# DNETECH

## 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	: BT-410 DONGLE
FCC ID.	: SOD-BT-410-DONGLE
Model Name	: BT-410 DONGLE
Multiple Model Nam	e: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: Approved by: Ki-Hong, Nam / Asst, Chief Engineer Keun-Young, Choi / Vice President **ONETECH** Corp. **ONETECH** Corp.

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EMC-003 (Rev.2)

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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## **Revision History**

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

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#### **1. VERIFICATION OF COMPLIANCE**

Applicant : ROBOTIS	: 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	BT-410 DONGLE				
THIS REPORT CONCERNS	Original Grant				
MEASUREMENT PROCEDURES	ANSI C63.10: 2013				
TYPE OF EQUIPMENT TESTED	Pre-Production				
KIND OF EQUIPMENT	Certification				
AUTHORIZATION REQUESTED	Certification				
EQUIPMENT WILL BE OPERATED	FOG DADT 15 SUDDADT G S				
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 BT-410 DONGLE. The product specification described herein was obtained from product data sheet or user's manual.

Device Type	BT-410 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	16 MHz	
Freq.(Freq. >= 1 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/cm<sup>2</sup> for the device operating 1 500 ~ 100 000 MHz.

4.2	EUT	Description
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Kind of EUT	BT-410 DONGLE		
	□ Wireless Microphone: 494.000 MHz ~ 501.000 MHz		
	and 498.200 MHz ~ 505.200 MHz		
	□ WLAN: 2 412 MHz ~ 2 462 MHz		
Operating Frequency Band	□ 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		
MAX. RF OUTPUT POWER	-2.64 dBm		
Antenna Gain	-0.92 dBi		
	□ MPE		
Exposure	□ SAR		
Evaluation Applied	■ N/A		

#### 4.3 Test Result

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 [ $\sqrt{f(GHz)}$ ] < 3

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

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	$-2.5 \pm 0.5$	-2.0	0.63		0.20
	2 440	-3.5 ± 0.5	-3.0	0.50	5	0.17
	2 480	$-4.5 \pm 0.5$	-4.0	0.40		0.13

Tested by: Tae-Ho, Kim / Manager

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