



FCC RF EXPOSURE REPORT

Applicant	:	Roadway Smart Technologies Co., Ltd
Address of Applicant	:	Room 1118, Jinao International Apartment, No.19 Madian East Road, Haidian District, Beijing, China
Manufacturer	:	Roadway Smart Technologies Co., Ltd
Address of Manufacturer	:	Room 1118, Jinao International Apartment, No.19 Madian East Road, Haidian District, Beijing, China
Equipment under Test	:	AIoT Edge Controller
Model No.	:	MB41
FCC ID	:	2BECT-MB41
Test Standard(s)	:	KDB447498 D01 General RF Exposure Guidance v06
Report No.	:	DDT-RE23111537-2E11
Issue Date	:	2024/02/21
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd.
Address of Laboratory	:	Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Guangdong Dongdian Testing Service Co., Ltd and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Guangdong Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No.:	DDT-RE23111537-2E11		
Date of Receipt:	2023/12/25	Date of Test:	2023/12/25 ~ 2024/02/21

Prepared By:

Approved By:

Tiger Mo

Damon Hu

Tiger Mo/Engineer

Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2024/02/21	

1. General Information

1.1. Description of equipment

EUT Name	: AloT Edge Controller
Model Number	: MB41
EUT function description	: Please reference user manual of this device
Power Supply	: DC 5V from external Power supply
Radio Technology	: Bluetooth V5.0 (BR/EDR/LE), WLAN(2.4 GHz): IEEE 802.11b/g/n, WLAN(5 GHz): IEEE 802.11a/n/ac
Operation frequency	: Bluetooth (BR/EDR/LE): 2402 MHz-2480 MHz IEEE 802.11b/g/n: 2412 MHz to 2462 MHz, IEEE 802.11a/n/ac: 5180 MHz to 5240 MHz, 5260 MHz to 5320 MHz, 5500 MHz to 5720 MHz, 5745 MHz to 5825 MHz
Modulation	: Bluetooth BR/EDR: GFSK, $\pi/4$ -DQPSK, 8DPSK Bluetooth LE: GFSK IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g/a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: Bluetooth BR/EDR: 1 Mbps, 2 Mbps, 3 Mbps Bluetooth LE: 1 Mbps, 2 Mbps IEEE 802.11b: up to 11 Mbps IEEE 802.11a/g: up to 54 Mbps IEEE 802.11n HT20: up to 144.4 Mbps IEEE 802.11n HT40: up to 300 Mbps IEEE 802.11ac VHT20: up to 173.4 Mbps IEEE 802.11ac VHT40: up to 400 Mbps IEEE 802.11ac VHT80: up to 866.6 Mbps
Antenna Type	: Bluetooth (BR/EDR/LE): Dual band fan-shaped rubber rod omnidirectional antenna, maximum PK gain: 3.09 dBi 2.4G WIFI: Antenna 1: Dual band fan-shaped rubber rod omnidirectional antenna, Maximum PK gain: 3.09 dBi Antenna 2: FPC antenna , Maximum PK gain: 2.5 dBi 5G WIFI: Antenna 1: Dual band fan-shaped rubber rod omnidirectional antenna: Maximum PK gain: 4.56 dBi Antenna 2: FPC Maximum PK gain: 4.2 dBi

Note : EUT is the abbreviation of equipment under test.

1.2. Assess laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No.17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China 523808

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2. RF Exposure Evaluation

2.1. Requirement

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 0.2 m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(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

2.2. Calculation method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2 m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation result

Mode	Output power (dBm)	Output power (mW)	tune up power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
BT	8.97	7.89	9	3.09	2.04	0.003	1
BLE	6.15	4.12	7	3.09	2.04	0.002	1
2.4G WIFI	18.92	77.98	19	2.5	1.78	0.028	1
5G WIFI	18.36	68.55	19	4.56	2.86	0.039	1

The EUT support simultaneous emission, worst case is:

$$0.003/1+0.039/1=0.042<1$$

Note: The estimation distance is 20 cm

Conclusion: MPE evaluation required since transmitter power is below FCC threshold

END OF REPORT