

MPE REPORT

Report No.: SRTC2023-9004(F)-23101701(I)
Product Name: WiFi/BT Module
Model Name: MWH538B
Applicant: Qingdao Intelligent & Precise Electronics Co., Ltd.
Manufacturer: Qingdao Intelligent & Precise Electronics Co., Ltd.
FCC ID: 2AJVQ-MWH538B

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

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1 GENERAL INFORMATION

1.1 Notes of the test report

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The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Designation number:	CN1267
Registration number:	239125
Certificate Number:	5055.02
Address:	15th Building, No.30 Shixing Street, Shijingshan District, Beijing P.R.China
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1.3 Applicant's details

Company:	Qingdao Intelligent & Precise Electronics Co., Ltd.
Address:	218 Qianwangang Road, Qingdao Economic& Technological Development Zone, Qingdao, China

1.4 Manufacturer's details

Company:	Qingdao Intelligent & Precise Electronics Co., Ltd.
Address:	218 Qianwangang Road, Qingdao Economic& Technological Development Zone, Qingdao, China

1.5 Test environment

Date of Receipt of test sample at SRTC:	2023-10-31
Testing Start Date:	2023-11-01
Testing End Date:	2023-11-08

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	70	---
Minimum Extreme	-10	---

2 DESCRIPTION OF THE EQUIPMENT UNDER TEST

2.1 Final equipment build status

Frequency Range	2.402GHz~2.480GHz
Number of Channel	79
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Duplex Mode	TDD
Channel Spacing	1MHz
Data Rate	1Mbps,2Mbps,3Mbps
Antenna Type	IFA Antenna
Antenna Gain	0.82dBi
Power Supply	DC supply
Software Revision:	NA
Hardware Revision:	V1.00
IMEI / SN:	#1

Frequency Range:	2.402GHz~2.480GHz
Number of Channel:	40
Modulation Type:	GFSK
Duplex Mode:	TDD
Channel Spacing:	2MHz
Data Rate:	LE 1Mbps/2Mbps
Antenna Type	IFA Antenna
Antenna Gain	0.82dBi
Power Supply:	DC supply
Software Revision:	NA
Hardware Revision:	V1.00
IMEI:	#1

Frequency Range:	2.412GHz~2.472GHz
Number of Channel For 20MHz:	13
Duplex Mode:	TDD

Channel Spacing:	5MHz
Mode:	802.11b / 802.11g / 802.11n (HT20/HT40)
Antenna Type:	IFA Antenna
Antenna Gain:	ANT0: 1.44dBi ANT1: -0.45dBi
Power Supply:	DC supply
Software Revision:	NA
Hardware Revision:	V1.00

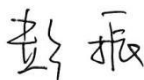
Operating Band(s):	5.15GHz~5.35GHz 5.47GHz~5.725GHz	
Channel/For 20MHz:	36/40/44/48/52/56/60/64/100/104/108/112/116/ 120/124/128/132/136/140	
Channel/For 40MHz:	38/46/54/62/102/110/118/126/134	
Channel/For 80MHz:	42/56/106/122	
The DFS related operating mode(s) of the equipment:	☐	Master
	☐	Slave with radar detection
	☒	Slave without radar detection
Modulation Type:	802.11a/n (HT20/HT40) 802.11ac (VHT20/VHT40/VHT80)	
Duplex Mode:	TDD	
Antenna Type:	IFA Antenna	
Antenna Gain:	ANT0: 2.98dBi ANT1: 2.35dBi	
Beamforming Directional Gain:	N/A	
Power Supply	DC supply	
Software Revision:	NA	
Hardware Revision:	V1.00	
SN:	#1	

3 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: 20231110

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/cm ²)	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/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 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 20 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/cm²

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)	d(cm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density/ Limit
BT	2441	7.66	0.82	8.48	7.047	20.0	0.001	1	0.001
BLE	2440	8.56	0.82	9.38	8.670	20.0	0.002	1	0.002
WIFI 2.4G MIMO	2412	19.10	1.44	20.54	113.240	20.0	0.023	1	0.023
WIFI 5G MIMO	5785	20.47	2.98	23.45	221.309	20.0	0.044	1	0.044

Simultaneous Transmission Result

Power / Limit	Power / Limit	$\Sigma(\text{Power} / \text{Limit})$
0.002(BLE)	0.023(WIFI 2.4G)	0.025
0.002(BLE)	0.044(WIFI 5G)	0.046

Note: Simultaneous Transmission Limit = $\text{Power}_1 / \text{Limit}_1 + \text{Power}_2 / \text{Limit}_2 < 1$.

---End of Test Report---