

FCC 47 CFR MPE REPORT

Zylux Acoustic Corporation

Big Blue 200

Model Number: AR108A4BKA

FCC ID: XN6-AR108A4BKA

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Maximum Permissible Exposure

1、Applicable Standard

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.

(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

2、MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } P_d \text{ (W/m}^2\text{)} = E^2 / 377$$

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

$$P_d = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

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

3、Calculated Result and Limit

3.1 Antenna 1

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
					(dBi)	(Linear)			
GFSK	2402	5.40	3.467	5±2	3.24	2.109	0.00210	1	Compiles
	2441	5.70	3.715	5±2	3.24	2.109	0.00210	1	Compiles
	2480	5.60	3.631	5±2	3.24	2.109	0.00210	1	Compiles
8-DPSK	2402	9.00	7.943	9±2	3.24	2.109	0.00528	1	Compiles
	2441	8.90	7.762	8±2	3.24	2.109	0.00419	1	Compiles
	2480	8.70	7.413	8±2	3.24	2.109	0.00419	1	Compiles
BLE	2402	2.81	1.910	2±2	3.24	2.109	0.00105	1	Compiles
	2440	2.57	1.807	2±2	3.24	2.109	0.00105	1	Compiles
	2480	2.42	1.746	2±2	3.24	2.109	0.00105	1	Compiles
IEEE 802.11b	2412	10.35	10.839	10±2	3.24	2.109	0.00665	1	Compiles
	2437	10.43	11.041	10±2	3.24	2.109	0.00665	1	Compiles
	2462	10.05	10.116	10±2	3.24	2.109	0.00665	1	Compiles
IEEE 802.11g	2412	8.54	7.145	8±2	3.24	2.109	0.00419	1	Compiles
	2437	8.04	6.368	8±2	3.24	2.109	0.00419	1	Compiles
	2462	8.13	6.501	8±2	3.24	2.109	0.00419	1	Compiles
IEEE 802.11n HT20	2412	7.69	5.875	7±2	3.24	2.109	0.00333	1	Compiles
	2437	7.08	5.105	7±2	3.24	2.109	0.00333	1	Compiles
	2462	7.72	5.916	7±2	3.24	2.109	0.00333	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
					(dBi)	(Linear)			
IEEE 802.11a	5180	13.70	23.442	13±2	3.12	2.051	0.01290	1	Compiles
	5200	13.90	24.547	13±2	3.12	2.051	0.01290	1	Compiles
	5240	13.80	23.988	13±2	3.12	2.051	0.01290	1	Compiles
	5260	14.20	26.303	14±2	3.12	2.051	0.01625	1	Compiles
	5300	14.20	26.303	14±2	3.12	2.051	0.01625	1	Compiles
	5320	14.50	28.184	14±2	3.12	2.051	0.01625	1	Compiles
	5500	14.80	30.200	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.70	29.512	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.80	30.200	14±2	3.12	2.051	0.01625	1	Compiles
	5745	15.10	32.359	15±2	3.12	2.051	0.02045	1	Compiles
	5785	15.50	35.481	15±2	3.12	2.051	0.02045	1	Compiles
	5825	15.30	33.884	15±2	3.12	2.051	0.02045	1	Compiles
IEEE 802.11n HT20	5180	13.60	22.909	13±2	3.12	2.051	0.01290	1	Compiles
	5200	13.60	22.909	13±2	3.12	2.051	0.01290	1	Compiles
	5240	13.90	24.547	13±2	3.12	2.051	0.01290	1	Compiles
	5260	14.30	26.915	14±2	3.12	2.051	0.01625	1	Compiles
	5300	14.60	28.840	14±2	3.12	2.051	0.01625	1	Compiles
	5320	14.60	28.840	14±2	3.12	2.051	0.01625	1	Compiles
	5500	14.90	30.903	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.50	28.184	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.80	30.200	14±2	3.12	2.051	0.01625	1	Compiles
	5745	15.00	31.623	15±2	3.12	2.051	0.02045	1	Compiles
	5785	15.10	32.359	15±2	3.12	2.051	0.02045	1	Compiles
	5825	15.60	36.308	14±2	3.12	2.051	0.02045	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
IEEE 802.11ac 20	5180	13.50	22.387	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5200	13.60	22.909	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5240	14.00	25.119	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5260	14.00	25.119	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5300	14.50	28.184	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5320	14.40	27.542	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5500	14.90	30.903	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5580	14.40	27.542	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5700	14.60	28.840	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5745	15.00	31.623	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5785	15.30	33.884	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5825	15.40	34.674	15 ± 2	3.12	2.051	0.02045	1	Compiles
IEEE 802.11n HT40	5190	9.70	9.333	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5230	10.00	10.000	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5270	11.40	13.804	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5310	11.30	13.490	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5510	12.80	19.055	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.90	19.498	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.70	18.621	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	15.50	35.481	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5795	15.50	35.481	15 ± 2	3.12	2.051	0.02045	1	Compiles
IEEE 802.11ac 40	5190	9.70	9.333	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5230	9.70	9.333	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5270	11.00	12.589	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5310	10.80	12.023	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5510	12.70	18.621	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.70	18.621	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.80	19.055	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	15.40	34.674	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5795	15.40	34.674	15 ± 2	3.12	2.051	0.02045	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
IEEE 802.11ac 80	5210	6.30	4.266	6 ± 2	3.12	2.051	0.00257	1	Compiles
	5290	7.00	5.012	7 ± 2	3.12	2.051	0.00324	1	Compiles
	5530	10.60	11.482	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5775	11.10	12.882	11 ± 2	3.12	2.051	0.00814	1	Compiles

