FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Shenzhen PICEA Intelligent Technology Co., Ltd

Robot Vacuum

Model Number: HOME-S10U

FCC ID: 2BGN6-SCZN0719

Applicant	Shenzhen PICEA Intelligent Technology Co., Ltd
Address:	Floor 10, Block A, Han's Innovation Building, No. 9018,
	Beihuan Avenue, North District, High-tech Park,
	Nanshan District, Shenzhen, Guangdong,P.R. China
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-R2408167
Date of Test:	Jul. 18, 2024~ Aug. 20, 2024
Date of Report:	Aug. 24, 2024

TABLE OF CONTENTS

Description Page

TEST REPORT VERIFICATION 3
1. GENERAL INFORMATION 5
1.1. Description of Device (EUT) 5
1.2. Antenna Information 5
1.3. Information of RF Cable 5
2. SUMMARY OF TEST 6
2.1. Summary of test result 6
2.2. Test Facilities 7
2.3. Measurement uncertainty 8
2.4. Assistant equipment used for test 8
2.5. Block Diagram 8
2.6. Test Mode 9
2.7. Power Setting of Test Software 9
2.8. Channel List 9
2.9. Test Equipment List 10
3. FIELD STRENGTH OF FUNDAMENTAL 12
3.1. Limit 12
3.2. Test Setup 12
3.3. Spectrum Analyzer Setting 12
3.4. Test Procedure 13
3.5. Test Result 14
4. RADIATED SPURIOUS EMISSIONS AND BAND EDGE 21
4.1. Limit 21
4.2. Test Setup 23
4.3. Spectrum Analyzer Setting 24
4.4. Test Procedure 25
4.5. Test Result 26
5. 20DB BANDWIDTH 38
5.1. Limit 38
5.2. Test Setup 38
5.3. Spectrum Analyzer Setting 38
5.4. Test Procedure 38
5.5. Test Condition 38
5.6. Test Result 39
6. AC POWER LINE CONDUCTED EMISSIONS 44
6.1. Limit 44
6.2. Test Setup 44
6.3. Spectrum Analyzer Setting 44
6.4. Test Procedure 44
6.5. Test Result 45
7. ANTENNA REQUIREMENTS 47
7.1. Limit 47
7.2. Test Result 47
8. TEST SETUP PHOTO 48

9. EUT PHOTO 50

Applicant: **Address:**	Shenzhen PICEA Intelligent Technology Co., Ltd Floor 10, Block A, Han's Innovation Building, No. 9018, Beihuan Avenue, North District, High-tech Park, Nanshan District, Shenzhen, Guangdong,P.R. China
Manufacturer: **Address:**	Shenzhen PICEA Intelligent Technology Co., Ltd Floor 10, Block A, Han's Innovation Building, No. 9018, Beihuan Avenue, North District, High-tech Park, Nanshan District, Shenzhen, Guangdong,P.R. China
Factory: **Address:**	Shenzhen PICEA Robotics Co., Ltd 101, 201 of Building 26, Building 19 &20 &21 &22 &23 &24 &27, Huai De Cui Gang 4th Industrial Park, Fuyong Street, Baoan District, Shenzhen, Guangdong, P.R. China
E.U.T:	Robot Vacuum
Model Number:	HOME-S10U
Power Supply:	Robot Vacuum: DC 14.4V From Battery Robot Vacuum Station: AC 120V/60Hz
Trade Name:	Serial No.: ------
Date of Receipt:	Jul. 18, 2024 Date of Test: Jul. 18, 2024~ Aug. 20, 2024
Test Specification:	FCC Part 15 Subpart C (15.249) ANSI C63.10:2013
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. **Date:** Aug. 24, 2024

Prepared by:	Reviewed by:	Approved by:
Ring Yang / Assistant	Seven Wang / Engineer	Iceman Hu / Manager

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	Robot Vacuum
Model Number	:	HOME-S10U
Software Version	:	N/A
Hardware Version	:	N/A
Operation frequency	:	2405MHz-2480MHz
Number of channel	:	76
Field Strength of Fundamental	:	Avg: 81.53dBμV/m
Modulation Type	:	GFSK
Sample Type	:	Prototype production

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	-	Internal	-	3.97

Note:
1.The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.
2.The test results of this report only apply to the sample as received.

1.3. Information of RF Cable

Cable Loss(dB)	Provided by
1.0	Shenzhen PICEA Intelligent Technology Co., Ltd

Note:
1.The customer declared the loss value of the RF Cable. and the test results of this report only apply to the sample as received.
2.The laboratory is not responsible for the accuracy of the cable loss.

2. SUMMARY OF TEST

2.1. Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	Field Strength of Fundamental	15.249(a)	PASS
2	Radiated Spurious Emissions and Band Edge	15.205 15.209 15.249(a)(c)(d)(e) 15.35(b)	PASS
3	20dB Bandwidth	15.215	PASS
4	AC Power Line Conducted Emissions	15.207	PASS
5	Antenna Requirement	15.203	PASS

Note: “N/A” denotes test is not applicable in this test report.

2.2. Test Facilities

EMC Lab	:	Accredited by CNAS, CHINA Registration No.: L5288 This Accreditation is valid until: November 12, 2029 Recognized by FCC, USA Designation Number: CN1215 This Recognition is valid until: January 31, 2026 Accredited by A2LA, USA Registration No.: 4366.01 This Accreditation is valid until: January 31, 2026 Recognized by Industry Canada CAB identifier No.: CN0035 This Recognition is valid until: January 31, 2026 Recognized by VCCI, Japan Registration No.:C-14103; T-20073; R-13663; R-20103; G-20097 Date of registration: Apr. 20, 2020 This Recognition is valid until: Apr. 19, 2026 Recognized by TUV Rheinland, Germany Registration No.: UA 50413872 0001 Date of registration: July 31, 2018 Recognized by Intertek Registration No.: 2011-RTL-L2-64 Date of registration: November 08, 2018
Name of Firm	:	EST Technology Co., Ltd.
Site Location	:	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	±3.48dB
Uncertainty for spurious emissions test (Below 30MHz)	±1.62 dB
Uncertainty for spurious emissions test (30MHz-1GHz)	±4.60 dB(Polarize: H)
	±4.68 dB(Polarize: V)
Uncertainty for spurious emissions test (1GHz to 18GHz)	±4.96dB
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	1.08dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.4. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into test mode by software before test.

EUT

DC 14.4V

(EUT: Robot Vacuum)

2.6. Test Mode

The test mode was selected for the final test as listed below.

Test Item	Test Mode	Test Channel
Field Strength of Fundamental	TX	Low/Middle/High
Radiated Spurious Emissions	TX	Low/Middle/High
20dB Bandwidth	TX	Low/Middle/High
AC Power Line Conducted Emissions	TX	Low/Middle/High

Note: In radiated measurement,the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane.**

2.7. Power Setting of Test Software

Software Name	N/A		
Frequency(MHz)	2405	2441	2480
Setting	default	default	default

Note: This information is provided by the applicant.

2.8. Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	27	2431	53	2457
2	2406	28	2432	54	2458
3	2407	29	2433	55	2459
4	2408	30	2434	56	2460
5	2409	31	2435	57	2461
6	2410	32	2436	58	2462
7	2411	33	2437	59	2463
8	2412	34	2438	60	2464
9	2413	35	2439	61	2465
10	2414	36	2440	62	2466
11	2415	37	2441	63	2467
12	2416	38	2442	64	2468
13	2417	39	2443	65	2469
14	2418	40	2444	66	2470
15	2419	41	2445	67	2471
16	2420	42	2446	68	2472
17	2421	43	2447	69	2473
18	2422	44	2448	70	2474
19	2423	45	2449	71	2475
20	2424	46	2450	72	2476
21	2425	47	2451	73	2477
22	2426	48	2452	74	2478
23	2427	49	2453	75	2479
24	2428	50	2454	76	2480
25	2429	51	2455	-	-
26	2430	52	2456	-	-

2.9. Test Equipment List

For conducted emission test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESRP3	EST-E070	LISAI	June 11,24	June 10,25
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E048	LISAI	June 11,24	June 10,25
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E078	LISAI	June 11,24	June 10,25
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

For radiated emission test(9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 11,24	June 10,25
Active Loop Antenna	SCHWAREBECK	FMZB 1519B	EST-E054	LISAI	June 11,24	June 10,25
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	N/A	EST-001	N/A	N/A	N/A	N/A

For radiated emissions test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 11,24	June 10,25
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 11,24	June 10,25
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
30-1000MHz Cable	N/A	EST-002	N/A	N/A	N/A	N/A

For radiated emission test(Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZBECK	BBHA9120D	EST-E144	LISAI	June 11,24	June 10,25
Horn Antenna	Com-Power	AHA-840	EST-E133	LISAI	June 11,24	June 10,25
Low Noise Amplifier	RF	TRLA-010180G45N	EST-E142	LISAI	June 11,24	June 10,25
Spectrum Analyzer	Rohde &Schwarz	FSV40	EST-E069	LISAI	June 11,24	June 10,25
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
Above 1GHz Cable	N/A	EST-003	N/A	N/A	N/A	N/A

For connect EUT antenna terminal test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
TS 1120	Tonscend	/	/	/	/	/
Test Software	Tonscend	TS1120-3	3.3.38	/	/	/
RF Control Unit	Tonscend	JS0806-2	EST-E134	LISAI	June 11,24	June 10,25
Signal and Spectrum Analyzer	Keysight	N9010B	EST-E141	LISAI	June 11,24	June 10,25

3. FIELD STRENGTH OF FUNDAMENTAL

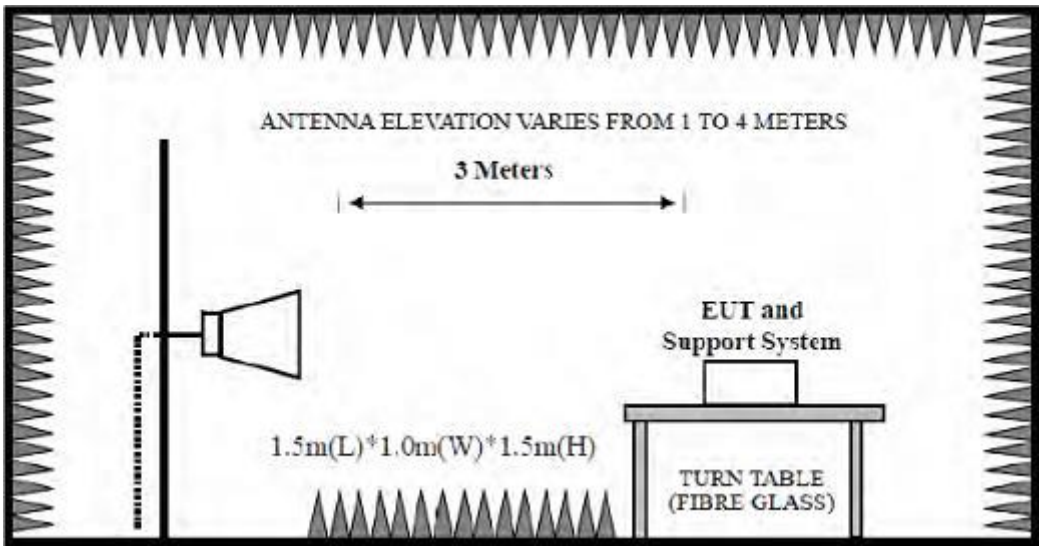
3.1. Limit

Fundamental frequency	Field strength of fundamental@3m (millivolts/meter)	Average Limit@3m dBμV/m	Peak Limit@3m dBμV/m
902-928MHz	50	94	114
2400-2483.5MHz	50	94	114
5725-5875MHz	50	94	114
24.0-24.25	250	108	128

Note：

1. Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)].
2. Peak Limit (dBμV/m)= Average Limit (dBμV/m)+20dB

3.2. Test Setup



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	≥OBW
VBW	3×RBW
Start frequency	2405MHz
Stop frequency	2480MHz
Sweep Time	Auto
Detector	PEAK/AVG
Trace Mode	Max Hold

3.4. Test Procedure

a. EUT was placed on a turn table, which is 1.5 meter high above the ground.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
c. Spectrum analyzer setting parameters in accordance with section 3.3.
d. Set the EUT transmit continuously with maximum output power.
e. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
f. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test,record the average and peak value.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.

3.5. Test Result

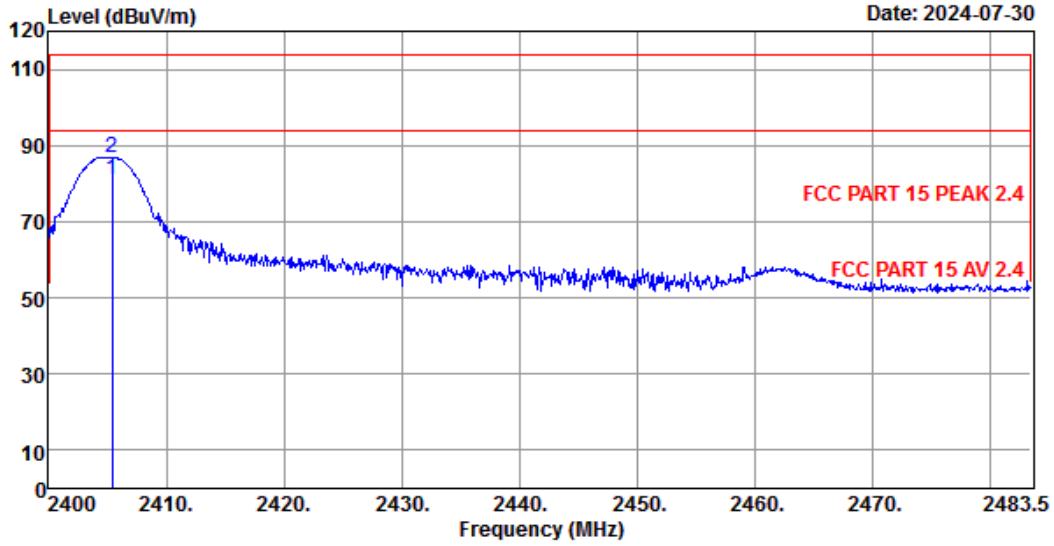
Test frequency (MHz)	Fundamental frequency (MHz)	Field strength of fundamental level (dBμV/m)		Limit (dBμV/m)		Result	Antenna Pole (H/V)
		Avg	Peak	Avg	Peak		
2405	2405.43	80.92	86.91	94	114	Pass	V
	2404.51	81.53	88.51	94	114	Pass	H
2441	2441.50	78.45	83.67	94	114	Pass	V
	2441.58	81.51	91.99	94	114	Pass	H
2480	2479.66	78.78	85.66	94	114	Pass	V
	2479.58	80.90	93.62	94	114	Pass	H

