

FCC 47 CFR MPE REPORT

ShenZhen Modern Business Trading Co.,Ltd.

Robot Vacuum Cleaner

Model Number: SL60

FCC ID: 2AUTI-SLR1

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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)	Target power (dBm)	Antenna gain	
					(dBi)	(Linear)
IEEE 802.11 b	2412	17.27	53.33	17 ± 2	1	1.26
	2437	17.32	53.95	17 ± 2	1	1.26
	2462	16.89	48.87	17 ± 2	1	1.26
IEEE 802.11 g	2412	16.58	45.50	17 ± 2	1	1.26
	2437	16.50	44.67	17 ± 2	1	1.26
	2462	16.22	41.88	16 ± 2	1	1.26
IEEE 802.11 n HT20	2412	16.66	46.34	17 ± 2	1	1.26
	2437	16.67	46.45	17 ± 2	1	1.26
	2462	16.22	41.88	16 ± 2	1	1.26
IEEE 802.11 n HT40	2422	16.94	49.43	17 ± 2	1	1.26
	2437	16.87	48.64	17 ± 2	1	1.26
	2452	16.56	45.29	17 ± 2	1	1.26

3. Calculated Result and Limit

Mode	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						
IEEE 802.11 b	19	1	1.26	0.0199	1	Complies
IEEE 802.11 g	19	1	1.26	0.0199	1	Complies
IEEE 802.11 n HT20	19	1	1.26	0.0199	1	Complies
IEEE 802.11 n HT40	19	1	1.26	0.0199	1	Complies

End of Test Report