

RF Exposure Evaluation Report

Product : UGOT Robot
Trade mark : UBTECH
Model/Type reference : ERXI101, ERXwxyy ("w" can be A-Z, indicating the product version; "x" can be 0-6, indicating the product category; "yy" can be 00-99, indicating the product attributes.)
Serial Number : N/A
Report Number : EED32P81119605
FCC ID : 2AHJX-UGOTERX
Date of Issue : Aug. 23, 2023
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
47 CFR Part 2.1093
447498 D04 Interim General RF Exposure Guidance v01
Test result : PASS

Prepared for:

UBTECH ROBOTICS CORP LTD

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2 Version

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4 General Information

4.1 Client Information

Applicant:	UBTECH ROBOTICS CORP LTD
Address of Applicant:	Room 2201, Building C1, Nanshan Smart Park, No.1001 Xueyuan Avenue, Changyuan Community, Taoyuan Street, Nanshan District, Shenzhen, PRC
Manufacturer:	UBTECH ROBOTICS CORP LTD
Address of Manufacturer:	Room 2201, Building C1, Nanshan Smart Park, No.1001 Xueyuan Avenue, Changyuan Community, Taoyuan Street, Nanshan District, Shenzhen, PRC

4.2 General Description of EUT

Product Name:	UGOT Robot
Model No.:	ERXI101, ERXwxyy ("w" can be A-Z, indicating the product version; "x" can be 0-6, indicating the product category; "yy" can be 00-99, indicating the product attributes.)
Test Model No.:	ERXI101
Trade mark:	UBTECH

4.3 Product Specification subjective to this standard

Frequency Range:	BLE/BT: 2402MHz~2480MHz 2.4G WIFI: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz 5G WIFI: U-NII-1: 5150-5250MHz U-NII-3: 5725-5875MHz
Modulation Type:	BLE: GFSK, BT: GFSK, $\pi/4$ DQPSK, 8DPSK 2.4G WIFI: IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM,QPSK,BPSK) 5G WIFI: IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac(VHT20/VHT40/VHT80): OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Test Power Grade:	Default
Test Software of EUT:	BLE/BT: Bluetooth RF Test Tool.exe 2.4G WIFI/5G WIFI: Putty.exe
Antenna Type:	PIFA antenna
Antenna Gain:	BLE/BT: 1.94dBi 2.4G WIFI: Ant1: 1.94dBi; Ant2: 1.92dBi 5G WIFI Band 1: Ant1: 2.37dBi; Ant2: 1.92dBi 5G WIFI Band 4: Ant1: 3.78dBi; Ant2: 3.07dB

Power Supply:	Adapter:	MODEL:S024AMM1900100 INPUT:100-240V~50/60Hz,0.6A MAX OUTPUT:19.0V,1.0A,19.0W
	Battery:	DC 10.8V,2600mAh,28.08Wh
Sample Received Date:	Jul. 21, 2023	
Sample tested Date:	Jul. 27, 2023 to Aug. 08, 2023	
Remark: Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified. Model No.: ERXI101, ERXwxyy (" w "can be A-Z, indicating the product version; "x" can be 0-6, indicating the product category; "yy" can be 00-99, indicating the product attributes.) Only the model ERXI101 was tested. Their internal structure and circuit principle are the same. Model No. ERXI101 has the most complete configuration including all the electronic components and plastic components. Different model No. have different configuration. But all the electronic components and plastic components come from ERXI101.		

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

The 1 mW Blanket Exemption of § 1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5.1.3 EUT RF Exposure Evaluation

For Stand alone:

For BLE

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2480	5.62	1.94	7.56	5.41	3.475	3060	0.0011	PASS

For BT

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2480	3.08	1.94	5.02	2.87	1.936	3060	0.0006	PASS

For 2.4G Wi-Fi

ANT 1:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2437	19.32	1.94	21.26	19.11	81.470	3060	0.0266	PASS

ANT 2:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2422	18.57	1.92	20.49	18.34	68.234	3060	0.0223	PASS

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For 5G Wi-Fi
Band 1 ANT 1:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5240	15.12	2.37	17.49	15.34	34.198	3060	0.0111	PASS

Band 1 ANT 2:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5240	14.68	1.92	16.6	14.45	27.861	3060	0.0091	PASS

Band 4 ANT 1:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5785	16.2	3.78	19.98	17.83	60.674	3060	0.0198	PASS

Band 4 ANT 2:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5745	15.1	3.07	18.17	16.02	39.994	3060	0.0131	PASS

Note:

- ① EIRP=conducted power+antenna gain;
- ② ERP=EIRP-2.15
- ③ The test data refer to the report of EED32P81119601,EED32P81119602,EED32P81119603, EED32P81119604, and only the worst case data was recorded in the report.
- ④ The separation distance is 20cm.

For Simultaneous Transmission:

As MPE ratio (2.4G Wi-Fi+5G Wi-Fi)=0.0266+0.0198=0.0464 < 1, it's deemed to fulfil the RF exposure requirement.

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*** End of Report ***