

# FCC PART 15C TEST REPORT FOR CERTIFICATION On Behalf of

Shenzhen KingChuang Smart Navi Technology Co.,Ltd.

Robot Vacuum Cleaner

Model Number: SL68

#### Additional Model:

SL40,SL68 Plus,SL68 Plus+,SL68 Pro,SL68 Pro+,SL68 Max,SL68 Max+,SL68 Pure, SL68 Ultra,SL68 MaxV,B12,B12 Plus,B12 Plus+,B12 Pro,B12 Pro+,B12 Max,B12 Max+, B12 Pure,B12 Ultra,B12 MaxV,SL40A,SL40B,SL40C SL40D,SDL40,SDL40A,SDL40B, SDL40C,SDL40D,Mars01,Mars01 Pro,Mars01 Nex,V9,V9 Pro,V9 SE,M500L,L9S,L8000, L8000 Pro,L8500,L8500 Pro,L8000 Plus,L8500 Pro Plus,L8500 Pro Plus,L8500 Pro +,V-RVCLM40A

FCC ID: 2BA3GKFTYRM24

| Applicant :   | oplicant : Shenzhen KingChuang Smart Navi Technology Co.,Ltd. |  |  |  |
|---|---|--|--|--|
| Address:  | Building 10, Furong Industrial Zone, 177 Furong Avenue,       |  |  |  |
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|   |   |  |  |  |
| Prepared By: EST Technology Co., Ltd.                               |   |  |  |  |
| Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |   |  |  |  |
| Tel: 86-769-83081888-808  |   |  |  |  |

| Report Number:  | ESTE-R2309159-2  |
|-----------------|------------------|
| Date of Test:   | Jan. 12~29, 2024 |
| Date of Report: | Jan. 31, 2024    |



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| Applicant/<br>Manufacturer:<br>Address: | Shenzhen KingChuang Smart Navi Technology Co.,Ltd. Building 10, Furong Industrial Zone, 177 Furong Avenue, Xinqiao Street, Baoan District, Shenzhen, China   |  |  |
|---|--|--|--|
| Factory:<br>Address:                    | Shenzhen KingChuang Smart Navi Technology Co.,Ltd. Building 10, Furong Industrial Zone, 177 Furong Avenue, Xinqiao Street, Baoan District, Shenzhen, China   |  |  |
| E.U.T:                                  | Robot Vacuum Cleaner   |  |  |
| Model Number:                           | SL68   |  |  |
| Additional Model:                       | SL40,SL68 Plus,SL68 Plus+,SL68 Pro,SL68 Pro+,SL68 Max, SL68 Max+,SL68 Pure,SL68 Ultra,SL68 MaxV,B12,B12 Plus, B12 Plus+,B12 Pro,B12 Pro+,B12 Max,B12 Max+,B12 Pure, B12 Ultra,B12 MaxV,SL40A,SL40B,SL40C SL40D,SDL40,SDL40A,SDL40B,SDL40C,SDL40D,Mars01,Mars01 Pro,Mars01 Nex,V9, V9 Pro,V9 SE,M500L,L9S,L8000, L8000 Pro,L8500,L8500 Pro,L8000 Plus,L8000 Pro Plus,L8500 Plus,L8500 Pro Plus,L8000 +,L8000 Pro +,L8500 +,L8500 Pro +,V-RVCLM40A Note: They are identical except model name.                                     |  |  |
| Power Supply:                           | DC 14.4V From Battery DC 19V From Adapter Input AC 100-240V, 50/60Hz AC 100-240V, 50/60Hz for collecting dust bucket   |  |  |
| Trade Name:                             | Serial No.:  |  |  |
| Date of Receipt:                        | Jan. 12, 2024 Date of Test: Jan. 12~29, 2024   |  |  |
| Test Specification:                     | FCC Part 15 Subpart C (15.247) ANSI C63.10:2013 FCC KDB 558074 D01 15.247 Meas Guidance v05r02   |  |  |
| 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. |  |  |
| Prepared by:                            | Reviewed by: Approved by:  |  |  |

Ring Yang / Assistant

Seven Wang / Engineer

Iceman Hu / Manager

Other Aspects: This report base on the previous report with report number: ESTE-R2309159-1, Add models, batteries, fans, air pumps, motor and dust buckets to the report, so just re-tested spurious emissions (30-1000MHz) and conducted emissions, other test item needn't re-tested.

