

FCC 47 CFR MPE REPORT

Arovast corporation

Levoit Dual 200S Smart Top-Fill Humidifier

Model Number: LUH-D301S-BUS

Additional Model: LUH-D301S-Followed by up to 4 characters

FCC ID: 2ARBY-DUAL200SA

Applicant:	Arovast corporation
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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 1Mbps	2402	9.53	8.974
	2440	7.35	5.433
	2480	2.92	1.959
BLE 2Mbps	2402	7.23	5.284
	2440	4.86	3.062
	2480	0.68	1.169
IEEE 802.11b	2412	19.08	80.910
	2437	18.07	64.121
	2462	15.31	33.963
IEEE 802.11g	2412	19.57	90.573
	2437	18.75	74.989
	2462	15.97	39.537
IEEE 802.11n HT20	2412	19.70	93.325
	2437	18.94	78.343
	2462	16.11	40.832
IEEE 802.11n HT40	2422	17.65	58.210
	2437	17.08	51.050
	2452	15.72	37.325

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 1Mbps	9.53	9±1	10	3.37	2.173	0.00432	1	Complies
BLE 2Mbps	7.23	7±1	8	3.37	2.173	0.00273	1	Complies
IEEE 802.11b	19.08	19±1	20	3.37	2.173	0.04322	1	Complies
IEEE 802.11g	19.57	19±1	20	3.37	2.173	0.04322	1	Complies
IEEE 802.11n HT20	19.70	19±1	20	3.37	2.173	0.04322	1	Complies
IEEE 802.11n HT40	17.65	17±1	18	3.37	2.173	0.02727	1	Complies

End of Test Report