RF Exposure Evaluation Report

Product	:	Yarbo Snow Blower
Trade mark	:	Yarbo
Model/Type reference	:	S1
Serial Number	:	N/A
Report Number	:	EED32P81644202
FCC ID	:	2A9JF-HY0919-YARBO
Date of Issue	:	Oct. 12, 2024
Test Standards	:	47 CFR Part 1.1307 47 CFR Part 1.1310 47 CFR Part 2.1091(mobile devices) 47 CFR Part 2.1093(portable devices) KDB 447498 D04 Interim General RF Exposure Guidance v01 KDB 680106 D01 Wireless Power Transfer v04
Test result	:	PASS

Prepared for:

Shenzhen Hanyang Technology Co., Ltd
Room 5018,Buildings 3, 4 and 5, Baoneng Science and Technology Park,Qinghu Community, Longhua Street, Longhua District, Shenzhen, China

Prepared by:

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Approved by:	Aaron Ma	Date:	Oct. 12, 2024
	Aaron Ma		

Check No.: 1449171023

1 Contents

2 General Information

2.1 Client Information

Applicant:	Shenzhen Hanyang Technology Co., Ltd
Address of Applicant:	Room 5018,Buildings 3, 4 and 5, Baoneng Science and Technology Park,Qinghu Community, Longhua Street, Longhua District, Shenzhen, China
Manufacturer:	Shenzhen Hanyang Technology Co., Ltd
Address of Manufacturer:	Room 5018,Buildings 3, 4 and 5, Baoneng Science and Technology Park,Qinghu Community, Longhua Street, Longhua District, Shenzhen, China
Factory:	Hanyang (Zhejiang) Robotics Technology Co., Ltd.
Address of Factory:	Floors 1 and 2，No. 18, Zhenzhong East Road, Weitang Street, Jiashan County, Jiaxing City, Zhejiang , China.

2.2 General Description of EUT

Product Name:	Yarbo Snow Blower
Model No.(EUT):	S1
Trade Mark:	Yarbo

2.3 Product Specification subjective to this standard

Frequency Range:	49kHz-89kHz	
Modulation Type:	FSK	
Test Power Grade:	Default	
Test Software of EUT:	RF test	
Antenna Type:	Coil antenna	
Device type:	Floor Stand device	
Power Supply:	Input:	AC 100-240V~50/60Hz,5.0A
	Output:	42.0V,7.7A
	Wireless charging:	RX Coil: DC 42V15A (630W)
Sample Received Date:	Sep. 16, 2024	
Sample tested Date:	Sep. 16, 2024 to Sep. 24, 2024	

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.

2.4 Test Environment and Mode

Operating Environment:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Test mode: Transmitting mode	
Mode a:	Wireless charging mode with 0% battery
Mode b:	Wireless charging mode with 50% battery
Mode c:	Wireless charging mode with 100% battery
Mode d:	Direct exposure during device removal
Mode e:	Standby mode

2.5 Description of Support Units

The EUT has been tested with associated equipment below.

1）support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Wireless Recharger	Yarbo	/	FCC ID and DOC	Client

2.6 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

2.7 Deviation from Standards

None.

2.8 Abnormalities from Standard Conditions

None.

2.9 Other Information Requested by the Customer

None.

3 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-08-2023	06-07-2026
Electric and Magnetic field analyzer	Narda	EHP-200AC	180ZX11020	12-21-2023	12-20-2024
PC-1	HP	ZHAN200	--	--	--
EHP200-TS	Narda	EP-601	EP-601	07-22-2024	07-21-2025
Test software	Narda S.T.S./PMM	EHP200-TS	--	--	--
Steel Ruler	Wynn's	300mm	--	11-04-2021	11-03-2024

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

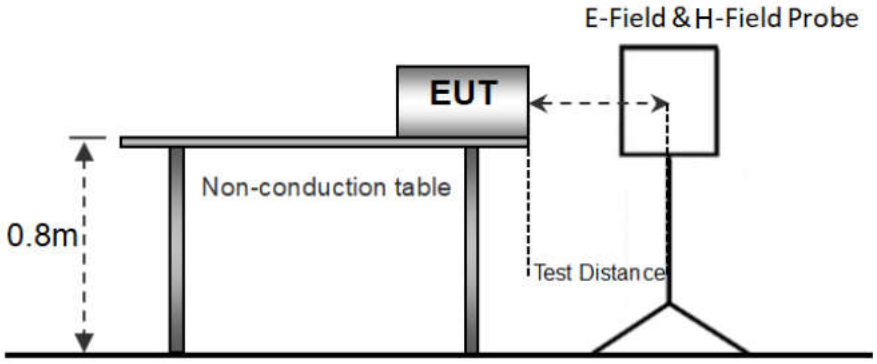
§ 1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency(RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter.