Low Channel(2405MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 113 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 113
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2405MHz

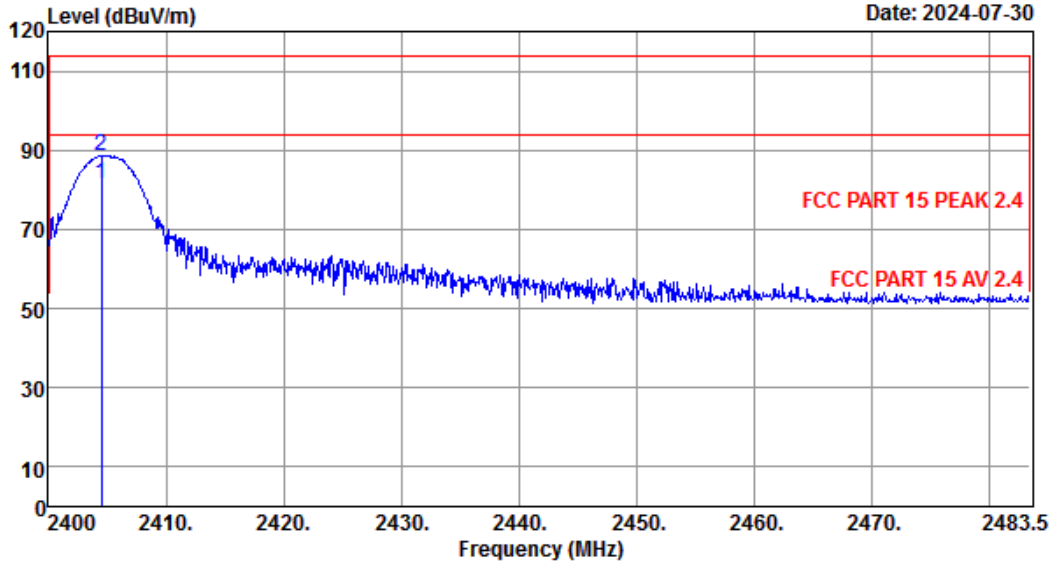
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2405.43	27.60	4.90	44.13	92.55	80.92	94.00	13.08	Average
2	2405.43	27.60	4.90	44.13	98.54	86.91	114.00	27.09	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 114 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 114
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2405MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2404.51	27.60	4.90	44.13	93.16	81.53	94.00	12.47	Average
2	2404.51	27.60	4.90	44.13	100.14	88.51	114.00	25.49	Peak

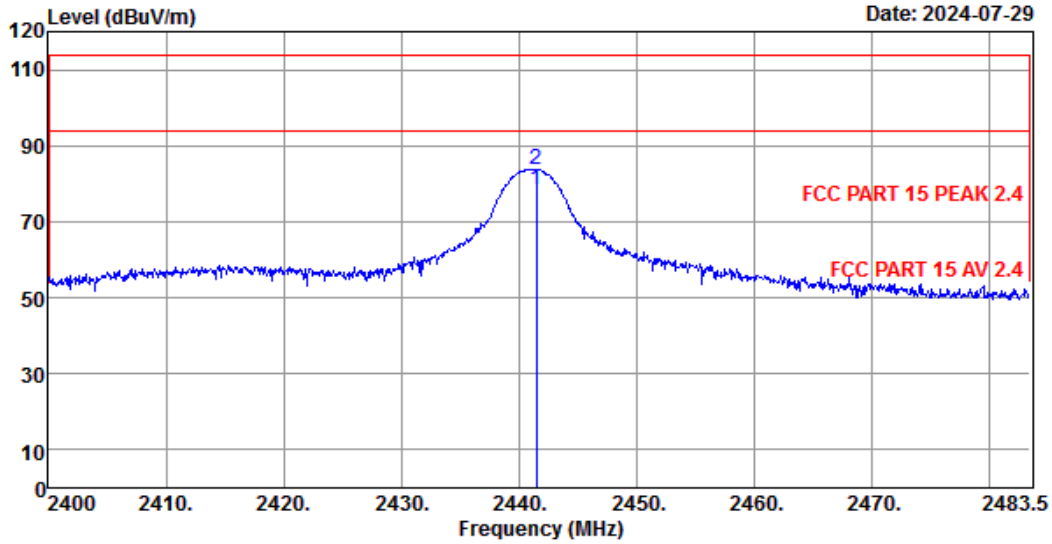
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

Middle Channel(2441MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 119 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 119
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2441MHz

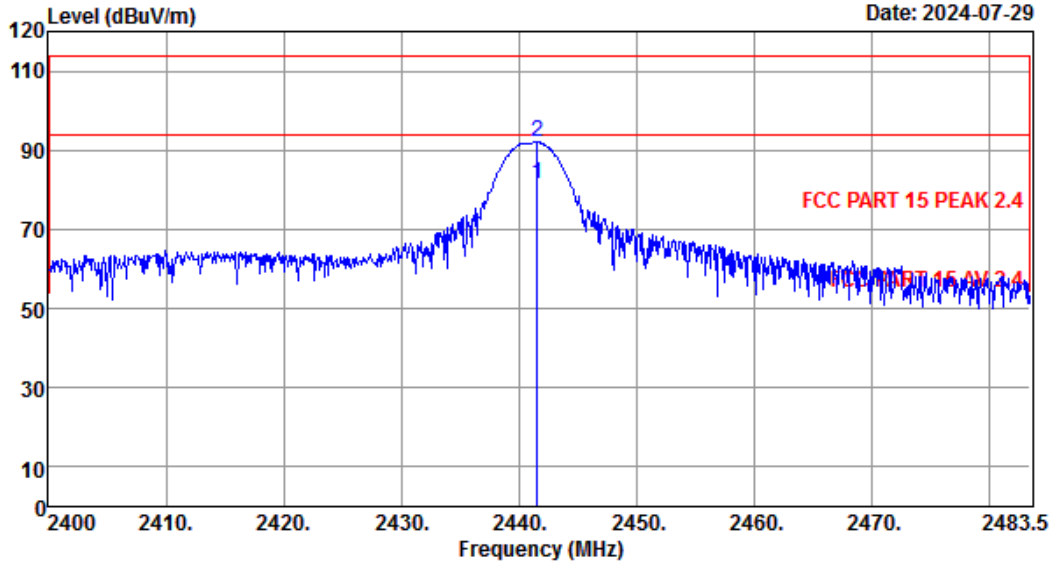
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.50	28.02	4.95	44.08	89.56	78.45	94.00	15.55	Average
2	2441.50	28.02	4.95	44.08	94.78	83.67	114.00	30.33	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 120 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 120
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.58	28.02	4.95	44.08	92.62	81.51	94.00	12.49	Average
2	2441.58	28.02	4.95	44.08	103.10	91.99	114.00	22.01	Peak

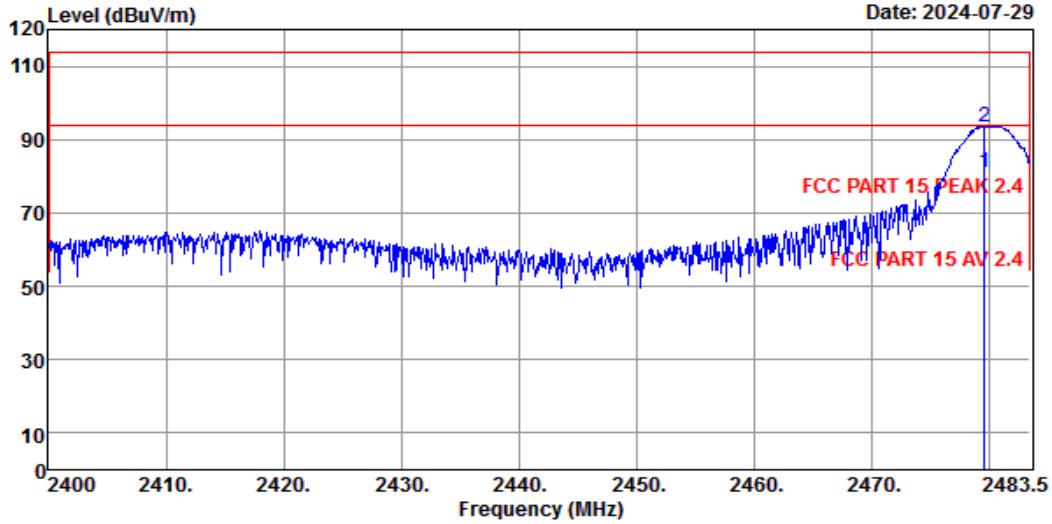
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

High Channel(2480MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 117 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 117
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2480MHz

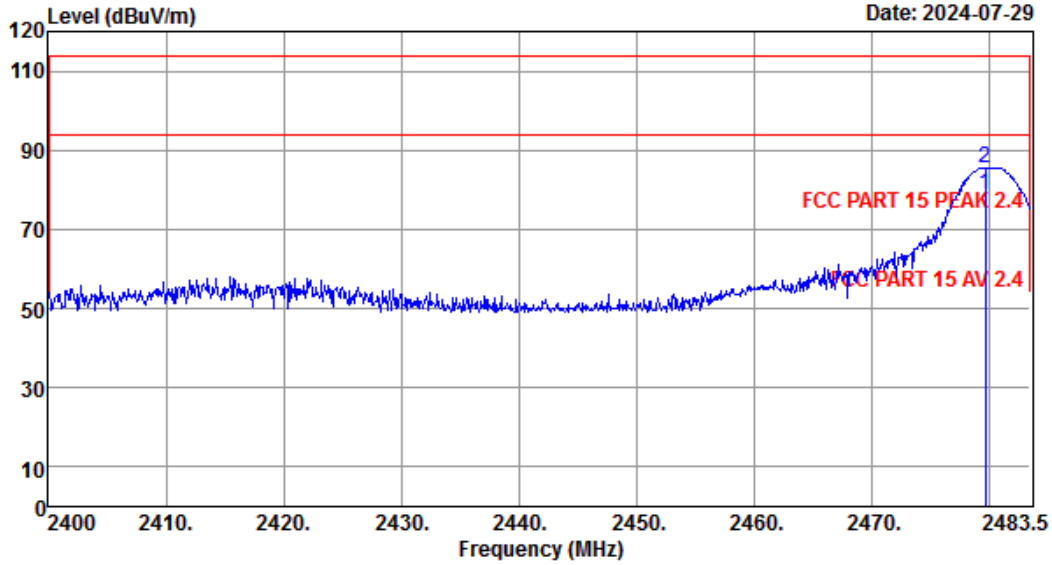
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.58	28.22	4.99	44.04	91.73	80.90	94.00	13.10	Average
2	2479.58	28.22	4.99	44.04	104.45	93.62	114.00	20.38	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 118 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 118
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.66	28.22	4.99	44.04	89.61	78.78	94.00	15.22	Average
2	2479.66	28.22	4.99	44.04	96.49	85.66	114.00	28.34	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

4. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

4.1. Limit

(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of harmonics@3m (microvolts/meter)	Average Limit@3m dBμV/m	Peak Limit@3m dBμV/m
902-928MHz	500	54	74
2400-2483.5MHz	500	54	74
5725-5875MHz	500	54	74
24.0-24.25	2500	68	88

(b) Field strength limits are specified at a distance of 3 meters.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

15.209 Radiated emission limits

Frequency (MHz)	Field Strength(μV/m)	Distance(m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

(d) As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation

Note:

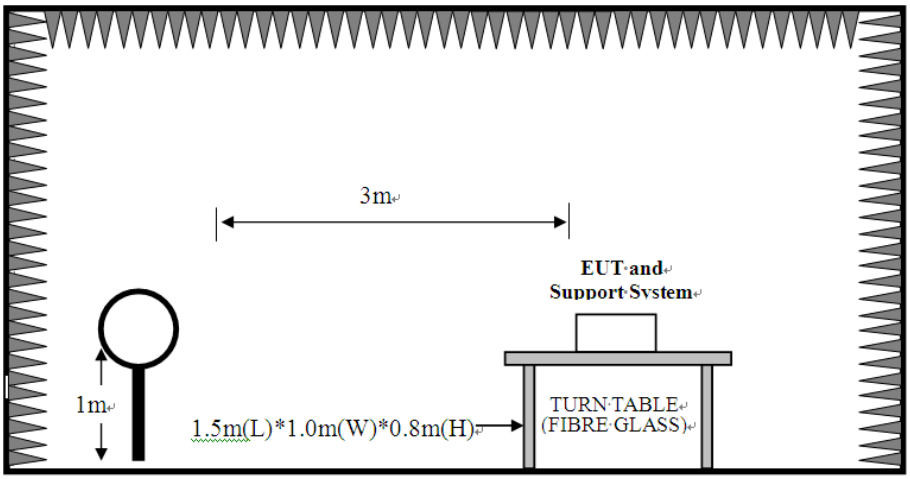
(1) Emission level dBμV = 20 log Emission level μV/m.

(2) The smaller limit shall apply at the cross point between two frequency bands.

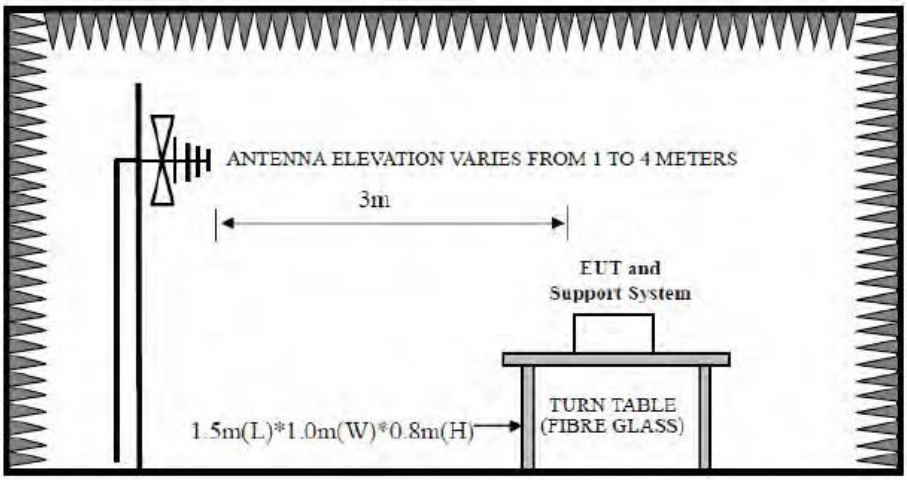
(3) Distance is the distance in meters between the measuring instrument,antenna and the closest point of any part of the device or system.