3.2 Antenna 2

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW/cm ²)	Limited of Power Density (S) (mW/cm ²)	Test Result
					(dBi)	(Linear)			
GFSK	2402	5.90	3.890	5±2	3.24	2.109	0.00210	1	Compiles
	2441	5.80	3.802	5±2	3.24	2.109	0.00210	1	Compiles
	2480	5.50	3.548	5±2	3.24	2.109	0.00210	1	Compiles
8-DPSK	2402	9.00	7.943	9±2	3.24	2.109	0.00528	1	Compiles
	2441	8.90	7.762	8±2	3.24	2.109	0.00419	1	Compiles
	2480	8.70	7.413	8±2	3.24	2.109	0.00419	1	Compiles
BLE	2402	2.05	1.603	2±2	3.24	2.109	0.00105	1	Compiles
	2440	2.39	1.734	2±2	3.24	2.109	0.00105	1	Compiles
	2480	2.21	1.663	2±2	3.24	2.109	0.00105	1	Compiles
IEEE 802.11b	2412	10.51	11.246	10±2	3.24	2.109	0.00665	1	Compiles
	2442	10.55	11.350	10±2	3.24	2.109	0.00665	1	Compiles
	2472	10.92	12.359	10±2	3.24	2.109	0.00665	1	Compiles
IEEE 802.11g	2412	8.45	6.998	8±2	3.24	2.109	0.00419	1	Compiles
	2442	8.14	6.516	8±2	3.24	2.109	0.00419	1	Compiles
	2472	8.86	7.691	8±2	3.24	2.109	0.00419	1	Compiles
IEEE 802.11n HT20	2412	7.14	5.176	7±2	3.24	2.109	0.00333	1	Compiles
	2442	7.93	6.209	7±2	3.24	2.109	0.00333	1	Compiles
	2472	7.57	5.715	7±2	3.24	2.109	0.00333	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
					(dBi)	(Linear)			
IEEE 802.11a	5180	14.10	25.704	14±2	3.12	2.051	0.01625	1	Compiles
	5200	13.90	24.547	13±2	3.12	2.051	0.01290	1	Compiles
	5240	13.90	24.547	13±2	3.12	2.051	0.01290	1	Compiles
	5260	14.20	26.303	14±2	3.12	2.051	0.01290	1	Compiles
	5300	14.70	29.512	14±2	3.12	2.051	0.01625	1	Compiles
	5320	14.80	30.200	14±2	3.12	2.051	0.01625	1	Compiles
	5500	14.90	30.903	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.50	28.184	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.50	28.184	14±2	3.12	2.051	0.01625	1	Compiles
	5745	15.00	31.623	15±2	3.12	2.051	0.02045	1	Compiles
	5785	15.10	32.359	15±2	3.12	2.051	0.02045	1	Compiles
	5825	14.80	30.200	14±2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11n HT20	5180	13.70	23.442	13±2	3.12	2.051	0.01290	1	Compiles
	5200	14.00	25.119	14±2	3.12	2.051	0.01625	1	Compiles
	5240	14.10	25.704	14±2	3.12	2.051	0.01625	1	Compiles
	5260	14.20	26.303	14±2	3.12	2.051	0.01625	1	Compiles
	5300	14.30	26.915	14±2	3.12	2.051	0.01625	1	Compiles
	5320	14.70	29.512	14±2	3.12	2.051	0.01625	1	Compiles
	5500	15.00	31.623	15±2	3.12	2.051	0.02045	1	Compiles
	5580	14.30	26.915	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.10	25.704	14±2	3.12	2.051	0.01625	1	Compiles
	5745	14.50	28.184	14±2	3.12	2.051	0.01625	1	Compiles
	5785	14.70	29.512	14±2	3.12	2.051	0.01625	1	Compiles
	5825	14.90	30.903	14±2	3.12	2.051	0.01625	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
IEEE 802.11ac 20	5180	13.90	24.547	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5200	13.80	23.988	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5240	13.90	24.547	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5260	14.00	25.119	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5300	14.40	27.542	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5320	14.80	30.200	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5500	14.50	28.184	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5580	14.10	25.704	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5700	13.90	24.547	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5745	14.60	28.840	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5785	14.60	28.840	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5825	14.80	30.200	14 ± 2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11n HT40	5190	7.80	6.026	7 ± 2	3.12	2.051	0.00324	1	Compiles
	5230	8.00	6.310	8 ± 2	3.12	2.051	0.00408	1	Compiles
	5270	10.10	10.233	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5310	10.50	11.220	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5510	12.60	18.197	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.40	17.378	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.40	17.378	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	15.00	31.623	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5795	14.90	30.903	14 ± 2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11ac 40	5190	7.90	6.166	7 ± 2	3.12	2.051	0.00324	1	Compiles
	5230	7.80	6.026	7 ± 2	3.12	2.051	0.00324	1	Compiles
	5270	9.90	9.772	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5310	10.10	10.233	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5510	12.50	17.783	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.10	16.218	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.30	16.982	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	12.40	17.378	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5795	14.70	29.512	14 ± 2	3.12	2.051	0.01625	1	Compiles

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
IEEE 802.11ac 80	5210	5.60	3.631	5 ± 2	3.12	2.051	0.00205	1	Compiles
	5290	7.10	5.129	7 ± 2	3.12	2.051	0.00324	1	Compiles
	5530	10.20	10.471	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5775	10.40	10.965	10 ± 2	3.12	2.051	0.00647	1	Compiles

3.3 Note:

A、2.4 and 5GHz bands are share an antenna, Cann't both the 2.4 and 5 GHz bands operate simultaneously;

B、Antenna 1 and 2 cann't both operate simultaneously。