode

8.6.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 755.00	35.76	0.50	35.26
	High	5 795.00	35.66	0.50	35.16

8.6.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Low	5 755.00	35.76	0.50	35.26
	High	5 795.00	35.66	0.50	35.16

8.7 Test data for 802.11ac_VHT80 RLAN Mode

8.7.1 Test data for Internal Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Middle	5 775.00	76.32	0.50	75.82

8.7.2 Test data for External Antenna

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)
5 725 ~ 5 850	Middle	5 775.00	76.32	0.50	75.82

9. MAXIMUM CONDUCTED OUTPUT POWER (Radiated output power (E.I.R.P))

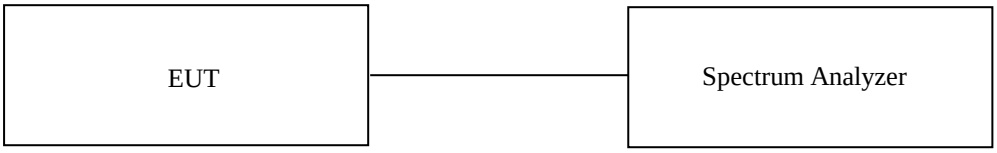
9.1 Operating environment

Temperature : 24 °C

Relative humidity : 45 % R.H.

9.2 Test set-up for conducted measurement

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 26 dB & 6 dB bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



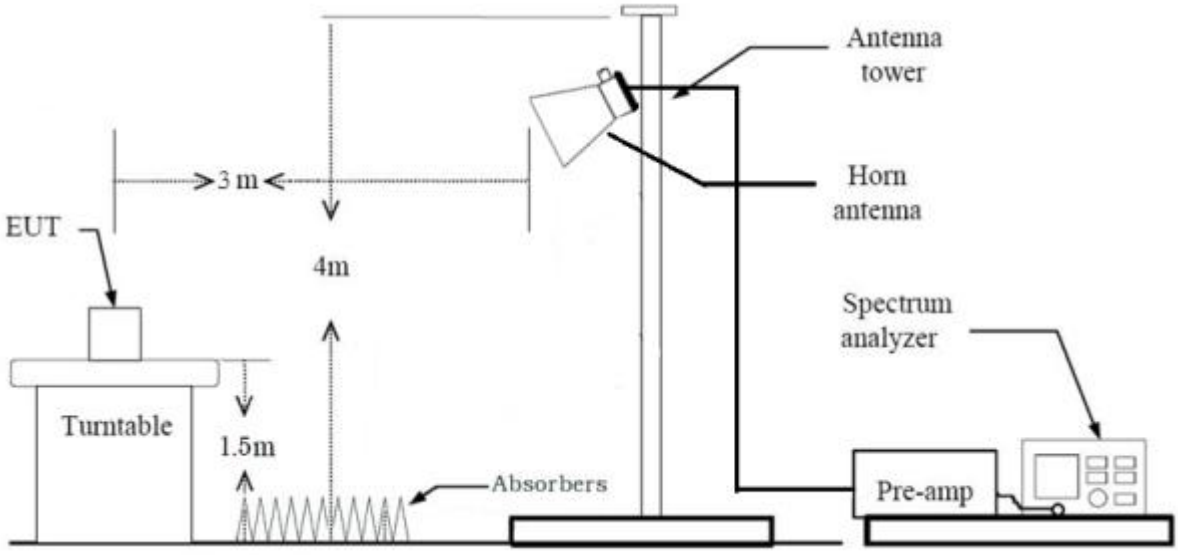
9.3 Test set-up for radiated measurement

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.

- Test Configuration

Above 1 GHz



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

9.4 Test Date

June 19, 2023 ~ July 05, 2023

9.5 UNII 1

9.5.1 Test data for Internal Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	OBW (MHz)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 180.00	H	1.7	290	16.43	72.72	38.04	110.76	15.50	0.63	14.87	24.00
	5 220.00	H	1.7	290	16.43	72.70	38.05	110.75	15.49	0.63	14.86	24.00
	5 240.00	H	1.7	290	16.48	72.68	37.86	110.54	15.28	0.63	14.65	24.00
802.11n (HT20)	5 180.00	H	1.7	290	17.63	73.64	38.04	111.68	16.42	0.63	15.79	24.00
	5 220.00	H	1.7	290	17.63	73.57	38.05	111.62	16.36	0.63	15.73	24.00
	5 240.00	H	1.7	290	17.58	73.57	37.86	111.43	16.17	0.63	15.54	24.00
802.11n (HT40)	5 190.00	H	1.7	290	36.26	72.87	38.08	110.95	15.69	0.63	15.06	24.00
	5 230.00	H	1.7	290	36.26	72.65	37.90	110.55	15.29	0.63	14.66	24.00
802.11ac (VHT80)	5 210.00	H	1.7	290	76.32	68.92	38.25	107.17	11.91	0.63	11.28	24.00

9.5.2 Test data for External Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	OBW (MHz)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 180.00	V	1.7	230	16.43	67.75	38.04	105.79	10.53	2.37	8.16	24.00
	5 220.00	V	1.7	230	16.43	67.71	38.05	105.76	10.50	2.37	8.13	24.00
	5 240.00	V	1.7	230	16.48	67.16	37.86	105.02	9.76	2.37	7.39	24.00
802.11n (HT20)	5 180.00	V	1.7	230	17.58	68.72	38.04	106.76	11.50	2.37	9.13	24.00
	5 220.00	V	1.7	230	17.58	68.53	38.05	106.58	11.32	2.37	8.95	24.00
	5 240.00	V	1.7	230	17.58	68.21	37.86	106.07	10.81	2.37	8.44	24.00
802.11n (HT40)	5 190.00	V	1.7	230	36.26	67.58	38.08	105.66	10.40	2.37	8.03	24.00
	5 230.00	V	1.7	230	36.26	67.44	37.90	105.34	10.08	2.37	7.71	24.00
802.11ac (VHT80)	5 210.00	V	1.7	230	76.52	63.75	38.25	102.00	6.74	2.37	4.37	24.00

9.6 UNII 3

9.6.1 Test data for Internal Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	OBW (MHz)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 745.00	V	1.7	350	16.43	70.64	38.68	109.32	14.06	-1.04	15.10	30.00
	5 785.00	V	1.7	350	16.43	69.63	38.92	108.55	13.29	-1.04	14.33	30.00
	5 825.00	V	1.7	350	16.43	69.20	38.98	108.18	12.92	-1.04	13.96	30.00
802.11n (HT20)	5 745.00	V	1.7	350	17.58	71.65	38.68	110.33	15.07	-1.04	16.11	30.00
	5 785.00	V	1.7	350	17.63	70.73	38.92	109.65	14.39	-1.04	15.43	30.00
	5 825.00	V	1.7	350	17.58	70.24	38.98	109.22	13.96	-1.04	15.00	30.00
802.11n (HT40)	5 755.00	V	1.7	350	36.26	70.29	38.66	108.95	13.69	-1.04	14.73	30.00
	5 795.00	V	1.7	350	36.26	69.57	38.91	108.48	13.22	-1.04	14.26	30.00
802.11ac (VHT80)	5 775.00	V	1.7	350	76.52	66.22	38.98	105.20	9.94	-1.04	10.98	30.00

9.6.2 Test data for External Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	OBW (MHz)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 745.00	V	1.7	255	16.48	67.52	38.68	106.20	10.94	3.61	7.33	30.00
	5 785.00	V	1.7	255	16.48	68.15	38.92	107.07	11.81	3.61	8.20	30.00
	5 825.00	V	1.7	255	16.48	67.31	38.98	106.29	11.03	3.61	7.42	30.00
802.11n (HT20)	5 745.00	V	1.7	255	17.53	68.47	38.68	107.15	11.89	3.61	8.28	30.00
	5 785.00	V	1.7	255	17.63	69.11	38.92	108.03	12.77	3.61	9.16	30.00
	5 825.00	V	1.7	255	17.58	68.34	38.98	107.32	12.06	3.61	8.45	30.00
802.11n (HT40)	5 755.00	V	1.7	255	36.36	67.57	38.66	106.23	10.97	3.61	7.36	30.00
	5 795.00	V	1.7	255	36.36	67.73	38.91	106.64	11.38	3.61	7.77	30.00
802.11ac (VHT80)	5 775.00	V	1.7	255	76.92	63.97	38.98	102.95	7.69	3.61	4.08	30.00

10. PEAK POWER SPECTRAL DENSITY (Radiated power spectral density)

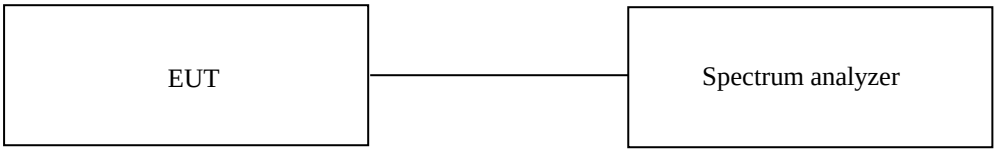
10.1 Operating environment

Temperature : 24 °C

Relative humidity : 45 % R.H.

10.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz(500 kHz for frequency range 5 725 MHz ~ 5 850 MHz), the video bandwidth is set to 3 times the resolution bandwidth. The maximum level form the EUT in 1 MHz bandwidth was measured with above condition.



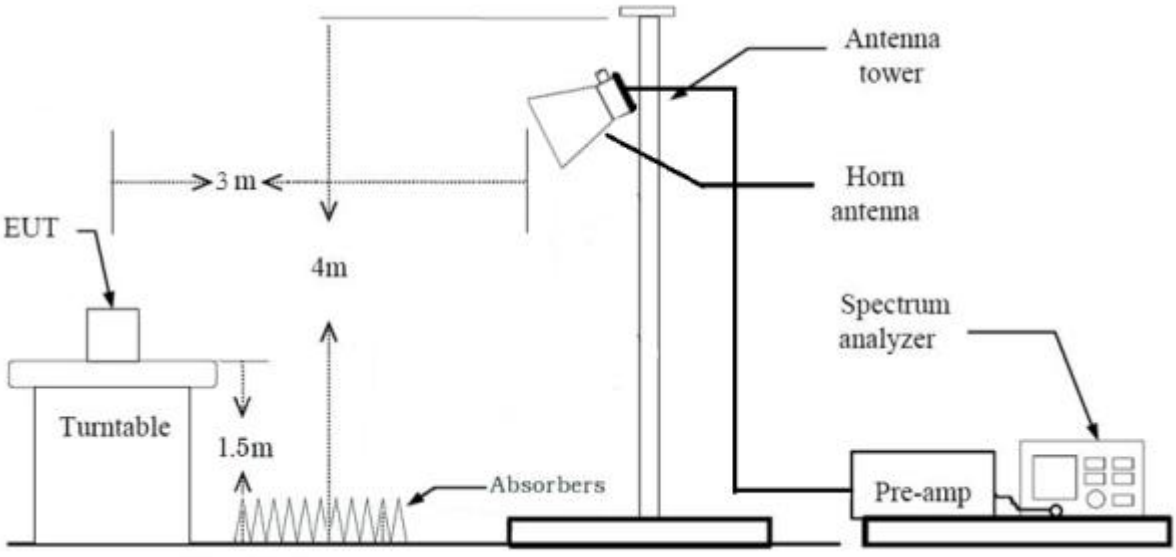
10.3 Test set-up for radiated measurement

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.

