


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


Test Report No. : OT-196-RWD-013
AGR No. : A192A-017
Applicant : BIOLOG DEVICE
Address : 3F, 64-10, Dongtangiheung-ro, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, Korea
Manufacturer : BIOLOG DEVICE
Address : 3F, 64-10, Dongtangiheung-ro, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, Korea
Type of Equipment : Face Recognition Terminal
FCC ID. : 2ATMI-FL1000-A
Model Name : FL1000-A
Multiple Model Name: FL1000-B, FL1000-C, FL1000-D, FL1000-E, FL1000-F, FL1000-G, FL1000-H, FL1000-I, FL1000-J, FL1000-K, FL1000-L, FL1000-M, FL1000-N, FL1000-O, FL1000-P, FL1000-Q, FL1000-R, FL1000-S, FL1000-T, FL1000-U, FL1000-V
Serial number : N/A
Total page of Report : 9 pages (including this page)
Date of Incoming : April 15, 2019
Date of issue : June 07, 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.

CONTENTS

	PAGE
1. VERIFICATION OF COMPLIANCE	4
2. GENERAL INFORMATION	5
2.1 PRODUCT DESCRIPTION.....	5
3. EUT MODIFICATIONS.....	6
4. MAXIMUM PERMISSIBLE EXPOSURE	7
4.1 RF EXPOSURE CALCULATION	7
4.2 EUT DESCRIPTION.....	7
4.3 TEST RESULT OF SAR EXCLUSION FOR DEVICES	8
4.4 CALCULATION RESULT OF SIMULTANEOUS RF POWER.....	9

REVISION HISTORY

Issued Report No.	Issued Date	Revisions	Effect Section
OT-196-RWD-013	June 07, 2019	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

Applicant : BIOLOG DEVICE
 Address : 3F, 64-10, Dongtangiheung-ro, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, Korea
 Contact Person : PARK YUN HO / Deputy department head
 Telephone No. : +82-70-5015-4176
 FCC ID : 2ATMI-FL1000-A
 Model Name : FL1000-A
 Brand Name : N/A
 Serial Number : N/A
 Date : June 07, 2019

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Face Recognition Terminal
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.

2. GENERAL INFORMATION

2.1 Product Description

The BIOLOG DEVICE, Model FL1000-A (referred to as the EUT in this report) is a Face Recognition Terminal. Product specification information described herein was obtained from product data sheet or user’s manual.

Device Type	Face Recognition Terminal		
Operating Frequency	Bluetooth	2 402 MHz ~ 2 480 MHz	
	WLAN 2.4 GHz Hand	2 412 MHz ~ 2 462 MHz	
	NFC	13.56 MHz	
RF Output Power	Bluetooth	1 Mbps	6.33 dBm
		2 Mbps	5.33 dBm
		3 Mbps	5.51 dBm
	WLAN 2.4 GHz Hand	Wi-Fi 802.11b (8.99 dBm) Wi-Fi 802.11g (8.37 dBm) Wi-Fi 802.11n(HT20) (8.23 dBm)	
Number of Channel	Bluetooth	79 Channels	
	WLAN 2.4 GHz Hand	11 Channels	
	NFC	1 Channel	
Modulation Type	Bluetooth	GFSK for 1 Mbps, $\pi/4$ -DQPSK for 2 Mbps, 8-DPSK for 3 Mbps	
	WLAN 2.4 GHz Hand	DSSS Modulation(DBPSK/DQPSK/CCK) OFDM Modulation(BPSK/QPSK/16QAM/64QAM)	
	NFC	ASK	
Antenna Type	Bluetooth	FPCB Antenna	
	WLAN 2.4 GHz Hand		
	NFC	PCB Antenna	
Antenna Gain	Bluetooth	2.0 dBi	
	WLAN 2.4 GHz Hand		
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	12 MHz, 25 MHz, 26 MHz		
Rated Supply Voltage	DC 12.0 V		

Note: Bluetooth and WLAN do not operate simultaneously.

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

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

Model Name	Differences	Tested
FL1000-A	Basic Model	<input checked="" type="checkbox"/>
FL1000-B	This model is identical to the basic model except for model name. Multiple Model name is added for the marketing purpose.	<input type="checkbox"/>
FL1000-C		<input type="checkbox"/>
FL1000-D		<input type="checkbox"/>
FL1000-E		<input type="checkbox"/>
FL1000-F		<input type="checkbox"/>
FL1000-G		<input type="checkbox"/>
FL1000-H		<input type="checkbox"/>
FL1000-I		<input type="checkbox"/>
FL1000-J		<input type="checkbox"/>
FL1000-K		<input type="checkbox"/>
FL1000-L		<input type="checkbox"/>
FL1000-M		<input type="checkbox"/>
FL1000-N		<input type="checkbox"/>
FL1000-O		<input type="checkbox"/>
FL1000-P		<input type="checkbox"/>
FL1000-Q		<input type="checkbox"/>
FL1000-R		<input type="checkbox"/>
FL1000-S		<input type="checkbox"/>
FL1000-T		<input type="checkbox"/>
FL1000-U		<input type="checkbox"/>
FL1000-V	<input type="checkbox"/>	

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

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

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

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	Face Recognition Terminal	
Operating Frequency Band	<input type="checkbox"/> Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz <input checked="" type="checkbox"/> WLAN: 2 412 MHz ~ 2 462 MHz <input type="checkbox"/> WLAN: 5 180 MHz ~ 5 240 MHz <input type="checkbox"/> WLAN: 5 745 MHz ~ 5 825 MHz <input type="checkbox"/> Bluetooth: 2 402 MHz ~ 2 480 MHz <input type="checkbox"/> Bluetooth BLE: 2 402 MHz ~ 2 480 MHz <input checked="" type="checkbox"/> NFC : 13.56 MHz	
MAX. RF OUTPUT POWER	802.11b	6.33 dBm
	802.11g	5.33 dBm
	802.11n(HT20)	5.51 dBm
Antenna Gain	2.0 dBi	
Exposure Evaluation Applied	<input type="checkbox"/> MPE <input type="checkbox"/> SAR <input checked="" type="checkbox"/> 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

$$[(\text{Max. Power of channel, including tune-up tolerance, mW})/(\text{Min. test separation distance, mm})] \times [\sqrt{f(\text{GHz})}] < 7.5$$

$$= (8.89/5) \times \sqrt{2.442} = 2.78$$

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	2 442	8.99 ± 0.5	9.49	8.89	5	2.78
802.11g	2 462	8.37 ± 0.5	8.87	7.71	5	2.42
802.11n(HT20)	2 442	8.23 ± 0.5	8.73	7.46	5	2.33



Tested by: Yu-Seog, Sim / Assistant Manager

4.4 Calculation Result of Simultaneous RF Power

WLAN transmit simultaneously with NFC.

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

$$8.89 + 0.000\ 055\ 847 = 8.890\ 055\ 847\ \text{mW}$$

$$[(\text{Simultaneous RF Power, mW})/(\text{Mim. test separation distance, mm})] \times [\sqrt{f(\text{GHz})}] < 7.5$$

$$= (8.890\ 055\ 847/5) \times \sqrt{2.442} = 2.78$$

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

Note 1. Power of WLAN(Worst Case) = 8.89 mW

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

$$= 53.23\ \text{dB}\mu\text{V/m} + 20\log(3) - 104.8$$

$$= -42.03\ \text{dBm}$$

$$= 0.000\ 055\ 847\ \text{mW}$$



Tested by: Yu-Seog, Sim / Assistant Manager