Certificate #5505.02

MPE REPORT

Report No.:	SRTC2024-9004(F)-24032606(I)
Product Name:	WiFi/BT Module
Model Name:	MWH540S
Applicant:	Qingdao Intelligent & Precise Electronics Co., Ltd.
Manufacturer:	Qingdao Intelligent & Precise Electronics Co., Ltd.
FCC ID:	2AJVQ-MWH540S

Reference Specification
FCC Part §1.1310

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30, Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1 GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Test Site 1:	15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2:	No.80, Zhaojiachang, Beizang, Daxing District
City:	Beijing
Country or Region:	P.R.China
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Designation Number:	CN1267
Registration number:	239125

1.3 Applicant’s details

Company:	Qingdao Intelligent & Precise Electronics Co., Ltd.
Address:	No.218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao City, Shandong Province, P. R. China

1.4 Manufacturer’s details

Company:	Qingdao Intelligent & Precise Electronics Co., Ltd.
Address:	No.218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao City, Shandong Province, P. R. China

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2024-03-26
Testing Start Date:	2024-03-27
Testing End Date:	2024-04-12

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	70	---
Minimum Extreme	0	---

Normal Supply Voltage (V d.c.):	3.3
Maximum Extreme Supply Voltage (V d.c.):	3.5
Minimum Extreme Supply Voltage (V d.c.):	3.1

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

BT

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	79
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Duplex Mode:	TDD
Channel Spacing:	1MHz
Data Rate:	1Mbps, 2 Mbps, 3 Mbps
Power Supply:	DC supply
Software Revision:	NA
Hardware Revision:	V1.00
IMEI:	#2
Antenna type**:**	Ipex pullout antenna

BLE

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	40
Modulation Type:	GFSK
Equipment Class:	DTS
Channel Spacing:	2MHz
Data Rate:	LE 1Mbps/2Mbps
Power Supply:	DC supply
Software Revision:	NA
Hardware Revision:	V1.00
IMEI:	#23
Antenna type:	Ipex pullout antenna

Wi-Fi 2.4G

Frequency Band:	2.412GHz~2.462GHz
Number of Channel For 20MHz:	11
Number of Channel For 40MHz:	7

Modulation Type:	802.11b 802.11g 802.11n (HT20/HT40)
Power Supply:	DC supply
Antenna gain:	ANT0：1.06dBi ANT1：1.06dBi
Directional Gain:	1.06dBi
Software Revision:	NA
Hardware Revision:	V1.00
IMEI:	#2
Antenna type:	Ipex pullout antenna

Wi-Fi 5G

Frequency Band(s)**:**	U-NII-1:5150MHz-5250MHz U-NII-2A:5250MHz-5350MHz U-NII-2C:5470MHz-5725MHz U-NII-3:5725MHz-5850MHz	
The DFS related operating mode(s) of the equipment:	□	Master
	□	Slave with radar detection
	☑	Slave without radar detection
Modulation Type:	802.11a 802.11n (HT20/HT40) 802.11ac (VHT20/VHT40/VHT80)	
Antenna Type**:**	Ipex pullout antenna	
Antenna gain	ANT0：1.06dBi ANT1：1.06dBi	
Directional Gain:	1.06dBi	
Power Supply**:**	DC supply	
Software Revision:	NA	
Hardware Revision:	V1.00	
IMEI:	#2	

3 REFERENCE SPECIFICATION

Specification	Version	Title
Part 1.1310	Latest	Radio frequency radiation exposure limits.

4 RESULT SUMMARY

Case	Verdict
MPE	Pass

This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Mr. Hui Wen	Issued date: 2024/04/22

5.CALCULATION RESULT

5.1 Maximum permissible exposure (MPE)

Limit:

(A) Limits for Occupational/Controlled Exposure ☐

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(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/cm2)	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^2	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

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

Result:

According to §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

The MPE was calculated at 50 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

The $S = PG / (4\pi R^2)$

Where S = power density in mW/cm^2

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

Standalone Transmission Result

Band	Freq. (MHz)	Maximum Power (dBm)	ANT Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP(mW)	Power Density at 50cm (mW/cm^2)	Limit (mW/cm^2)	Power Density/ Limit
BT	2441	5.44	1.06	6.50	4.467	0.001	1	0.001
BLE	2480	6.42	1.06	7.48	5.598	0.001	1	0.001
WIFI 2.4GMIMO	2452	17.38	1.06	18.44	69.823	0.014	1	0.014
WIFI 5.2GMIMO	5180	17.55	1.81	19.36	86.298	0.017	1	0.017
WIFI 5.3GMIMO	5260	17.83	1.81	19.64	92.045	0.018	1	0.018
WIFI 5.6GMIMO	5590	17.49	1.81	19.30	85.114	0.017	1	0.017
WIFI 5.8GMIMO	5745	17.74	1.81	19.55	90.157	0.018	1	0.018

Simultaneous Transmission Result

Power Density1 / Limit	Powe Density2 / Limit	Σ(Power Density / Limit)
0.001	0.018	0.019

Note: Simultaneous Transmission Limit = Power_1 / Limit_1 + Power_2 / Limit_2 < 1.

---End of Test Report---