4.2. Test Setup

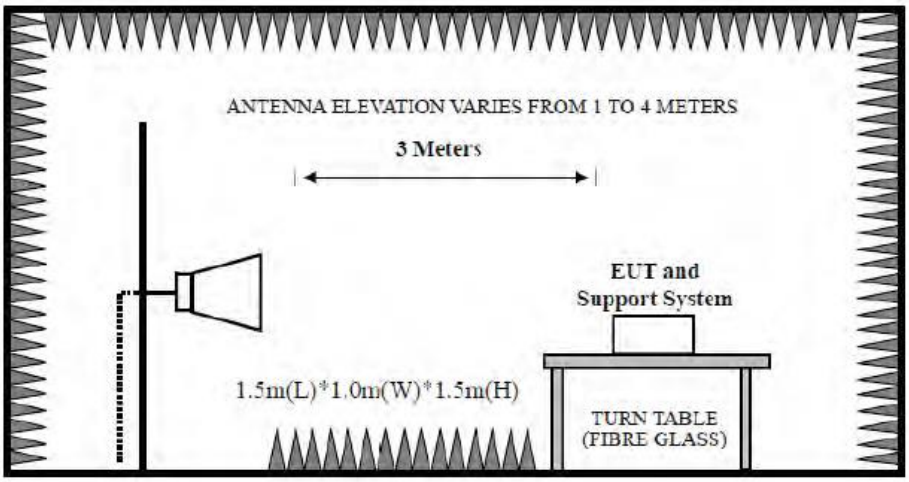
9kHz~30MHz



30~1000MHz



Above 1GHz



4.3. Spectrum Analyzer Setting

For 9KHz-150KHz

Spectrum Parameters	Setting
RBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
VBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

For 150KHz-30MHz

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For 30MHz-1000MHz

Spectrum Parameters	Setting
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1000MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz

Spectrum Parameters	Setting
RBW	1MHz
VBW	3MHz
Start frequency	1GHz
Stop frequency	10 Times Carrier Frequency
Sweep Time	Auto
Detector	PEAK
Trace Mode	Max Hold

4.4. Test Procedure

a. EUT was placed on a turn table, which is 0.8 meter high above ground for below 1GHz test, and which is 1.5 meter high above ground for above 1GHz test.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
c. Set the EUT transmit continuously with maximum output power.
d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
e. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
f. Spectrum analyzer setting parameters in accordance with section 4.3.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.

Note:

1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2405MHz/2441MHz/2480MHz are fundamental frequency.

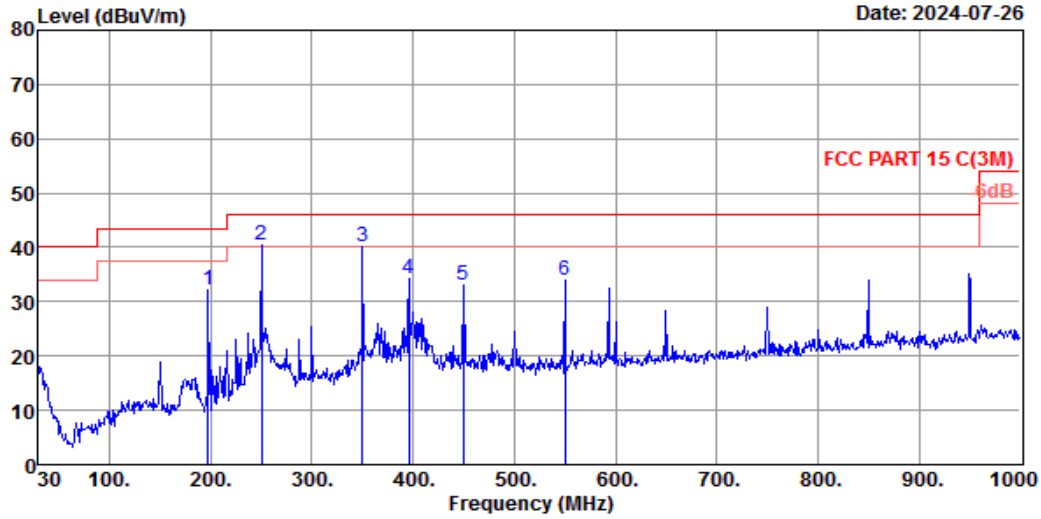
4.5. Test Result

Radiated Emissions Below 1GHz

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 79 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 79
Dis. / Ant. : 3m 54681 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C(3M)
Env. / Ins. : Temp:25℃;Humi:58%;Press:101.50kPa
Engineer : Luke
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX Mode

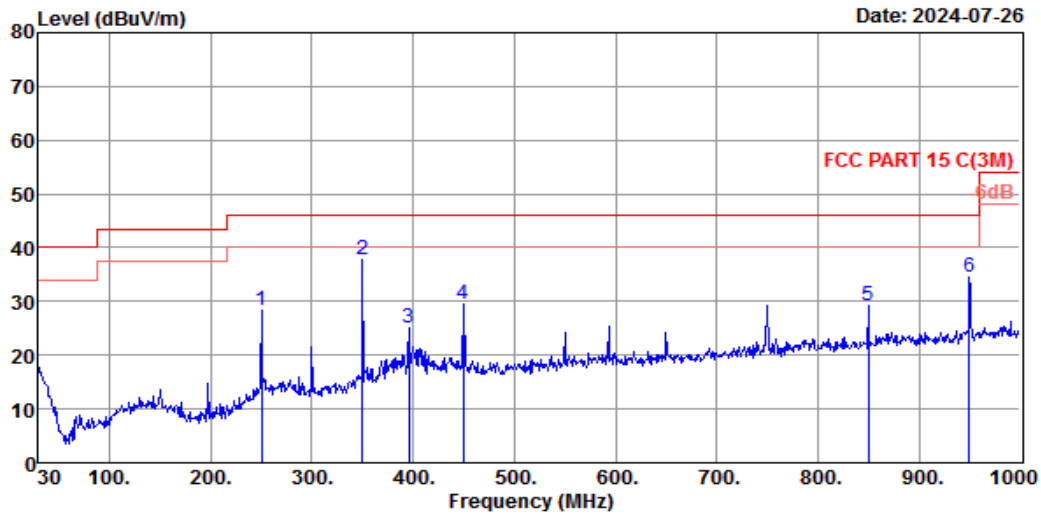
	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	197.81	9.00	2.42	20.68	32.10	43.50	11.40	QP
2	250.19	13.10	2.74	24.52	40.36	46.00	5.64	QP
3	350.10	14.70	3.28	22.22	40.20	46.00	5.80	QP
4	395.69	15.76	3.51	15.11	34.38	46.00	11.62	QP
5	450.01	17.00	3.76	12.30	33.06	46.00	12.94	QP
6	549.92	19.30	4.19	10.59	34.08	46.00	11.92	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 80 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 80
Dis. / Ant. : 3m 54681 Ant. pol. : VERTICAL
Limit : FCC PART 15 C(3M)
Env. / Ins. : Temp:25℃;Humi:58%;Press:101.50kPa
Engineer : Luke
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	250.19	13.10	2.74	12.45	28.29	46.00	17.71	QP
2	350.10	14.70	3.28	19.83	37.81	46.00	8.19	QP
3	395.69	15.76	3.51	5.76	25.03	46.00	20.97	QP
4	450.01	17.00	3.76	8.81	29.57	46.00	16.43	QP
5	849.65	22.90	5.31	0.98	29.19	46.00	16.81	QP
6	949.56	24.50	5.64	4.37	34.51	46.00	11.49	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

Note:

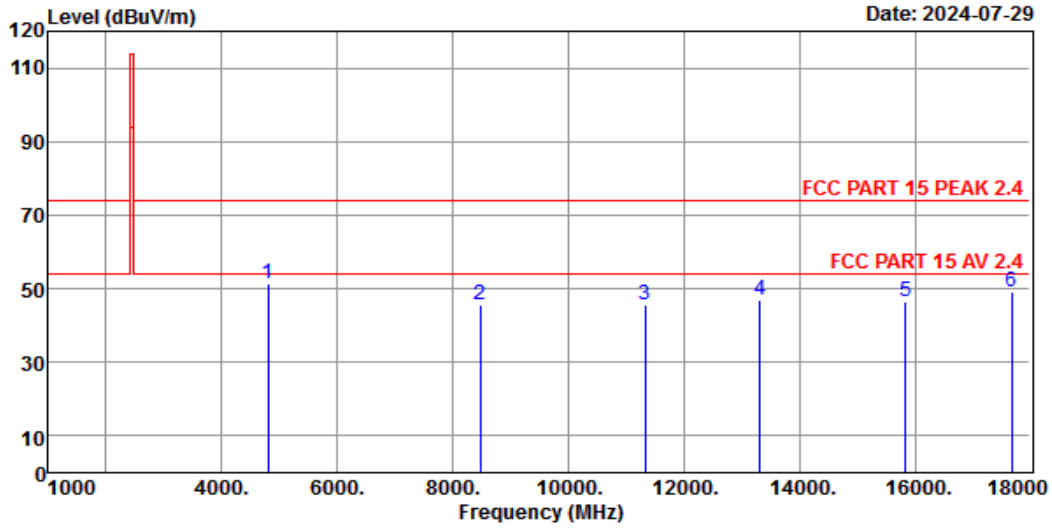
1. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
2. All channels had been pre-test,only the worst case was reported.

Radiated Emissions Above 1G

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 169 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 169
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2402MHz

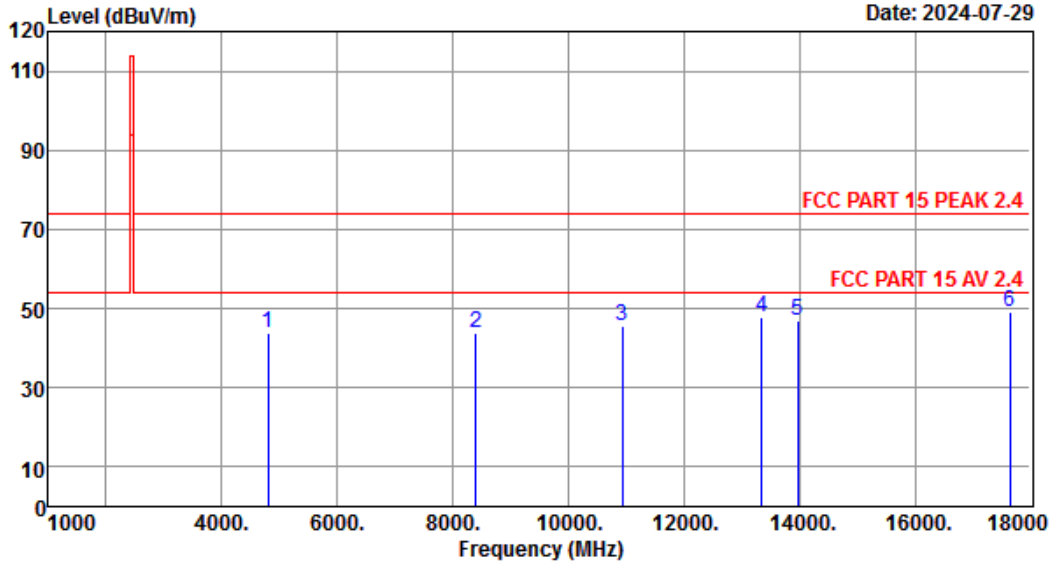
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4804.00	33.10	6.80	43.17	54.44	51.17	74.00	22.83	Peak
2	8480.00	37.67	8.90	42.62	41.77	45.72	74.00	28.28	Peak
3	11336.00	39.90	10.75	41.00	36.15	45.80	74.00	28.20	Peak
4	13325.00	40.28	11.31	39.69	35.12	47.02	74.00	26.98	Peak
5	15841.00	36.60	12.11	42.74	40.68	46.65	74.00	27.35	Peak
6	17677.00	41.62	14.14	41.72	34.95	48.99	74.00	25.01	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 170 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 170
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2402MHz

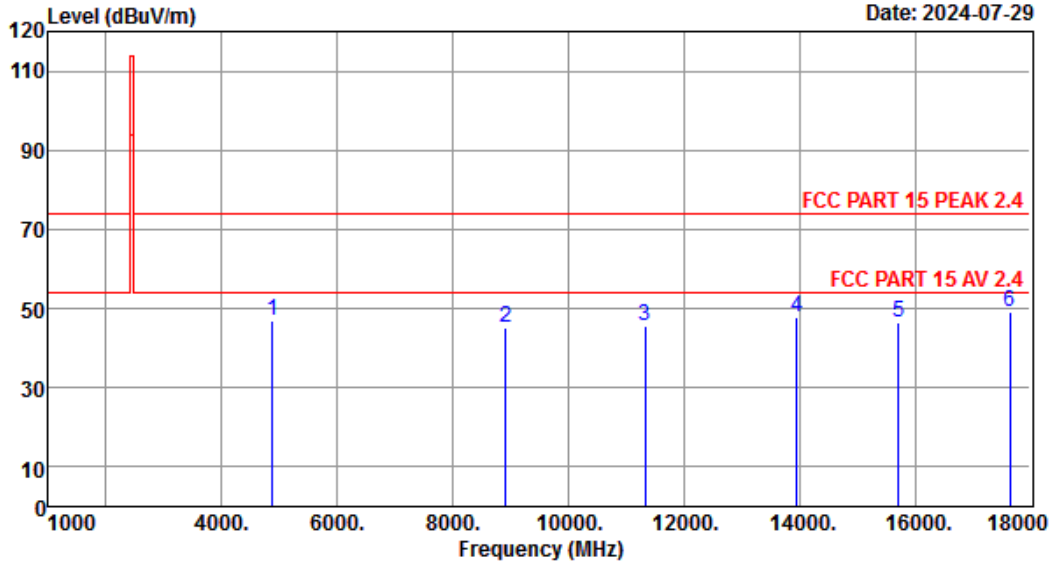
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4804.00	33.10	6.80	43.17	46.98	43.71	74.00	30.29	Peak
2	8395.00	37.60	8.85	42.67	39.94	43.72	74.00	30.28	Peak
3	10928.00	38.20	10.53	41.14	37.90	45.49	74.00	28.51	Peak
4	13342.00	40.37	11.31	39.71	35.88	47.85	74.00	26.15	Peak
5	13971.00	40.37	11.26	40.27	35.71	47.07	74.00	26.93	Peak
6	17643.00	41.65	14.11	41.76	34.97	48.97	74.00	25.03	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 171 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 171
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2441MHz