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 Cleaner |
|---------------------|---|----------------------|
| Model Number        | : | SL68                 |
| Software Version    | : | N/A                  |
| Hardware Version    | : | N/A                  |
| Operation frequency | : | 2402MHz~2480MHz      |
| Number of channel   | : | 40                   |
| 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       | ı     | -          | Internal     | -         | 4.5        |
|         |       |            |              |           |            |

#### 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 KingChuang Smart Navi Technology Co.,Ltd. |
| Mata.          |  |

#### 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   | 6dB Bandwidth                             | 15.247(a)(2)                  | N/A     |
| 2   | Maximum Peak Output Power                 | 15.247(b)(3)                  | N/A     |
| 3   | Power Spectral Density                    | 15.247(e)                     | N/A     |
| 4   | Conducted Band Edge                       | 15.247(d)                     | N/A     |
| 5   | Conducted Spurious Emissions              | 15.247(d)                     | N/A     |
| 6   | Radiated Spurious Emissions and Band Edge | 15.205<br>15.209<br>15.247(d) | PASS    |
| 7   | AC Power Line Conducted Emissions         | 15.207                        | PASS    |
| 8   | Antenna Requirement                       | 15.203                        | N/A     |

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: February 29, 2024

Accredited by A2LA, USA Registration No.: 4366.01

This Accreditation is valid until: February 29, 2024

Recognized by Industry Canada CAB identifier No.: CN0035

This Recognition is valid until: February 29, 2024

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                 | ±4.60 dB(Polarize: H) |
| (30MHz-1GHz)  | ±4.68 dB(Polarize: V) |
| Uncertainty for spurious emissions test (1GHz to 25GHz) | ±4.96dB               |
| Uncertainty for radio frequency                         | 7×10 <sup>-8</sup>    |
| 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<br>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 BLE test mode by software before test.

EUT
DC 14.4V From Battery

(EUT: Robot Vacuum Cleaner)



## 2.6.Test Mode

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

| Test Item                                  | Modulation<br>Type | Test Channel    |
|--|--------------------|-----------------|
| Radiated Spurious<br>Emissions(Below 1GHz) | GFSK               | Low/Middle/High |
| AC Power Line Conducted<br>Emissions       | GFSK               | 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  | CMD            |      |      |  |  |
|----------------|----------------|------|------|--|--|
| Frequency(MHz) | 2402 2440 2480 |      |      |  |  |
| Setting        | 0x18           | 0x18 | 0x18 |  |  |

Note: This information is provided by the applicant.



## 2.8.Channel List

| Channel | Frequency | Channe | Frequenc |
|---------|-----------|--------|----------|
| No.     | (MHz)     |        | у        |
| 110.    | (1411 12) | No.    | (MHz)    |
| 0       | 2402      | 1      | 2404     |
| 2       | 2406      | 3      | 2408     |
| 4       | 2410      | 5      | 2412     |
| 6       | 2414      | 7      | 2416     |
| 8       | 2418      | 9      | 2420     |
| 10      | 2422      | 11     | 2424     |
| 12      | 2426      | 13     | 2428     |
| 14      | 2430      | 15     | 2432     |
| 16      | 2434      | 17     | 2436     |
| 18      | 2438      | 19     | 2440     |
| 20      | 2442      | 21     | 2444     |
| 22      | 2446      | 23     | 2448     |
| 24      | 2450      | 25     | 2452     |
| 26      | 2454      | 27     | 2456     |
| 28      | 2458      | 29     | 2460     |
| 30      | 2462      | 31     | 2464     |
| 32      | 2466      | 33     | 2468     |
| 34      | 2470      | 35     | 2472     |
| 36      | 2474      | 37     | 2476     |
| 38      | 2478      | 39     | 2480     |



