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

Test Report No.	**: W174R-D060**
AGR No.	**: A15OA-150**
Applicant	**: AIRO Co.,LTD.**
Address	**: 203, Hanulteo Bldg, 464-2, Sangsam-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do, South Korea, 58005**
Manufacturer	**: AIRO Co.,LTD.**
Address	**: 203, Hanulteo Bldg, 464-2, Sangsam-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do, South Korea, 58005**
Type of Equipment	**: Router for Aquarium Fish Robot**
FCC ID.	**: 2ALUA-MIRO-9-ROUTER**
Model Name	**: MIRO-9-ROUTER**
Serial number	**: N/A**
Total page of Report	**: 8 pages (including this page)**
Date of Incoming	**: January 29, 2016**
Date of issue	**: April 21, 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: 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

Issued Report No.	Issued Date	Revisions	Effect Section
W174R-D060	April 21, 2017	Initial Issue	All

DOCUMENT HISTORY

Revision No.	Issued Date	Revisions	Effect Section
Original	April 21, 2017	Initial Issue	-
Revision 01	April 28, 2017	Modify Device Category	4.2 EUT Description

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1. VERIFICATION OF COMPLIANCE

Applicant	: AIRO Co.,LTD.
Address	: 203, Hanulteo Bldg, 464-2, Sangsam-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do, South Korea, 58005
Contact Person	: Ji-hoon Kim / Manager
Telephone No.	: +82-61-727-6760
FCC ID	: 2ALUA-MIRO-9-ROUTER
Model Name	: MIRO-9-ROUTER
Serial Number	: N/A
Date	: April 21, 2017

EQUIPMENT CLASS	DSS – PART 15 SPREAD SPECTRUM TRANSMITTER
E.U.T. DESCRIPTION	Router for Aquarium Fish Robot
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 FC C Rules and Regulations. This said equipment in the configuration described in this report, shows the maximu m emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The AIRO Co.,LTD., Model MIRO-9-ROUTER (referred to as the EUT in this report) is a Router for Aquarium Fish Robot. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Router for Aquarium Fish Robot
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
RF OUTPUT POWER	2.70 dBm
NUMBER OF CHANNEL	79 Channels
MODULATION TYPE	GFSK for 1 Mbps
ANTENNA TYPE	Helical Antenna
LIST OF EACH OSC. OR CRYSTAL. FREQ.(FREQ.>=1 MHz)	16 MHz
RATED SUPPLY VOLTAGE	DC 5 V (Adapter) / DC 3.7 V (Battery)

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	Router for Aquarium Fish Robot	
Operating Frequency Band	☐ Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz ☐ WLAN: 2 412 MHz ~ 2 462 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	
Device Category	☐ Portable (< 20 cm separation) ■ Mobile (> 20 cm separation) ☐ Others	
MAX. RF OUTPUT POWER	Bluetooth	2.70 dBm
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A	

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4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(dBm)	(mW)	Log	Linear			
2 402 ~ 2 480	1 Mbps	2.2 ± 0.5	2.7	1.85	1.79	1.51	2.22	0.0055	1.00

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