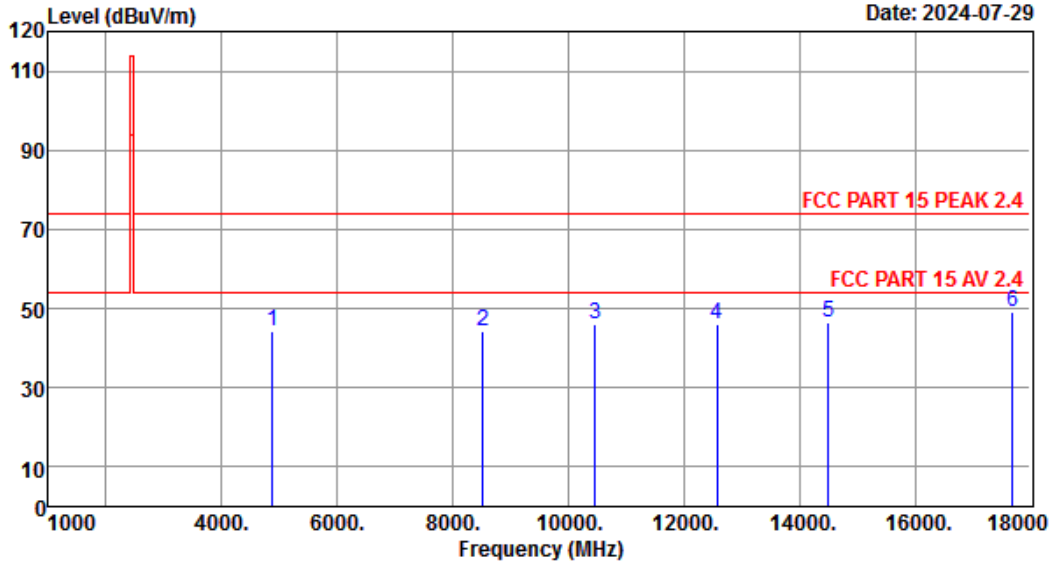
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4882.00	33.47	6.86	43.15	49.75	46.93	74.00	27.07	Peak
2	8922.00	38.20	9.14	42.35	40.31	45.30	74.00	28.70	Peak
3	11336.00	39.90	10.75	41.00	35.97	45.62	74.00	28.38	Peak
4	13954.00	40.40	11.26	40.25	36.41	47.82	74.00	26.18	Peak
5	15722.00	37.37	11.97	42.69	39.96	46.61	74.00	27.39	Peak
6	17643.00	41.65	14.11	41.76	35.16	49.16	74.00	24.84	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 172 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 172
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2441MHz

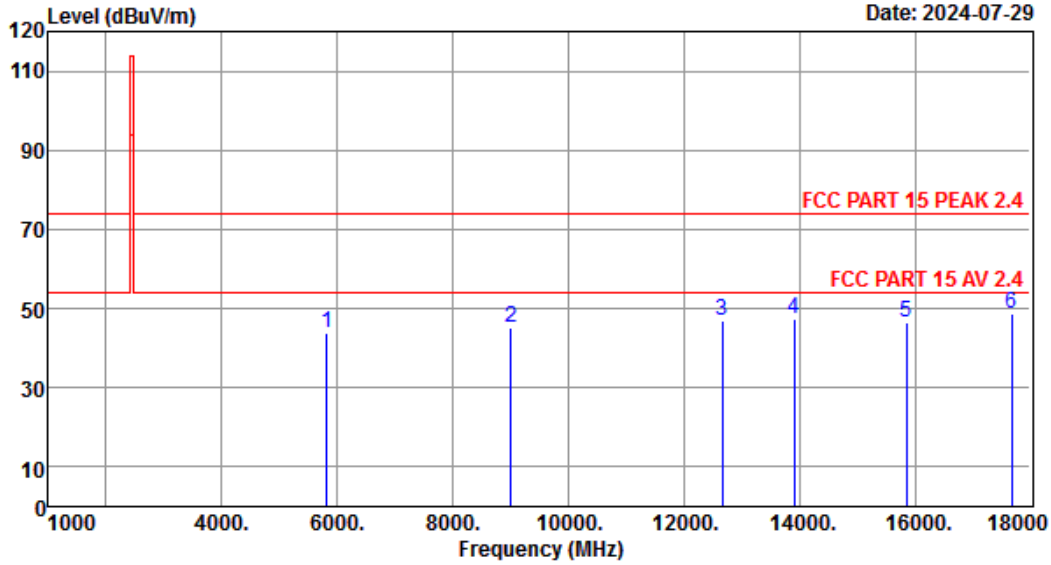
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4882.00	33.47	6.86	43.15	47.00	44.18	74.00	29.82	Peak
2	8514.00	38.00	8.92	42.59	40.13	44.46	74.00	29.54	Peak
3	10469.00	38.47	10.16	41.42	38.85	46.06	74.00	27.94	Peak
4	12577.00	39.40	11.22	39.99	35.54	46.17	74.00	27.83	Peak
5	14498.00	39.35	11.20	41.33	37.35	46.57	74.00	27.43	Peak
6	17694.00	41.60	14.15	41.70	35.06	49.11	74.00	24.89	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 173 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 173
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2480MHz

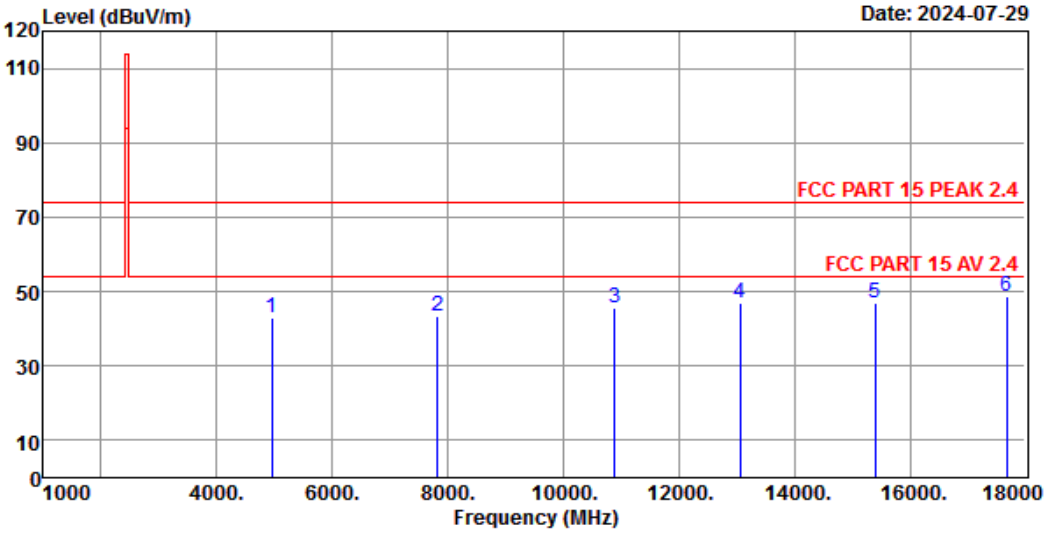
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5811.00	34.93	7.71	42.86	44.09	43.87	74.00	30.13	Peak
2	9007.00	37.90	9.19	42.30	40.55	45.34	74.00	28.66	Peak
3	12662.00	39.80	11.24	39.87	35.56	46.73	74.00	27.27	Peak
4	13903.00	40.50	11.27	40.21	35.97	47.53	74.00	26.47	Peak
5	15858.00	36.57	12.13	42.74	40.40	46.36	74.00	27.64	Peak
6	17677.00	41.62	14.14	41.72	34.70	48.74	74.00	25.26	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 174 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)




```
Site no.      : 5# 966 Chamber              Data no.  : 174
Dis. / Ant.   : 3m   BBHA9120D-2667         Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer      : Aron
EUT           : Robot Vacuum
Power         : DC 14.4V From Battery
M/N           : HOME-S10U
Test Mode     : TX 2480MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4960.00	33.57	6.92	43.11	45.50	42.88	74.00	31.12	Peak
2	7817.00	37.30	8.59	42.90	40.29	43.28	74.00	30.72	Peak
3	10894.00	38.20	10.50	41.16	38.24	45.78	74.00	28.22	Peak
4	13053.00	40.20	11.33	39.45	34.81	46.89	74.00	27.11	Peak
5	15399.00	37.80	11.60	42.56	40.03	46.87	74.00	27.13	Peak
6	17677.00	41.62	14.14	41.72	34.64	48.68	74.00	25.32	Peak

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
         2. Margin= Limit - Emission Level.
         3. The emission levels that are 20dB below the official
            limit are not reported.
```

Note:

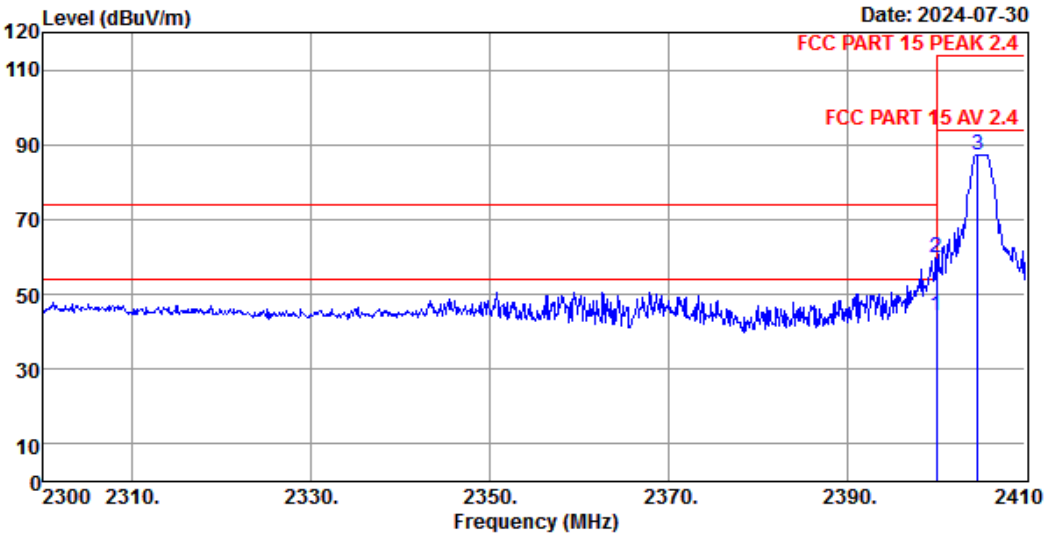
1. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Radiated Band Edge

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 111 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 111
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2405MHz

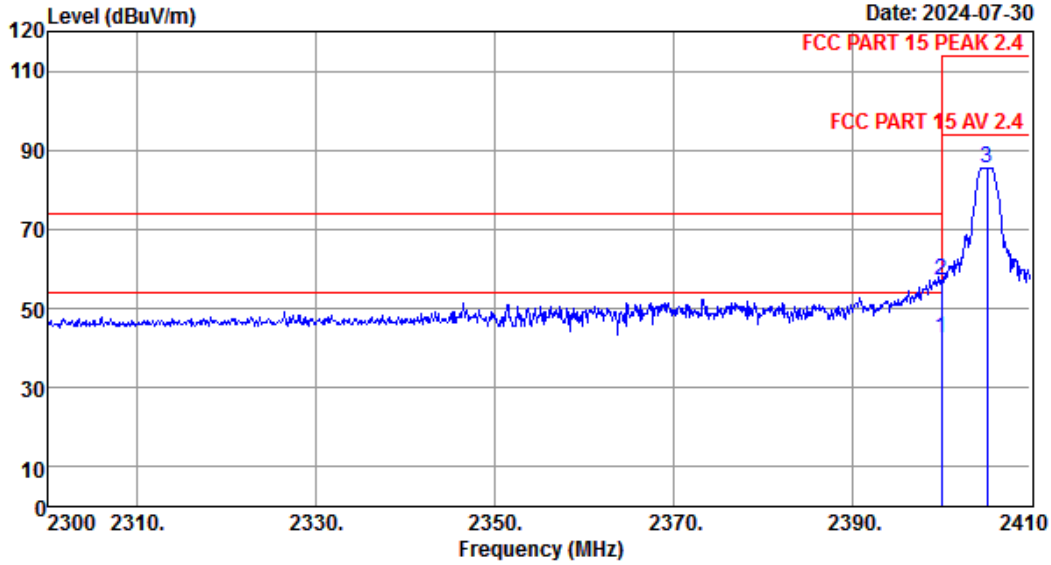
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2400.00	27.60	4.88	44.15	55.94	44.27	54.00	9.73	Average
2	2400.00	27.60	4.88	44.15	71.61	59.94	74.00	14.06	Peak
3	2404.61	27.60	4.90	44.13	99.08	87.45	114.00	26.55	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 112 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 112
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2405MHz

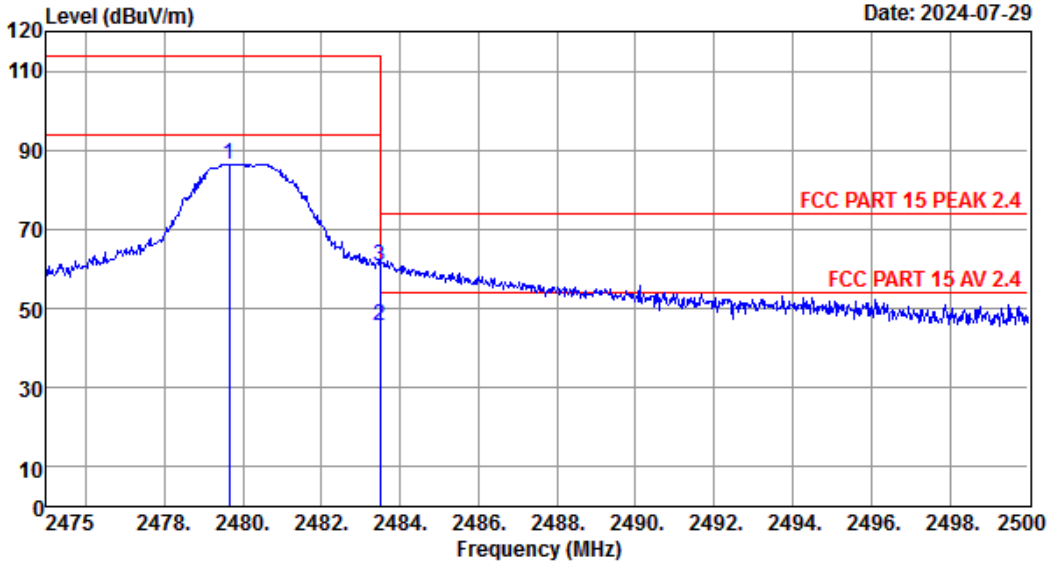
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2400.00	27.60	4.88	44.15	54.12	42.45	54.00	11.55	Average
2	2400.00	27.60	4.88	44.15	68.94	57.27	74.00	16.73	Peak
3	2405.16	27.60	4.90	44.13	97.23	85.60	114.00	28.40	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 115 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 115
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2480MHz