## 2.9. Test Equipment List

| For conducted emission test |                    |              |            |                     |            |           |  |
|-----------------------------|--------------------|--------------|------------|---------------------|------------|-----------|--|
| Equipment                   | Manufacturer       | Model No.    | Serial No. | Calibration<br>Body | Last Cal.  | Next Cal. |  |
| EMI Test Receiver           | Rohde<br>& Schwarz | ESHS30       | EST-E001   | LISAI               | June 12,23 | 1 Year    |  |
| Artificial Mains Network    | Rohde<br>& Schwarz | ENV216       | EST-E002   | LISAI               | June 12,23 | 1 Year    |  |
| Pulse Limiter               | Rohde<br>& Schwarz | ESH3-Z2      | EST-E078   | LISAI               | June 12,23 | 1 Year    |  |
| 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<br>Receiver   | Rohde<br>& Schwarz | ESR7         | EST-E047 | LISAI | June 12,23 | 1 Year |  |  |
| Active Loop Antenna  | SCHWAREBE<br>CK    | FMZB 1519B   | EST-E054 | LISAI | June 12,23 | 1 Year |  |  |
| 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<br>Receiver   | Rohde<br>& Schwarz                          | ESR7      | EST-E047 | LISAI | June 12,23 | 1 Year |  |  |
| Bilog Antenna  | Teseq                                       | CBL 6111D | EST-E034 | LISAI | June 12,23 | 1 Year |  |  |
| Test Software  | 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    |  |  |



#### 3. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

#### 3.1.Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

#### 15.205 Restricted frequency band

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 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     | ( <sup>2</sup> ) |

#### 15.209 Limit

| 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           |

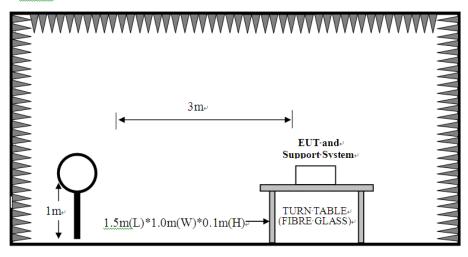
#### Note:

- (1) Emission level  $dB\mu V = 20 \log Emission level \mu V/m$ .
- (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.

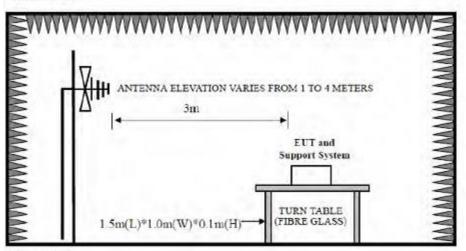


## 3.2.Test Setup

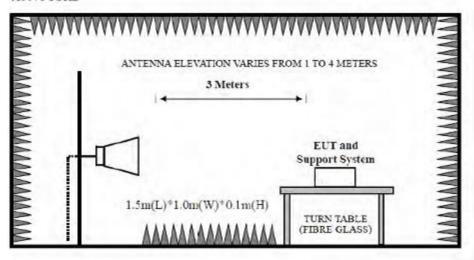
9kHz~30MHz4



30~1000MHz



Above 1GHz





## 3.3.Spectrum Analyzer Setting

#### For 9KHz-150KHz

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

#### For 30MHz-1GHz

| Spectrum<br>Parameters | Setting  |
|------------------------|----------|
| RBW                    | 120KHz   |
| VBW                    | 300KHz   |
| Start frequency        | 30MHz    |
| Stop frequency         | 1GHz     |
| Sweep Time             | Auto     |
| Detector               | QP       |
| Trace Mode             | Max Hold |

### For Above 1GHz

| Spectrum<br>Parameters | Setting                          |                         |  |  |  |
|------------------------|----------------------------------|-------------------------|--|--|--|
| RBW                    | 1MHz                             |                         |  |  |  |
|                        | PEAK Measurement AVG Measurement |                         |  |  |  |
| VBW                    | ONALL                            | Duty cycle≥98%,VBW=10Hz |  |  |  |
|                        | 3MHz                             | Duty cycle<98%,VBW≥1/T  |  |  |  |
| Start frequency        | 1GHz                             |                         |  |  |  |
| Stop frequency         | 25                               | 5GHz                    |  |  |  |
| Sweep Time             | Auto                             |                         |  |  |  |
| Detector               | PEAK                             |                         |  |  |  |
| Trace Mode             | Ma                               | x Hold                  |  |  |  |

Note: T is the on-time time of the duty cycle, when EUT transmit continuously with maximum output power, unit is seconds. reference section 2.8 for the on-time time.



