

RF Exposure Evaluation Report

Product : ROBOTIC LAWN MOWER
Trade mark : AIRSEEKERS
Model/Type reference : TRON
Serial Number : N/A
Report Number : EED32R80464706
FCC ID : 2BPTW-TRONE1
Date of Issue : Jun. 04, 2025
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
47 CFR Part 2.1093
KDB 447498 D04 Interim General RF
Exposure Guidance v01
Test result : PASS

Prepared for:

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1 Version

Version No.	Date	Description
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3 General Information

3.1 Client Information

Applicant:	Guangdong Changyao Innovation Technology Co., Ltd
Address of Applicant:	201, Building 1, No. 1322, Meijie Road, Xiangzhou District, Zhuhai
Manufacturer:	Guangdong Changyao Innovation Technology Co., Ltd
Address of Manufacturer:	201, Building 1, No. 1322, Meijie Road, Xiangzhou District, Zhuhai

3.2 General Description of EUT

Product Name:	ROBOTIC LAWN MOWER
Model No.(EUT):	TRON
Trade Mark:	AIRSEEKERS

3.3 Product Specification subjective to this standard

Frequency Range:	BLE: 2402MHz~2480MHz 2.4G Wi-Fi: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz 5G Wi-Fi: U-NII-1: 5150-5250MHz NII-3: 5745-5825MHz Lora: 902.750MHz, 915.25MHz, 927.250MHz LTE: FDD band 2:UL:1850 – 1910MHz,DL: 1930 – 1990MHz; FDD band 4:UL:1710 – 1755MHz,DL: 2110 – 2155MHz; FDD band 5:UL:824 – 849MHz,DL: 869 – 894MHz; FDD band 7:UL:2500 – 2570MHz,DL: 2620 – 2690MHz; FDD band 12:UL:699 – 716MHz,DL: 729 – 746MHz; FDD band 13:UL:777 – 787MHz,DL: 746 – 756MHz; FDD band 25:UL:1850 – 1915MHz,DL: 1930 – 1990MHz; FDD band 26:UL:824 – 849MHz,DL: 859– 894MHz; FDD band 38:UL:2570 – 2620MHz,DL: 2570 – 2620MHz; FDD band 41:UL:2496 – 2690MHz,DL: 2496 – 2690MHz.
Modulation Type:	BLE: GFSK 2.4G Wi-Fi: 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 Wi-Fi: 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) Lora: LoRa LTE: QPSK, 16QAM, 64QAM
Test Power Grade:	Default
Test Software of EUT:	ESP32.exe MobaXterm_Personal_22.1.exe

Antenna Type:	FPC Antenna	
Antenna Gain:	BLE: ESP32: 3.0dBi, AP6256: 2.5 dBi 2.4G Wi-Fi: 2.5 dBi 5G Wi-Fi: U-NII-1: 5.0 dBi U-NII-3: 4.7 dBi LoRa: 2.3dBi LTE: FDD band 2: 2.2 dBi FDD band 4: 2.3 dBi FDD band 5: 1.8 dBi FDD band 7: 1.6 dBi FDD band 12: 1.8 dBi FDD band 13: 1.8 dBi FDD band 25: 2.2 dBi FDD band 26: 1.8 dBi FDD band 38: 1.6 dBi FDD band 41: 2.0 dBi	
Power Supply:	Adapter:	DC 24V
Sample Received Date:	Apr. 16, 2025	
Sample tested Date:	Apr. 16, 2025 to May 26, 2025	

3.4 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

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.

3.7 Other Information Requested by the Customer

None.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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 Pth (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). Pth 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 ERP20cm 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.

4.1.2 Test Procedure

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

4.1.3 EUT RF Exposure Evaluation

Maximum tune-up Power

	Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
BLE	0	6.76	6.00±1	7	5.012
2.4G Wi-Fi	1	13.29	13.00±1	14	25.119
5G Wi-Fi	157	13.72	13.00±1	14	25.119
Lora	16	14.74	14.00±1	15.00	31.623
LTE	Band 26	24.99	24.5±1	25.5	354.813

Remark: The Max Conducted Peak Output Power data refer to the report EED32R80464701, EED32R80464702, EED32R80464703, EED32R80464704, EED32R80464705. Only the worst case was recorded in the report.

For Stand alone:

BLE for ESP32:

Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
@2.4GHz	20	6.76	3	7.61	5.768	3060	0.0019	Pass

BLE for AP6256:

Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
@2.4GHz	20	6.47	2.5	6.82	4.808	3060	0.0016	Pass

2.4G Wi-Fi:

Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
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@2.4GHz	20	13.29	2.5	13.64	23.121	3060	0.0076	Pass
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5G Wi-Fi:

Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
@5GHz	20	13.72	4.7	16.27	42.364	3060	0.0138	Pass

Lora:

Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
@Lora	20	14.74	2.3	14.89	30.832	1868.19	0.0165	Pass

LTE:

Band	Frequency (MHz)	Estimation distance (cm)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
Band 2	1908.5	20	14.74	2.2	14.79	30.130	3060.00	0.0098	Pass
Band 4	1732.5	20	23.44	2.3	23.59	228.560	3060.00	0.0747	Pass
Band 5	826.5	20	24.06	1.8	23.71	234.963	1686.06	0.1394	Pass
Band 7	2535	20	22.36	1.6	21.81	151.705	3060.00	0.0496	Pass
Band 12	707.5	20	23.91	1.8	23.56	226.986	1443.30	0.1573	Pass
Band 13	782	20	23.93	1.8	23.58	228.034	1595.28	0.1429	Pass
Band 25	1860	20	23.73	2.2	23.78	238.781	3060.00	0.0780	Pass
Band 26A	823.3	20	23.68	1.8	23.33	215.278	1679.53	0.1282	Pass
Band 26B	825.3	20	24.99	1.8	24.64	291.072	1683.61	0.1729	Pass
Band 38	2595	20	23.91	1.6	23.36	216.770	3060.00	0.0708	Pass
Band 41	2593	20	23.44	2.0	23.29	213.304	3060.00	0.0697	Pass

Note:

① EIRP=conducted power+antenna gain;

② ERP=EIRP-2.15;

③ EIRP(dBm) = Field strength of the fundamental signal(dBuV/m@3m) – 95.23;

④ ERP(mW) = $10^{(ERP \text{ (dBm)}/10)}$;

⑤ The estimation distance is 20cm;

⑥ The test data please refer to the report of EED32R80464701, EED32R80464702, EED32R80464703, EED32R80464704, EED32R80464705 and only the worst case data was recorded in the report.

For Simultaneous Transmission:

As MPE ratio (BLE+2.4G Wi-Fi + 5G Wi-Fi+Lora+LTE)= $0.0019^2+0.0076^2+0.0138^2+0.0165^2+0.1729^2=0.0304 < 1$, it's deemed to fulfil the RF exposure requirement.

Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;
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*** End of Report ***