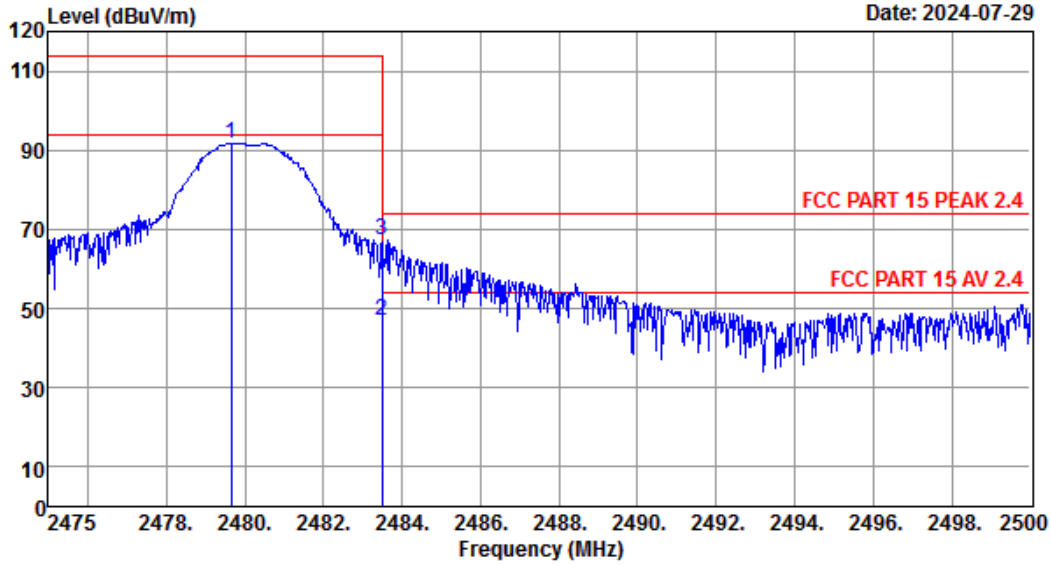
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.65	28.22	4.99	44.04	97.28	86.45	114.00	27.55	Peak
2	2483.50	28.21	4.99	44.04	56.56	45.72	54.00	8.28	Average
3	2483.50	28.21	4.99	44.04	71.38	60.54	74.00	13.46	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 116 File: \\EMC-966-5\Test Data\2024\RF\S\Shan Chuan\HOME-S10U-FCC.EM6 (182)



Site no. : 5# 966 Chamber Data no. : 116
Dis. / Ant. : 3m BBHA9120D-2667 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:19.5℃;Humi:50%;Press:101.55kPa
Engineer : Aron
EUT : Robot Vacuum
Power : DC 14.4V From Battery
M/N : HOME-S10U
Test Mode : TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.65	28.22	4.99	44.04	102.41	91.58	114.00	22.42	Peak
2	2483.50	28.21	4.99	44.04	57.63	46.79	54.00	7.21	Average
3	2483.50	28.21	4.99	44.04	77.98	67.14	74.00	6.86	Peak

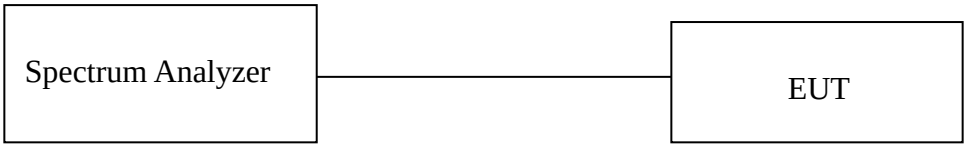
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

5. 20DB BANDWIDTH

5.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

5.2. Test Setup



5.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	1%~5% OBW
VBW	3×RBW
Span	two times and five times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

5.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 5.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

5.5. Test Condition

Temperature	25℃	Relative Humidity	55%	Test Voltage	DC 14.4V

5.6. Test Result

Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
2.4G SRD	Ant1	2405	1.916	2403.980	2405.896	---	---
2.4G SRD	Ant1	2441	1.964	2440.064	2442.028	---	---
2.4G SRD	Ant1	2480	2.140	2478.992	2481.132	---	---

Test Graphs

2.4G SRD-Ant1-2402

2.4G SRD-Ant1-2405

2.4G SRD-Ant1-2441

2.4G SRD-Ant1-2480

2.4G SRD-Ant1-2482

22.4G SRD-Ant1-2402

22.4G SRD-Ant1-2441

22.4G SRD-Ant1-2480

32.4G SRD-Ant1-2402

32.4G SRD-Ant1-2441

32.4G SRD-Ant1-2480

6. AC POWER LINE CONDUCTED EMISSIONS

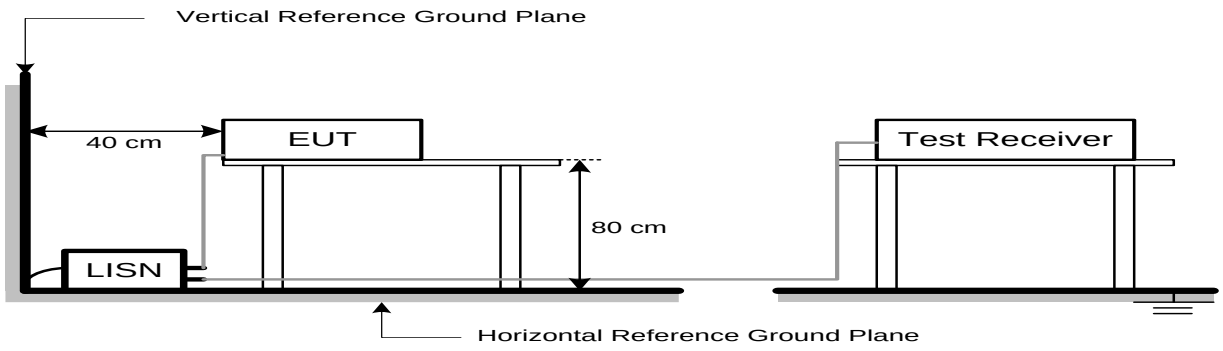
6.1. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note:

1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.2. Test Setup



6.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

6.4. Test Procedure

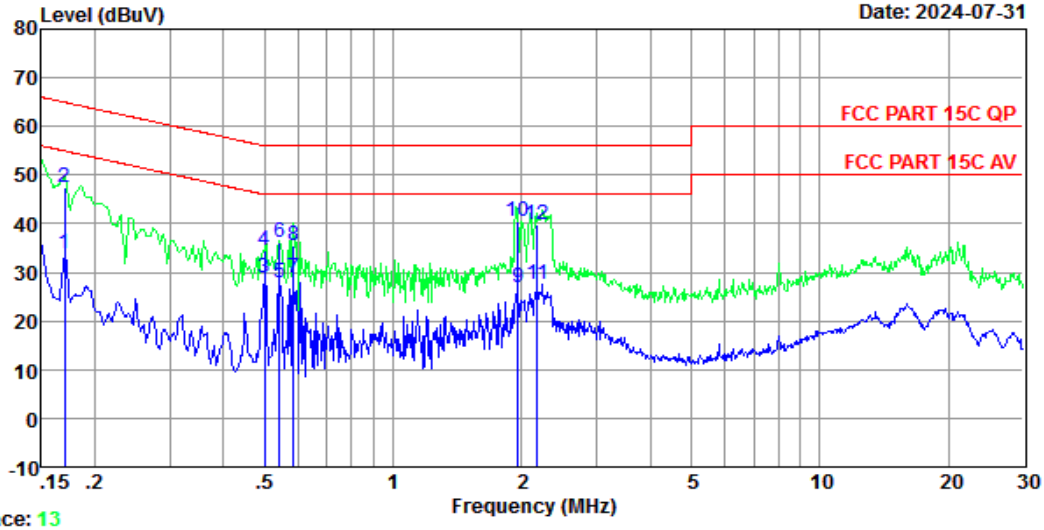
a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
b. The EUT Power connected to the power mains through a line impedance stabilization network.
c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
d. Set the EUT transmit continuously with maximum output power.
e. Spectrum analyzer setting parameters in accordance with section 6.3.
f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
g. Record the results in the test report.

6.5. Test Result

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 14 File: \\EMC-CE-3\Test Data2\2024\RF\S\Shan Chuan\HOME-S10U.EM6 (28)



Trace: 13

Site no : 3#CE Shield Room Data no. : 14
Env. / Ins. : Temp:25.3℃;Humi:59%;Press:101.1kPa LINE Phase : NEUTRAL
Limit : FCC PART 15C QP
Engineer : Wind
EUT : Robot Vauum
Power : AC 120V/60Hz
M/N : HOME-S10U
Test Mode : TX Mode

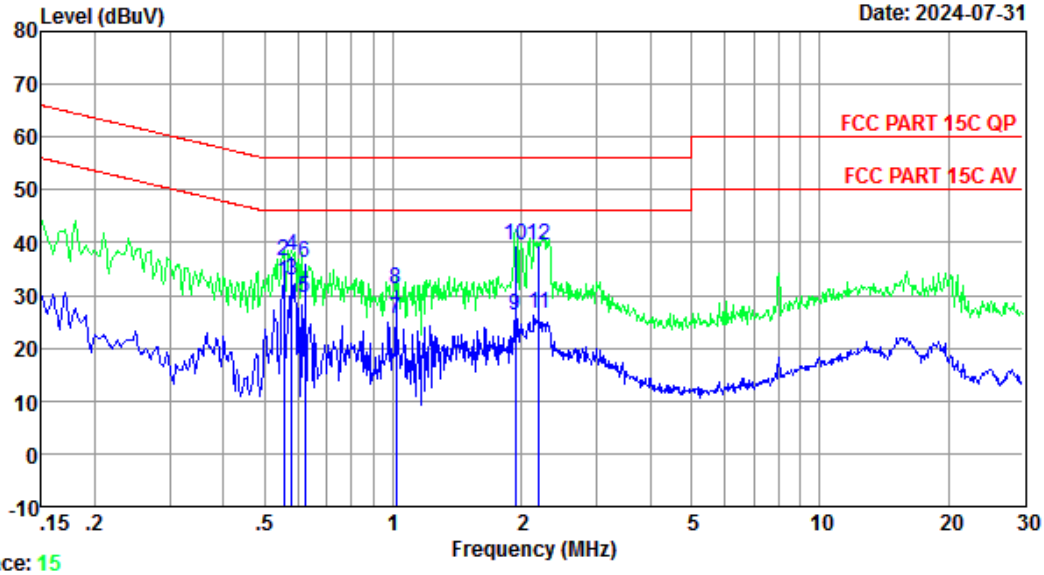
	Freq. (MHz)	LISN Factor (db)	Cable Loss (db)	Reading dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.17	9.99	9.82	14.10	33.91	54.94	21.03	Average
2	0.17	9.99	9.82	27.60	47.41	64.94	17.53	QP
3	0.50	10.16	9.83	8.76	28.75	46.01	17.26	Average
4	0.50	10.16	9.83	14.43	34.42	56.01	21.59	QP
5	0.54	10.14	9.83	7.99	27.96	46.00	18.04	Average
6	0.54	10.14	9.83	16.27	36.24	56.00	19.76	QP
7	0.59	10.13	9.83	9.00	28.96	46.00	17.04	Average
8	0.59	10.13	9.83	15.53	35.49	56.00	20.51	QP
9	1.96	10.22	9.85	6.71	26.78	46.00	19.22	Average
10	1.96	10.22	9.85	20.26	40.33	56.00	15.67	QP
11	2.18	10.22	9.85	7.53	27.60	46.00	18.40	Average
12	2.18	10.22	9.85	19.83	39.90	56.00	16.10	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 16 File: \\EMC-CE-3\Test Data2\2024\RF\S\Shan Chuan\HOME-S10U.EM6 (28)



Trace: 15

Site no : 3#CE Shield Room Data no. : 16
Env. / Ins. : Temp:25.3℃;Humi:59%;Press:101.1kPa LINE Phase : LINE
Limit : FCC PART 15C QP
Engineer : Wind
EUT : Robot Vauum
Power : AC 120V/60Hz
M/N : HOME-S10U
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (db)	Cable Loss (db)	Reading dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.56	10.17	9.83	12.51	32.51	46.00	13.49	Average
2	0.56	10.17	9.83	16.54	36.54	56.00	19.46	QP
3	0.58	10.16	9.83	12.81	32.80	46.00	13.20	Average
4	0.58	10.16	9.83	17.54	37.53	56.00	18.47	QP
5	0.62	10.16	9.83	9.45	29.44	46.00	16.56	Average
6	0.62	10.16	9.83	16.27	36.26	56.00	19.74	QP
7	1.02	10.21	9.84	5.48	25.53	46.00	20.47	Average
8	1.02	10.21	9.84	11.26	31.31	56.00	24.69	QP
9	1.94	10.15	9.85	6.08	26.08	46.00	19.92	Average
10	1.94	10.15	9.85	19.43	39.43	56.00	16.57	QP
11	2.20	10.13	9.85	6.69	26.67	46.00	19.33	Average
12	2.20	10.13	9.85	19.37	39.35	56.00	16.65	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7. ANTENNA REQUIREMENTS

7.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

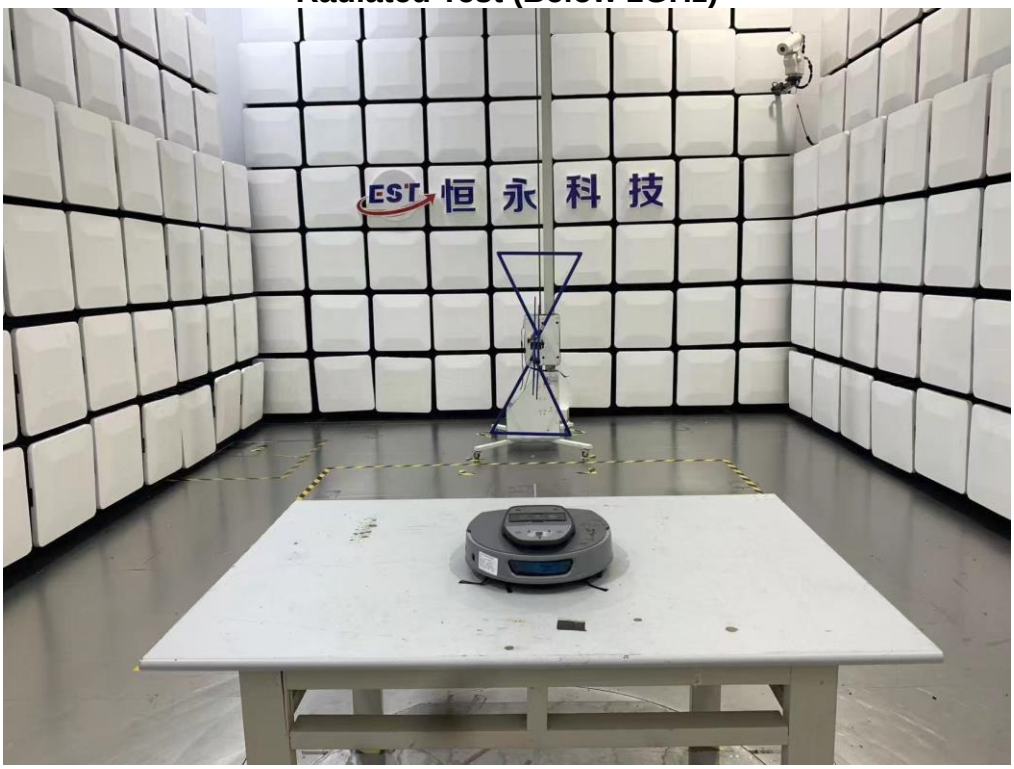
7.2. Test Result

The antennas used for this product is internal antenna ,so compliance with antenna requirements. (Please refer to the EUT photo for details)