- Test Configuration

Above 1 GHz



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

10.4 Test Date

June 19, 2023 ~ July 05, 2023

10.5 UNII 1

10.5.1 Test data for Internal Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 180.00	H	1.7	290	61.37	38.04	99.41	4.15	0.63	3.52	11.00
	5 220.00	H	1.7	290	61.73	38.05	99.78	4.52	0.63	3.89	11.00
	5 240.00	H	1.7	290	61.70	37.86	99.56	4.30	0.63	3.67	11.00
802.11n (HT20)	5 180.00	H	1.7	290	62.48	38.04	100.52	5.26	0.63	4.63	11.00
	5 220.00	H	1.7	290	62.43	38.05	100.48	5.22	0.63	4.59	11.00
	5 240.00	H	1.7	290	62.59	37.86	100.45	5.19	0.63	4.57	11.00
802.11n (HT40)	5 190.00	H	1.7	290	58.83	38.08	96.91	1.64	0.63	1.02	11.00
	5 230.00	H	1.7	290	58.58	37.90	96.48	1.22	0.63	0.59	11.00
802.11ac (VHT80)	5 210.00	H	1.7	290	51.59	38.25	89.84	-5.42	0.63	-6.05	11.00

10.5.2 Test data for External Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 180.00	V	1.7	230	57.03	38.04	95.07	-0.19	2.37	-2.56	11.00
	5 220.00	V	1.7	230	57.09	38.05	95.14	-0.12	2.37	-2.49	11.00
	5 240.00	V	1.7	230	56.51	37.86	94.37	-0.89	2.37	-3.26	11.00
802.11n (HT20)	5 180.00	V	1.7	230	57.64	38.04	95.68	0.42	2.37	-1.95	11.00
	5 220.00	V	1.7	230	57.56	38.05	95.61	0.35	2.37	-2.02	11.00
	5 240.00	V	1.7	230	57.06	37.86	94.92	-0.34	2.37	-2.71	11.00
802.11n (HT40)	5 190.00	V	1.7	230	53.28	38.08	91.36	-3.90	2.37	-6.27	11.00
	5 230.00	V	1.7	230	53.72	37.90	91.62	-3.64	2.37	-6.01	11.00
802.11ac (VHT80)	5 210.00	V	1.7	230	46.25	38.25	84.50	-10.76	2.37	-13.13	11.00

10.6 UNII 3

10.6.1 Test data for Internal Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (˚)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 745.00	V	1.7	350	56.67	38.68	95.34	0.09	-1.04	1.13	30.00
	5 785.00	V	1.7	350	56.02	38.92	94.94	-0.32	-1.04	0.72	30.00
	5 825.00	V	1.7	350	55.50	38.98	94.48	-0.78	-1.04	0.26	30.00
802.11n (HT20)	5 745.00	V	1.7	350	57.56	38.68	96.24	0.98	-1.04	2.02	30.00
	5 785.00	V	1.7	350	56.48	38.92	95.40	0.14	-1.04	1.18	30.00
	5 825.00	V	1.7	350	56.12	38.98	95.10	-0.16	-1.04	0.88	30.00
802.11n (HT40)	5 755.00	V	1.7	350	53.59	38.66	92.25	-3.01	-1.04	-1.97	30.00
	5 795.00	V	1.7	350	52.66	38.91	91.57	-3.69	-1.04	-2.65	30.00
802.11ac (VHT80)	5 775.00	V	1.7	350	46.03	38.98	85.01	-10.25	-1.04	-9.21	30.00

10.6.2 Test data for External Antenna

Mode	Frequency (MHz)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (˚)	Measured (dBuV)	C.F (dB)	Result (dBuV/m)	E.I.R.P (dBm)	Ant Gain (dBi)	Conducted Power (dBm)	Limit (dBm)
802.11a	5 745.00	V	1.7	255	53.99	38.68	92.67	-2.59	3.61	-6.20	30.00
	5 785.00	V	1.7	255	54.75	38.92	93.67	-1.59	3.61	-5.20	30.00
	5 825.00	V	1.7	255	54.04	38.98	93.02	-2.24	3.61	-5.85	30.00
802.11n (HT20)	5 745.00	V	1.7	255	54.69	38.68	93.37	-1.89	3.61	-5.50	30.00
	5 785.00	V	1.7	255	55.73	38.92	94.65	-0.61	3.61	-4.22	30.00
	5 825.00	V	1.7	255	54.40	38.98	93.38	-1.88	3.61	-5.49	30.00
802.11n (HT40)	5 755.00	V	1.7	255	50.76	38.66	89.42	-5.84	3.61	-9.45	30.00
	5 795.00	V	1.7	255	51.17	38.91	90.08	-5.18	3.61	-8.79	30.00
802.11ac (VHT80)	5 775.00	V	1.7	255	43.74	38.98	82.72	-12.54	3.61	-16.15	30.00

11. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

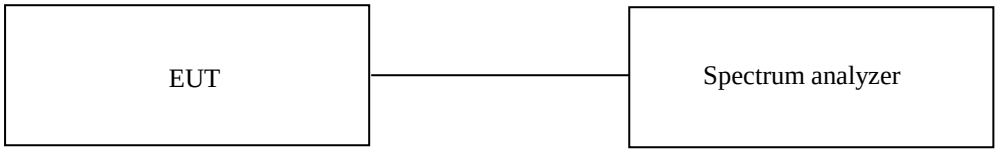
11.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

11.2 Test set-up

Turn EUT off and set chamber temperature to -30 °C and then allow sufficient time (approximately 20 min to 30 min after chamber reach the assigned temperature) for EUT to stabilize. Turn on the EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10 °C step from -30 °C to +50 °C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.



11.3 Test Date

February 01, 2023 ~ March 06, 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)

11.4 Test Data for U-NII-1

11.4.1 Test data for Internal Antenna

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
-30	5 180 000 000	5 180 024 200	24 200
-20		5 180 024 200	24 200
-10		5 180 039 850	39 850
0		5 180 031 250	31 250
10		5 180 021 900	21 900
20		5 180 025 000	25 000
30		5 180 017 950	17 950
40		5 180 000 750	750
50		5 180 001 550	1 550
-30	5 220 000 000	5 220 033 600	33 600
-20		5 220 041 400	41 400
-10		5 220 044 500	44 500
0		5 220 029 700	29 700
10		5 220 038 250	38 250
20		5 220 031 250	31 250
30		5 220 014 850	14 850
40		5 220 007 000	7 000
50		5 220 004 700	4 700
-30	5 240 000 000	5 240 021 850	21 850
-20		5 240 025 000	25 000
-10		5 240 047 650	47 650
0		5 240 038 300	38 300
10		5 240 031 250	31 250
20		5 240 022 650	22 650
30		5 240 010 950	10 950
40		5 239 992 150	- 7 850
50		5 240 000 800	800

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

11.4.2 Test data for External Antenna

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
-30	5 180 000 000	5 180 022 650	22 650
-20		5 180 025 000	25 000
-10		5 180 009 350	9 350
0		5 180 035 900	35 900
10		5 180 014 050	14 050
20		5 180 021 850	21 850
30		5 180 010 150	10 150
40		5 180 008 600	8 600
50		5 180 006 250	6 250
-30	5 220 000 000	5 220 030 450	30 450
-20		5 220 021 850	21 850
-10		5 220 014 850	14 850
0		5 220 039 100	39 100
10		5 220 010 150	10 150
20		5 220 014 800	14 800
30		5 220 007 050	7 050
40		5 219 992 150	- 7 850
50		5 220 017 950	17 950
-30	5 240 000 000	5 240 037 500	37 500
-20		5 240 043 750	43 750
-10		5 240 021 850	21 850
0		5 240 032 800	32 800
10		5 240 025 000	25 000
20		5 240 017 950	17 950
30		5 240 003 150	3 150
40		5 239 992 200	- 7 800
50		5 240 014 050	14 050

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

11.5 Test Data for U-NII-3

11.5.1 Test data for Internal Antenna

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
-30	5 745 000 000	5 745 019 500	19 500
-20		5 745 029 700	29 700
-10		5 745 030 450	30 450
0		5 745 036 750	36 750
10		5 745 021 850	21 850
20		5 745 019 550	19 550
30		5 745 012 500	12 500
40		5 745 008 550	8 550
50		5 744 991 400	- 8 600
-30	5 785 000 000	5 785 020 350	20 350
-20		5 785 025 750	25 750
-10		5 785 041 400	41 400
0		5 785 043 750	43 750
10		5 785 021 100	21 100
20		5 785 016 400	16 400
30		5 785 019 500	19 500
40		5 785 004 700	4 700
50		5 784 989 850	- 10 150
-30	5 825 000 000	5 825 014 850	14 850
-20		5 825 022 650	22 650
-10		5 825 028 150	28 150
0		5 825 028 100	28 100
10		5 825 027 350	27 350
20		5 825 014 050	14 050
30		5 825 010 950	10 950
40		5 825 000 800	800
50		5 824 994 550	- 5 450

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

11.5.2 Test data for External Antenna

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
-30	5 745 000 000	5 745 032 800	32 800
-20		5 745 032 800	32 800
-10		5 745 052 350	52 350
0		5 745 021 050	21 050
10		5 745 031 250	31 250
20		5 745 025 000	25 000
30		5 745 010 950	10 950
40		5 744 980 450	- 19 550
50		5 745 017 200	17 200
-30	5 785 000 000	5 785 024 200	24 200
-20		5 785 033 600	33 600
-10		5 785 040 650	40 650
0		5 785 015 650	15 650
10		5 785 026 550	26 550
20		5 785 027 350	27 350
30		5 785 010 950	10 950
40		5 784 978 100	- 21 900
50		5 785 023 450	23 450
-30	5 825 000 000	5 825 021 850	21 850
-20		5 825 033 600	33 600
-10		5 825 042 150	42 150
0		5 825 019 500	19 500
10		5 825 034 400	34 400
20		5 825 008 600	8 600
30		5 825 003 150	3 150
40		5 824 976 550	- 23 450
50		5 825 018 000	18 000

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. FREQUENCY STABILITY WITH VOLTAGE VARIATION

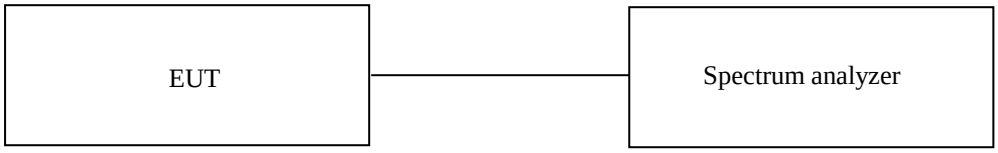
12.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

12.2 Test set-up

An external DC power supply was connected to the input of the EUT. The voltage of EUT set to 115 % of the nominal value and then was reduced to 85 % of nominal voltage. The output frequency was recorded at each step.