#### 3.4.Test Procedure

- a. EUT was placed on a turn table, which is 0.1 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 8.3.
- 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 2402MHz ,2440MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.



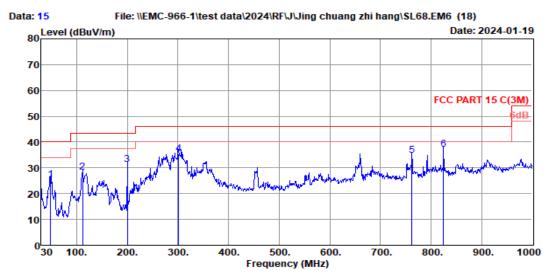
#### 3.5.Test Result

#### **Radiated Emissions Below 1GHz**

## EST Technology

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Fax:+86-769-83081878



Data no. : 15 Ant. pol. : VERTICAL : 1# 966 Chamber Site no. 37062 : 3m Dis. / Ant.

: FCC PART 15 C(3M) Limit

Env. / Ins. : Temp:23.9°C;Humi:53.5%;Press:101.82KPa

Engineer : DCY

EUT : Robot Vacuum Cleaner Power : DC 14.4V From Battery

M/N : SL68 Test Mode : TX Mode

Battery:CMICR18650F9M-4S1P Draught fan:QYC20A16F-53 Air pump:JFB1518083

|   | Freq.  | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|--------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 48.43  | 10.50                   | 0.94                  | 14.04             | 25.48                         | 40.00             | 14.52          | QP     |
| 2 | 111.48 | 10.90                   | 1.49                  | 15.96             | 28.35                         | 43.50             | 15.15          | QP     |
| 3 | 199.75 | 8.10                    | 2.05                  | 21.06             | 31.21                         | 43.50             | 12.29          | QP     |
| 4 | 301.60 | 13.90                   | 2.64                  | 18.86             | 35.40                         | 46.00             | 10.60          | QP     |
| 5 | 762.35 | 22.48                   | 4.39                  | 7.86              | 34.73                         | 46.00             | 11.27          | QP     |
| 6 | 824.43 | 23.80                   | 4.59                  | 8.69              | 37.08                         | 46.00             | 8.92           | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. Margin= Limit - Emission Level.

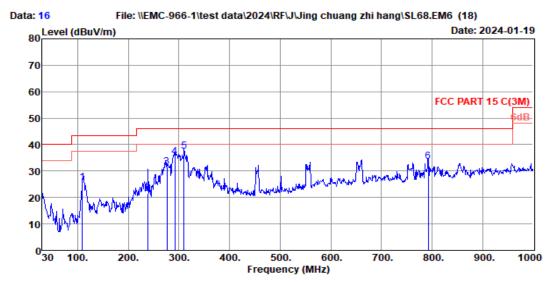
3. The emission levels that are 20dB below the official limit are not reported.



## EST Technology

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Site no. : 1# 966 Chamber Data no. : 16

Dis. / Ant. : 3m 37062 Ant. pol. : HORIZONTAL

Limit : FCC PART 15 C (3M)

Env. / Ins. : Temp:23.9°C; Humi:53.5%; Press:101.82KPa

Engineer : DCY

EUT : Robot Vacuum Cleaner Power : DC 14.4V From Battery

M/N : SL68 Test Mode : TX Mode

Battery:CMICR18650F9M-4S1P Draught fan:QYC20A16F-53 Air pump:JFB1518083

|   | Freq.  | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|--------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 109.54 | 11.00                   | 1.48                  | 13.20             | 25.68                         | 43.50             | 17.82          | QP     |
| 2 | 238.55 | 10.90                   | 2.26                  | 8.38              | 21.54                         | 46.00             | 24.46          | QP     |
| 3 | 276.38 | 13.00                   | 2.48                  | 16.10             | 31.58                         | 46.00             | 14.42          | QP     |
| 4 | 291.90 | 13.60                   | 2.58                  | 19.34             | 35.52                         | 46.00             | 10.48          | QP     |
| 5 | 310.33 | 12.90                   | 2.67                  | 22.00             | 37.57                         | 46.00             | 8.43           | QP     |
| 6 | 792.42 | 23.42                   | 4.49                  | 5.75              | 33.66                         | 46.00             | 12.34          | 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.