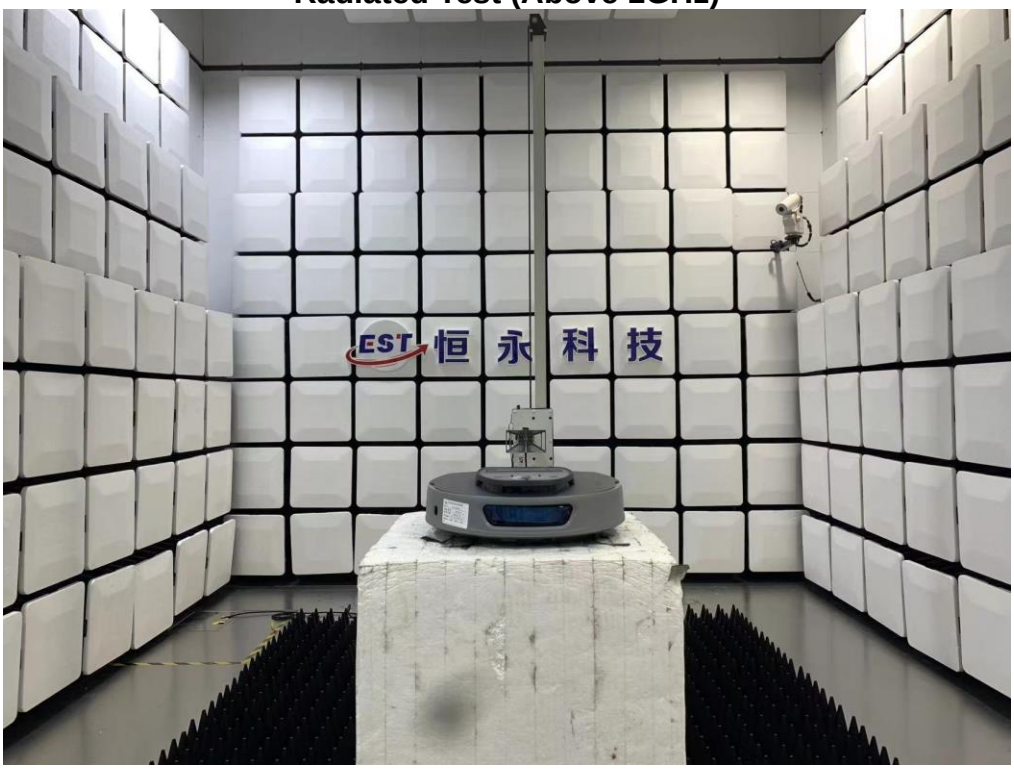
8. TEST SETUP PHOTO

Conducted Emissions Test

Radiated Test (Below 1GHz)

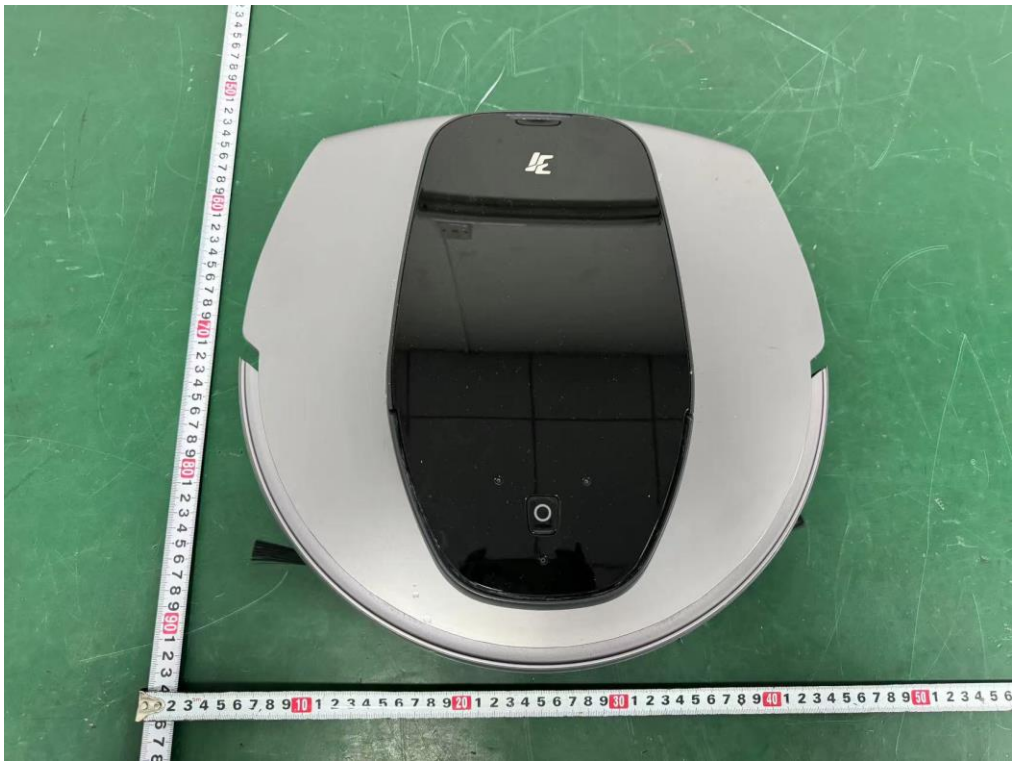


Radiated Test (Above 1GHz)