12.3 Test Date

February 01, 2023 ~ March 06, 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 for U-NII-1

12.4.1 Test data for Internal Antenna

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 180 000 000	5 180 028 900	28 900
10.2		5 180 010 150	10 150
13.8		5 180 018 000	18 000
12.0	5 220 000 000	5 220 025 750	25 750
10.2		5 220 012 500	12 500
13.8		5 220 020 300	20 300
12.0	5 240 000 000	5 240 017 150	17 150
10.2		5 240 007 800	7 800
13.8		5 240 017 200	17 200

12.4.2 Test data for External Antenna

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 180 000 000	5 180 012 500	12 500
10.2		5 180 007 800	7 800
13.8		5 180 012 500	12 500
12.0	5 220 000 000	5 220 018 750	18 750
10.2		5 220 002 300	2 300
13.8		5 220 005 450	5 450
12.0	5 240 000 000	5 240 012 500	12 500
10.2		5 240 003 900	3 900
13.8		5 240 005 500	5 500

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

12.5 Test Data for U-NII-3

12.5.1 Test data for Internal Antenna

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 745 000 000	5 745 032 050	32 050
10.2		5 745 024 200	24 200
13.8		5 745 025 750	25 750
12.0	5 785 000 000	5 785 032 050	32 050
10.2		5 785 035 150	35 150
13.8		5 785 029 700	29 700
12.0	5 825 000 000	5 825 032 000	32 000
10.2		5 825 035 950	35 950
13.8		5 825 030 450	30 450

12.5.2 Test data for External Antenna

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 745 000 000	5 745 020 350	20 350
10.2		5 745 010 950	10 950
13.8		5 745 026 550	26 550
12.0	5 785 000 000	5 785 014 050	14 050
10.2		5 785 019 500	19 500
13.8		5 785 020 300	20 300
12.0	5 825 000 000	5 825 007 050	7 050
10.2		5 825 008 600	8 600
13.8		5 825 018 750	18 750

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

13. RADIATED SPURIOUS EMISSIONS

13.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

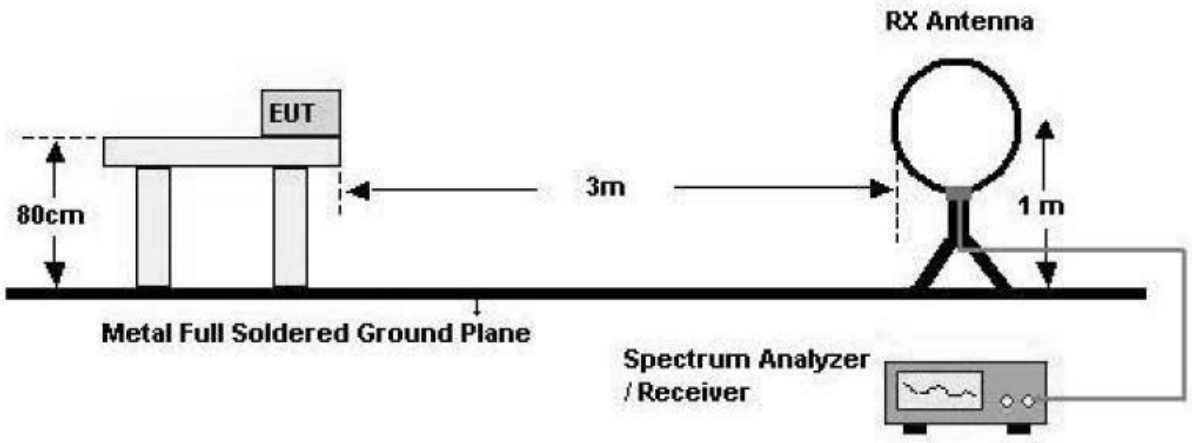
13.2 Test set-up for conducted measurement

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.

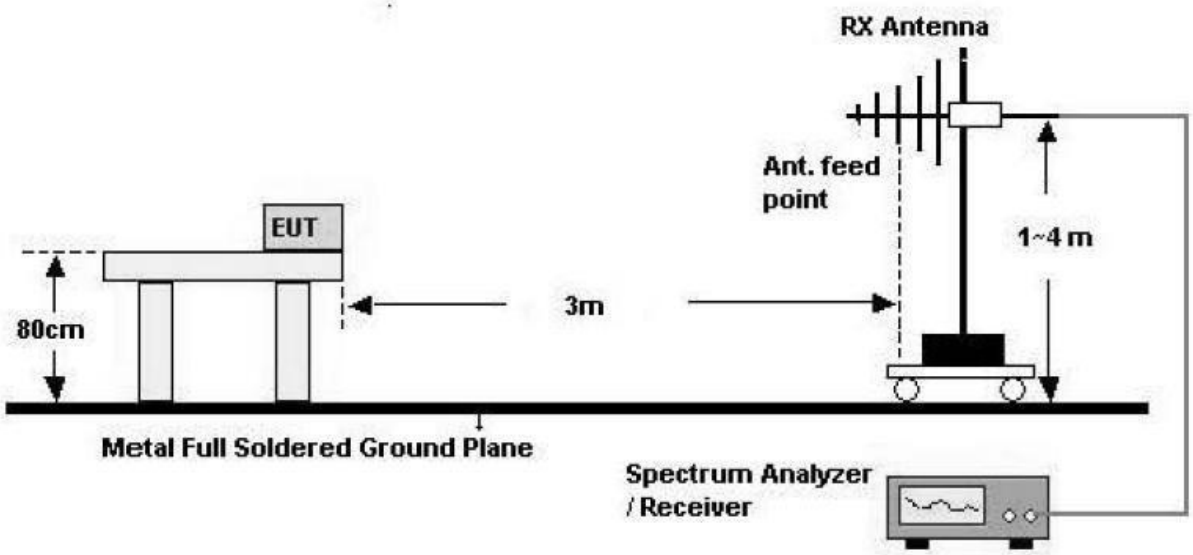
The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

- Test Configuration

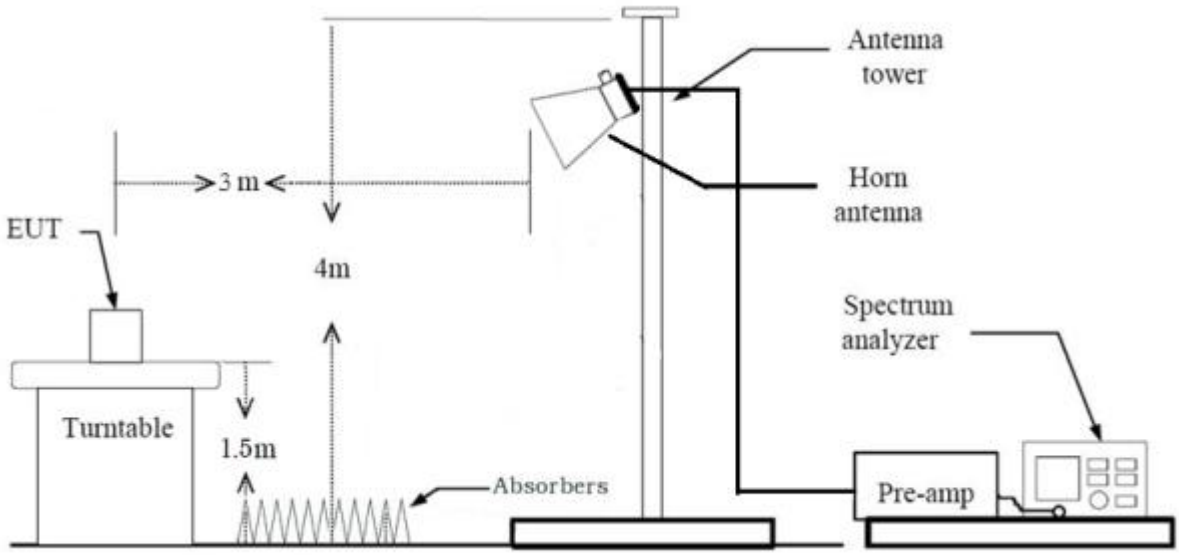
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



13.3 Test Date

February 01, 2023 ~ March 06, 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)

13.4 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.									

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

13.5 Test data for 30 MHz ~ 1 000 MHz

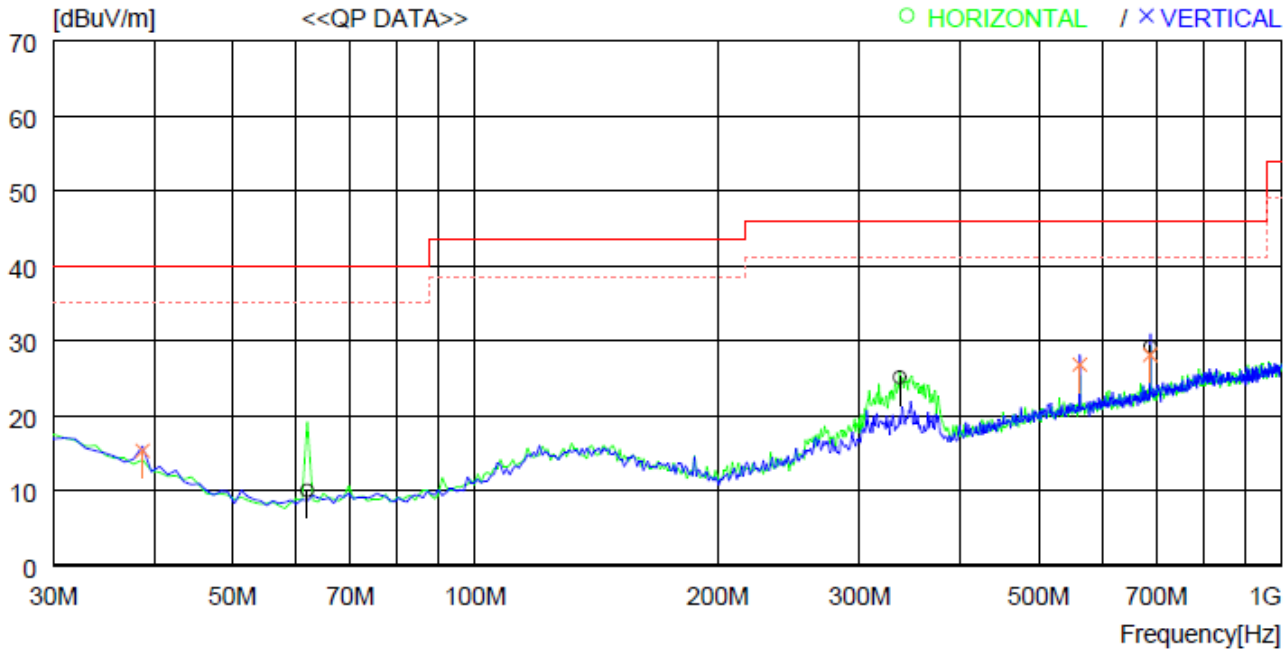
13.5.1 Test data for WLAN 5 GHz_Internal Antenna

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

Result : PASSED

EUT : Silverbox RADIO ASM-RECEIVER

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	62.010	28.7	12.3	1.0	32.0	10.0	40.0	30.0	400	350
2	336.520	35.0	19.7	2.4	32.0	25.1	46.0	20.9	100	130
3	687.655	32.9	25.2	3.4	32.3	29.2	46.0	16.8	400	19
----- Vertical ------										
4	38.730	29.0	17.6	0.8	32.1	15.3	40.0	24.7	100	146
5	562.529	32.2	23.7	3.1	32.2	26.8	46.0	19.2	100	0
6	687.655	31.8	25.2	3.4	32.3	28.1	46.0	17.9	100	204

