

FCC 47 CFR MPE REPORT

ZHEJIANG MIYUE TECHNOLOGY CO., LTD.

Robot Vacuum Cleaner

Model Number: S212

Additional Model: S211

FCC ID: 2A8LSL1100

Applicant:	ZHEJIANG MIYUE TECHNOLOGY CO., LTD.
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Report Number:	ESTE-R2210004
Date of Test:	Aug. 16~Sep. 30, 2022
Date of Report:	Oct. 08, 2022

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)
IEEE 802.11b	2412	12.19	16.5577
	2437	17.24	52.9663
	2462	17.06	50.8159
IEEE 802.11g	2412	21.06	127.6439
	2437	20.32	107.6465
	2462	20.15	103.5142
IEEE 802.11n HT20	2412	19.86	96.8278
	2437	19.67	92.6830
	2462	19.47	88.5116
IEEE 802.11n HT40	2422	16.73	47.0977
	2437	16.66	46.3447
	2452	16.55	45.1856

3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
				(dBi)	(Linear)			
2.4G Band								
IEEE 802.11b	17.24	17±1	18	3.2	2.0893	0.0262	1	Complies
IEEE 802.11g	21.06	21±1	22	3.2	2.0893	0.0659	1	Complies
IEEE 802.11n HT20	19.86	19±1	20	3.2	2.0893	0.0416	1	Complies
IEEE 802.11n HT40	16.73	16±1	17	3.2	2.0893	0.0208	1	Complies

End of Test Report