Test Report

Verified code: 246345

Report No.: E202205133248-3

Customer:	Guangdong Bestcore Internet of Things Technology Co.,Ltd
Address:	Room 1011, 10F, ShuMao Building,6 Xiangxing Road,Torch Development District Zhongshan,China
Sample Name:	Bluetooth module
Sample Model:	BC213
Receive Sample Date:	May.16,2022
Test Date:	May.16,2022 ~ Jun.14,2022
Reference Document:	CFR 47, FCC Part 2.1091Radiofrequency radiation exposure evaluation: mobile devices.
Test Result:	Pass

Prepared by: Huang Lifang Reviewed by: Jiang Tao Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-06-28

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202205133248-3	Original Issue	2022-06-14

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1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name:	Guangdong Bestcore Internet of Things Technology Co.,Ltd
Address:	Room 1011, 10F, ShuMao Building,6 Xiangxing Road,Torch Development District Zhongshan,China

1.2. MANUFACTURER

Name:	Guangdong Bestcore Internet of Things Technology Co.,Ltd
Address:	Room 1011, 10F, ShuMao Building,6 Xiangxing Road,Torch Development District Zhongshan,China

1.3. FACTORY

Name:	Guangdong Bestcore Internet of Things Technology Co.,Ltd
Address:	Room 1011, 10F, ShuMao Building,6 Xiangxing Road,Torch Development District Zhongshan,China

1.4. BASIC DESCRIPTIONOF EQUIPMENTUNDER TEST

Equipment:	Bluetooth module
Model No.:	BC213
Adding Model:	/
Trade Name:	Best-core
FCC ID:	2AW3Q-BC213
Power Supply:	DC 3.3V Power Supply By Serial port plate
Frequency Band:	2402MHz-2480MHz
Transmit Power:	1.28 dBm
Modulation type:	GFSK
Antenna Specification:	Ceramic antenna with 1dBi gain (Max.)
Temperature Range:	-20℃~+85℃
Hardware Version:	1.0
Software Version:	1.0
Sample No:	E202205133248-0002,E202205133248-0003
Note1:	/

2. LABORATORYAND 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.
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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

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3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Mobile Device

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

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4. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

(B)Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength(H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time$[E]^2$, $[H]^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100,000	/	/	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

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5. CALCULATION METHOD

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to anisotropic radiator
R=distance to the center of radiation of the antenna
From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used as following information, the RF power density can be obtained.

Frequency Band	Antenna type	Maximum antenna gain
BLE	Ceramic antenna	1dBi

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6. ESTIMATION RESULT

6.1. CONDUCTED POWER RESULTS

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
BLE	2402	1.28
	2440	1.18
	2480	0.91

6.2. MANUFACTURING TOLERANCE

Frequency(MHz)	BLE
	2402
Target(dBm)	1.0
Tolerance ±(dB)	1.0

6.3. MEASUREMENT RESULTS

6.3.1. STANDALONE MPE

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)				
BLE	2.0	1.5849	1	1.2589	0.0004	1.0000

Note:

$S(2402MHz)=PG/4\pi R^2= 1.5849*1.2589/4/3.14/400 =0.0004\ mW/cm^2$

Remark: 1. Maximum peak conducted output power including tune-up tolerance;

2. MPE use distance is 20cm from manufacturer declaration of user manual.

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7. CONCLUSION

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

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