FCC 47 CFR MPE REPORT

Arovast Corporation

Vesync Aura Smart Thermostat

Model Number: LTM-A401S-WUS

FCC ID: 2ARBY-A401S

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Report Number:	ESTE-R2203162
Date of Test:	Feb. 10~Mar. 10, 2022
Date of Report:	Mar. 11, 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.o	30

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

1.2. MPE Calculation Method

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

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)	Target power（dBm）	Antenna gain	
					(dBi)	(Linear)
GFSK	2402	7.67	5.848	7±1	1.79	1.510
	2441	8.53	7.129	8±1	1.79	1.510
	2480	8.79	7.568	8±1	1.79	1.510
8-DPSK	2402	10.08	10.186	10±1	1.79	1.510
	2441	10.98	12.531	10±1	1.79	1.510
	2480	11.27	13.397	11±1	1.79	1.510
BLE	2402	6.98	4.989	6±1	1.79	1.510
	2440	7.95	6.237	7±1	1.79	1.510
	2480	8.16	6.546	8±1	1.79	1.510
Zigbee	2405	10.42	11.015	10±1	1.88	1.542
	2445	10.56	11.376	10±1	1.88	1.542
	2480	10.60	11.482	10±1	1.88	1.542
IEEE 802.11b	2412	18.54	71.450	18±1	1.79	1.510
	2437	18.60	72.444	18±1	1.79	1.510
	2462	18.97	78.886	18±1	1.79	1.510
IEEE 802.11g	2412	22.12	162.930	22±1	1.79	1.510
	2437	22.31	170.216	22±1	1.79	1.510
	2462	22.62	182.810	22±1	1.79	1.510
IEEE 802.11n HT20	2412	22.26	168.267	22±1	1.79	1.510
	2437	22.43	174.985	22±1	1.79	1.510
	2462	22.80	190.546	22±1	1.79	1.510
IEEE 802.11n HT40	2422	22.16	164.437	22±1	1.79	1.510
	2437	21.99	158.125	21±1	1.79	1.510
	2452	22.40	173.780	22±1	1.79	1.510

3. Calculated Result and Limit

Mode	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						
GFSK	9	1.79	1.510	0.00239	1	Complies
8-DPSK	12	1.79	1.510	0.00476	1	Complies
BLE	9	1.79	1.510	0.00239	1	Complies
Zigbee	11	1.88	1.542	0.00386	1	Complies
IEEE 802.11b	19	1.79	1.510	0.02386	1	Complies
IEEE 802.11g	23	1.79	1.510	0.05994	1	Complies
IEEE 802.11n HT20	23	1.79	1.510	0.05994	1	Complies
IEEE 802.11n HT40	23	1.79	1.510	0.05994	1	Complies

End of Test Report