

FCC 47 CFR MPE REPORT

AUO Display Plus Corporation

WIFI Module

Model Number: AP6575P

FCC ID: 2A639-AP6575P

Applicant:	AUO Display Plus Corporation
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Report Number:	ESTE-R2303083
Date of Test:	Jan. 06~Mar. 09, 2023
Date of Report:	Mar. 11, 2023

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)	Antenna	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	ant 1	4.16	2.606
	2441	ant 1	4.48	2.805
	2480	ant 1	5.29	3.381
$\pi/4$ -DQPSK	2402	ant 1	5.3	3.388
	2441	ant 1	6.15	4.121
	2480	ant 1	7	5.012
8-DPSK	2402	ant 1	5.77	3.776
	2441	ant 1	6.59	4.560
	2480	ant 1	7.51	5.636
BLE 1M	2402	ant 1	6.85	4.842
	2440	ant 1	6.61	4.581
	2480	ant 1	5.47	3.524
BLE 2M	2402	ant 1	7.1	5.129
	2440	ant 1	6.85	4.842
	2480	ant 1	5.87	3.864
IEEE 802.11b	2412	ant 1	16.24	42.073
		ant 2	17.02	50.350
	2437	ant 1	15.87	38.637
		ant 2	16.87	48.641
	2462	ant 1	15.13	32.584
		ant 2	15.57	36.058
IEEE 802.11g	2412	ant 1	15.77	37.757
		ant 2	16.04	40.179
	2437	ant 1	15.91	38.994
		ant 2	15.97	39.537
	2462	ant 1	15.75	37.584
		ant 2	16.69	46.666
IEEE 802.11n HT20	2412	ant 1	15.32	34.041
		ant 2	14.55	28.510
	2437	ant 1	16.35	43.152
		ant 2	16.53	44.978

	2462	ant 1	15.88	38.726
		ant 2	14.2	26.303
IEEE 802.11ax HE20	2412	ant 1	15.46	35.156
		ant 2	16.51	44.771
	2437	ant 1	16.07	40.458
		ant 2	16.39	43.551
	2462	ant 1	16.11	40.832
		ant 2	16.86	48.529
IEEE 802.11a	5180	ant 1	13.27	21.232
		ant 2	13.28	21.281
	5200	ant 1	13.28	21.281
		ant 2	13.5	22.387
	5240	ant 1	13.44	22.080
		ant 2	13.61	22.961
	5260	ant 1	13.27	21.232
		ant 2	13.05	20.184
	5300	ant 1	13.16	20.701
		ant 2	12.39	17.338
	5320	ant 1	12.77	18.923
		ant 2	12.28	16.904
	5500	ant 1	14.33	27.102
		ant 2	13.21	20.941
	5580	ant 1	14.42	27.669
		ant 2	13.22	20.989
	5700	ant 1	14.63	29.040
		ant 2	13.82	24.099
	5745	ant 1	14.5	28.184
		ant 2	14.85	30.549
	5785	ant 1	14.17	26.122
		ant 2	14.43	27.733
	5825	ant 1	14.17	26.122
		ant 2	14.01	25.177
IEEE 802.11n20	5180	ant 1	9.94	9.863
		ant 2	9.03	7.998
	5200	ant 1	9.87	9.705
		ant 2	9.16	8.241
	5240	ant 1	9.44	8.790

		ant 2	9.12	8.166
		ant 1	14.77	29.992
		ant 2	14.38	27.416
		ant 1	14.7	29.512
		ant 2	13.76	23.768
		ant 1	14.12	25.823
		ant 2	13.33	21.528
		ant 1	15.26	33.574
		ant 2	15.12	32.509
		ant 1	15.59	36.224
		ant 2	15.05	31.989
		ant 1	15.74	37.497
		ant 2	15.44	34.995
		ant 1	15.82	38.194
		ant 2	16.85	48.417
		ant 1	15.29	33.806
		ant 2	16.64	46.132
		ant 1	15.22	33.266
		ant 2	16.3	42.658
IEEE 802.11ac VHT20	5180	ant 1	9.74	9.419
		ant 2	9.18	8.279
	5200	ant 1	9.7	9.333
		ant 2	9.27	8.453
	5240	ant 1	9.96	9.908
		ant 2	9.25	8.414
	5260	ant 1	15.07	32.137
		ant 2	14.45	27.861
	5300	ant 1	15.04	31.915
		ant 2	14.08	25.586
	5320	ant 1	14.25	26.607
		ant 2	13.73	23.605
	5500	ant 1	16.08	40.551
		ant 2	15.7	37.154
	5580	ant 1	16.34	43.053
		ant 2	15.49	35.400
	5700	ant 1	16.51	44.771
		ant 2	16.14	41.115

