

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

Test Report No. : W179R-D022
AGR No. : A179A-375
Applicant : ROBOTIS
Address : #1505,1506, Ace High End Tower No.3, 371-50 Gasandong Geumcheongu, Seoul, Korea
Manufacturer : ROBOTIS
Address : #1505,1506, Ace High End Tower No.3, 371-50 Gasandong Geumcheongu, Seoul, Korea
Type of Equipment : Bluetooth Dongle
FCC ID. : SOD-BT-410-DONGLE
Model Name : BT-410 DONGLE
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 6 pages (including this page)
Date of Incoming : September 11, 2017
Date of issue : September 27, 2017

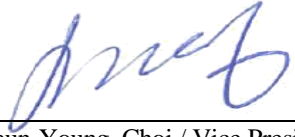
SUMMARY

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: 
Ki-Hong, Nam / Asst, Chief Engineer
ONETECH Corp.

Approved by: 
Keun-Young, Choi / Vice President
ONETECH Corp.

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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W179R-D022	September 27, 2017	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

Applicant : ROBOTIS
 Address : #1505,1506, Ace High End Tower No.3, 371-50 Gasandong Geumcheongu, Seoul, Korea
 Contact Person : Eunsung, Lee / Senior Engineer
 Telephone No. : +82-70-8671-2600
 FCC ID : SOD-BT-410-DONGLE
 Model Name : BT-410 DONGLE
 Serial Number : N/A
 Date : September 27, 2017

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
KIND OF EQUIPMENT	Bluetooth Dongle
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 ROBOTIS, Model BT-410 DONGLE (referred to as the EUT in this report) is a Bluetooth Dongle. The product specification described herein was obtained from product data sheet or user's manual.

Device Type	Bluetooth Dongle
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	-2.64 dBm
Number of Channel	40 Channel
Modulation Type	GFSK
Antenna Type	Chip Antenna
Antenna Gain	-0.92 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	16 MHz
Rated Supply Voltage	DC 5.0 V

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

-. None

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1 mW/cm² for the device operating 1 500 ~ 100 000 MHz.

4.2 EUT Description

Kind of EUT	Bluetooth Dongle
Operating Frequency Band	<input type="checkbox"/> Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz <input 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 checked="" type="checkbox"/> Bluetooth BLE: 2 402 MHz ~ 2 480 MHz
MAX. RF OUTPUT POWER	-2.64 dBm
Antenna Gain	-0.92 dBi
Exposure Evaluation Applied	<input type="checkbox"/> MPE <input type="checkbox"/> SAR <input checked="" type="checkbox"/> N/A

4.3 Test Result

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

$$[(\text{Max. Power of channel, including tune-up tolerance, mW})/(\text{Mim. test separation distance, mm})] \times [\sqrt{f(\text{GHz})}] < 3$$

$$= (0.63/5) \times \sqrt{2.402} = 0.20$$

Conclusion: The SAR test exclusion threshold is less than 3, so the device meets the RF Exposure Requirement and excluded SAR Test.

	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
BLE (GFSK)	2 402	-2.5 ± 0.5	-2.0	0.63	5	0.20
	2 440	-3.5 ± 0.5	-3.0	0.50		0.17
	2 480	-4.5 ± 0.5	-4.0	0.40		0.13



Tested by: Tae-Ho, Kim / Manager