### **4.AC POWER LINE CONDUCTED EMISSIONS**

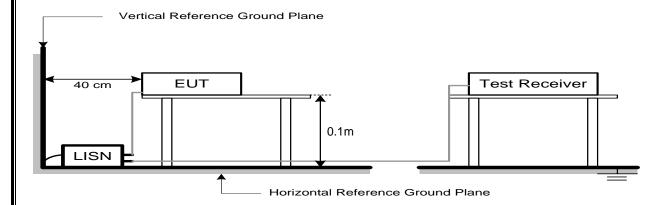
#### 4.1.Limit

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

#### Note:

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

#### 4.2.Test Setup



## 4.3. Spectrum Analyzer Setting

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

#### 4.4.Test Procedure

- a. The EUT was placed on a non-metallic table, 0.1m 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 9.3.
- f. The AC line are checked to find out the maximum conducted emission. In order to find the



| ď | 1. | 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. Record the results in the test report. |
|---|----|---|
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|   |    |   |



#### 4.5. Test Result

## EST Technology

Data: 22

30 20

10

Env. / Ins.

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

Fax:+86-769-83081878



File: \\EMC-CE1\Test data\2024\RF\J\Jing chuang zhi hang\SL68.EM6 (32)

Trace: 21 Site no

: 1#CE Shield Room Data no. : Temp:21.8C; Humi:50.8%; Press:101.50kPa LINE Phase : NEUTRAL

2

Frequency (MHz)

5

10

20

30

1

: FCC PART 15C QP Limit

Engineer : GGZ

0<mark>.15 .2</mark>

EUT : Robot Vacuum Cleaner

Power : AC 120V/60Hz M/N : SL68 Test Mode : TX Mode

Dust collector:SD80 Draught fan:QYC20A16F-53

.5

Battery: CMICR18650F9M-4S1P Air pump:JFB1518083

|    | Freq. | LISN<br>Factor<br>(db) | Cable<br>Loss<br>(db) | Reading<br>dBuV) | Emission<br>Level<br>(dBuv) | Limits (dBuv) | Margin<br>(dB) | Remark  |
|----|-------|------------------------|-----------------------|------------------|-----------------------------|---------------|----------------|---------|
| 1  | 0.46  | 10.23                  | 9.91                  | 15.67            | 35.81                       | 46.71         | 10.90          | Average |
| 2  | 0.46  | 10.23                  | 9.91                  | 20.42            | 40.56                       | 56.71         | 16.15          | QP      |
| 3  | 0.48  | 10.22                  | 9.91                  | 16.62            | 36.75                       | 46.32         | 9.57           | Average |
| 4  | 0.48  | 10.22                  | 9.91                  | 20.52            | 40.65                       | 56.32         | 15.67          | QP      |
| 5  | 4.11  | 10.01                  | 9.90                  | 9.75             | 29.66                       | 46.00         | 16.34          | Average |
| 6  | 4.11  | 10.01                  | 9.90                  | 12.56            | 32.47                       | 56.00         | 23.53          | QP      |
| 7  | 6.49  | 10.02                  | 9.88                  | 12.11            | 32.01                       | 50.00         | 17.99          | Average |
| 8  | 6.49  | 10.02                  | 9.88                  | 17.23            | 37.13                       | 60.00         | 22.87          | QP      |
| 9  | 8.24  | 10.05                  | 9.87                  | 12.61            | 32.53                       | 50.00         | 17.47          | Average |
| 10 | 8.24  | 10.05                  | 9.87                  | 17.52            | 37.44                       | 60.00         | 22.56          | QP      |
| 11 | 11.20 | 10.09                  | 9.91                  | 10.30            | 30.30                       | 50.00         | 19.70          | Average |
| 12 | 11.20 | 10.09                  | 9.91                  | 15.24            | 35.24                       | 60.00         | 24.76          | 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.

