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

Test Report No. : **OT-18D-RWD-033**

AGR No. : **A18NA-180**

Applicant : **CAMMSYS Corp.**

Address : **26, Venture-ro, 100beon-gil, Yeonsu-gu, Incheon, 22013, Korea**

Manufacturer : **CAMMSYS Corp.**

Address : **26, Venture-ro, 100beon-gil, Yeonsu-gu, Incheon, 22013, Korea**

Type of Equipment : **BlackBox**

FCC ID. : **2ARTT-CH300**

Model Name : **CH-300**

Multiple Model Name : **N/A**

Serial number : **N/A**

Total page of Report : **8 pages (including this page)**

Date of Incoming : **October 19, 2018**

Date of issue : **December 21, 2018**

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: Jae-Ho Lee / Chief Engineer
ONETECH Corp.

Approved by: Keun-Young, Choi / Vice President
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-18D-RWD-033	December 21, 2018	Initial Issue	All

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1. VERIFICATION OF COMPLIANCE

Applicant	: CAMMSYS Corp.
Address	: 26, Venture-ro, 100beon-gil, Yeonsu-gu, Incheon, 22013, Korea
Contact Person	: Kyunghwan Na / Senior Manager
Telephone No.	: +82-70-4680-2592
FCC ID	: 2ARTT-CH300
Model Name	: CH-300
Serial Number	: N/A
Date	: December 21, 2018

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	BlackBox
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.

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2. GENERAL INFORMATION

2.1 Product Description

The CAMMSYS Corp., Model CH-300 (referred to as the EUT in this report) is a BlackBox. Product specification information described herein was obtained from product data sheet or user's manual.

Device Type	BlackBox
Operating Frequency	2 422 MHz ~ 2 452 MHz
RF Output Power	16.91 dBm
Number of Channel	7 Channels
Modulation Type	OFDM
Antenna Type	PCB Pattern Antenna
Antenna Gain	-0.59 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	24 MHz
Rated Supply Voltage	DC 12.0 V, DC 24.0 V

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

-. None

3. EUT MODIFICATIONS

-. None

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4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are f/1500 mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$E = \sqrt{(30 * P * G)} / d$, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric filed strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combing equations and rearranging the terms to express the distance as a function of the remaining variable

$d = \sqrt{(30 * P * G) / (377 * 10\ S)}$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 0.01 * d (m)

$d = 0.282 * \sqrt{(P * G) / S}$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

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4.2 EUT Description

Kind of EUT	BlackBox
Operating Frequency Band	☐ Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz ■ WLAN: 2 422 MHz ~ 2 452 MHz ☐ 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	16.91 dBm
Antenna Gain	-0.59 dBi
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A

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4.3 Calculated MPE Safe Distance

4.3.1 Test data for DC 12 V

According to above equation, the following result was obtained

Mode	Frequency (MHz)	Target Power W/tolerance	Max tune up power		Antenna Gain		Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(dBm)	(mW)	Log	Linear		
802.11n_HT40	2422.0	16.15 ± 0.5	16.65	46.24	-0.59	0.873	0.008 0	1.00

4.3.2 Test data for DC 24 V

According to above equation, the following result was obtained.

Mode	Frequency (MHz)	Target Power W/tolerance	Max tune up power		Antenna Gain		Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(dBm)	(mW)	Log	Linear		
802.11n_HT40	2422.0	16.41 ± 0.5	16.91	49.09	-0.59	0.873	0.008 5	1.00

Tested by: Ha-Ram, Lee / Assistant Manager

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