

FCC 47 CFR MPE REPORT

Shenzhen KingChuang Smart Navi Technology Co., Ltd.

Robot Vacuum Cleaner

Model Number: SL62

Additional Model: SL61, SL61A, SL61B, SL61C, SL61D, SDL61, SDL61A, SDL61B, SDL61C, SDL61D, L9700, L9700 Plus, L9700 Pro, L9700 Ultra, L9700 Max, SL62, SL62A, SL62B, SL62C, SL62D, SDL62, SDL62A, SDL62B, SDL62C, SDL62D, SL63, SL63A, SL63B, SL63C, SL63D, SDL63, SL64, SL64A, SL64B, SL64C, SL64D, SDL64, SDL64A, SDL64B, SDL64C, SDL64D, SL65, SL65A, SL65B, SL65C, SL65D, SDL65, SDL65A, SDL65B, SDL65C, SDL65D

FCC ID: 2BA3G8821CS

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

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Maximum Permissible Exposure

1. Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
BLE 1M	2402	5	3.162
	2440	4.19	2.624
	2480	2.5	1.778
IEEE 802.11b	2412	15.99	39.719
	2437	14.93	31.117
	2462	14.25	26.607
IEEE 802.11g	2412	15.46	35.156
	2437	15.34	34.198
	2462	14.71	29.580
IEEE 802.11n HT20	2412	15.72	37.325
	2437	15.24	33.420
	2462	14.56	28.576
IEEE 802.11n HT40	2422	15.92	39.084
	2437	15.62	36.475
	2452	15.16	32.810
IEEE 802.11a	5180	11.17	13.092
	5200	11.37	13.709
	5240	11.45	13.964
	5260	12.06	16.069
	5300	13.02	20.045
	5320	13.06	20.230
	5500	15.03	31.842
	5580	14.86	30.620
	5700	13.75	23.714
	5745	12.51	17.824
	5785	12.62	18.281
	5825	11.42	13.868
IEEE 802.11n HT20	5180	11.2	13.183
	5200	10.19	10.447
	5240	10.37	10.889
	5260	10.76	11.912
	5300	11.52	14.191
	5320	11.31	13.521

	5500	13.68	23.335
	5580	13.47	22.233
	5700	12.35	17.179
	5745	12.78	18.967
	5785	11.75	14.962
	5825	10.11	10.257
IEEE 802.11ac VHT20	5180	9.57	9.057
	5200	9.85	9.661
	5240	10.32	10.765
	5260	10.77	11.940
	5300	11.48	14.060
	5320	11.4	13.804
	5500	12.8	19.055
	5580	11.64	14.588
	5700	12.36	17.219
	5745	10.99	12.560
	5785	10.86	12.190
	5825	10.19	10.447
IEEE 802.11n HT40	5190	10.23	10.544
	5230	10.66	11.641
	5270	11.3	13.490
	5310	11.74	14.928
	5510	13.14	20.606
	5550	12.17	16.482
	5670	13.17	20.749
	5755	11.49	14.093
	5795	11.15	13.032
IEEE 802.11ac VHT40	5190	10.4	10.965
	5230	10.87	12.218
	5270	11.32	13.552
	5310	11.86	15.346
	5510	11.47	14.028
	5550	11.89	15.453
	5670	12.44	17.539
	5755	11.2	13.183
	5795	10.93	12.388

IEEE 802.11ac VHT80	5210	10.11	10.257
	5290	11.19	13.152
	5530	11.7	14.791
	5610	12.02	15.922
	5775	11.49	14.093

3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
				(dBi)	(Linear)			
2.4G Band								
BLE 1M	5	5±1	6	4.5	2.818	0.00223	1	Complies
IEEE 802.11b	15.99	15±1	16	4.5	2.818	0.02232	1	Complies
IEEE 802.11g	15.46	15±1	16	4.5	2.818	0.02232	1	Complies
IEEE 802.11n HT20	15.72	15±1	16	4.5	2.818	0.02232	1	Complies
IEEE 802.11n HT40	15.92	15±1	16	4.5	2.818	0.02232	1	Complies
5G Band								
IEEE 802.11a	15.03	15±1	16	4.19	2.624	0.02078	1	Complies
IEEE 802.11n HT20	13.68	13±1	14	4.19	2.624	0.01311	1	Complies
IEEE802.11acVHT20	12.8	12±1	13	4.19	2.624	0.01042	1	Complies
IEEE 802.11n HT40	13.17	13±1	14	4.19	2.624	0.01311	1	Complies
IEEE802.11acVHT40	12.44	12±1	13	4.19	2.624	0.01042	1	Complies
IEEE802.11acVHT80	12.02	12±1	13	4.19	2.624	0.01042	1	Complies

End of Test Report