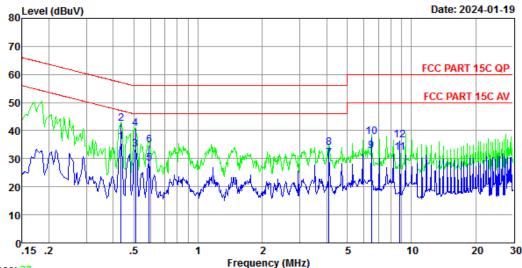


## EST Technology

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Fax:+86-769-83081878

Data: 24 File: \\EMC-CE1\Test data\2024\RF\J\Jing chuang zhi hang\SL68.EM6 (32)



Trace: 23

Site no : 1#CE Shield Room Data no. : 24

Env. / Ins. : Temp:21.8C; Humi:50.8%; Press:101.50kPa LINE Phase : LINE

Limit : FCC PART 15C QP

Engineer : GGZ

EUT : Robot Vacuum Cleaner

Power : AC 120V/60Hz M/N : SL68 Test Mode : TX Mode

Dust collector:SD80 Battery:CMICR18650F9M-4S1P Draught fan:QYC20A16F-53 Air pump:JFB1518083

|    | Freq. | LISN<br>Factor<br>(db) | Cable<br>Loss<br>(db) | Reading<br>dBuV) | Emission<br>Level<br>(dBuv) | Limits (dBuv) | Margin<br>(dB) | Remark  |
|----|-------|------------------------|-----------------------|------------------|-----------------------------|---------------|----------------|---------|
| 1  | 0.44  | 10.20                  | 9.91                  | 15.84            | 35.95                       | 47.15         | 11.20          | Average |
| 2  | 0.44  | 10.20                  | 9.91                  | 22.43            | 42.54                       | 57.15         | 14.61          | QP      |
| 3  | 0.51  | 10.23                  | 9.91                  | 13.18            | 33.32                       | 46.00         | 12.68          | Average |
| 4  | 0.51  | 10.23                  | 9.91                  | 20.47            | 40.61                       | 56.00         | 15.39          | QP      |
| 5  | 0.59  | 10.26                  | 9.92                  | 8.28             | 28.46                       | 46.00         | 17.54          | Average |
| 6  | 0.59  | 10.26                  | 9.92                  | 14.52            | 34.70                       | 56.00         | 21.30          | QP      |
| 7  | 4.11  | 10.41                  | 9.90                  | 9.67             | 29.98                       | 46.00         | 16.02          | Average |
| 8  | 4.11  | 10.41                  | 9.90                  | 13.57            | 33.88                       | 56.00         | 22.12          | QP      |
| 9  | 6.49  | 10.43                  | 9.88                  | 12.51            | 32.82                       | 50.00         | 17.18          | Average |
| 10 | 6.49  | 10.43                  | 9.88                  | 17.47            | 37.78                       | 60.00         | 22.22          | QP      |
| 11 | 8.82  | 10.47                  | 9.88                  | 11.93            | 32.28                       | 50.00         | 17.72          | Average |
| 12 | 8.82  | 10.47                  | 9.88                  | 16.25            | 36.60                       | 60.00         | 23.40          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

Margin= Limit - Emission Level.

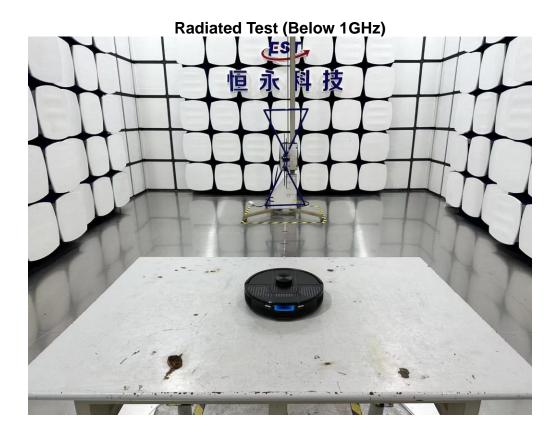
If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



## 5. TEST SETUP PHOTO









## 6. EUT PHOTO

## External Photos