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

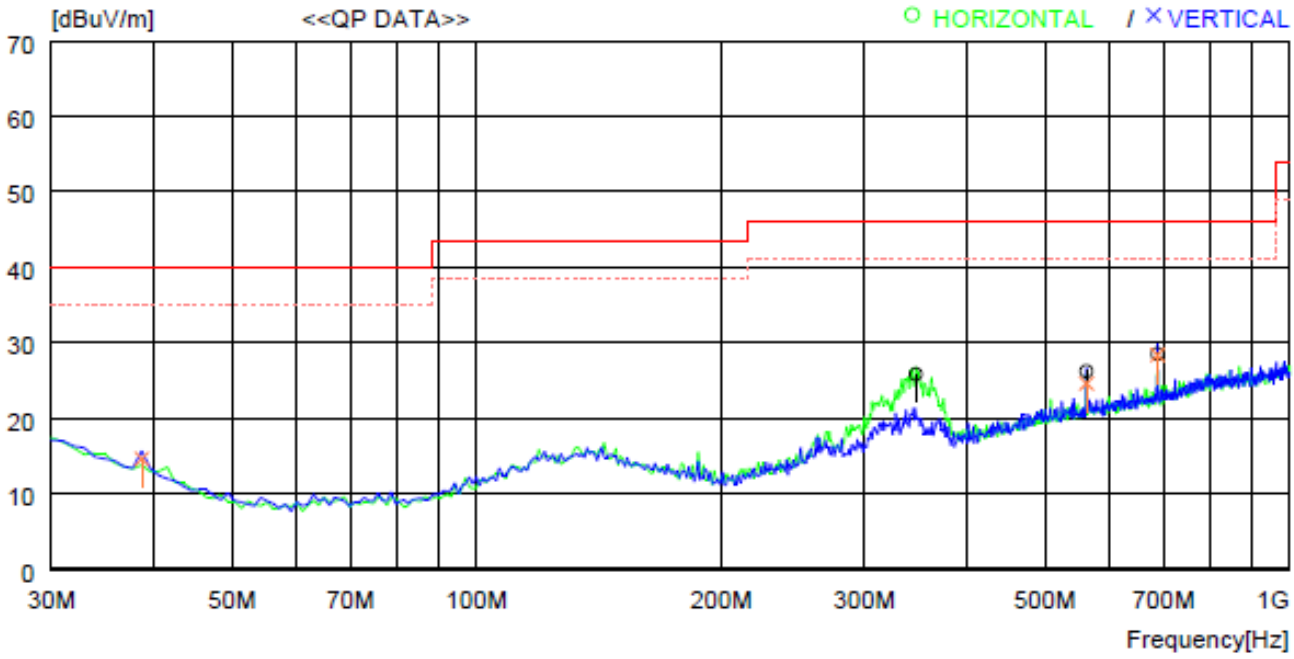
13.5.2 Test data for WLAN 5 GHz_External Antenna

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

Result : PASSED

EUT : Silverbox RADIO ASM-RECEIVER

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	347.190	35.5	19.9	2.4	32.0	25.8	46.0	20.2	100	152
2	562.529	31.6	23.7	3.1	32.2	26.2	46.0	19.8	400	301
3	687.655	32.2	25.2	3.4	32.3	28.5	46.0	17.5	400	0
----- Vertical ------										
4	38.730	28.3	17.6	0.8	32.1	14.6	40.0	25.4	100	0
5	562.529	30.0	23.7	3.1	32.2	24.6	46.0	21.4	400	359
6	687.655	32.1	25.2	3.4	32.3	28.4	46.0	17.6	100	235

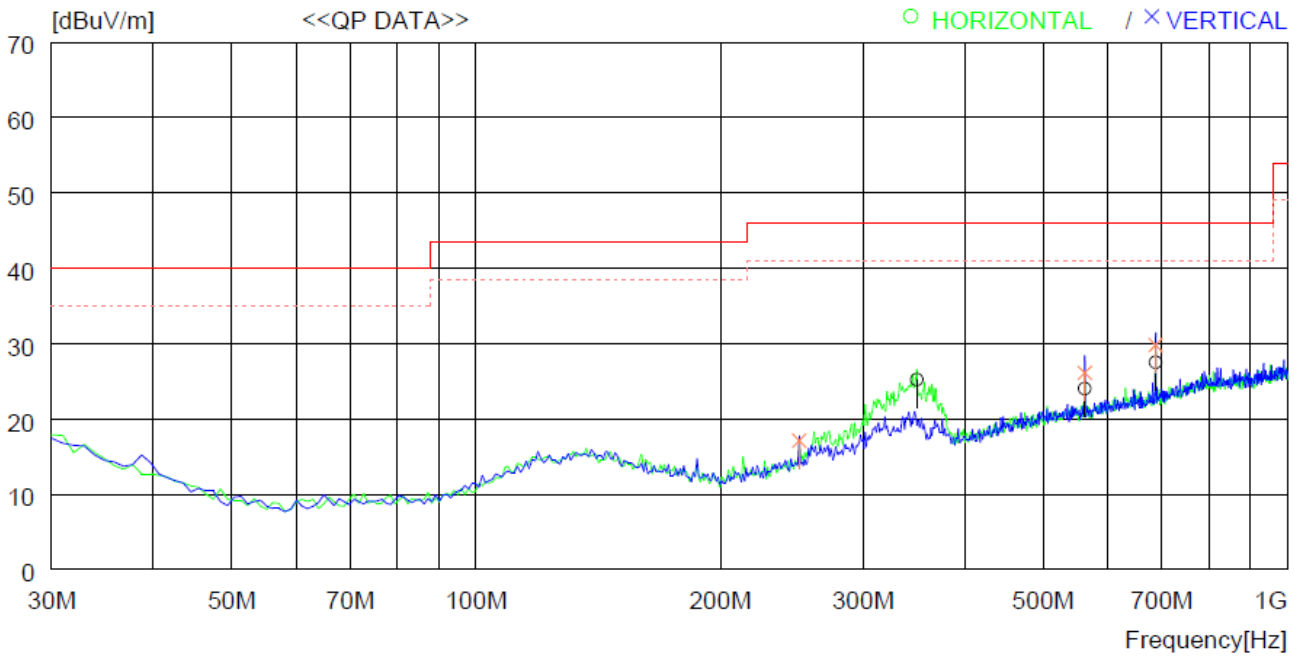
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.5.3 Test data for Intermodulation Mode(Bluetooth + WLAN 5 GHz)

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30 MHz ~ 1 000 MHz

-. Measurement distance : 3 m



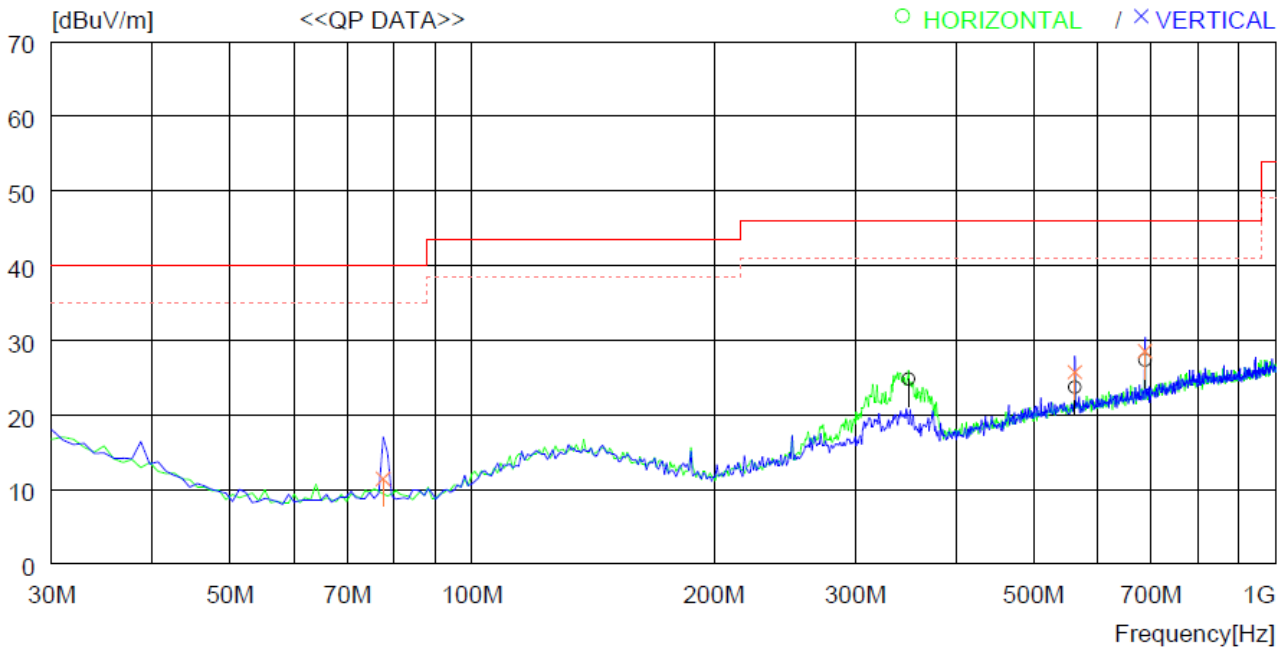
No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	349.130	34.9	19.9	2.4	32.0	25.2	46.0	20.8	100	137
2	562.529	29.4	23.7	3.1	32.2	24.0	46.0	22.0	400	0
3	687.655	31.2	25.2	3.4	32.3	27.5	46.0	18.5	400	165
----- Vertical ------										
4	250.190	29.5	17.6	2.0	32.0	17.1	46.0	28.9	200	32
5	562.529	31.5	23.7	3.1	32.2	26.1	46.0	19.9	100	254
6	687.655	33.5	25.2	3.4	32.3	29.8	46.0	16.2	100	0

13.5.4 Test data for Intermodulation Mode(WLAN 2.4 GHz + WLAN 5 GHz)

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30 MHz ~ 1 000 MHz

-. Measurement distance : 3 m



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	349.130	34.5	19.9	2.4	32.0	24.8	46.0	21.2	100	359
2	562.529	29.1	23.7	3.1	32.2	23.7	46.0	22.3	400	261
3	687.655	31.0	25.2	3.4	32.3	27.3	46.0	18.7	400	26
----- Vertical ------										
4	77.530	29.1	13.2	1.1	32.0	11.4	40.0	28.6	400	48
5	562.529	31.1	23.7	3.1	32.2	25.7	46.0	20.3	100	166
6	687.655	32.2	25.2	3.4	32.3	28.5	46.0	17.5	100	201

13.6 Test data for Above 1 GHz

13.6.1 Test data for Frequency UNII I

13.6.1.1 Test data for 802.11a RLAN Mode

13.6.1.1.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.97 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
10 359.55	50.07	Peak	H	39.66	13.92	45.33	-	58.32	68.20	9.88
10 357.40	50.14	Peak	V	39.66	13.92	45.33	-	58.39	68.20	9.81
Middle Channel										
10 429.46	49.57	Peak	H	39.90	13.92	45.31	-	58.08	68.20	10.12
10 432.36	50.59	Peak	V	39.90	13.92	45.31	-	59.10	68.20	9.10
High Channel										
10 482.50	50.18	Peak	H	39.98	13.92	45.30	-	58.78	68.20	9.42
10 499.63	50.15	Peak	V	39.98	13.92	45.30	-	58.75	68.20	9.45

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.1.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.97 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 347.36	49.31	Peak	H	39.66	13.92	45.33	-	57.56	68.20	10.64
10 368.44	49.54	Peak	V	39.66	13.92	45.33	-	57.79	68.20	10.41
Middle Channel										
10 457.88	49.14	Peak	H	39.90	13.92	45.31	-	57.65	68.20	10.55
10 447.64	49.57	Peak	V	39.90	13.92	45.31	-	58.08	68.20	10.12
High Channel										
10 456.57	49.33	Peak	H	39.98	13.92	45.30	-	57.93	68.20	10.27
10 490.39	49.67	Peak	V	39.98	13.92	45.30	-	58.27	68.20	9.93

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.2 Test data for 802.11n_HT20 RLAN Mode

13.6.1.2.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.90 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 361.35	50.15	Peak	H	39.66	13.92	45.33	-	58.40	68.20	9.80
10 365.64	49.70	Peak	H	39.66	13.92	45.33	-	57.95	68.20	10.25
Middle Channel										
10 439.10	50.05	Peak	H	39.90	13.92	45.31	-	58.56	68.20	9.64
10 447.99	49.97	Peak	V	39.90	13.92	45.31	-	58.48	68.20	9.72
High Channel										
10 493.94	50.67	Peak	H	39.98	13.92	45.30	-	59.27	68.20	8.93
10 478.00	50.12	Peak	V	39.98	13.92	45.30	-	58.72	68.20	9.48

