FCC 47 CFR MPE REPORT

ALPINE ELECTRONICS MARKETING, INC.

7-INCH AUDIO/VIDEO RECEIVER

Model Number: iLX-W770

Additional Model: iLX-W770E

FCC ID: 2A38MILXW770

Applicant:	ALPINE ELECTRONICS MARKETING, INC.
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Report Number:	ESTE-R2402047
Date of Test:	Jan. 11 ~ Mar. 12, 2024
Date of Report:	Mar. 13, 2024

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) = $\frac{\sqrt{30 \times P \times G}}{d}$ 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. Calculated Result and Limit

Conducted Power Result

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	3.08	2.032
	2441	2.4	1.738
	2480	1.72	1.486
π/4-DQPSK	2402	3.03	2.009
	2441	2.2	1.660
	2480	1.69	1.476
8-DPSK	2402	3.29	2.133
	2441	2.51	1.782
	2480	1.92	1.556
IEEE 802.11a	5745	12.22	16.672
	5785	12.7	18.621
	5825	12.27	16.866

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11n HT20	5745	12.31	17.022
	5785	10.8	12.023
	5825	12.3	16.982
IEEE 802.11ac VHT20	5745	10.2	10.471
	5785	8.75	7.499
	5825	7.92	6.194

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11n HT40	5755	12.30	16.982
	5795	12.09	16.181
IEEE 802.11ac VHT40	5755	12.91	19.543
	5795	12.29	16.943
IEEE 802.11ac VHT80	5775	9.73	9.397

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	3.08	3±1	4	4.2	2.630	0.00131	1	Complies
π/4-DQPSK	3.03	3±1	4	4.2	2.630	0.00131	1	Complies
8-DPSK	3.29	3±1	4	4.2	2.630	0.00131	1	Complies
5G Band								
IEEE 802.11a	12.70	12±1	13	4.3	2.692	0.01068	1	Complies
IEEE 802.11n HT20	12.31	12±1	13	4.3	2.692	0.01068	1	Complies
IEEE802.11acVHT20	10.20	10±1	11	4.3	2.692	0.00674	1	Complies
IEEE 802.11n HT40	12.30	12±1	13	4.3	2.692	0.01068	1	Complies
IEEE802.11acVHT40	12.91	12±1	13	4.3	2.692	0.01068	1	Complies
IEEE802.11acVHT80	9.73	9±1	10	4.3	2.692	0.00535	1	Complies

BT+WIFI:

MAX Ture-up power ratio Bluetooth	MAX Ture-up power Total ratio Wi-Fi	Total Ratio	Limit Ratio	Test Result
0.00131	0.01068	0.01199	1	Complies

End of Test Report