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

Test Report No.	**: OT-194-RWD-019**
AGR No.	**: A192A-095R**
Applicant	**: BLUECOM Co., Ltd.**
Address	**: 116, Venture-ro, Yeonsu-gu, Incheon, 22013, South Korea**
Manufacturer	**: BLUECOM Co., Ltd.**
Address	**: 116, Venture-ro, Yeonsu-gu, Incheon, 22013, South Korea**
Type of Equipment	**: Bluetooth Earbud**
FCC ID.	**: U3WBCST90**
Model Name	**: BCS-T90**
Serial number	**: N/A**
Total page of Report	**: 7 pages (including this page)**
Date of Incoming	**: March 18, 2019**
Date of issue	**: April 03, 2019**

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 / 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-194-RWD-019	April 03, 2019	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : BLUECOM Co., Ltd.

Address : 116, Venture-ro, Yeonsu-gu, Incheon, 22013, South Korea

Contact Person : Ki-eok, Park / Principal Engineer

Telephone No. : +82-32-8100-582

FCC ID : U3WBCST90

Model Name : BCS-T90

Brand Name : -

Serial Number : N/A

Date : April 03, 2019

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Bluetooth Earbud
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 BLUECOM Co., Ltd., Model BCS-T90 (referred to as the EUT in this report) is a Bluetooth Earbud. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Bluetooth Earbud		
Temperature Range	-10 ℃ ~ 50 ℃		
OPERATING FREQUENCY	Bluetooth LE	2 402 MHz ~ 2 480 MHz	
	Bluetooth	2 402 MHz ~ 2 480 MHz	
MODULATION TYPE	Bluetooth LE	GFSK	
	Bluetooth	GFSK for 1Mbps, π/4-DQPSK for 2Mbps, 8-DPSK for 3Mbps	
RF OUTPUT POWER'	Bluetooth LE	9.80 dBm	
	Bluetooth	1 Mbps	9.36 dBm
		2 Mbps	9.20 dBm
		3 Mbps	9.55 dBm
ANTENNA TYPE	FPCB Antenna		
ANTENNA GAIN	3.00 dBi		
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32 MHz		
RATED SUPPLY VOLTAGE	DC 3.6 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

4.2 EUT Description

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

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4.3 Calculated MPE Safe Distance

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

= (9.55/5) X √ 2.402 = 2.96

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

Mode	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
1 Mbps	2 402.00	9.30 ± 0.5	9.80	9.55	5.00	2.96
2 Mbps	2 402.00	9.30 ± 0.5	9.80	9.55	5.00	2.96
3 Mbps	2 402.00	9.30 ± 0.5	9.80	9.55	5.00	2.96
BLE	2 402.00	9.30 ± 0.5	9.80	9.55	5.00	2.96

Tested by: Hyung-Kwon, Oh / Assistant Manager

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