

FCC 47 CFR MPE REPORT

Zylux Acoustic Corporation

Big Blue 100

Model Number: AD107A4BKA

FCC ID: XN6-AD107A4BKA

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Report Number: ESTE-R1702011

Date of Test : January 04 ~ February 06, 2017

Date of Report : February 07, 2017

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	0.81	1.205	0 ± 2	3.24	2.109	0.00066	1	Compiles
	2441	0.34	1.081	0 ± 2	3.24	2.109	0.00066	1	Compiles
	2480	-0.20	0.955	-1 ± 2	3.24	2.109	0.00053	1	Compiles
8-DPSK	2402	1.26	1.337	1 ± 2	3.24	2.109	0.00084	1	Compiles
	2441	0.84	1.213	0 ± 2	3.24	2.109	0.00066	1	Compiles
	2480	0.36	1.086	0 ± 2	3.24	2.109	0.00066	1	Compiles
BLE	2402	1.14	1.300	1 ± 2	3.24	2.109	0.00084	1	Compiles
	2440	0.56	1.138	0 ± 2	3.24	2.109	0.00066	1	Compiles
	2480	0.25	1.059	0 ± 2	3.24	2.109	0.00066	1	Compiles
IEEE 802.11b	2412	13.10	20.417	13 ± 2	3.24	2.109	0.01327	1	Compiles
	2437	13.70	23.442	13 ± 2	3.24	2.109	0.01327	1	Compiles
	2462	13.57	22.751	13 ± 2	3.24	2.109	0.01327	1	Compiles
IEEE 802.11g	2412	10.57	11.403	10 ± 2	3.24	2.109	0.00665	1	Compiles
	2437	10.13	10.304	10 ± 2	3.24	2.109	0.00665	1	Compiles
	2462	10.36	10.864	10 ± 2	3.24	2.109	0.00665	1	Compiles
IEEE 802.11n HT20	2412	9.11	8.1470	9 ± 2	3.24	2.109	0.00528	1	Compiles
	2437	9.68	9.290	9 ± 2	3.24	2.109	0.00528	1	Compiles
	2462	9.29	8.492	9 ± 2	3.24	2.109	0.00528	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	14.43	27.733	14±2	3.12	2.051	0.01625	1	Compiles
	5200	14.42	27.669	14±2	3.12	2.051	0.01625	1	Compiles
	5240	14.01	25.177	14±2	3.12	2.051	0.01625	1	Compiles
	5260	14.17	26.122	14±2	3.12	2.051	0.01625	1	Compiles
	5300	13.70	23.442	13±2	3.12	2.051	0.01290	1	Compiles
	5320	13.72	23.550	13±2	3.12	2.051	0.01290	1	Compiles
	5500	14.71	29.580	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.75	29.854	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.57	28.642	14±2	3.12	2.051	0.01625	1	Compiles
	5745	15.02	31.769	15±2	3.12	2.051	0.02045	1	Compiles
	5785	15.08	32.211	15±2	3.12	2.051	0.02045	1	Compiles
	5825	15.07	32.137	15±2	3.12	2.051	0.02045	1	Compiles
IEEE 802.11n HT20	5180	14.54	28.445	14±2	3.12	2.051	0.01625	1	Compiles
	5200	14.09	25.645	14±2	3.12	2.051	0.01625	1	Compiles
	5240	14.28	26.792	14±2	3.12	2.051	0.01625	1	Compiles
	5260	14.10	25.704	14±2	3.12	2.051	0.01625	1	Compiles
	5300	13.36	21.677	13±2	3.12	2.051	0.01290	1	Compiles
	5320	13.72	23.550	13±2	3.12	2.051	0.01290	1	Compiles
	5500	14.68	29.377	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.60	28.840	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.57	28.642	14±2	3.12	2.051	0.01625	1	Compiles
	5745	14.60	28.840	14±2	3.12	2.051	0.01625	1	Compiles
	5785	15.09	32.285	15±2	3.12	2.051	0.02045	1	Compiles
	5825	14.95	31.261	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	14.03	25.293	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5200	14.08	25.586	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5240	13.60	22.909	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5260	13.89	24.491	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5300	13.77	23.823	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5320	13.65	23.174	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5500	14.36	27.290	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5580	13.65	23.174	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5700	14.68	29.377	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5745	14.71	29.580	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5785	15.03	31.842	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5825	14.93	31.117	14 ± 2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11n HT40	5190	10.23	10.544	10 ± 2	3.12	2.051	0.00647	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	11.41	13.836	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5510	11.30	13.490	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5550	11.46	13.996	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5670	11.30	13.490	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5755	15.22	33.266	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5795	14.99	31.550	14 ± 2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11ac 40	5190	12.02	15.922	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5230	11.82	15.205	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5270	11.77	15.031	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5310	11.29	13.459	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5510	11.28	13.428	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5550	11.63	14.555	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5670	11.28	13.428	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5755	15.14	32.659	15 ± 2	3.12	2.051	0.02045	1	Compiles
	5795	14.94	31.189	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	8.60	7.244	8 ± 2	3.12	2.051	0.00408	1	Compiles
	5290	8.52	7.112	8 ± 2	3.12	2.051	0.00408	1	Compiles