	5745	ant 1	16.29	42.560
		ant 2	16.42	43.853
	5785	ant 1	15.79	37.931
		ant 2	15.84	38.371
	5825	ant 1	15.95	39.355
		ant 2	15.67	36.898
IEEE 802.11ax HE20	5180	ant 1	9.46	8.831
		ant 2	8.94	7.834
	5200	ant 1	9.46	8.831
		ant 2	8.65	7.328
	5240	ant 1	9.71	9.354
		ant 2	7.85	6.095
	5260	ant 1	13.53	22.542
		ant 2	13.91	24.604
	5300	ant 1	13.89	24.491
		ant 2	13.53	22.542
	5320	ant 1	13.8	23.988
		ant 2	12.82	19.143
	5500	ant 1	15.32	34.041
		ant 2	14.28	26.792
	5580	ant 1	14.67	29.309
		ant 2	13.08	20.324
	5700	ant 1	15.05	31.989
		ant 2	13.47	22.233
	5745	ant 1	14.5	28.184
		ant 2	15.14	32.659
	5785	ant 1	13.67	23.281
		ant 2	14.89	30.832
	5825	ant 1	13.89	24.491
		ant 2	13.67	23.281
IEEE 802.11n HT40	5190	ant 1	9.08	8.091
		ant 2	12.61	18.239
	5230	ant 1	9.39	8.690
		ant 2	8.58	7.211
	5270	ant 1	14.14	25.942
		ant 2	13.55	22.646
	5310	ant 1	13.61	22.961

	5510	ant 2	12.91	19.543
		ant 1	15.14	32.659
	5550	ant 2	14.85	30.549
		ant 1	15.31	33.963
	5670	ant 2	14.95	31.261
		ant 1	15.12	32.509
	5755	ant 2	14.83	30.409
		ant 1	15.39	34.594
	5795	ant 2	16.29	42.560
		ant 1	14.98	31.477
IEEE 802.11a VHT40	5190	ant 2	15.82	38.194
		ant 1	10.26	10.617
	5230	ant 2	10.08	10.186
		ant 1	10.76	11.912
	5270	ant 2	10.06	10.139
		ant 1	14.16	26.062
	5310	ant 2	14.21	26.363
		ant 1	14.08	25.586
	5510	ant 2	13.6	22.909
		ant 1	14.62	28.973
	5550	ant 2	15.24	33.420
		ant 1	14.6	28.840
	5670	ant 2	15.37	34.435
		ant 1	14.1	25.704
	5755	ant 2	15.35	34.277
		ant 1	15.14	32.659
	5795	ant 2	15.56	35.975
		ant 1	14.72	29.648
IEEE 802.11ax HE40	5190	ant 2	15.66	36.813
		ant 1	10.41	10.990
	5230	ant 2	9.92	9.817
		ant 1	11.11	12.912
	5270	ant 2	9.22	8.356
		ant 1	13.75	23.714
	5310	ant 2	13.02	20.045
		ant 1	13.4	21.878
	5310	ant 2	13.53	22.542
		ant 1	13.53	22.542

	5510	ant 1	13.76	23.768
		ant 2	14.09	25.645
	5550	ant 1	14.21	26.363
		ant 2	14.18	26.182
	5670	ant 1	13.64	23.121
		ant 2	14.51	28.249
	5755	ant 1	14.47	27.990
		ant 2	12.3	16.982
	5795	ant 1	14.33	27.102
		ant 2	14.58	28.708
IEEE 802.11ac VHT80	5210	ant 1	13.09	20.370
		ant 2	14.7	29.512
	5290	ant 1	13.99	25.061
		ant 2	13.95	24.831
	5530	ant 1	15.53	35.727
		ant 2	15.87	38.637
	5610	ant 1	14.65	29.174
		ant 2	15.2	33.113
	5775	ant 1	15.04	31.915
		ant 2	15.32	34.041
IEEE 802.11ax HE80	5210	ant 1	10.44	11.066
		ant 2	12.89	19.454
	5290	ant 1	12.75	18.836
		ant 2	13.34	21.577
	5530	ant 1	14.23	26.485
		ant 2	13.95	24.831
	5610	ant 1	13.03	20.091
		ant 2	12.87	19.364
	5775	ant 1	14.06	25.468
		ant 2	13.29	21.330

