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

Test Report No. : **OT-207-RWD-059**

Reception No. : **2007002562**

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 : **Controller**

FCC ID. : **SOD-CA-100**

Model Name : **CA-100**

Multiple Model Name : **CM-300**

Serial number : **N/A**

Total page of Report : **7 pages (including this page)**

Date of Incoming : **July 08, 2020**

Date of issue : **July 30, 2020**

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: Tae-Ho, Kim / Senior Manager, ONETECH Corp.

Approved by: Ki-Hong, Nam / General Manager, 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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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-207-RWD-059	July 30, 2020	Initial Release	All

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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 / Research Engineer
Telephone No.	: +82-70-8671-2600
FCC ID	: SOD-CA-100
Model Name	: CA-100
Brand Name	: -
Serial Number	: N/A
Date	: July 30, 2020

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Controller
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 KDB 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	10 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 ROBOTIS, Model CA-100 (referred to as the EUT in this report) is a Controller. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Controller
Temperature Range	-5 °C ~ 70 °C
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
MODULATION TYPE	GFSK
RF OUTPUT POWER	-17.08 dBm
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	-2.23 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32 MHz

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
CA-100	Basic Model	☑
CM-300	The model is identical to basic model except for the model name only.	☐

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

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4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 Applicable Standard

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.

This is a Portable device with its physical nature to be used nearby, the distance between radiating structure and human is less than 20 cm.

As per KDB 447498 D01, The 1-g and 10-g SAR test exclusion thesholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are detrmined by:

[(Max. Power of channel, including tune-up tolerance, mW)/(Mim. test separation distance, mm)] X [√ f(GHz)]
< 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

F(GHz) is the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation
The result is rounded to one decimal place for comparison.

4.2 EUT Description

Kind of EUT	Controller
Device Category	■ Portable (< 20 cm separation) ☐ Mobile (> 20 cm separation) ☐ Others
Exposure Evaluation Applied	☐ MPE ☐ SAR ■ N/A

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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 [√ f(GHz)] < 3

= (0.93/5) X √ 2.402 = 0.29

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

Operating Mode	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
Bluetooth LE	2 402.00	-18.0 ± 0.5	-17.50	0.02	5.00	0.01
	2 440.00	-17.5 ± 0.5	-17.00	0.02	5.00	0.01
	2 480.00	-17.0 ± 0.5	-16.50	0.02	5.00	0.01

Tested by: Hyung-Kwon, Oh / Manager

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