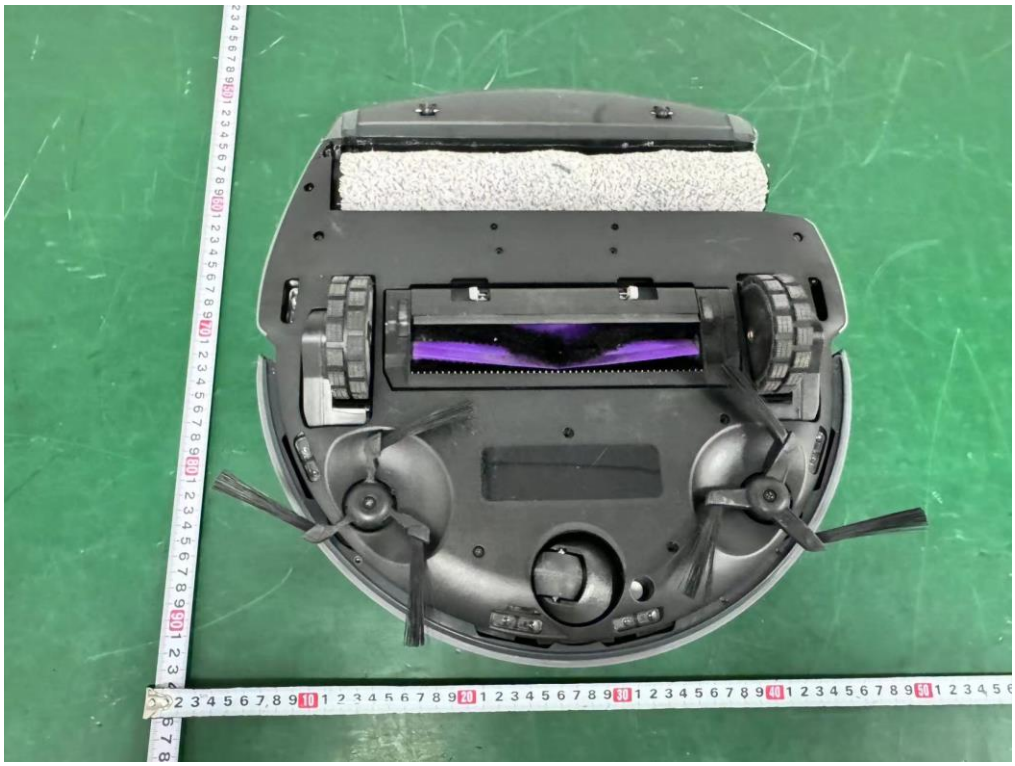
9. EUT PHOTO

External Photos
M/N: HOME-S10U



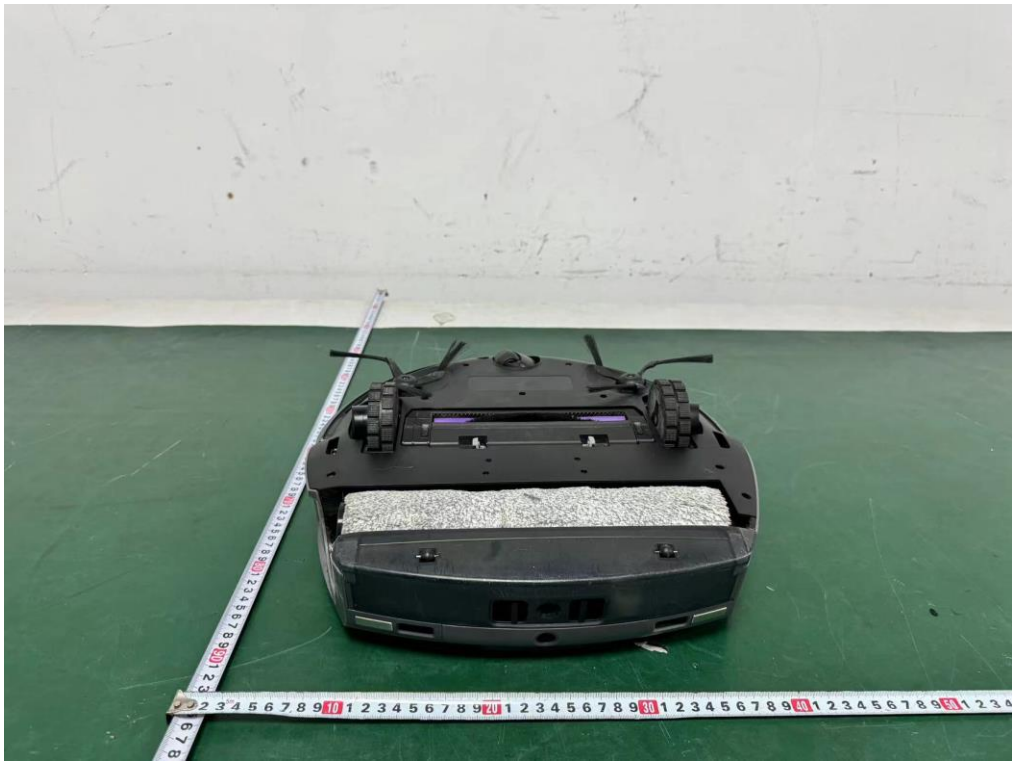
External Photos

M/N: HOME-S10U



External Photos

M/N: HOME-S10U

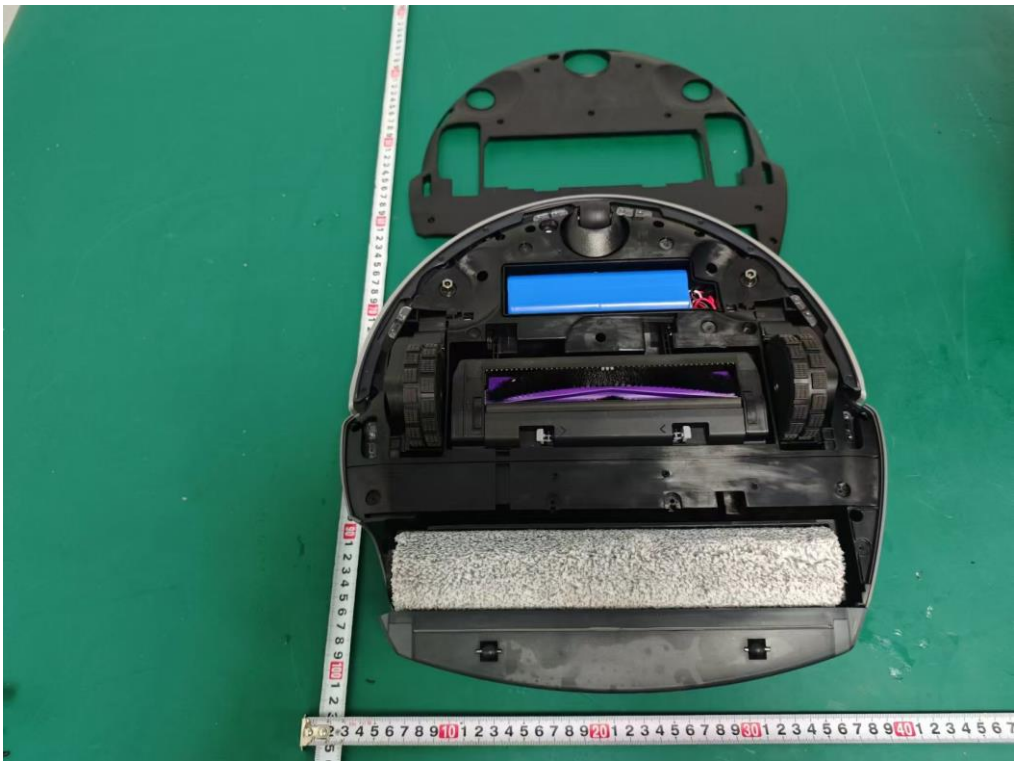


External Photos

M/N: HOME-S10U

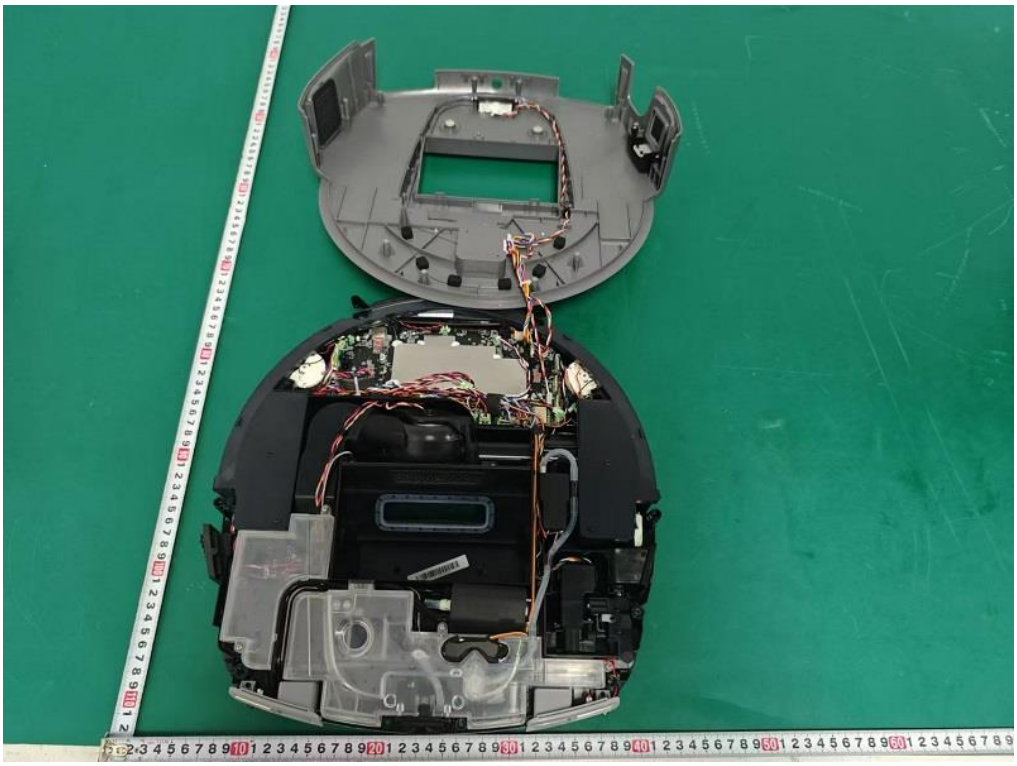
Internal Photos

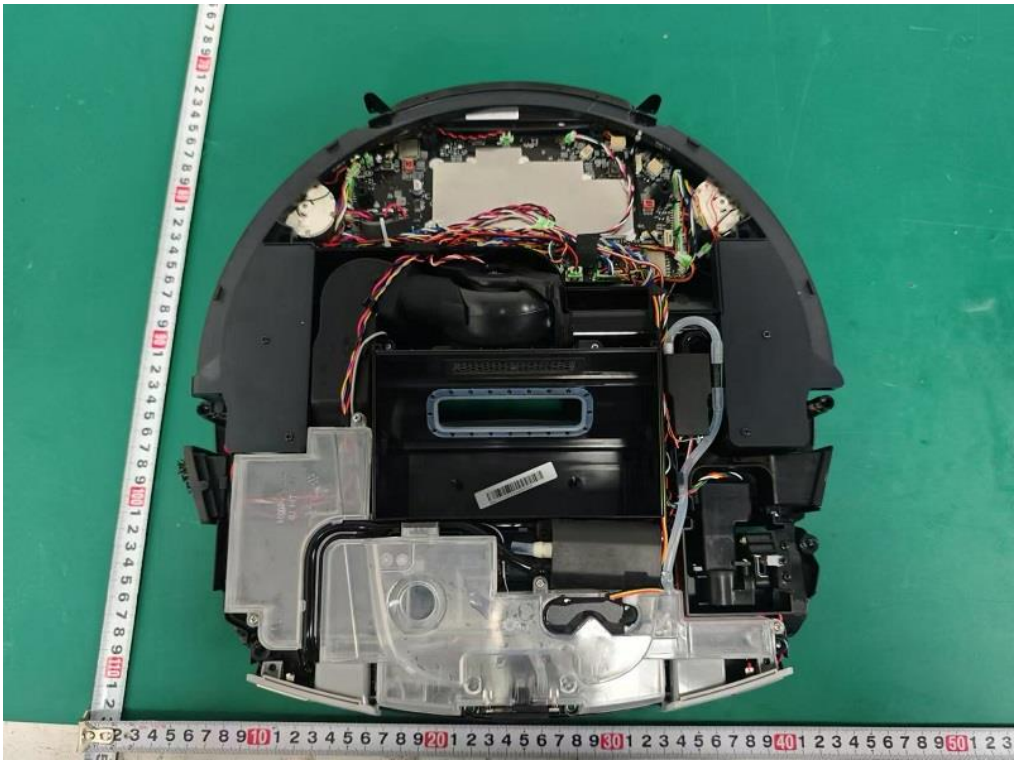
M/N: HOME-S10U



Internal Photos

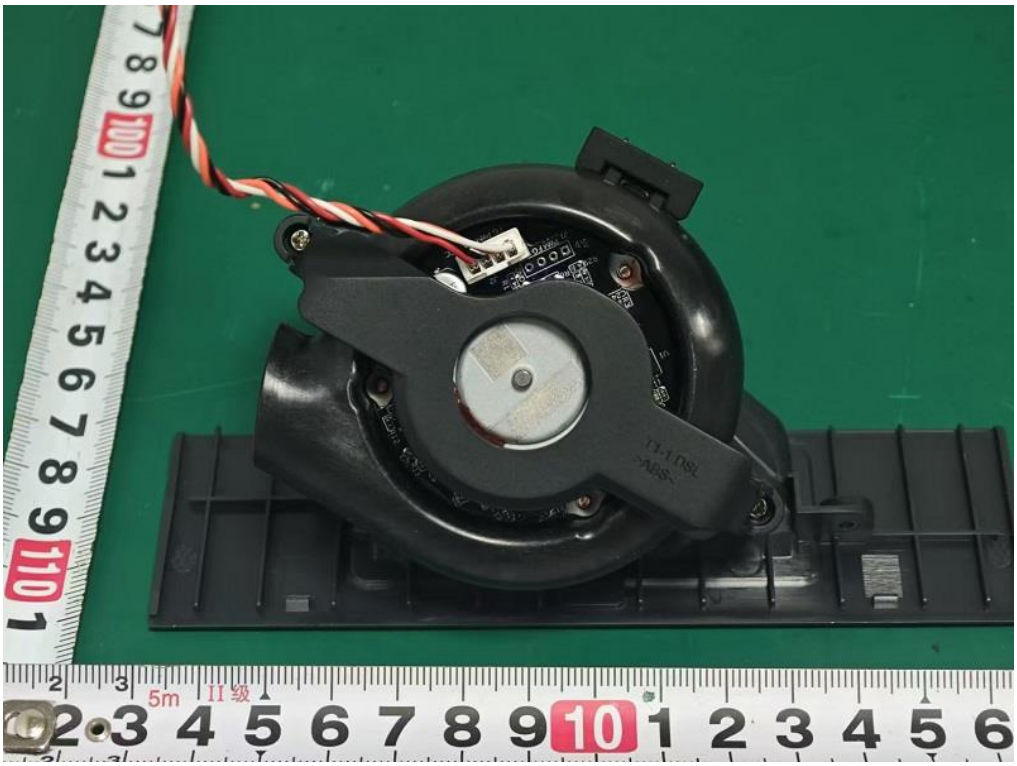
M/N: HOME-S10U

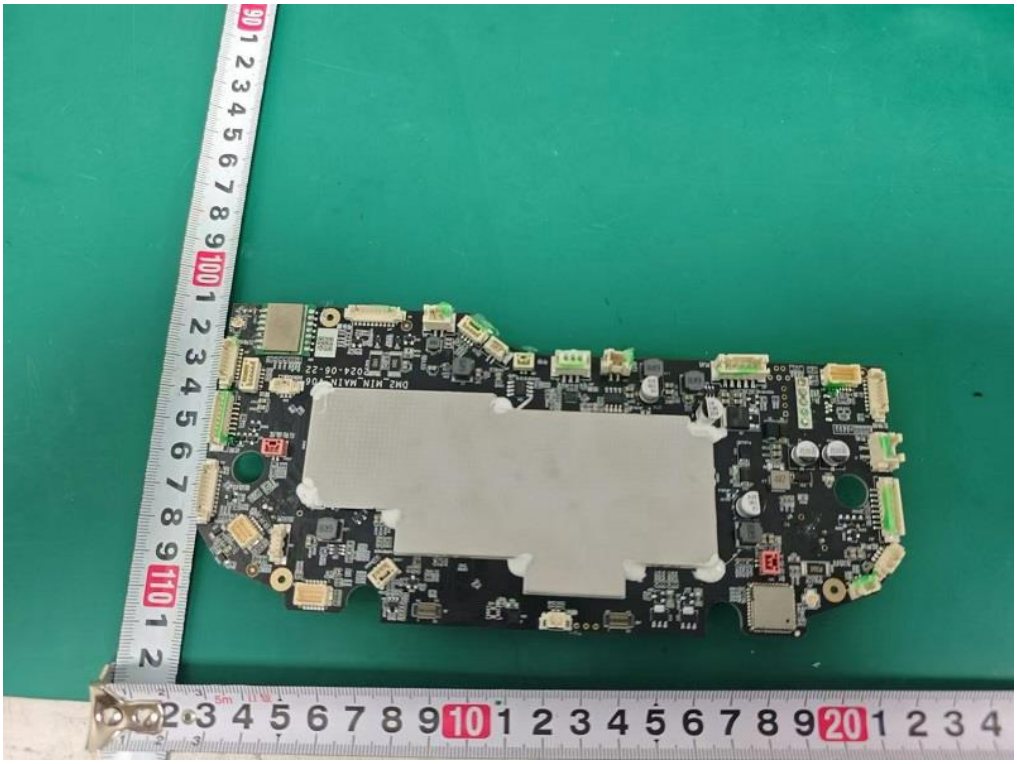




Internal Photos

