

FCC 47 CFR MPE REPORT

Arovast Corporation

Smart Air Fryer Toaster Oven

Model Number: CTO-R251S

FCC ID: 2ARBY-CTO-R251S

Applicant:	Arovast Corporation
Address:	1202 N Miller St. Suite A, Anaheim, California 92806, United States
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-R2211035
Date of Test:	Sep. 30~Nov. 03, 2022
Date of Report:	Nov. 04, 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)
GFSK	2402	6.31	4.2756
	2441	6.34	4.3053
	2480	6.43	4.3954
$\pi/4$ DQPSK	2402	8.45	6.9984
	2441	8.48	7.0469
	2480	8.50	7.0795
8-DPSK	2402	8.89	7.7446
	2441	8.87	7.7090
	2480	8.91	7.7804
BLE	2402	6.14	4.1115
	2440	6.17	4.1400
	2480	6.41	4.3752
IEEE 802.11b	2412	17.31	53.8270
	2437	16.58	45.4988
	2462	16.93	49.3174
IEEE 802.11g	2412	16.81	47.9733
	2437	16.29	42.5598
	2462	16.28	42.4620
IEEE 802.11n HT20	2412	16.60	45.7088
	2437	16.18	41.4954
	2462	16.20	41.6869
IEEE 802.11n HT40	2422	16.14	41.1150
	2437	15.77	37.7572
	2452	15.67	36.8978

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								
GFSK	6.43	6±1	7	2	1.585	0.00158	1	Complies
$\pi/4$ DQPSK	8.50	8±1	9	2	1.585	0.00250	1	Complies
8-DPSK	8.91	8±1	9	2	1.585	0.00250	1	Complies
BLE	6.41	6±1	7	2	1.585	0.00158	1	Complies
IEEE 802.11b	17.31	17±1	18	2	1.585	0.01989	1	Complies
IEEE 802.11g	16.81	16±1	17	2	1.585	0.01580	1	Complies
IEEE 802.11n HT20	16.60	16±1	17	2	1.585	0.01580	1	Complies
IEEE 802.11n HT40	16.14	16±1	17	2	1.585	0.01580	1	Complies

End of Test Report