

FCC 47 CFR MPE REPORT

Bang & Olufsen a/s

Wireless Speaker

Model Number: Beolab 8

FCC ID: TTUBEOLAB8

Applicant:	Bang & Olufsen a/s
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Report Number:	ESTE-R2308308
Date of Test:	Aug. 03-25, 2023
Date of Report:	Aug. 27, 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

LE Audio Module

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
BLE 1M	2402	-0.19	0.957
	2440	-0.22	0.951
	2480	-0.19	0.957
BLE 2M	2402	0.04	1.009
	2440	0.04	1.009
	2480	-0.06	0.986

UWB Module

Mode	Frequency (MHz)	EIRP (dBm/50MHz)	EIRP (mW/50MHz)
UWB	6489.6	-7.62	0.173
	7987.2	-3.64	0.433

3. Calculated Result and Limit

LE Audio Module

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)			
BLE 1M	-0.19	0±1	1	1.18	1.312	0.00033	1	Complies
BLE 2M	0.04	0±1	1	1.18	1.312	0.00033	1	Complies

UWB Module

Mode	EIRP (dBm/50MHz)	Target EIRP (dBm/50MHz)	MAX Target EIRP (dBm/50MHz)	Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
UWB	-3.64	-3±1	-2	0.00013	1	Complies

Simultaneous Transmission Mode: LE Audio+ UWB+ Contain Module

Module	Result	Limit	Simultaneous Transmissions Result	Simultaneous Transmissions Limit	Total Result
LE Audio	0.00033	1	0.70796	1	Complies
UWB	0.00013	1			
Contain Module 1	0.00750	1			
Contain Module 2	0.70000	1			

End of Test Report