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.2.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.90 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 366.34	50.12	Peak	H	39.66	13.92	45.33	-	58.37	68.20	9.83
10 339.32	49.16	Peak	V	39.66	13.92	45.33	-	57.41	68.20	10.79
Middle Channel										
10 441.80	49.31	Peak	H	39.90	13.92	45.31	-	57.82	68.20	10.38
10 443.60	48.86	Peak	V	39.90	13.92	45.31	-	57.37	68.20	10.83
High Channel										
10 484.50	49.02	Peak	H	39.98	13.92	45.30	-	57.62	68.20	10.58
10 497.13	49.25	Peak	V	39.98	13.92	45.30	-	57.85	68.20	10.35

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.3 Test data for 802.11n_HT40 RLAN Mode

13.6.1.3.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 97.83 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 412.17	50.70	Peak	H	39.66	13.92	45.33	-	58.95	68.20	9.25
10 507.85	50.60	Peak	V	39.66	13.92	45.33	-	58.85	68.20	9.35
High Channel										
10 482.18	50.81	Peak	H	39.90	13.92	45.31	-	59.32	68.20	8.88
10 348.13	50.83	Peak	V	39.90	13.92	45.31	-	59.34	68.20	8.86

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

13.6.1.3.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 97.82 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
10 420.46	49.03	Peak	H	39.66	13.92	45.33	-	57.28	68.20	10.92
10 338.64	49.53	Peak	V	39.66	13.92	45.33	-	57.78	68.20	10.42
High Channel										
10 425.93	49.21	Peak	H	39.90	13.92	45.31	-	57.72	68.20	10.48
10 481.18	49.65	Peak	V	39.90	13.92	45.31	-	58.16	68.20	10.04

Remark - "H": Horizontal, "V": Vertical

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.4 Test data for 802.11ac_HT80 RLAN Mode

13.6.1.4.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 95.47 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel										
10 467.15	49.05	Peak	H	39.85	13.92	45.32	-	57.50	68.20	10.70
10 402.22	48.99	Peak	V	39.85	13.92	45.32	-	57.44	68.20	10.76

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.1.4.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 95.49 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel										
10 424.20	48.56	Peak	H	39.85	13.92	45.32	-	57.01	68.20	11.19
10 439.38	49.29	Peak	V	39.85	13.92	45.32	-	57.74	68.20	10.46

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2 Test data for Frequency UNII 3

13.6.2.1 Test data for 802.11a RLAN Mode

13.6.2.1.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.97 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 471.52	49.73	Peak	H	40.10	15.12	45.30	-	59.65	74.00	14.35
11 475.12	36.65	Average	H	40.10	15.12	45.30	0.04	46.61	54.00	7.39
11 473.22	49.02	Peak	V	40.10	15.12	45.30	-	58.94	74.00	15.06
11 471.77	36.60	Average	V	40.10	15.12	45.30	0.04	46.56	54.00	7.44
Middle Channel										
11 578.79	49.77	Peak	H	40.02	15.12	45.30	-	59.61	74.00	14.39
11 580.14	37.27	Average	H	40.02	15.12	45.30	0.04	47.15	54.00	6.85
11 585.04	49.50	Peak	V	40.02	15.12	45.30	-	59.34	74.00	14.66
11 575.10	37.42	Average	V	40.02	15.12	45.30	0.04	47.30	54.00	6.70
High Channel										
11 630.07	50.08	Peak	H	39.70	15.12	45.30	-	59.60	74.00	14.40
11 657.19	37.15	Average	H	39.70	15.12	45.30	0.04	46.71	54.00	7.29
11 674.18	49.15	Peak	V	39.70	15.12	45.30	-	58.67	74.00	15.33
11 650.65	37.16	Average	V	39.70	15.12	45.30	0.04	46.72	54.00	7.28

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.1.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.97 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
11 467.62	49.27	Peak	H	40.10	15.12	45.30	-	59.19	74.00	14.81
11 474.57	36.48	Average	H	40.10	15.12	45.30	0.04	46.44	54.00	7.56
11 505.24	48.40	Peak	V	40.10	15.12	45.30	-	58.32	74.00	15.68
11 482.46	36.38	Average	V	40.10	15.12	45.30	0.04	46.34	54.00	7.66
Middle Channel										
11 592.93	49.47	Peak	H	40.02	15.12	45.30	-	59.31	74.00	14.69
11 568.30	37.15	Average	H	40.02	15.12	45.30	0.04	47.03	54.00	6.97
11 550.57	49.81	Peak	V	40.02	15.12	45.30	-	59.65	74.00	14.35
11 569.55	37.26	Average	V	40.02	15.12	45.30	0.04	47.14	54.00	6.86
High Channel										
11 673.33	49.08	Peak	H	39.70	15.12	45.30	-	58.60	74.00	15.40
11 658.14	36.80	Average	H	39.70	15.12	45.30	0.04	46.36	54.00	7.64
11 656.39	49.03	Peak	V	39.70	15.12	45.30	-	58.55	74.00	15.45
11 655.79	36.82	Average	V	39.70	15.12	45.30	0.04	46.38	54.00	7.62

Remark - "H": Horizontal, "V": Vertical

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.2 Test data for 802.11n_HT20 RLAN Mode

13.6.2.2.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.90 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
11 479.76	49.34	Peak	H	40.10	15.12	45.30	-	59.26	74.00	14.74
11 487.00	36.75	Average	H	40.10	15.12	45.30	0.05	46.72	54.00	7.28
11 493.45	48.94	Peak	V	40.10	15.12	45.30	-	58.86	74.00	15.14
11 483.61	36.54	Average	V	40.10	15.12	45.30	0.05	46.51	54.00	7.49
Middle Channel										
11 570.70	49.68	Peak	H	40.02	15.12	45.30	-	59.52	74.00	14.48
11 571.00	37.27	Average	H	40.02	15.12	45.30	0.05	47.16	54.00	6.84
11 579.24	49.79	Peak	V	40.02	15.12	45.30	-	59.63	74.00	14.37
11 573.65	37.25	Average	V	40.02	15.12	45.30	0.05	47.14	54.00	6.86
High Channel										
11 627.17	49.20	Peak	H	39.70	15.12	45.30	-	58.72	74.00	15.28
11 664.64	37.04	Average	H	39.70	15.12	45.30	0.05	46.61	54.00	7.39
11 633.77	48.83	Peak	V	39.70	15.12	45.30	-	58.35	74.00	15.65
11 650.40	36.99	Average	V	39.70	15.12	45.30	0.05	46.56	54.00	7.44

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.2.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 98.90 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 478.51	48.54	Peak	H	40.10	15.12	45.30	-	58.46	74.00	15.54
11 465.82	36.29	Average	H	40.10	15.12	45.30	0.05	46.26	54.00	7.74
11 478.56	48.41	Peak	V	40.10	15.12	45.30	-	58.33	74.00	15.67
11 476.21	36.39	Average	V	40.10	15.12	45.30	0.05	46.36	54.00	7.64
Middle Channel										
11 578.29	49.55	Peak	H	40.02	15.12	45.30	-	59.39	74.00	14.61
11 573.05	37.03	Average	H	40.02	15.12	45.30	0.05	46.92	54.00	7.08
11 551.32	49.29	Peak	V	40.02	15.12	45.30	-	59.13	74.00	14.87
11 573.75	37.16	Average	V	40.02	15.12	45.30	0.05	47.05	54.00	6.95
High Channel										
11 649.90	49.91	Peak	H	39.70	15.12	45.30	-	59.43	74.00	14.57
11 626.72	36.71	Average	H	39.70	15.12	45.30	0.05	46.28	54.00	7.72
11 663.34	48.72	Peak	V	39.70	15.12	45.30	-	58.24	74.00	15.76
11 658.69	36.67	Average	V	39.70	15.12	45.30	0.05	46.24	54.00	7.76

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.3 Test data for 802.11n_HT40 RLAN Mode

13.6.2.3.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 97.83 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
11 466.94	49.39	Peak	H	40.10	15.12	45.30	-	59.31	74.00	14.69
11 559.45	37.24	Average	H	40.10	15.12	45.30	0.10	47.26	54.00	6.74
11 580.31	49.17	Peak	V	40.10	15.12	45.30	-	59.09	74.00	14.91
11 581.71	36.93	Average	V	40.10	15.12	45.30	0.10	46.95	54.00	7.05
High Channel										
11 575.41	49.80	Peak	H	40.02	15.12	45.30	-	59.64	74.00	14.36
11 581.71	37.53	Average	H	40.02	15.12	45.30	0.10	47.47	54.00	6.53
11 536.57	49.54	Peak	V	40.02	15.12	45.30	-	59.38	74.00	14.62
11 559.35	37.33	Average	V	40.02	15.12	45.30	0.10	47.27	54.00	6.73

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.3.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 97.83 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel										
11 514.20	49.40	Peak	H	40.10	15.12	45.30	-	59.32	74.00	14.68
11 550.96	36.70	Average	H	40.10	15.12	45.30	0.10	46.72	54.00	7.28
11 538.97	49.39	Peak	V	40.10	15.12	45.30	-	59.31	74.00	14.69
11 559.65	36.73	Average	V	40.10	15.12	45.30	0.10	46.75	54.00	7.25
High Channel										
11 571.62	49.08	Peak	H	40.02	15.12	45.30	-	58.92	74.00	15.08
11 578.01	37.01	Average	H	40.02	15.12	45.30	0.10	46.95	54.00	7.05
11 576.61	48.99	Peak	V	40.02	15.12	45.30	-	58.83	74.00	15.17
11 574.92	37.03	Average	V	40.02	15.12	45.30	0.10	46.97	54.00	7.03

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.4 Test data for 802.11ac_HT80 RLAN Mode

13.6.2.4.1 Test data for Internal Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 95.47 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Middle Channel										
11 482.87	49.04	Peak	H	40.06	15.12	45.30	-	58.92	74.00	15.08
11 575.57	37.23	Average	H	40.06	15.12	45.30	0.20	47.31	54.00	6.69
11 555.00	48.92	Peak	V	40.06	15.12	45.30	-	58.80	74.00	15.20
11 571.58	37.15	Average	V	40.06	15.12	45.30	0.20	47.23	54.00	6.77

Remark - "H": Horizontal, "V": Vertical

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

13.6.2.4.2 Test data for External Antenna

-. 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 ~ 40 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 95.49 %

-. Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor(dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Middle Channel										
11 578.17	49.05	Peak	H	40.06	15.12	45.30	-	58.93	74.00	15.07
11 574.38	37.04	Average	H	40.06	15.12	45.30	0.20	47.12	54.00	6.88
11 560.19	48.22	Peak	V	40.06	15.12	45.30	-	58.10	74.00	15.90
11 576.57	36.89	Average	V	40.06	15.12	45.30	0.20	46.97	54.00	7.03

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + Duty Factor

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

14. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

14.1 Operating environment

Temperature : 24 °C

Relative humidity : 52 % R.H.

