ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: OT-199-RWD-046**
AGR No.	**: A195A-069**
Applicant	**: BBB Inc.**
Address	**: 28, Yatap-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea**
Manufacturer	**: BBB Inc.**
Address	**: 28, Yatap-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea**
Type of Equipment	**: Immnuoassay Analyzer**
FCC ID.	**: 2AKGP-MB100**
Model Name	**: MB-100**
Multiple Model Name	**: N/A**
Serial number	**: N/A**
Total page of Report	**: 9 pages (including this page)**
Date of Incoming	**: May 13, 2019**
Date of issue	**: September 24, 2019**

SUMMARY

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

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

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

Reviewed by: Ha-Ram Lee / Assistant Manager, ONETECH Corp.

Approved by: Jae-Ho Lee / Chief Engineer, 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)

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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

Issued Report No.	Issued Date	Revisions	Effect Section
OT-199-RWD-046	September 24, 2019	Initial Issue	All

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1. VERIFICATION OF COMPLIANCE

Applicant : BBB Inc.

Address : 28, Yatap-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Contact Person : Jaekyu Choi / CEO

Telephone No. : +82-2-565-9653

FCC ID : 2AKGP-MB100

Model Name : MB-100

Brand Name : markB Analyzer

Serial Number : N/A

Date : September 24, 2019

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

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

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2. GENERAL INFORMATION

2.1 Product Description

The BBB Inc., Model MB-100 (referred to as the EUT in this report) is a Immnuoassay Analyzer. Product specification information described herein was obtained from product data sheet or user's manual.

Device Type	Immnuoassay Analyzer	
Operating Frequency	Bluetooth LE	2 402 MHz ~ 2 480 MHz
	WLAN 2.4 GHz Band	2 412 MHz ~ 2 462 MHz (802.11b/g/n(HT20))
		2 422 MHz ~ 2 452 MHz (802.11n(HT40))
	NFC	13.56 MHz
RF Output Power	Bluetooth LE	-6.78 dBm
	WLAN 2.4 GHz Band	802.11b (13.13 dBm) 802.11g (10.67 dBm) 802.11n(HT20) (11.01 dBm) 802.11n(HT40) (10.81 dBm)
Number of Channel	Bluetooth LE	40 Channels
	WLAN 2.4 GHz Band	11 Channels
	NFC	1 Channel
Modulation Type	Bluetooth LE	DSSS Modulation(GFSK)
	WLAN 2.4 GHz Band	DSSS Modulation(DBPSK/DQPSK/CCK) OFDM Modulation(BPSK/QPSK/16QAM/64QAM)
	NFC	ASK
Antenna Type	Bluetooth LE	FPC Antenna
	WLAN 2.4 GHz Band	
	NFC	PCB Antenna
Antenna Gain	Bluetooth LE	1.74 dBi
	WLAN 2.4 GHz Band	
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32.768kHz, 13.56 MHz, 32 MHz	
Rated Supply Voltage	DC 3.8 V	

Note: Bluetooth and WLAN do not operate simultaneously.

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

-. None

3. EUT MODIFICATIONS

-. None

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4. RF Exposure Evaluation

4.1 RF Exposure Calculation

According to 1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

7.5 - the limit for extremity is being used. Extremity limit is being used since the device has a touch pad and not a handheld device.

4.2 EUT Description

Kind of EUT	Immnuoassay Analyzer	
Operating Frequency Band	☐ Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz ■ WLAN: 2 412 MHz ~ 2 462 MHz ■ WLAN: 2 422 MHz ~ 2 452 MHz ☐ WLAN: 5 180 MHz ~ 5 240 MHz ☐ WLAN: 5 745 MHz ~ 5 825 MHz ☐ Bluetooth: 2 402 MHz ~ 2 480 MHz ■ Bluetooth BLE: 2 402 MHz ~ 2 480 MHz ■ NFC：13.56 MHz	
MAX. RF OUTPUT POWER	802.11b	13.13 dBm
	802.11g	10.67 dBm
	802.11n(HT20)	11.01 dBm
	802.11n(HT40)	10.81 dBm
Antenna Gain	1.74 dBi	
Exposure Evaluation Applied	☐ MPE ☐ SAR ■ SAR Test Exclusion Evaluation	

4.3 Test Result of SAR Exclusion for Devices

According to the procedure, KDB 447498 D01, the standalone SAR test exclusion threshold is

[(Max. Power of channel, including tune-up tolerance, mW)/(Mim. test separation distance, mm)] X [√ f(GHz)] < 7.5

= (23.07/5) X √ 2.462 = 7.24

Conclusion: The SAR test exclusion threshold is less than 7.5, so the device meets the RF Exposure Requirement and excluded SAR Test.

Mode	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
802.11b	2 462	13.13 ± 0.5	13.63	23.07	5	7.24
802.11g	2 442	10.67 ± 0.5	11.17	13.09	5	4.09
802.11n(HT20)	2 462	11.01 ± 0.5	11.51	14.16	5	4.44
802.11n(HT40)	2 462	10.81 ± 0.5	11.31	13.52	5	4.24

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4.4 Calculation Result of Simultaneous RF Power

WLAN transmit simultaneously with NFC.

Simultaneous RF Power = Power of WLAN(Worst Case) + EIRP of NFC

23.07 + 0.000 000 010 9 = 23.070 000 010 9 mW

[(Simultaneous RF Power, mW)/(Mim. test separation distance, mm)] X [√ f(GHz)] < 7.5

= (23.070 000 010 9/5) X √ 2.462 = 7.24

- Therefore the maximum calculations of above situations are less than the “7.5” limit.

Note 1. Power of WLAN(Worst Case) = 23.07 mW

Note 2. EIRP of NFC = E (dBμV/m) + 20 log D − 104.8; where D is the measurement distance in meters.

= 15.64 dBμV/m + 20log(3) – 104.8

= -79.62 dBm

= 0.000 000 010 9 mW

Tested by: Yu-Seog, Sim / Assistant Manager