

Test Report

Verified code: 810951

Report No.: E20240624383901-2

Customer: Qingdao YiGoal Technology Co.,Limited

Address: Qingdao City, Shibei District, Tailiu Road, No. 280, Vanke City, Toronto Block,
Building 4, Unit 203. China

Sample Name: Bluetooth module

Sample Model: HT288

Receive Sample Date: Jun.27,2024

Test Date: Jul.03,2024 ~ Jul.11,2024

Reference Document: CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation:
mobile devices

Test Result: Pass

Prepared by: Wen Wenwen
Wen Wenwen

Reviewed by: Wu Haoting
Wu Haoting

Approved by: Xiao Liang
Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD

Issued Date: 2024-08-29

GRG METROLOGY & TEST GROUP 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. This testing report is only for scientific research, teaching, internal quality control, etc.

——Blank space below this page——

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 AND ACCREDITATIONS	6
2.1.	LABORATORY	6
2.2.	ACCREDITATIONS	6
3.	LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE	7
4.	CALCULATION METHOD	8
5.	ESTIMATION RESULT	8
5.1	MEASUREMENT RESULTS	8
6.	CONCLUSION	9

——Blank space below this page——

REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20240624383901-2	Original Issue	2024-07-25

Blank space below this page

1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name: Qingdao YiGoal Technology Co.,Limited
Address: Qingdao City, Shibei District, Tailiu Road, No. 280, Vanke City, Toronto Block, Building 4, Unit 203. China

1.2. MANUFACTURER

Name: Qingdao YiGoal Technology Co.,Limited
Address: Qingdao City, Shibei District, Tailiu Road, No. 280, Vanke City, Toronto Block, Building 4, Unit 203. China

1.3. Factory

Name: Guangdong Bestcore Internet of Things Technology Co.,Ltd
Address: Room 1501, 15F, ShuMao Building, 6 Xiangxing Road, Torch Development District ,Zhongshan

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Bluetooth module
Model No.: HT288
Additional Model: HT228, HT227
Models Difference descriptions: They have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical, except sales area are different.
Trade Mark: Yigoal
FCC ID: 2BHMW-HT288
Power supply: DC 3.3V
Frequency Band: 2402MHz-2480MHz
Maximum conducted output Power: 4.37dBm
Modulation type: GFSK
Channel space: 2MHz
Antenna Specification: PCB printed antenna with -2.31dBi gain (Max.)
Temperature Range: -40℃ ~ +85℃
Hardware Version: 1.0
Software Version: 1.0
Sample No: E20240624383901-0001, E20240624383901-0004

Note :

The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2. LABORATORY AND ACCREDITATIONS

2.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add : Address: 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.

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>

——Blank space below this page——

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).

Formula (4.1):

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

4. CALCULATION METHOD

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

Mode	Antenna type	Maximum antenna gain
BLE	PCB printed antenna	-2.31dBi

Table 2 Transmit Power

Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)	Target (dBm)	Tolerance $\pm$ (dB)
BLE_1M	2402	4.33	5.00	1.0
	2440	4.16	5.00	1.0
	2480	3.77	4.00	1.0
BLE_2M	2402	4.37	5.00	1.0
	2440	4.18	5.00	1.0
	2480	3.78	4.00	1.0

5. ESTIMATION RESULT

5.1 MEASUREMENT RESULTS

STANDALONE MPE

Mode	Frequency (MHz)	Maximum Tune-up Output power (dBm)	Antenna Gain (dBi)	Maximum Tune-up EIRP (dBm)	ERP (dBm)	Maximum Tune-up ERP (W)	Threshold ERP(W)
BLE_1M	2402- 2480	6.0	-2.31	3.69	1.54	0.0014	0.768
BLE_2M	2402- 2480	6.0	-2.31	3.69	1.54	0.0014	0.768

Remark:

1. RF Exposure use distance is 20cm from manufacturer declaration of user manual.
2. Threshold $ERP(W) = 19.2R^2(W) = 19.2 \times 0.2 \times 0.2(W) = 0.768(W)$.
3. $ERP(dBm) = EIRP(dBm) - 2.15$.

6. 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 -----