

RF Exposure Report

FCC ID: 2A2PN-V8PRO

Report No. : SSP24060133-2E

Applicant : Ekoo Electronic Co., Ltd

Product Name : Robot Vacuum Cleaner

Model Name : Saturn01

Test Standard : FCC CFR 47 PART 1.1307(b)

Date of Issue : 2024-07-01




Shenzhen CCUT Quality Technology Co., Ltd.

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This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.

Test Report Basic Information

Applicant:	Ekoo Electronic Co., Ltd B09, Block B, F2, Bldg.B, Runfeng Pioneer Park, No.973, Minzhi Avenue, Address of Applicant.....:	Minzhi St, Longhua, Shenzhen, China
Manufacturer:	Ekoo Electronic Co., Ltd B09, Block B, F2, Bldg.B, Runfeng Pioneer Park, No.973, Minzhi Avenue, Address of Manufacturer.....:	Minzhi St, Longhua, Shenzhen, China
Product Name:	Robot Vacuum Cleaner	
Brand Name:	-	
Main Model:	Saturn01	
Series Models:	-	
Test Standard:	FCC CFR 47 PART 1.1307(b) KDB 447498 D01 v06	
Date of Test	2024-01-23 to 2024-02-20	
Test Result:	PASS	
Tested By	<u>Lorzix Luo</u> (Lorzix Luo)	
Reviewed By:	<u>Lieber Ouyang</u> (Lieber Ouyang)	
Authorized Signatory:	<u>Lahm Peng</u> (Lahm Peng)	
<p>Note : This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.. All test data presented in this test report is only applicable to presented test sample.</p>		

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Revision History

Revision	Issue Date	Description	Revised By
V1.0	2024-07-01	Initial Release	Lahm Peng

1. General Information

1.1 Product Information

Product Name:	Robot Vacuum Cleaner
Trade Name:	-
Main Model:	Saturn01
Series Models:	-
Rated Voltage:	DC 14.4V by battery, DC 20V Charging from Charging Base Charging Base Input: AC 100-240V~50/60Hz, Output: DC 20V/0.8A
Battery:	DC 14.4V, 2600mAh
Hardware Version:	V1.0
Software Version:	V1.0
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	

Wireless Specification	
Wireless Standard:	Bluetooth BLE, 802.11b/g/n
Operating Frequency:	BT: 2402MHz ~2480MHz, 2.4GWiFi: 2412 MHz ~2462 MHz
RF Output Power:	BLE: 1.65dBm, 2.4GWiFi: 15.55dBm
Antenna Gain:	3.46dBi
Type of Antenna:	FPCB Antenna
Type of Device:	<input type="checkbox"/> Portable Device <input checked="" type="checkbox"/> Mobile Device <input type="checkbox"/> Modular Device

1.2 Test Facilities

Laboratory Name:	Shenzhen CCUT Quality Technology Co., Ltd. 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China
CNAS Laboratory No.:	L18863
A2LA Certificate No.:	6893.01
FCC Registration No.:	583813
ISED Registration No.:	CN0164
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.	

2. RF Exposure

2.1 Standard and Limit

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)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
300-1500			f/300	6
1500-100,000			5	6
(B) 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
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz

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 = gain of antenna in linear scale, $\pi = 3.1416$;

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

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

Test Procedure

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

2.2 Test Data and Results

For BLE

Mode	Output power to antenna (dBm)	Tune-up Power(dBm)	Max Tune-up Power(dBm)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
GFSK	1.65	1(±1)	2	1.58	0.0007	1.0	PASS

For 2.4G WiFi

Mode	Output power to antenna (dBm)	Tune-up Power(dBm)	Max Tune-up Power(dBm)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
802.11b	15.55	15(±1)	16	39.81	0.0176	1.0	PASS

Remark: antenna gain=3.46dBi