

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

**Test Report No.** : W152R-D005

**AGR No.** : A151A-184

**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

**FCC ID.** : SOD-BT-410

**Model Name** : BT-410

**Serial number** : N/A

**Total page of Report** : 6 pages (including this page)

**Date of Incoming** : January 29, 2015

**Date of issue** : February 10, 2015

## 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 / Senior Engineer  
 ONETECH Corp.

Approved by:   
 \_\_\_\_\_  
 Sung-ik, Han / Managing Director  
 ONETECH Corp.

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### Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W152R-D005	February 10, 2015	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  
 Model Name : BT-410  
 Serial Number : N/A  
 Date : February 10, 2015

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Bluetooth
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2009
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 (referred to as the EUT in this report) is a Bluetooth. The product specification described herein was obtained from product data sheet or user’s manual.

Device Type	Bluetooth
Temperature Range	-10 °C ~ +50 °C
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	-4.47 dBm
Number of Channel	40 Channel
Modulation Type	GFSK
Antenna Type	Chip Antenna
USED RF CHIP	Marker: PLATEL Corporation Model Name: ABM6020B2
Antenna Gain	-0.70 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	16 MHz

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

-. None

## 3. EUT MODIFICATIONS

-. None

## 4. RADIO FREQUENCY EXPOSURE

### 4.1 RF Exposure Limit

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

Kind of EUT	Bluetooth
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 ~ 5 320 MHz / 5 500 MHz ~ 5 700 MHz <input type="checkbox"/> WLAN: 5 745 MHz ~ 5 825 MHz <input checked="" type="checkbox"/> Bluetooth BLE: 2 402 MHz ~ 2 480 MHz
Device Category	<input checked="" type="checkbox"/> Portable (< 20 cm separation) <input type="checkbox"/> Mobile (> 20 cm separation) <input type="checkbox"/> Others
Max. Output Power	-4.47 dBm
Used Antenna	Chip Antenna
Used Antenna Gain	-0.70 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

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

$$= (0.357/5) \times \sqrt{2.402} = 0.111$$

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	-5.47 ± 1.0	-4.47	0.357	5	0.111