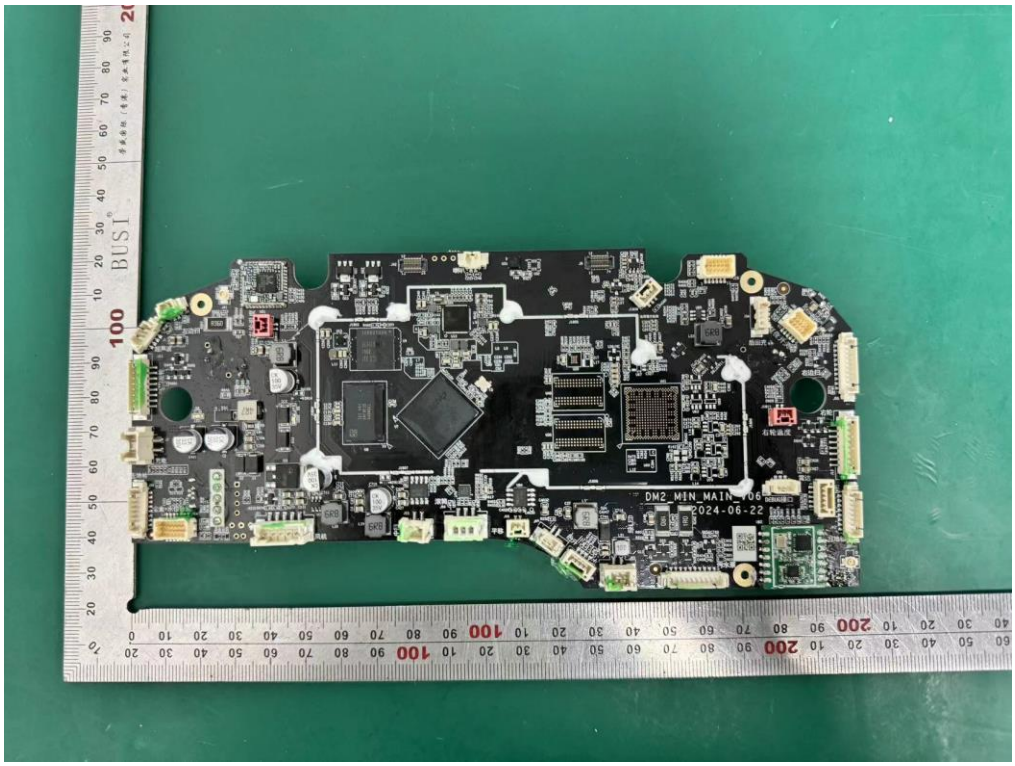
M/N: HOME-S10U

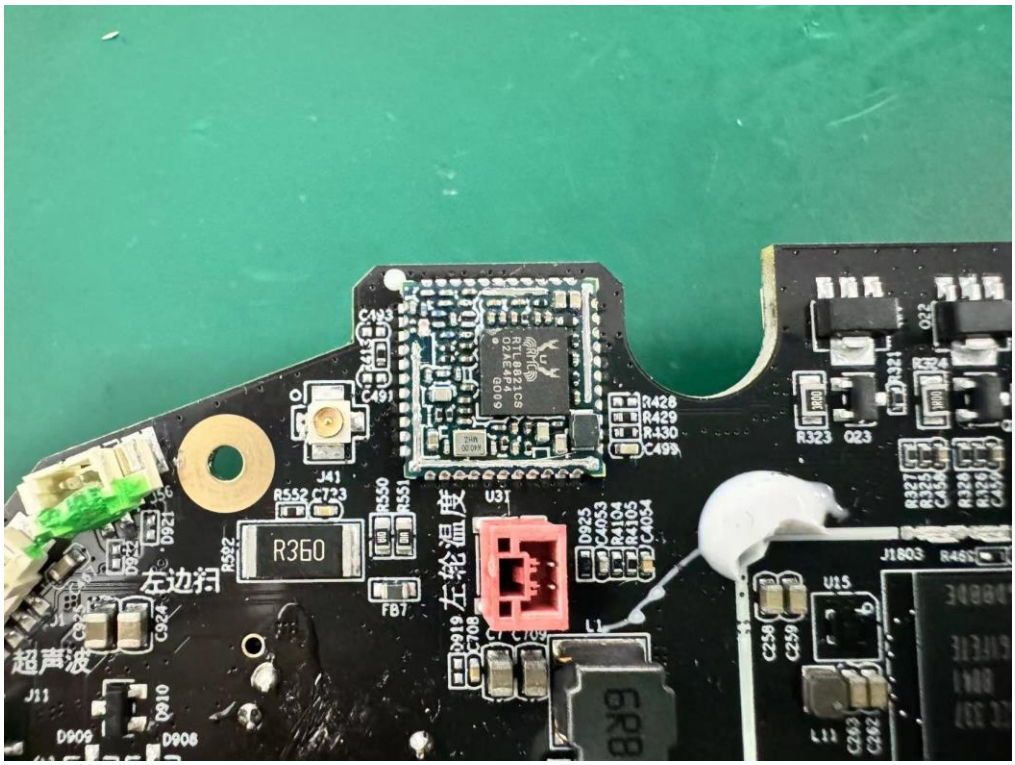




Internal Photos

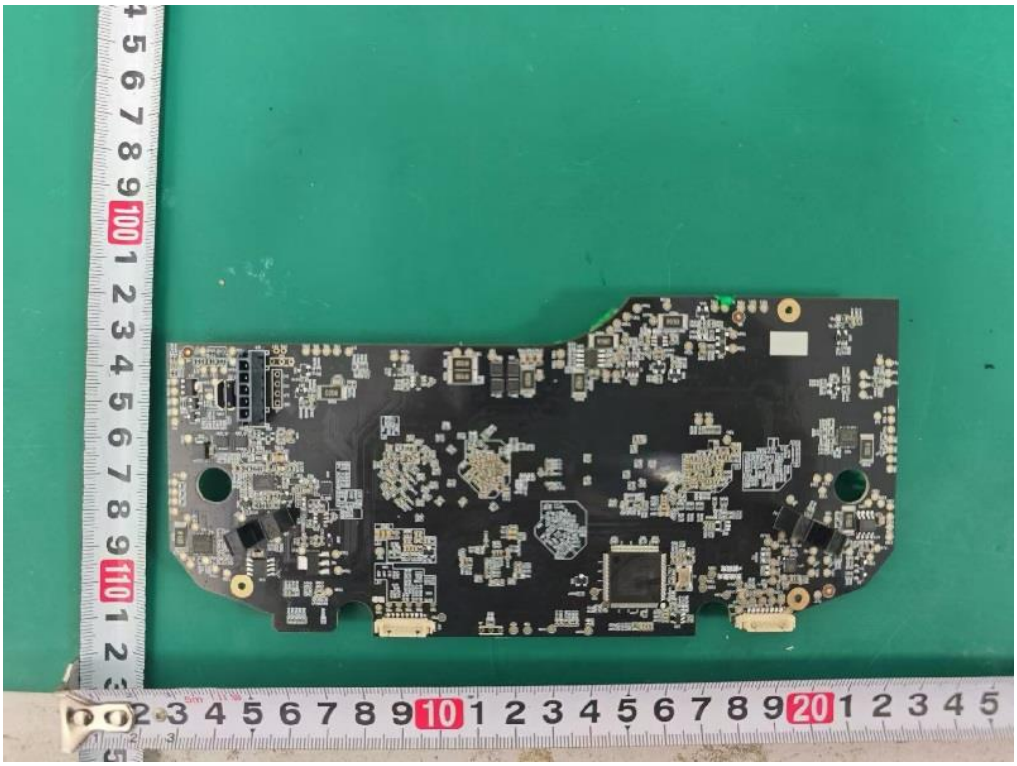
M/N: HOME-S10U





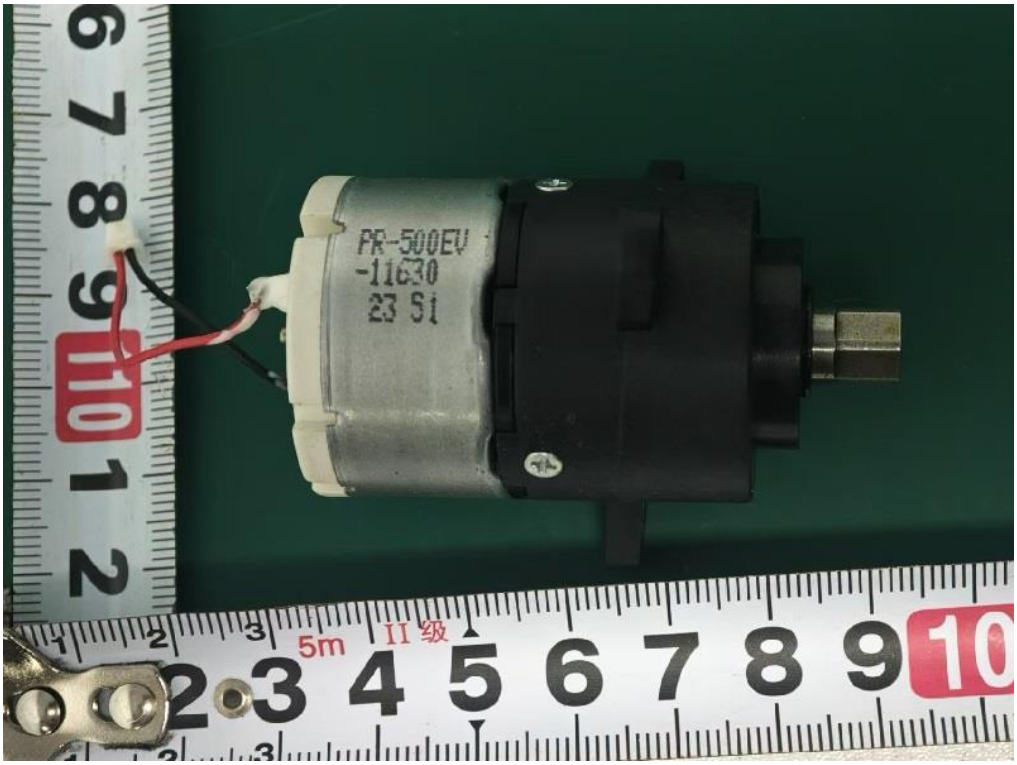
Internal Photos

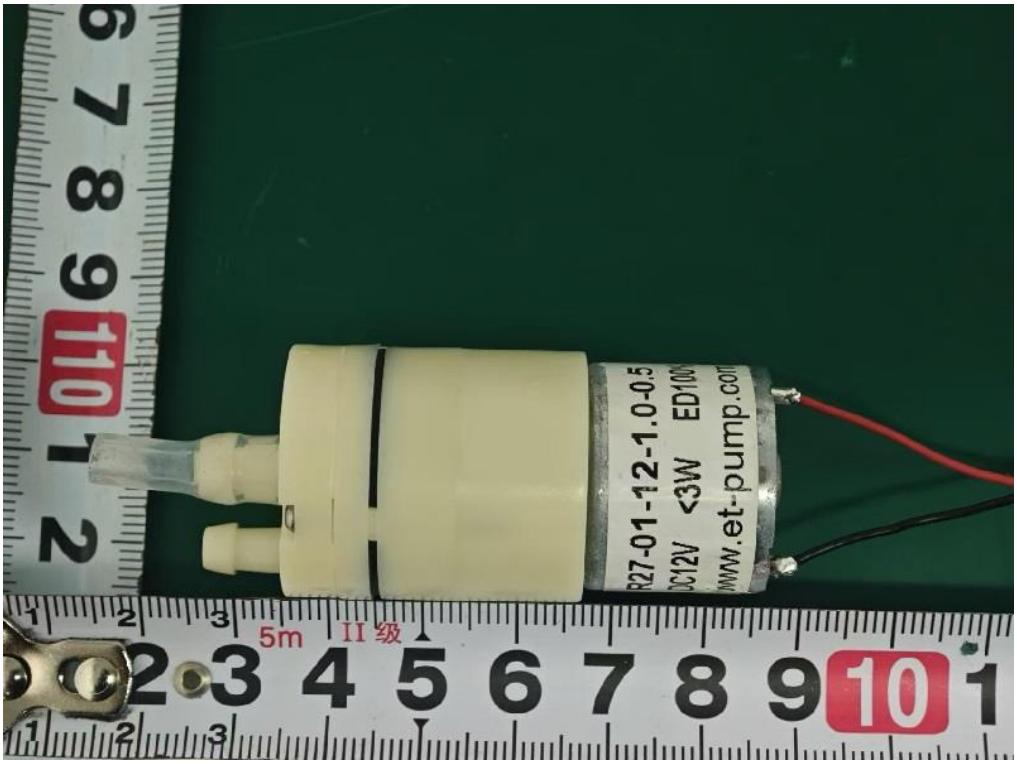
M/N: HOME-S10U



Internal Photos

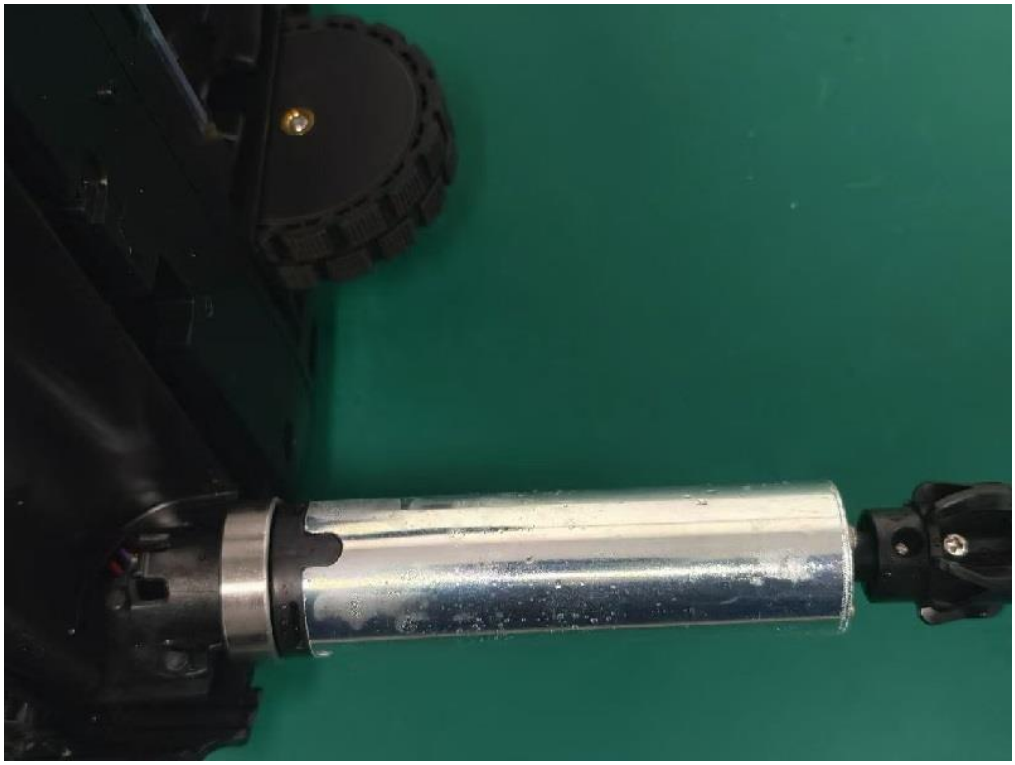
M/N: HOME-S10U





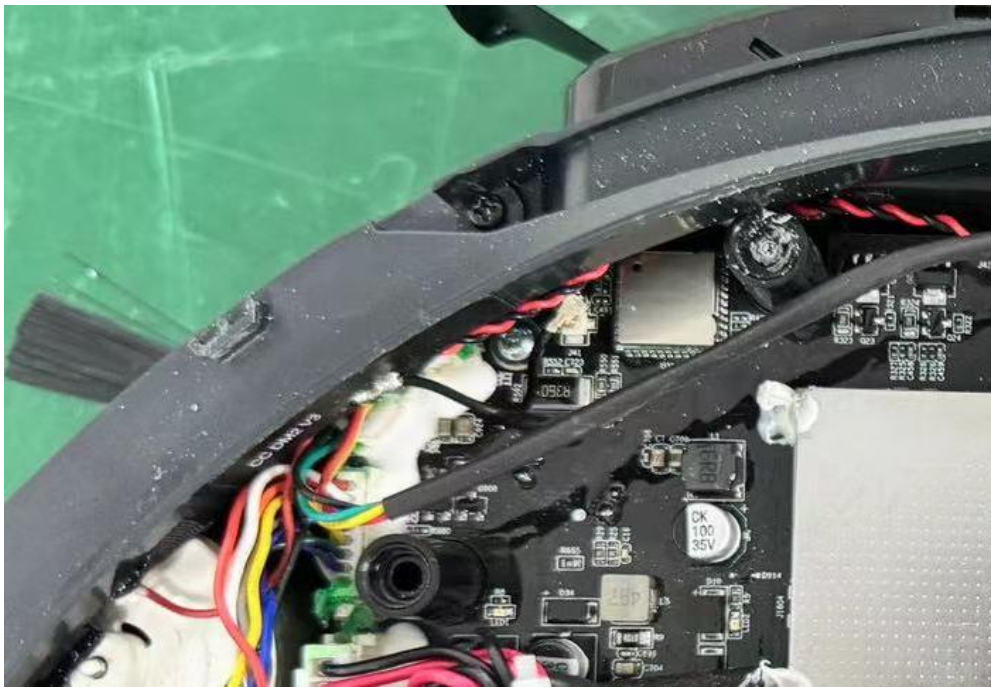
Internal Photos

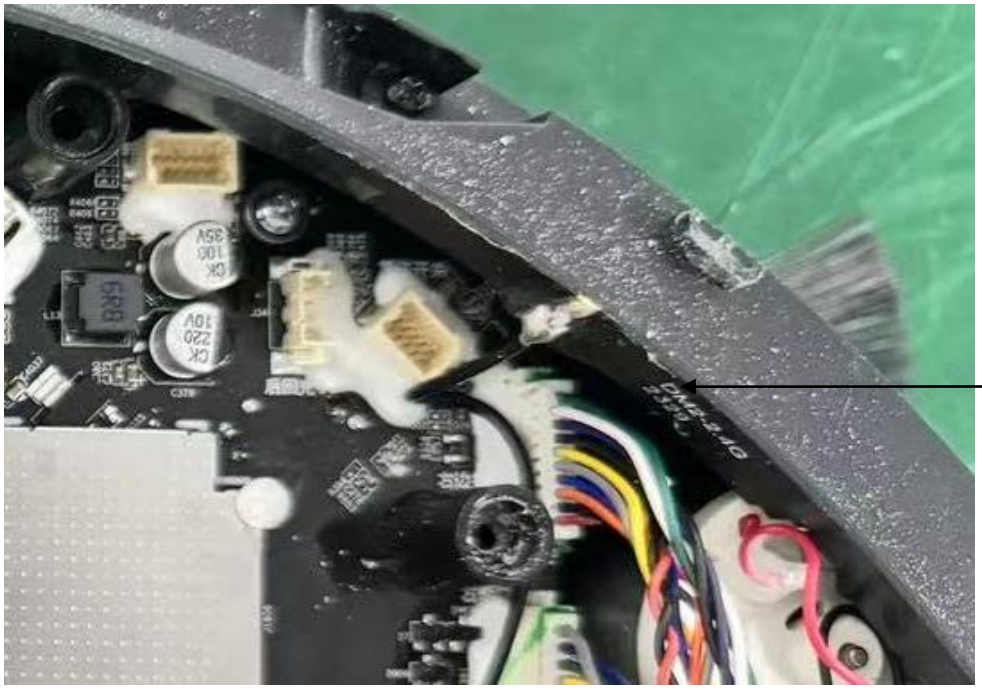
M/N: HOME-S10U



Internal Photos

M/N: HOME-S10U





End of Test Report