

FCC 47 CFR MPE REPORT

FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Bang & Olufsen a/s

Audio Converter Box

Model Number: BeoSound Core

FCC ID: TTUBSCORE

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Report Number:	ESTE-R1707054
Date of Test:	May 03 ~ June 20, 2017
Date of Report:	July 12, 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、Conducted Power Result



3.1 Antenna 0

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
GFSK	2402	6.87	4.864	6±2
	2441	6.90	4.898	6±2
	2480	7.08	5.105	7±2
8-DPSK	2402	8.67	7.362	8±2
	2441	8.60	7.244	8±2
	2480	8.49	7.063	8±2
BLE	2402	3.25	2.113	3±2
	2440	3.24	2.109	3±2
	2480	3.12	2.051	3±2
IEEE 802.11b	2412	10.62	11.535	10±2
	2437	13.02	20.045	13±2
	2462	13.45	22.131	13±2
IEEE 802.11g	2412	10.12	10.280	10±2
	2437	10.45	11.092	10±2
	2462	10.49	11.194	10±2
IEEE 802.11n HT20	2412	10.24	10.568	10±2
	2437	10.88	12.246	10±2
	2462	11.05	12.735	11±2
IEEE 802.11n HT40	2422	8.94	7.834	8±2
	2437	9.59	9.099	9±2
	2452	9.47	8.851	9±2
IEEE 802.11a	5180	13.20	20.893	13±2
	5200	13.00	19.953	13±2
	5240	12.80	19.055	12±2
	5260	13.00	19.953	13±2
	5300	13.20	20.893	13±2
	5320	13.00	19.953	13±2
	5500	14.10	25.704	14±2
	5580	14.60	28.840	14±2
	5700	12.30	16.982	12±2
	5745	14.80	30.200	14±2
	5785	14.60	28.840	14±2
5825	15.70	37.154	15±2	

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
IEEE 802.11n HT20	5180	13.10	20.417	13±2
	5200	12.90	19.498	12±2
	5240	13.10	20.417	13±2
	5260	10.30	10.715	10±2
	5300	10.00	10.000	10±2
	5320	9.90	9.772	9±2
	5500	14.10	25.704	14±2
	5580	14.80	30.200	14±2
	5700	12.50	17.783	12±2
	5745	15.00	31.623	15±2
	5785	14.50	28.184	14±2
	5825	15.80	38.019	15±2
IEEE 802.11ac VHT20	5180	15.33	34.119	15±2
	5200	15.15	32.734	15±2
	5240	12.65	18.408	12±2
	5260	15.88	38.726	15±2
	5300	15.95	39.355	15±2
	5320	15.85	38.459	15±2
	5500	15.61	36.392	15±2
	5580	17.40	54.954	17±2
	5700	12.30	16.982	12±2
	5745	17.93	62.087	17±2
	5785	14.06	25.468	14±2
	5825	17.68	58.614	17±2

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
IEEE 802.11n HT40	5190	12.30	16.982	12±2
	5230	12.80	19.055	12±2
	5270	12.70	18.621	12±2
	5310	12.60	18.197	12±2
	5510	10.60	11.482	10±2
	5550	14.80	30.200	14±2
	5670	8.60	7.244	8±2
	5755	14.60	28.840	14±2
	5795	13.80	23.988	13±2
IEEE 802.11ac VHT40	5190	14.66	29.242	14±2
	5230	14.85	30.549	14±2
	5270	15.06	32.063	15±2
	5310	15.32	34.041	15±2
	5510	12.56	18.030	12±2
	5550	11.96	15.704	11±2
	5670	11.00	12.589	11±2
	5755	9.73	9.397	9±2
	5795	11.74	14.928	11±2
IEEE 802.11ac VHT80	5210	11.60	14.454	11±2
	5290	8.50	7.079	8±2
	5530	9.90	9.772	9±2
	5775	15.50	35.481	15±2

3.2 Antenna 1

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
IEEE 802.11b	2412	11.52	14.191	11±2
	2437	12.32	17.061	12±2
	2462	12.74	18.793	12±2
IEEE 802.11g	2412	8.88	7.727	8±2
	2437	9.24	8.395	9±2
	2462	9.72	9.376	9±2
IEEE 802.11n HT20	2412	9.09	8.110	9±2
	2437	8.99	7.925	8±2
	2462	9.89	9.750	9±2
IEEE 802.11n HT40	2422	7.94	6.223	7±2
	2437	7.90	6.166	7±2
	2452	7.85	6.095	7±2
IEEE 802.11a	5180	10.70	11.749	10±2
	5200	10.40	10.965	10±2
	5240	10.10	10.233	10±2
	5260	10.30	10.715	10±2
	5300	10.20	10.471	10±2
	5320	10.10	10.233	10±2
	5500	10.90	12.303	10±2
	5580	11.90	15.488	11±2
	5700	8.60	7.244	8±2
	5745	11.50	14.125	11±2
	5785	11.40	13.804	11±2
5825	12.90	19.498	12±2	