3. Calculated Result and Limit

SISO

The Worst Mode	Antenna	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									
GFSK	ant 1	5.29	5±1	6	4.46	2.793	0.0022	1	Complies
π/4-DQPSK	ant 1	7	7±1	8	4.46	2.793	0.0035	1	Complies
8-DPSK	ant 1	7.51	7±1	8	4.46	2.793	0.0035	1	Complies
BLE	ant 1	7.1	7±1	8	4.46	2.793	0.0035	1	Complies
IEEE 802.11b	ant 1	16.24	16±1	17	4.46	2.793	0.0278	1	Complies
	ant 2	17.02	17±1	18	4.46	2.793	0.0351	1	Complies
IEEE 802.11g	ant 1	15.91	15±1	16	4.46	2.793	0.0221	1	Complies
	ant 2	16.69	16±1	17	4.46	2.793	0.0278	1	Complies
IEEE 802.11n HT20	ant 1	16.35	16±1	17	4.46	2.793	0.0278	1	Complies
	ant 2	16.53	16±1	17	4.46	2.793	0.0278	1	Complies
IEEE 802.11ax HT20	ant 1	16.11	16±1	17	4.46	2.793	16.11	1	Complies
	ant 2	16.86	16±1	17	4.46	2.793	16.86	1	Complies
5G Band									
IEEE 802.11a	ant 1	14.63	14±1	15	5.36	3.4356	0.0216	1	Complies
	ant 2	14.85	14±1	15	5.36	3.4356	0.0216	1	Complies
IEEE 802.11n HT20	ant 1	15.82	15±1	16	5.36	3.4356	0.0272	1	Complies
	ant 2	16.85	16±1	17	5.36	3.4356	0.0343	1	Complies
IEEE 802.11ac VHT20	ant 1	16.51	16±1	17	5.36	3.4356	0.0343	1	Complies
	ant 2	16.42	16±1	17	5.36	3.4356	0.0343	1	Complies
IEEE 802.11ax HT20	ant 1	15.32	15±1	16	5.36	3.4356	0.0272	1	Complies
	ant 2	15.14	15±1	16	5.36	3.4356	0.0272	1	Complies
IEEE 802.11n HT40	ant 1	15.39	15±1	16	5.36	3.4356	0.0272	1	Complies
	ant 2	16.29	16±1	17	5.36	3.4356	0.0343	1	Complies

IEEE 802.11ac VHT40	ant 1	15.14	15±1	16	5.36	3.4356	0.0272	1	Complies
	ant 2	15.66	15±1	16	5.36	3.4356	0.0272	1	Complies
IEEE 802.11ax HT40	ant 1	14.47	14±1	15	5.36	3.4356	0.0216	1	Complies
	ant 2	14.58	14±1	15	5.36	3.4356	0.0216	1	Complies
IEEE 802.11ac VHT80	ant 1	15.53	15±1	16	5.36	3.4356	0.0272	1	Complies
	ant 2	15.87	15±1	16	5.36	3.4356	0.0272	1	Complies
IEEE 802.11ax HT80	ant 1	14.23	14±1	15	5.36	3.4356	0.0216	1	Complies
	ant 2	13.95	13±1	14	5.36	3.4356	0.0172	1	Complies

MIMIO

Mode	Power Density (S) (mW /cm ²) Antenna 0	Power Density (S) (mW /cm ²) Antenna 1	Power Density (S) (mW /cm ²) Total	Limited of Power Density (S) (mW /cm ²)	Test Result
2.4G Band					
IEEE 802.11n HT20	0.0278	0.0278	0.0557	1	Complies
IEEE 802.11 ax HE20	0.0278	0.0278	0.0557	1	Complies
5G Band					
IEEE 802.11n HT20	0.0272	0.0343	0.0615	1	Complies
IEEE 802.11ac VHT20	0.0343	0.0343	0.0685	1	Complies
IEEE 802.11 ax HE20	0.0272	0.0272	0.0544	1	Complies
IEEE 802.11n HT40	0.0272	0.0343	0.0615	1	Complies
IEEE 802.11ac VHT40	0.0272	0.0272	0.0544	1	Complies
IEEE 802.11 ax HE40	0.0216	0.0216	0.0432	1	Complies
IEEE 802.11ac VHT80	0.0272	0.0272	0.0544	1	Complies
IEEE 802.11 ax HE80	0.0216	0.0172	0.0388	1	Complies

BT+WIFI

MAX Power Density (S) (mW/cm ²) Bluetooth	MAX Power Density (S) (mW/cm ²) WiFi	Total Ratio	Limit Ratio	Test Result
0.0035	0.0685	0.0720	1	Complies

Note: 2.4 and 5GHz bands are share an antenna, Can't both the 2.4 and 5 GHz bands operate simultaneously.

End of Test Report