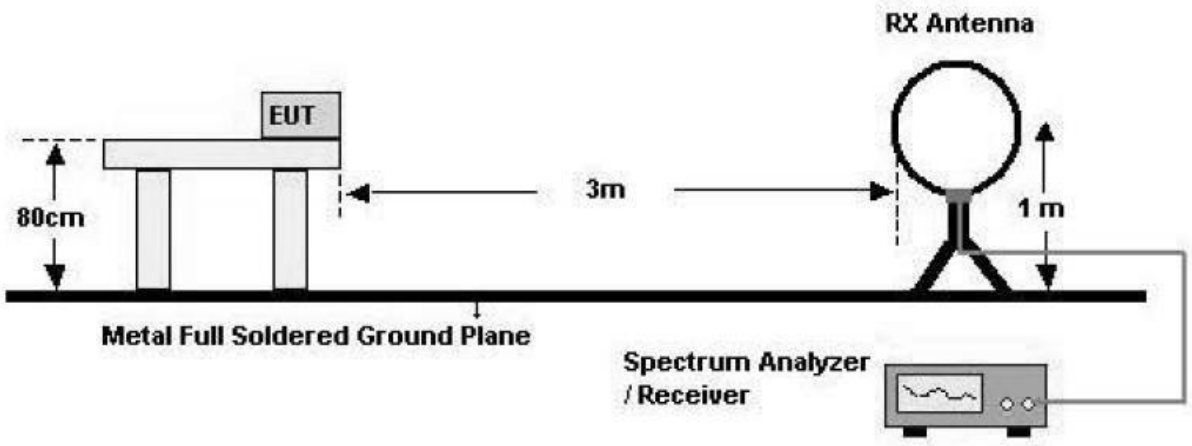
14.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

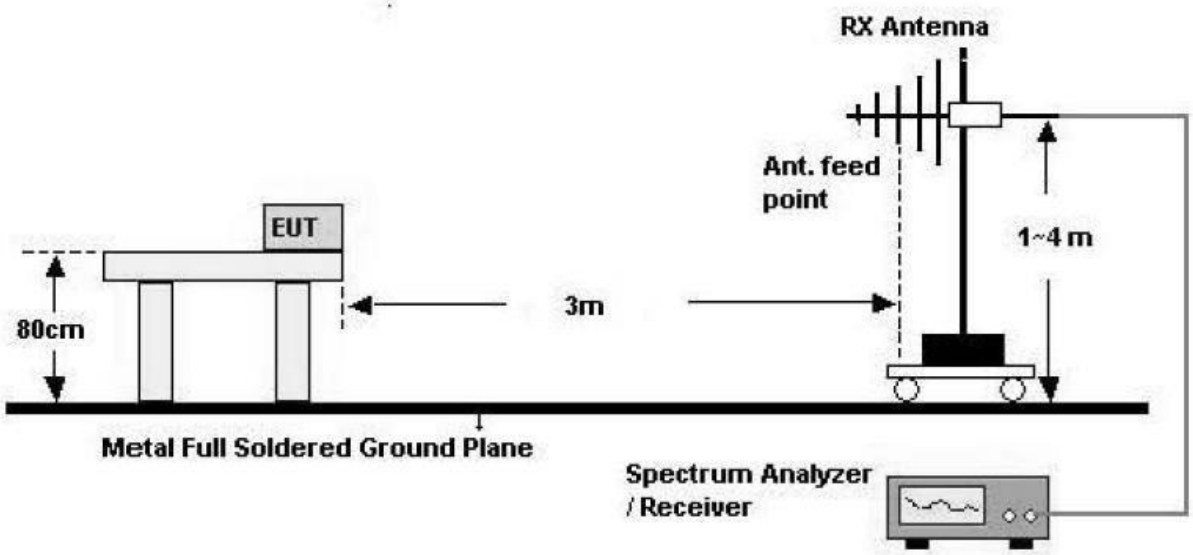
The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

- Test Configuration

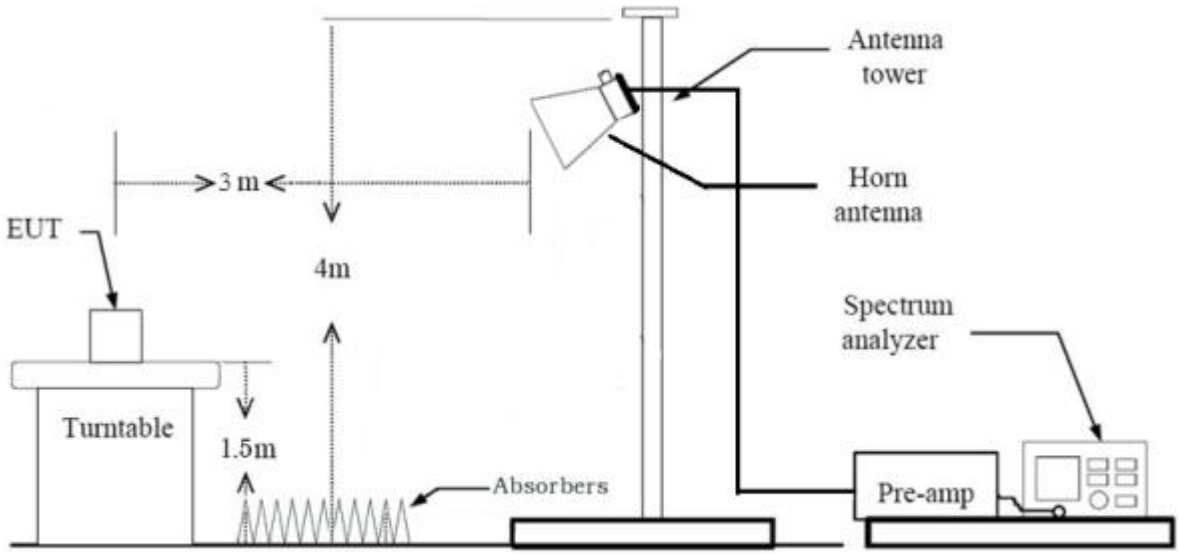
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



14.3 Test Date

February 01, 2023 ~ March 06, 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)

14.4 Test data for Frequency UNII I

14.4.1 Test data for 802.11a RLAN Mode

14.4.1.1 Test data for Internal Antenna

-. 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 : 98.97 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 149.09	55.38	Peak	H	31.90	8.38	44.73	5.80	-	56.73	74.00	17.27
5 149.77	42.81	Average	H	31.90	8.38	44.73	5.80	0.04	44.20	54.00	9.80
5 145.69	55.16	Peak	V	31.92	8.38	44.73	5.80	-	56.53	74.00	17.47
5 149.77	43.16	Average	V	31.90	8.38	44.73	5.80	0.04	44.55	54.00	9.45

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.4.1.2 Test data for External Antenna

-. 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 : 98.97 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4 928.31	53.63	Peak	H	31.30	8.20	44.69	5.80	-	54.24	74.00	19.76
5 145.01	42.17	Average	H	31.92	8.38	44.73	5.80	0.04	43.58	54.00	10.42
4 614.47	53.09	Peak	V	30.90	7.82	44.62	5.83	-	53.02	74.00	20.98
5 140.26	42.24	Average	V	31.94	8.38	44.73	5.80	0.04	43.67	54.00	10.33

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

14.4.2 Test data for 802.11n_HT20 RLAN Mode

14.4.2.1 Test data for Internal Antenna

-. 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 : 98.90 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 148.41	58.42	Peak	H	31.91	8.38	44.73	5.80	-	59.78	74.00	14.22
5 149.77	44.82	Average	H	31.90	8.38	44.73	5.80	0.05	46.22	54.00	7.78
5 149.77	61.88	Peak	V	31.90	8.38	44.73	5.80	-	63.23	74.00	10.77
5 147.05	44.44	Average	V	31.91	8.38	44.73	5.80	0.05	45.85	54.00	8.15

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

14.4.2.2 Test data for External Antenna

-. 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 : 98.90 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
4 941.22	53.59	Peak	H	31.30	8.20	44.69	5.80	-	54.20	74.00	19.80
5 148.41	42.24	Average	H	31.91	8.38	44.73	5.80	0.05	43.65	54.00	10.35
5 147.73	54.13	Peak	V	31.91	8.38	44.73	5.80	-	55.49	74.00	18.51
5 146.37	42.60	Average	V	31.91	8.38	44.73	5.80	0.05	44.01	54.00	9.99

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.4.3 Test data for 802.11n_HT40 RLAN Mode

14.4.3.1 Test data for Internal Antenna

-. 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 : 97.83 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 148.30	63.38	Peak	H	31.91	8.38	44.73	5.80	-	64.74	74.00	9.26
5 148.30	45.71	Average	H	31.91	8.38	44.73	5.80	0.10	47.17	54.00	6.83
5 148.30	65.63	Peak	V	31.91	8.38	44.73	5.80	-	66.99	74.00	7.01
5 148.30	46.38	Average	V	31.91	8.38	44.73	5.80	0.10	47.84	54.00	6.16

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

14.4.3.2 Test data for External Antenna

-. 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 : 97.82 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 146.92	55.59	Peak	H	31.91	8.38	44.73	5.80	-	56.95	74.00	17.05
5 146.92	42.60	Average	H	31.91	8.38	44.73	5.80	0.10	44.06	54.00	9.94
5 148.30	58.19	Peak	V	31.91	8.38	44.73	5.80	-	59.55	74.00	14.45
5 147.61	43.31	Average	V	31.91	8.38	44.73	5.80	0.10	44.77	54.00	9.23

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.4.4 Test data for 802.11ac_HT80 RLAN Mode

14.4.4.1 Test data for Internal Antenna

-. 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 : 95.47 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 140.84	55.66	Peak	H	31.94	8.38	44.73	5.80	-	57.05	74.00	16.95
5 145.81	43.48	Average	H	31.92	8.38	44.73	5.80	0.20	45.05	54.00	8.95
5 140.84	55.83	Peak	V	31.94	8.38	44.73	5.80	-	57.22	74.00	16.78
5 144.39	44.20	Average	V	31.92	8.38	44.73	5.80	0.20	45.77	54.00	8.23

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

14.4.4.2 Test data for External Antenna

-. 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 : 95.49 %

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
4 803.22	54.05	Peak	H	31.30	8.20	44.66	5.80	-	54.69	74.00	19.31
5 148.65	42.20	Average	H	31.91	8.38	44.73	5.80	0.20	43.76	54.00	10.24
4 853.58	54.02	Peak	V	31.30	8.20	44.67	5.80	-	54.65	74.00	19.35
5 147.94	42.27	Average	V	31.91	8.38	44.73	5.80	0.20	43.83	54.00	10.17

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5 Test data for Frequency U-NII-3

14.5.1 Test data for 802.11a RLAN Mode

14.5.1.1 Test data for Internal Antenna

-. 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 : 98.97 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.02	48.33	Peak	H	31.80	8.62	44.68	5.83	-	49.90	68.21	18.31
5 716.79	54.11	Peak	H	31.93	8.71	44.63	5.83	-	55.95	109.90	53.95
5 721.58	58.54	Peak	H	31.94	8.71	44.62	5.83	-	60.40	114.40	54.00
5 854.97	49.38	Peak	H	32.31	8.80	44.52	5.84	-	51.81	110.87	59.06
5 874.77	49.15	Peak	H	32.35	8.80	44.50	5.84	-	51.64	105.26	53.62
5 924.43	49.49	Peak	H	32.40	8.83	44.46	5.84	-	52.10	68.62	16.52
5 651.82	49.68	Peak	V	31.80	8.62	44.68	5.83	-	51.25	69.55	18.30
5 701.81	49.94	Peak	V	31.90	8.71	44.64	5.83	-	51.74	105.71	53.97
5 720.67	55.06	Peak	V	31.94	8.71	44.62	5.83	-	56.92	112.33	55.41
5 854.93	49.86	Peak	V	32.31	8.80	44.52	5.84	-	52.29	110.96	58.67
5 873.81	49.98	Peak	V	32.35	8.80	44.50	5.84	-	52.47	105.53	53.06
5 924.98	48.66	Peak	V	32.40	8.83	44.46	5.84	-	51.27	68.21	16.94

