

TEST REPORT

Product Name : ROBOTIC POOL CLEANER
Model Number : whale pro, Pleco pro
FCC ID : 2BN5V-WHALE

Prepared for : Nanjing Toua Robot Technology Co.,Ltd
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1. TEST RESULT CERTIFICATION

Applicant : Nanjing Toua Robot Technology Co.,Ltd
Address : F11, Building 1, Chuangzhi Park, 99#Wan 'an North Road,Jiangning District, Nanjing,Jiangsu, China
Manufacturer : Nanjing Toua Robot Technology Co.,Ltd
Address : F11, Building 1, Chuangzhi Park, 99#Wan 'an North Road,Jiangning District, Nanjing,Jiangsu, China
Factory : Anhui Toua Robot Co.,Ltd.
Address : Building 4#, No.29, Runzhou Road, Danyang Town, Bowang District, Maanshan, Anhui Province, P.R.China
EUT : ROBOTIC POOL CLEANER
Model Name : whale pro, Pleco pro
Trademark : N/A

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
§ 15.247(i), § 2.1091	PASS

The above equipment was tested by EMTEK(DONGGUAN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules FCC § 15.247(i), § 2.1091.

The test results of this report relate only to the tested sample identified in this report

Date of Test : Mar 03, 2025 to Mar 20, 2025

Prepared by : 
Galen Xiao /Editor

Reviewer : 
Warren Deng /Supervisor

Approve & Authorized Signer :  
Sam Lv /Manager

Modified History

Version	Report No.	Revision Date	Summary
	EDG2503030044E00404R	/	Original Report



2. EUT Specification

Characteristics	Description
Product:	ROBOTIC POOL CLEANER
Model Number:	whale pro, Pleco pro (Note: These models are the same, except for the model numbers; whale pro was selected for full test.)
Sample:	2#
Device Type:	BT/BLE 2.4G WIFI
Data Rate:	802.11b 802.11g 802.11n(20MHz channel bandwidth) 802.11n(40MHz channel bandwidth) 1Mbps for GFSK modulation 2Mbps for $\pi/4$ -DQPSK modulation 3Mbps for 8DPSK modulation 1Mbps for GFSK modulation
Modulation:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; GFSK, $\pi/4$ -DQPSK, 8DPSK
Operating Frequency Range(s) :	2412-2462MHz for 802.11b/g/n(HT20); 2422-2452MHz for 802.11n(HT40); 2402-2480MHz
Number of Channels:	11 channels for 802.11b/g/n(HT20); 7 Channels for 802.11n(HT40); BT: 79 channels BLE:40 channels
Transmit Power Max:	BT:2.52 dBm(0.001786 W) BLE:-0.22 dBm(0.000951 W) 2.4G WIFI:18.60 dBm(0.072444 W)
Antenna Type:	FPC Antenna
Antenna Gain:	2.33 dBi
Power supply:	DC 25.2V from adapter Adapter:Model:MX65W1-2522500U INPUT:100-240V~50/60Hz 2A OUTPUT:25.2V= 2.5A DC 21.9V built-in battery
Evaluation applied:	☒ MPE Evaluation ☐ SAR Evaluation

3. Test Requirement:

RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

4. Measurement Result

Antenna gain:

2.4G: 2.33 dBi

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2412	11B	12.76	13±1	14	25.119	2.33	1.71	0.0085	1
2437		15.56	15±1	16	39.811	2.33	1.71	0.0135	1
2462		18.6	18±1	19	79.433	2.33	1.71	0.0270	1
2412	11G	10.17	10±1	11	12.589	2.33	1.71	0.0043	1
2437		13.62	13±1	14	25.119	2.33	1.71	0.0085	1
2462		16.76	17±1	18	63.096	2.33	1.71	0.0215	1
2412	11N20SISO	9.96	10±1	11	12.589	2.33	1.71	0.0043	1
2437		13.43	13±1	14	25.119	2.33	1.71	0.0085	1
2462		16.59	16±1	17	50.119	2.33	1.71	0.0170	1
2422	11N40SISO	11.04	11±1	12	15.849	2.33	1.71	0.0054	1
2437		12.99	13±1	14	25.119	2.33	1.71	0.0085	1
2452		14.62	14±1	15	31.623	2.33	1.71	0.0108	1

Antenna gain:

BT/BLE: 2.33 dBi

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	-6.97	-6±1	-5	0.316	2.33	1.71	0.0001	1
2441		-3.07	-3±1	-2	0.631	2.33	1.71	0.0002	1
2480		-0.14	0±1	1	1.259	2.33	1.71	0.0004	1
2402	π/4-DQPSK	-5.44	-5±1	-4	0.398	2.33	1.71	0.0001	1
2441		-1.09	-1±1	0	1.000	2.33	1.71	0.0003	1
2480		2	2±1	3	1.995	2.33	1.71	0.0007	1
2402	8-DPSK	-4.98	-4±1	-3	0.501	2.33	1.71	0.0002	1
2441		-0.76	0±1	1	1.259	2.33	1.71	0.0004	1
2480		2.52	2±1	3	1.995	2.33	1.71	0.0007	1
2402	GFSK (1M)	-7.25	-7±1	-6	0.251	2.33	1.71	0.0001	1
2440		-3.22	-3±1	-2	0.631	2.33	1.71	0.0002	1
2480		-0.22	0±1	1	1.259	2.33	1.71	0.0004	1

According to KDB 447498, no stand-alone required for WIFI antenna, and no simultaneous SAR measurement is required.

*** End of Report ***