

Test Report

Verified code: 422259

Report No.: E202208182570-3

Customer: Blueiot (Beijing) Technology Co., Ltd.

Address: 10/F, Tower A, TusPark Innovation Plaza, Haidian District, Beijing, China

Sample Name: Blueiot RTLS Tag

Sample Model: BT2000-z

Receive Sample Date: Aug.30,2022

Test Date: Aug.31,2022 ~ Sep.23,2022

Reference Document: CFR 47, FCC Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.

Test Result: Pass

Prepared by: *Wen Wen*

Reviewed by: *Wu Haoming*

Approved by: *Liao Liang*

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-11-16

GUANGZHOU GRG METROLOGY & TEST CO., LTD.

Address: No.163, Pingyun Road, West of Huangpu Avenue, Guangzhou, Guangdong, China
Tel: (+86) 400-602-0999 FAX: (+86) 020-38698685 Web: <http://www.grgtest.com>



Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.
2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.
3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.
4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.
5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

----- The following blanks -----

TABLE OF CONTENTS

1.	GENERAL DESCRIPTION OF EUT.....	5
1.1	APPLICANT	5
1.2	MANUFACTURER.....	5
1.3	FACTORY	5
1.4	BASIC DESCRIPTION OF EQUIPMENT UNDER TEST	5
2.	LABORATORY & ACCREDITATIONS	6
2.1	LABORATORY	6
2.2	ACCREDITATIONS	6
3.	LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE	7
4.	ESTIMATION RESULT	8
4.1	MEASUREMENT RESULTS	8
5.	CONCLUSION	8

----- The following blanks -----

REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202208182570-3	Original Issue	2022-09-28

----- The following blanks -----

1. GENERAL DESCRIPTION OF EUT

1.1 APPLICANT

Name: Blueiot (Beijing) Technology Co., Ltd.
Address: 10/F,Tower A,TusPark Innovation Plaza, Haidian District, Beijing, China

1.2 MANUFACTURER

Name: Blueiot (Beijing) Technology Co., Ltd.
Address: 10/F,Tower A,TusPark Innovation Plaza, Haidian District, Beijing, China

1.3 FACTORY

Name: Blueiot (Beijing) Technology Co., Ltd.
Address: 10/F,Tower A,TusPark Innovation Plaza, Haidian District, Beijing, China

1.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Blueiot RTLS Tag
Model No.: BT2000-z
Adding Model: /
Trade Name: Blueiot
FCC ID: 2AZOM-BT2000Z
Power supply: DC 3.6V power supplied by battery
Battery Model: ER14250
Specification: Nominal Voltage: 3.6Vdc
Frequency Band: 2402MHz to 2480MHz
Maximum conducted peak output Power: BLE_1MHz: 9.34dBm
Modulation type: GFSK
Antenna Specification: Internal antenna with 0.5dBi gain (Max.)
Temperature Range: -20℃~70℃
Hardware Version: V0.1.1
Software Version: V1020
Sample No: E202208182570-0001
Note: /

2. LABORATORY&ACCREDITATIONS

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.

P.C.: 518110

Tel : 0755-61180008

Fax: 0755-61180008

2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:2017.

USA A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada ISED (Company Number: 24897, CAB identifier:CN0069)

USA FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.grgtest.com>

----- The following blanks -----

3. LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

According to the KDB 447498 D04 Interim General RF Exposure Guidance v01, General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table 4.1 to support an exemption from further evaluation from 300 kHz through 100 GHz.

TABLE 4.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	—	1.34	159 m	—	35.6 m	1,920 R ²
1.34	—	30	35.6 m	—	1.6 m	3,450 R ² /f ²
30	—	300	1.6 m	—	159 mm	3.83 R ²
300	—	1,500	159 mm	—	31.8 mm	0.0128 R ² f
1,500	—	100,000	31.8 mm	—	0.5 mm	19.2R ²
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

For mobile devices that are not exempt per Table 4.1 at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than $ERP_{20\text{cm}}$ in Formula (4.1).

$$P_{\text{th}} (\text{mW}) = ERP_{20 \text{ cm}} (\text{mW}) = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (4.1)$$

----- The following blanks -----

4. ESTIMATION RESULT

4.1 MEASUREMENT RESULTS

Predication of MPE limit at a given distance

$EIRP(dBm) = \text{Maximum Tune-up Output power (dBm)} + \text{Maximum antenna gain (dBi)}$

$ERP(dBm) = EIRP(dBm) - 2.15$

R= minimum distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, $d=20\text{cm}$, as well as the maximum gain of the used as following information, the RF power ERP can be obtained.

Table 1 Antenna Specification

Frequency Band	Antenna type	Internal Identification	Maximum antenna gain (dBi)
BLE	Internal antenna	Antenna 1	0.5dBi

Table 2 Transmit Power

Frequency Band	Maximum Conducted output peak Power (dBm)	Tune-up Maximum Conducted output peak Power (dBm)	Maximum Tune-up Maximum Conducted output peak Power (dBm)
BLE	9.34	9+1	10

STANDALONE MPE

Mode	Frequency (MHz)	Maximum Tune-up Maximum Conducted output peak Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (W)	Threshold ERP (W)
BLE	2480	10	0.5	10.5	8.35	0.0068	0.768

Remark:

1. RF Exposure use distance is 20cm from manufacturer declaration of user manual.

2. Threshold $ERP(W) = 19.2R^2(W) = 19.2 \times 0.2 \times 0.2(W) = 0.768(W)$.

5. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

----- End of Report -----