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 650.77	49.12	Peak	H	31.80	8.62	44.68	5.83	-	50.69	68.77	18.08
5 701.19	49.00	Peak	H	31.90	8.71	44.64	5.83	-	50.80	105.53	54.73
5 720.26	49.12	Peak	H	31.94	8.71	44.62	5.83	-	50.98	111.39	60.41
5 854.73	54.79	Peak	H	32.31	8.80	44.52	5.84	-	57.22	111.42	54.20
5 874.75	51.54	Peak	H	32.35	8.80	44.50	5.84	-	54.03	105.27	51.24
5 923.93	48.97	Peak	H	32.40	8.83	44.46	5.84	-	51.58	68.99	17.41
5 650.62	50.03	Peak	V	31.80	8.62	44.68	5.83	-	51.60	68.66	17.06
5 702.19	49.31	Peak	V	31.90	8.71	44.64	5.83	-	51.11	105.81	54.70
5 720.10	49.66	Peak	V	31.94	8.71	44.62	5.83	-	51.52	111.03	59.51
5 854.96	55.23	Peak	V	32.31	8.80	44.52	5.84	-	57.66	110.89	53.23
5 874.77	52.22	Peak	V	32.35	8.80	44.50	5.84	-	54.71	105.26	50.55
5 924.83	48.85	Peak	V	32.40	8.83	44.46	5.84	-	51.46	68.33	16.87

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

14.5.1.2 Test data for External Antenna

-. 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 : 98.97 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.12	48.67	Peak	H	31.80	8.62	44.68	5.83	-	50.24	68.29	18.05
5 701.43	48.93	Peak	H	31.90	8.71	44.64	5.83	-	50.73	105.60	54.87
5 720.96	55.50	Peak	H	31.94	8.71	44.62	5.83	-	57.36	112.99	55.63
5 854.83	48.45	Peak	H	32.31	8.80	44.52	5.84	-	50.88	111.19	60.31
5 873.49	49.61	Peak	H	32.35	8.80	44.50	5.84	-	52.10	105.62	53.52
5 924.92	48.23	Peak	H	32.40	8.83	44.46	5.84	-	50.84	68.26	17.42
5 650.77	49.36	Peak	V	31.80	8.62	44.68	5.83	-	50.93	68.77	17.84
5 705.22	61.42	Peak	V	31.91	8.71	44.64	5.83	-	63.23	106.66	43.43
5 720.31	56.77	Peak	V	31.94	8.71	44.62	5.83	-	58.63	111.51	52.88
5 855.00	49.33	Peak	V	32.31	8.80	44.52	5.84	-	51.76	110.80	59.04
5 874.05	49.36	Peak	V	32.35	8.80	44.50	5.84	-	51.85	105.47	53.62
5 924.53	48.93	Peak	V	32.40	8.83	44.46	5.84	-	51.54	68.55	17.01

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 650.42	48.32	Peak	H	31.80	8.62	44.68	5.83	-	49.89	68.51	18.62
5 700.41	49.40	Peak	H	31.90	8.71	44.64	5.83	-	51.20	105.31	54.11
5 720.05	48.78	Peak	H	31.94	8.71	44.62	5.83	-	50.64	110.91	60.27
5 854.90	49.46	Peak	H	32.31	8.80	44.52	5.84	-	51.89	111.03	59.14
5 874.99	49.53	Peak	H	32.35	8.80	44.50	5.84	-	52.02	105.20	53.18
5 924.73	48.24	Peak	H	32.40	8.83	44.46	5.84	-	50.85	68.40	17.55
5 650.22	48.88	Peak	V	31.80	8.62	44.68	5.83	-	50.45	68.36	17.91
5 707.76	53.07	Peak	V	31.92	8.71	44.63	5.83	-	54.90	107.37	52.47
5 720.04	48.79	Peak	V	31.94	8.71	44.62	5.83	-	50.65	110.89	60.24
5 854.73	51.66	Peak	V	32.31	8.80	44.52	5.84	-	54.09	111.42	57.33
5 873.33	49.58	Peak	V	32.35	8.80	44.50	5.84	-	52.07	105.67	53.60
5 924.98	48.21	Peak	V	32.40	8.83	44.46	5.84	-	50.82	68.21	17.39

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.2 Test data for 802.11n_HT20 RLAN Mode

14.5.2.1 Test data for Internal Antenna

-. 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 : 98.90 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.32	48.85	Peak	H	31.80	8.62	44.68	5.83	-	50.42	68.44	18.02
5 703.49	50.90	Peak	H	31.91	8.71	44.64	5.83	-	52.71	106.18	53.47
5 720.01	54.29	Peak	H	31.94	8.71	44.62	5.83	-	56.15	110.82	54.67
5 854.99	49.09	Peak	H	32.31	8.80	44.52	5.84	-	51.52	110.82	59.30
5 874.75	49.97	Peak	H	32.35	8.80	44.50	5.84	-	52.46	105.27	52.81
5 924.68	49.18	Peak	H	32.40	8.83	44.46	5.84	-	51.79	68.44	16.65
5 650.22	48.32	Peak	V	31.80	8.62	44.68	5.83	-	49.89	68.36	18.47
5 700.87	49.87	Peak	V	31.90	8.71	44.64	5.83	-	51.67	105.44	53.77
5 720.27	54.30	Peak	V	31.94	8.71	44.62	5.83	-	56.16	111.42	55.26
5 854.90	49.40	Peak	V	32.31	8.80	44.52	5.84	-	51.83	111.03	59.20
5 873.91	49.44	Peak	V	32.35	8.80	44.50	5.84	-	51.93	105.51	53.58
5 924.98	48.59	Peak	V	32.40	8.83	44.46	5.84	-	51.20	68.21	17.01

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 651.32	49.69	Peak	H	31.80	8.62	44.68	5.83	-	51.26	68.36	17.10
5 700.55	49.25	Peak	H	31.90	8.71	44.64	5.83	-	51.05	105.33	54.28
5 720.17	49.31	Peak	H	31.94	8.71	44.62	5.83	-	51.17	110.96	59.79
5 854.65	58.37	Peak	H	32.31	8.80	44.52	5.84	-	60.80	110.85	50.05
5 855.69	57.93	Peak	H	32.31	8.80	44.52	5.84	-	60.36	110.75	50.39
5 924.83	48.66	Peak	H	32.40	8.83	44.46	5.84	-	51.27	68.47	17.20
5 650.22	48.32	Peak	V	31.80	8.62	44.68	5.83	-	49.89	69.18	19.29
5 700.87	49.87	Peak	V	31.90	8.71	44.64	5.83	-	51.67	105.35	53.68
5 720.27	54.30	Peak	V	31.94	8.71	44.62	5.83	-	56.16	111.19	55.03
5 854.90	49.40	Peak	V	32.31	8.80	44.52	5.84	-	51.83	111.60	59.77
5 873.91	49.44	Peak	V	32.31	8.80	44.52	5.84	-	51.87	110.61	58.74
5 924.98	48.59	Peak	V	32.40	8.83	44.46	5.84	-	51.20	68.33	17.13

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.2.2 Test data for External Antenna

-. 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 : 98.90 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 651.02	48.68	Peak	H	31.80	8.62	44.68	5.83	-	50.25	68.95	18.70
5 719.19	57.77	Peak	H	31.94	8.71	44.62	5.83	-	59.63	110.57	50.94
5 720.24	57.90	Peak	H	31.94	8.71	44.62	5.83	-	59.76	111.35	51.59
5 854.27	50.66	Peak	H	32.31	8.80	44.52	5.84	-	53.09	112.46	59.37
5 874.11	49.26	Peak	H	32.35	8.80	44.50	5.84	-	51.75	105.45	53.70
5 924.63	49.17	Peak	H	32.40	8.83	44.46	5.84	-	51.78	68.47	16.69
5 650.22	48.12	Peak	V	31.80	8.62	44.68	5.83	-	49.69	68.36	18.67
5 718.67	59.71	Peak	V	31.94	8.71	44.63	5.83	-	61.56	110.43	48.87
5 721.54	61.67	Peak	V	31.94	8.71	44.62	5.83	-	63.53	114.31	50.78
5 854.67	50.48	Peak	V	32.31	8.80	44.52	5.84	-	52.91	111.55	58.64
5 874.09	48.62	Peak	V	32.35	8.80	44.50	5.84	-	51.11	105.45	54.34
5 924.92	48.32	Peak	V	32.40	8.83	44.46	5.84	-	50.93	68.26	17.33

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 650.57	48.38	Peak	H	31.80	8.62	44.68	5.83	-	49.95	68.62	18.67
5 700.35	48.59	Peak	H	31.90	8.71	44.64	5.83	-	50.39	105.30	54.91
5 720.27	49.72	Peak	H	31.94	8.71	44.62	5.83	-	51.58	111.42	59.84
5 854.60	53.63	Peak	H	32.31	8.80	44.52	5.84	-	56.06	111.71	55.65
5 874.59	49.07	Peak	H	32.35	8.80	44.50	5.84	-	51.56	105.31	53.75
5 924.48	48.63	Peak	H	32.40	8.83	44.46	5.84	-	51.24	68.58	17.34
5 651.07	48.65	Peak	V	31.80	8.62	44.68	5.83	-	50.22	68.99	18.77
5 701.85	48.70	Peak	V	31.90	8.71	44.64	5.83	-	50.50	105.72	55.22
5 720.13	50.10	Peak	V	31.94	8.71	44.62	5.83	-	51.96	111.10	59.14
5 854.22	54.97	Peak	V	32.31	8.80	44.52	5.84	-	57.40	112.58	55.18
5 874.95	49.12	Peak	V	32.35	8.80	44.50	5.84	-	51.61	105.21	53.60
5 924.33	48.20	Peak	V	32.40	8.83	44.46	5.84	-	50.81	68.70	17.89

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.3 Test data for 802.11n_HT40 RLAN Mode

14.5.3.1 Test data for Internal Antenna

-. 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 : 97.83 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.02	48.67	Peak	H	31.80	8.62	44.68	5.83	-	50.24	68.21	17.97
5 713.32	57.43	Peak	H	31.93	8.71	44.63	5.83	-	59.27	108.93	49.66
5 720.03	59.73	Peak	H	31.94	8.71	44.62	5.83	-	61.59	110.87	49.28
5 854.90	48.98	Peak	H	32.31	8.80	44.52	5.84	-	51.41	111.03	59.62
5 874.51	50.05	Peak	H	32.35	8.80	44.50	5.84	-	52.54	105.34	52.80
5 924.78	48.69	Peak	H	32.40	8.83	44.46	5.84	-	51.30	68.36	17.06
5 650.57	48.96	Peak	V	31.80	8.62	44.68	5.83	-	50.53	68.62	18.09
5 719.79	58.28	Peak	V	31.94	8.71	44.62	5.83	-	60.14	110.74	50.60
5 721.35	62.04	Peak	V	31.94	8.71	44.62	5.83	-	63.90	113.88	49.98
5 854.98	50.09	Peak	V	32.31	8.80	44.52	5.84	-	52.52	110.85	58.33
5 871.61	50.16	Peak	V	32.34	8.80	44.50	5.84	-	52.64	106.15	53.51
5 924.73	48.81	Peak	V	32.40	8.83	44.46	5.84	-	51.42	68.40	16.98