	5530	10.34	10.814	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5775	10.51	11.246	10 ± 2	3.12	2.051	0.00647	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	1.20	1.318	1±2	3.24	2.109	0.00084	1	Compiles
	2441	0.71	1.178	0±2	3.24	2.109	0.00066	1	Compiles
	2480	0.17	1.040	0±2	3.24	2.109	0.00066	1	Compiles
8-DPSK	2402	1.91	1.552	1±2	3.24	2.109	0.00084	1	Compiles
	2441	1.51	1.416	1±2	3.24	2.109	0.00084	1	Compiles
	2480	0.94	1.242	0±2	3.24	2.109	0.00066	1	Compiles
BLE	2402	1.17	1.309	1±2	3.24	2.109	0.00084	1	Compiles
	2440	0.25	1.059	0±2	3.24	2.109	0.00066	1	Compiles
	2480	0.06	1.014	0±2	3.24	2.109	0.00066	1	Compiles
IEEE 802.11b	2412	13.37	21.727	13±2	3.24	2.109	0.01327	1	Compiles
	2442	13.71	23.496	13±2	3.24	2.109	0.01327	1	Compiles
	2472	13.34	21.577	13±2	3.24	2.109	0.01327	1	Compiles
IEEE 802.11g	2412	10.85	12.162	10±2	3.24	2.109	0.00665	1	Compiles
	2442	10.44	11.066	10±2	3.24	2.109	0.00665	1	Compiles
	2472	10.73	11.830	10±2	3.24	2.109	0.00665	1	Compiles
IEEE 802.11n HT20	2412	9.21	8.337	9±2	3.24	2.109	0.00528	1	Compiles
	2442	9.62	9.162	9±2	3.24	2.109	0.00528	1	Compiles
	2472	9.14	8.204	9±2	3.24	2.109	0.00528	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	14.36	27.290	14±2	3.12	2.051	0.01625	1	Compiles
	5200	14.37	27.353	14±2	3.12	2.051	0.01625	1	Compiles
	5240	14.34	27.164	14±2	3.12	2.051	0.01625	1	Compiles
	5260	13.97	24.946	13±2	3.12	2.051	0.01290	1	Compiles
	5300	14.10	25.704	14±2	3.12	2.051	0.01625	1	Compiles
	5320	13.55	22.646	13±2	3.12	2.051	0.01290	1	Compiles
	5500	14.41	27.606	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.34	27.164	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.23	26.485	14±2	3.12	2.051	0.01625	1	Compiles
	5745	14.32	27.040	14±2	3.12	2.051	0.01625	1	Compiles
	5785	14.19	26.242	14±2	3.12	2.051	0.01625	1	Compiles
	5825	14.14	25.942	14±2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11n HT20	5180	14.41	27.606	14±2	3.12	2.051	0.01625	1	Compiles
	5200	14.40	27.542	14±2	3.12	2.051	0.01625	1	Compiles
	5240	13.86	24.322	13±2	3.12	2.051	0.01290	1	Compiles
	5260	13.93	24.717	13±2	3.12	2.051	0.01290	1	Compiles
	5300	13.58	22.803	13±2	3.12	2.051	0.01290	1	Compiles
	5320	14.08	25.586	14±2	3.12	2.051	0.01625	1	Compiles
	5500	14.35	27.227	14±2	3.12	2.051	0.01625	1	Compiles
	5580	14.43	27.733	14±2	3.12	2.051	0.01625	1	Compiles
	5700	14.04	25.351	14±2	3.12	2.051	0.01625	1	Compiles
	5745	14.55	28.510	14±2	3.12	2.051	0.01625	1	Compiles
	5785	14.14	25.942	14±2	3.12	2.051	0.01625	1	Compiles
	5825	14.11	25.763	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	14.50	28.184	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5200	13.93	24.717	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5240	14.08	25.586	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5260	13.91	24.604	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5300	13.53	22.542	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5320	13.52	22.491	13 ± 2	3.12	2.051	0.01290	1	Compiles
	5500	14.28	26.792	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5580	14.36	27.290	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5700	14.04	25.351	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5745	14.27	26.730	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5785	14.11	25.763	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5825	13.85	24.266	13 ± 2	3.12	2.051	0.01290	1	Compiles
IEEE 802.11n HT40	5190	11.39	13.772	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5230	11.08	12.823	11 ± 2	3.12	2.051	0.00814	1	Compiles
	5270	14.47	27.990	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5310	10.49	11.194	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5510	12.51	17.824	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.62	18.281	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.24	16.749	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	14.55	28.510	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5795	14.29	26.853	14 ± 2	3.12	2.051	0.01625	1	Compiles
IEEE 802.11ac 40	5190	10.15	10.351	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5230	9.63	9.183	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5270	9.59	9.099	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5310	9.15	8.222	9 ± 2	3.12	2.051	0.00514	1	Compiles
	5510	12.57	18.072	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5550	12.30	16.982	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5670	12.17	16.482	12 ± 2	3.12	2.051	0.01025	1	Compiles
	5755	14.07	25.527	14 ± 2	3.12	2.051	0.01625	1	Compiles
	5795	13.94	24.774	13 ± 2	3.12	2.051	0.01290	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	6.61	4.581	6 ± 2	3.12	2.051	0.00257	1	Compiles
	5290	6.30	4.266	6 ± 2	3.12	2.051	0.00257	1	Compiles
	5530	10.30	10.715	10 ± 2	3.12	2.051	0.00647	1	Compiles
	5775	9.62	9.162	9 ± 2	3.12	2.051	0.00324	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。