

RF Exposure Evaluation Report

Product : Smart Sweeping Robot
Trade mark : N/A
Model/Type reference : SI-340, SI-340A, SI-350
Serial Number : N/A
Report Number : EED32L00254502
FCC ID : 2AURN-SI
Date of Issue : Oct. 12, 2019
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01v06
Test result : PASS

Prepared for:

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2 Version

Version No.	Date	Description
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4 General Information

4.1 Client Information

Applicant:	Sinsion Technology Industrial Co., Ltd
Address of Applicant:	No. 11, Tongle Rd., Tangxia town, Pengjiang District, Jiangmen City, Guangdong Province, China
Manufacturer:	Sinsion Technology Industrial Co., Ltd
Address of Manufacturer:	No. 11, Tongle Rd., Tangxia town, Pengjiang District, Jiangmen City, Guangdong Province, China
Factory:	Sinsion Technology Industrial Co., Ltd
Address of Factory:	No. 11, Tongle Rd., Tangxia town, Pengjiang District, Jiangmen City, Guangdong Province, China

4.2 General Description of EUT

Product Name:	Smart Sweeping Robot
Model No.(EUT):	SI-340, SI-340A, SI-350
Test Model No.:	SI-350
Trade Mark:	N/A
EUT Supports Radios application	WiFi IEEE 802.11 /b/g/n(HT20) 2412MHz to 2462MHz

4.3 Product Specification subjective to this standard

Frequency Range:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz				
Modulation Type:	DSSS, OFDM				
Number of Channels:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels				
Test Power Grade:	Mode	Channel	Frequency	Data Rate	Power Setting
	802.11b	1	2412	1 Mbps	-3.25
		6	2437		-3.25
		11	2462		-5.25
	802.11g	1	2412	6 Mbps	3.25
		6	2437		3.25
		11	2462		1.5
	802.11n(HT20)	1	2412	MCS 0	4.25
		6	2437		3.75
		11	2462		2.25
Test Software of EUT:	ESP Series Modules				
Antenna Type:	PCB antenna				
Antenna Specification	2.4GHz	Antenna Gain :	3.00 dBi	(Numeric gain: 2.00)	
Maximum tune up power	IEEE 802.11b Mode:		18.22 dBm	(66.374 mW)	
	IEEE 802.11g Mode:		17.26 dBm	(53.211 mW)	
	IEEE 802.11n HT 20 Mode:		16.10 dBm	(40.738 mW)	
Power Supply:	Adapter:	MODEL: YLS0241A-T190100 INPUT: 100-240V~50/60Hz 0.8A OUTPUT: 19.0V --- 1.0A			

	Battery:	MODEL: ICR18650 Capacity: 2600mAh, 38.48Wh Nominal Voltage: 14.8V
Sample Received Date:	Sep. 09, 2019	
Sample tested Date:	Sep. 09, 2019 to Oct. 10, 2019	
The tested sample(s) and the sample information are provided by the client. Model No.: SI-340, SI-340A, SI-350 Only the model SI-350 was tested, among which SI-340 and SI-340A are the same machine,the difference is only the supporting charging block is different; The main circuit of si-340 and si-350 is exactly the same,and the wireless module is the same,the differences are as follows: 1、 Only the switch is different(SI-340 is mechanical switch,SI-350 is touch switch); 2、 The SI-350 is the main test model and the power is 30W,while the SI-340/SI-340A is 25W.		

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
1	2412	66.374	2	20	0.0264	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
1	2412	53.211	2	20	0.0212	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
11	2462	40.738	2	20	0.0162	1

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32L00254501 for EUT external and internal photos.

*** End of Report ***

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