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
IEEE 802.11n HT20	5180	10.30	10.715	10±2
	5200	10.00	10.000	10±2
	5240	9.90	9.772	9±2
	5260	10.20	10.471	10±2
	5300	10.20	10.471	10±2
	5320	10.10	10.233	10±2
	5500	10.90	12.303	10±2
	5580	12.00	15.849	12±2
	5700	8.70	7.413	8±2
	5745	11.80	15.136	11±2
	5785	11.50	14.125	11±2
	5825	12.80	19.055	12±2
IEEE 802.11ac VHT20	5180	12.83	19.187	12±2
	5200	12.15	16.406	12±2
	5240	12.68	18.535	12±2
	5260	12.68	18.535	12±2
	5300	13.21	20.941	13±2
	5320	12.90	19.498	12±2
	5500	12.51	17.824	12±2
	5580	15.00	31.623	15±2
	5700	9.86	9.683	9±2
	5745	15.26	33.574	15±2
	5785	16.66	46.345	16±2
	5825	14.96	31.333	14±2

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)	Target power (dBm)
IEEE 802.11n HT40	5190	9.40	8.710	9±2
	5230	9.50	8.913	9±2
	5270	9.40	8.710	9±2
	5310	9.40	8.710	9±2
	5510	9.30	8.511	9±2
	5550	12.10	16.218	12±2
	5670	7.70	5.888	7±2
	5755	11.10	12.882	11±2
	5795	10.70	11.749	10±2
IEEE 802.11ac VHT40	5190	12.10	16.218	12±2
	5230	12.30	16.982	12±2
	5270	11.80	15.136	11±2
	5310	12.45	17.579	12±2
	5510	10.15	10.351	10±2
	5550	9.65	9.226	9±2
	5670	8.02	6.339	8±2
	5755	13.08	20.324	13±2
	5795	8.68	7.379	8±2
IEEE 802.11ac VHT80	5210	8.50	7.079	8±2
	5290	8.10	6.457	8±2
	5530	10.10	10.233	10±2
	5775	13.00	19.953	13±2

4、 Calculated Result and Limit

4.1 Antenna 0

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	3.7	2.344	0.00370	1	Compiles
8-DPSK	10	3.7	2.344	0.00466	1	Compiles
BLE	5	3.7	2.344	0.00147	1	Compiles
IEEE 802.11b	15	3.7	2.344	0.01475	1	Compiles
IEEE 802.11g	12	3.7	2.344	0.00739	1	Compiles
IEEE 802.11n HT20	13	3.7	2.344	0.00931	1	Compiles
IEEE 802.11n HT40	11	3.7	2.344	0.00587	1	Compiles
5G Band						
IEEE 802.11a	17	5.4	3.467	0.03457	1	Compiles
IEEE 802.11n HT20	17	5.4	3.467	0.03457	1	Compiles
IEEE 802.11ac VHT20	19	5.4	3.467	0.05479	1	Compiles
IEEE 802.11n HT40	16	5.4	3.467	0.02746	1	Compiles
IEEE 802.11ac VHT40	17	5.4	3.467	0.03457	1	Compiles
IEEE 802.11ac VHT80	17	5.4	3.467	0.03457	1	Compiles

4.2 Antenna 1

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						
IEEE 802.11b	14	3.2	2.089	0.01044	1	Compiles
IEEE 802.11g	11	3.2	2.089	0.00523	1	Compiles
IEEE 802.11n HT20	11	3.2	2.089	0.00523	1	Compiles
IEEE 802.11n HT40	9	3.2	2.089	0.00330	1	Compiles
5G Band						
IEEE 802.11a	14	5.8	3.082	0.01900	1	Compiles
IEEE 802.11n HT20	14	5.8	3.082	0.01900	1	Compiles
IEEE 802.11ac VHT20	18	5.8	3.082	0.04772	1	Compiles
IEEE 802.11n HT40	14	5.8	3.082	0.01900	1	Compiles
IEEE 802.11ac VHT40	15	5.8	3.082	0.02392	1	Compiles
IEEE 802.11ac VHT80	15	5.8	3.082	0.02392	1	Compiles

4.3 Antenna 0+1

Mode	Power Density (S) (mW/cm2) Antenna 0	Power Density (S) (mW/cm2) Antenna 1	Power Density (S) (mW/cm2) Total	Limited of Power Density (S) (mW/cm2)	Test Result
2.4G Band					
IEEE 802.11n HT20	0.00482	0.00296	0.00778	1	Compiles
IEEE 802.11n HT40	0.00304	0.00187	0.00491	1	Compiles
5G Band					
IEEE 802.11n HT20	0.04214	0.03679	0.07893	1	Compiles
IEEE 802.11ac VHT20	0.04214	0.03679	0.07893	1	Compiles
IEEE 802.11n HT40	0.02659	0.01844	0.04503	1	Compiles
IEEE 802.11ac VHT40	0.02659	0.01844	0.04503	1	Compiles
IEEE 802.11ac VHT80	0.01059	0.00924	0.01983	1	Compiles

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