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 650.72	48.61	Peak	H	31.80	8.62	44.68	5.83	-	50.18	68.73	18.55
5 700.93	49.27	Peak	H	31.90	8.71	44.64	5.83	-	51.07	105.46	54.39
5 720.02	48.50	Peak	H	31.94	8.71	44.62	5.83	-	50.36	110.85	60.49
5 854.91	51.03	Peak	H	32.31	8.80	44.52	5.84	-	53.46	111.01	57.55
5 874.91	49.35	Peak	H	32.35	8.80	44.50	5.84	-	51.84	105.23	53.39
5 924.28	49.15	Peak	H	32.40	8.83	44.46	5.84	-	51.76	68.73	16.97
5 650.92	48.42	Peak	V	31.80	8.62	44.68	5.83	-	49.99	68.88	18.89
5 701.51	50.02	Peak	V	31.90	8.71	44.64	5.83	-	51.82	105.62	53.80
5 720.28	49.61	Peak	V	31.94	8.71	44.62	5.83	-	51.47	111.44	59.97
5 854.80	53.43	Peak	V	32.31	8.80	44.52	5.84	-	55.86	111.26	55.40
5 874.93	51.18	Peak	V	32.35	8.80	44.50	5.84	-	53.67	105.22	51.55
5 924.98	48.85	Peak	V	32.40	8.83	44.46	5.84	-	51.46	68.21	16.75

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.3.2 Test data for External Antenna

-. 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 : 97.83 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.08	48.55	Peak	H	31.80	8.62	44.68	5.83	-	50.12	68.26	18.14
5 715.31	55.75	Peak	H	31.93	8.71	44.63	5.83	-	57.59	109.49	51.90
5 720.42	58.04	Peak	H	31.94	8.71	44.62	5.83	-	59.90	111.76	51.86
5 854.74	48.80	Peak	H	32.31	8.80	44.52	5.84	-	51.23	111.39	60.16
5 873.55	49.25	Peak	H	32.35	8.80	44.50	5.84	-	51.74	105.61	53.87
5 924.83	47.69	Peak	H	32.40	8.83	44.46	5.84	-	50.30	68.33	18.03
5 650.22	48.83	Peak	V	31.80	8.62	44.68	5.83	-	50.40	68.36	17.96
5 719.97	58.55	Peak	V	31.94	8.71	44.62	5.83	-	60.41	110.79	50.38
5 720.36	59.90	Peak	V	31.94	8.71	44.62	5.83	-	61.76	111.62	49.86
5 854.94	48.81	Peak	V	32.31	8.80	44.52	5.84	-	51.24	110.94	59.70
5 872.09	49.95	Peak	V	32.34	8.80	44.50	5.84	-	52.43	106.01	53.58
5 924.48	48.39	Peak	V	32.40	8.83	44.46	5.84	-	51.00	68.58	17.58

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

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
High Channel											
5 650.32	48.90	Peak	H	31.80	8.62	44.68	5.83	-	50.47	68.44	17.97
5 700.67	48.57	Peak	H	31.90	8.71	44.64	5.83	-	50.37	105.39	55.02
5 720.09	48.76	Peak	H	31.94	8.71	44.62	5.83	-	50.62	111.01	60.39
5 854.95	50.01	Peak	H	32.31	8.80	44.52	5.84	-	52.44	110.91	58.47
5 874.87	49.72	Peak	H	32.35	8.80	44.50	5.84	-	52.21	105.24	53.03
5 924.58	49.21	Peak	H	32.40	8.83	44.46	5.84	-	51.82	68.51	16.69
5 650.17	48.07	Peak	V	31.80	8.62	44.68	5.83	-	49.64	68.33	18.69
5 700.19	48.88	Peak	V	31.90	8.71	44.64	5.83	-	50.68	105.25	54.57
5 720.38	49.65	Peak	V	31.94	8.71	44.62	5.83	-	51.51	111.67	60.16
5 854.66	51.64	Peak	V	32.31	8.80	44.52	5.84	-	54.07	111.58	57.51
5 872.65	49.62	Peak	V	32.35	8.80	44.50	5.84	-	52.11	105.86	53.75
5 923.98	48.50	Peak	V	32.40	8.83	44.46	5.84	-	51.11	68.95	17.84

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.4 Test data for 802.11ac_HT80 RLAN Mode

14.5.4.1 Test data for Internal Antenna

-. 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 : 95.47 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.02	48.90	Peak	H	31.80	8.62	44.68	5.83	-	50.47	68.21	17.74
5 701.37	51.06	Peak	H	31.90	8.71	44.64	5.83	-	52.86	105.58	52.72
5 720.08	50.53	Peak	H	31.94	8.71	44.62	5.83	-	52.39	110.98	58.59
5 854.96	49.62	Peak	H	32.31	8.80	44.52	5.84	-	52.05	110.89	58.84
5 870.77	51.09	Peak	H	32.34	8.80	44.50	5.84	-	53.57	106.38	52.81
5 924.92	48.91	Peak	H	32.40	8.83	44.46	5.84	-	51.52	68.26	16.74
5 650.08	47.85	Peak	V	31.80	8.62	44.68	5.83	-	49.42	68.26	18.84
5 700.13	51.04	Peak	V	31.90	8.71	44.64	5.83	-	52.84	105.24	52.40
5 720.08	51.20	Peak	V	31.94	8.71	44.62	5.83	-	53.06	110.98	57.92
5 854.44	52.64	Peak	V	32.31	8.80	44.52	5.84	-	55.07	112.08	57.01
5 873.45	51.10	Peak	V	32.35	8.80	44.50	5.84	-	53.59	105.63	52.04
5 924.98	48.89	Peak	V	32.40	8.83	44.46	5.84	-	51.50	68.21	16.71

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.5.4.2 Test data for External Antenna

-. 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 : 95.49 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty (dB)	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel											
5 650.08	47.66	Peak	H	31.80	8.62	44.68	5.83	-	49.23	68.26	19.03
5 700.37	49.16	Peak	H	31.90	8.71	44.64	5.83	-	50.96	105.30	54.34
5 720.02	48.13	Peak	H	31.94	8.71	44.62	5.83	-	49.99	110.85	60.86
5 854.30	50.35	Peak	H	32.31	8.80	44.52	5.84	-	52.78	112.40	59.62
5 873.79	49.16	Peak	H	32.35	8.80	44.50	5.84	-	51.65	105.54	53.89
5 924.68	48.38	Peak	H	32.40	8.83	44.46	5.84	-	50.99	68.44	17.45
5 650.37	48.91	Peak	V	31.80	8.62	44.68	5.83	-	50.48	68.47	17.99
5 701.85	49.83	Peak	V	31.90	8.71	44.64	5.83	-	51.63	105.72	54.09
5 720.03	50.36	Peak	V	31.94	8.71	44.62	5.83	-	52.22	110.87	58.65
5 854.95	49.91	Peak	V	32.31	8.80	44.52	5.84	-	52.34	110.91	58.57
5 874.23	49.97	Peak	V	32.35	8.80	44.50	5.84	-	52.46	105.42	52.96
5 924.83	48.36	Peak	V	32.40	8.83	44.46	5.84	-	50.97	68.33	17.36

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

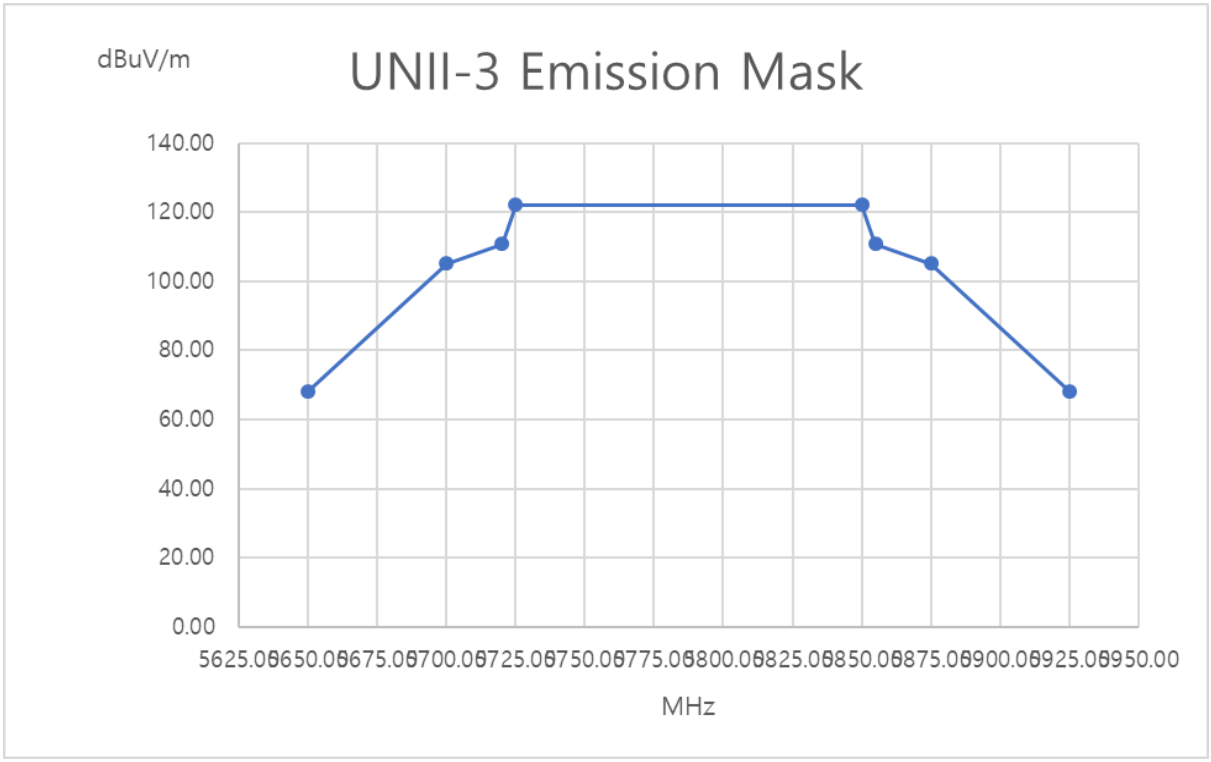
Margin (dB) = Limits (dBµV/m) - Total Level (dBµV/m)

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

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

14.6 U-NII-3 Emission Limits

14.6.1 Emission Mask Plots



Remark.

-. Title 47 → Part 15 → Subpart E—UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES

§ 15.407 General technical requirements.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

15. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSVA40	Rohde & Schwarz	Signal Analyzer	101598	Apr. 03, 2023 (1Y)
ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 06, 2023 (1Y)
GP-4303D	LG Precision Co.,Ltd	DC POWER SUPPLY	5071069	Jan. 04, 2023 (1Y)
WT-A5851-R12	Microwave	Cavity Band Rejection Filter	WT22040502-2	Apr. 03, 2023 (1Y)
WT-A1856-R12	Microwave	Cavity Band Rejection Filter	WT22040502-4	Apr. 03, 2023 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	392756	Oct. 13, 2022 (1Y)
SCU18	Rohde & Schwarz	Pre-Amplifer	102266	Jul. 14, 2023 (1Y)
SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Jan. 18, 2023 (1Y)
QFA1802-26-6-S	Qualwave	6dB Attenuator	225340	Apr. 04, 2023 (1Y)
DT2000-2t	Innco System	Turn Table	N/A	N/A
CO3000	Innco System	Controller	1026/40960617/P	N/A
MA-4640-XPET	Innco System	Antenna Master	MA4640/652/43100318/P	N/A
HLP-2008	TDK	Hybrid Antenna	131316	Mar. 07, 2022 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jun. 22, 2023 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 04, 2023 (1Y)
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2022 (2Y)
PSL-2KP	ESPEC	Temperature & Humidity Chamber	14009407	Jan. 18, 2023 (1Y)

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