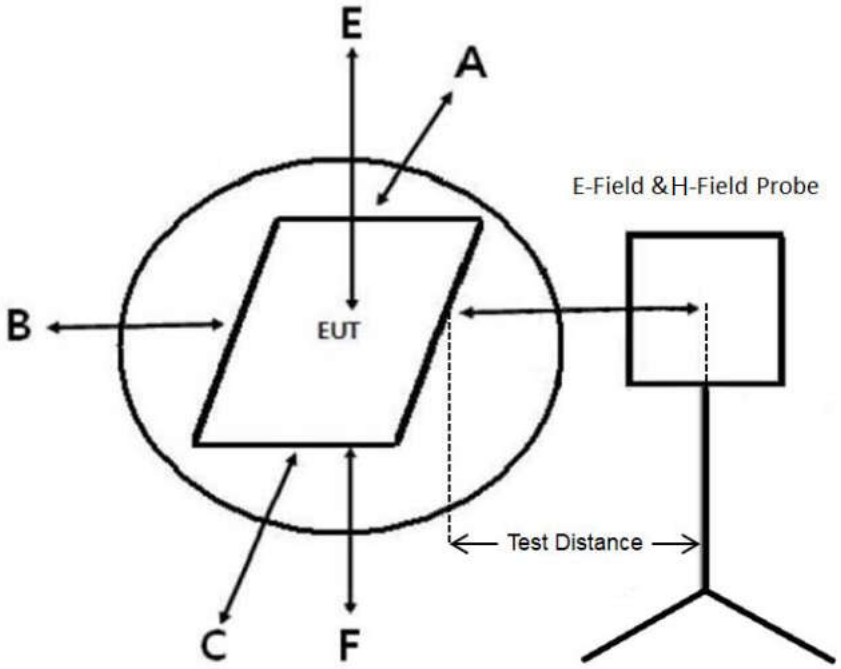
Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
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
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
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
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

4.1.2 Test Procedure





a. The measurement probe was placed at test distance(15 cm for A,B,C,D,F and 20 cm for E) which is between the edge of the charger and the geometric center of probe.
b. The highest emission level was recorded at the measurement points(A, B, C, D, E, F).
c. The EUT was measured according to the distance of KDB 680106 D01 Wireless Power Transfer v04.

4.1.3 Equipment approval considerations

The EUT does comply with section 5.2 of KDB 680106 D01 Wireless Power Transfer v04.
(1) The power transfer frequency is below 1 MHz.
--Yes,the device operate in the frequency range 49kHz-89kHz.

(2) A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)
--Yes,client device is placed directly in contact with the transmitter.

(3) Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).
--Yes.

(4) The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.
--Yes, the EUT H-field strengths levels are less than 50% of MPE limit.

(5) For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.
--This product has only one radiating structure.

4.1.4 RF Exposure Evaluation

4.1.4.1 Field strengths Evaluation

1.According to April 27,2022 TCB Workshop, for portable devices that do not physically attach to phone, desktop WPT testing guidance from FCC KDB 680106 D01 Wireless Power Transfer v04 is applied.
2.The equipment under test was placed on a wooden desk inside of shield room. The isotropic field probe was used to measure the field strength for 6 EUT surfaces. The detailed setup photo please refer to Appendix A.
3.Per FCC KDB 680106 D01 Wireless Power Transfer v04 and April 27,2022 TCB Workshop, For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. And aggregate H-field strengths and E-field strengths from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
4.According to the KDB 680106 D01 Wireless Power Transfer v04, we tested at 20cm, 22cm and 24cm distance, and only the worst case of 20cm test data was recorded in the report.

Test data:

Mode a						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	1.5022	307	0.2272	0.815	Pass
Top	20	9.7841	307	0.7451	0.815	Pass
Left	20	25.6230	307	0.7027	0.815	Pass
Right	20	8.5793	307	0.7185	0.815	Pass
Rear	20	3.3452	307	0.2669	0.815	Pass
Bottom*	20	/	/	/	/	/
*This product is belongs to floor stand device device,therefore it doesn't apply.						

Mode b						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	1.4501	307	0.2115	0.815	Pass
Top	20	4.1038	307	0.7266	0.815	Pass
Left	20	27.741	307	0.7843	0.815	Pass
Right	20	8.4291	307	0.6267	0.815	Pass
Rear	20	3.2884	307	0.2752	0.815	Pass
Bottom*	20	/	/	/	/	/
*This product is belongs to floor stand device device,therefore it doesn't apply.						

Mode c						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	1.3746	307	0.2179	0.815	Pass
Top	20	7.4631	307	0.7261	0.815	Pass
Left	20	18.415	307	0.7602	0.815	Pass
Right	20	8.4822	307	0.6429	0.815	Pass
Rear	20	2.9389	307	0.2629	0.815	Pass
Bottom*	20	/	/	/	/	/
*This product is belongs to floor stand device device,therefore it doesn't apply.						

Mode d						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	0.8776	307	0.3390	0.815	Pass
Top	20	16.5450	307	0.7143	0.815	Pass
Left	20	2.5809	307	0.7075	0.815	Pass
Right	20	4.5894	307	0.7954	0.815	Pass
Rear	20	0.5010	307	0.3717	0.815	Pass
Bottom*	20	/	/	/	/	/
*This product is belongs to floor stand device device,therefore it doesn't apply.						

Mode e						
Test position	Test distance (cm)	Electric Field Strength (V/m)	50% Limit (V/m)	Magnetic Field Strength (A/m)	50%Limit (A/m)	Result
Front	20	0.1555	307	0.0217	0.815	Pass
Top	20	0.1449	307	0.0217	0.815	Pass
Left	20	0.1983	307	0.0236	0.815	Pass
Right	20	0.1539	307	0.0217	0.815	Pass
Rear	20	0.1449	307	0.0217	0.815	Pass
Bottom*	20	/	/	/	/	/
*This product is belongs to floor stand device device,therefore it doesn't apply.						

Conclusions:

From the measurement data obtained, the tested sample was considered to have complied with the requirements for the relevant §1.1310 Radio frequency radiation exposure limits and KDB 680106 D01 Wireless Power Transfer v04.