



# FCC 47 CFR MPE REPORT

Arovast Corporation

Air Purifier

Model Number: Core 200S

FCC ID: 2ARBY-CORE-200SA

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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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,  $d=0.2\text{m}$ , 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)
GFSK	2402	10.42	11.015
	2441	10.16	10.375
	2480	10.39	10.940
$\pi/4$ -DQPSK	2402	12.43	17.498
	2441	12.41	17.418
	2480	12.48	17.701
8-DPSK	2402	12.94	19.679
	2441	13.01	19.999
	2480	13.03	20.091
BLE 1M	2402	10.82	12.078
	2440	10.65	11.614
	2480	10.68	11.695
IEEE 802.11b	2412	22.28	169.044
	2437	22.15	164.059
	2462	22.24	167.494
IEEE 802.11g	2412	19.74	94.189
	2437	19.69	93.111
	2462	19.61	91.411
IEEE 802.11n HT20	2412	19.84	96.383
	2437	19.7	93.325
	2462	19.59	90.991
IEEE 802.11n HT40	2422	19.53	89.743
	2437	19.33	85.704
	2452	19.27	84.528

### 3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm <sup>2</sup> )	Limited of Power Density (S) (mW /cm <sup>2</sup> )	Test Result
				(dBi)	(Linear)			
<b>2.4G Band</b>								
GFSK	10.42	10±1	11	3.76	2.377	0.00595	1	Complies
π/4-DQPSK	12.48	12±1	13	3.76	2.377	0.00943	1	Complies
8-DPSK	13.03	13±1	14	3.76	2.377	0.01188	1	Complies
BLE	10.82	10±1	11	3.76	2.377	0.00595	1	Complies
IEEE 802.11b	22.28	22±1	23	3.76	2.377	0.09435	1	Complies
IEEE 802.11g	19.74	19±1	20	3.76	2.377	0.04729	1	Complies
IEEE 802.11n HT20	19.84	19±1	20	3.76	2.377	0.04729	1	Complies
IEEE 802.11n HT40	19.53	19±1	20	3.76	2.377	0.04729	1	Complies

**End of Test Report**