FCC 47 CFR MPE REPORT

Arovast Corporation

Smart Hybrid Ultrasonic Humidifier

Model Number: LUH-A603S-WUS

Additional Model: LUH-A603S-WUSR, LUH-A603S-WUSC, LUH-A603S-XXXX

FCC ID: 2ARBY-LUH-A603S

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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 $\mid E \mid^2$, $\mid H \mid^2$ 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 $\mid E \mid^2$, $\mid H \mid^2$ 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.o	30

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

1.2. MPE Calculation Method

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

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

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

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	7.32	5.3951
	2440	4.57	2.8642
	2480	5.56	3.5975
BLE 2M	2402	7.26	5.3211
	2440	4.90	3.0903
	2480	5.90	3.8905
IEEE 802.11b	2412	21.37	137.0882
	2437	19.15	82.2243
	2462	21.16	130.6171
IEEE 802.11g	2412	17.45	55.5904
	2437	15.40	34.6737
	2462	17.19	52.3600
IEEE 802.11n HT20	2412	18.71	74.3019
	2437	16.70	46.7735
	2462	18.44	69.8232
IEEE 802.11n HT40	2422	14.73	29.7167
	2437	13.61	22.9615
	2452	14.54	28.4446

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	7.32	7±1	8	3.37	2.173	0.00273	1	Complies
BLE 2M	7.26	7±1	8	3.37	2.173	0.00273	1	Complies
IEEE 802.11b	21.37	21±1	22	3.37	2.173	0.06850	1	Complies
IEEE 802.11g	17.45	17±1	18	3.37	2.173	0.02727	1	Complies
IEEE 802.11n HT20	18.71	18±1	19	3.37	2.173	0.03433	1	Complies
IEEE 802.11n HT40	14.73	14±1	15	3.37	2.173	0.01367	1	Complies

End of Test Report