

RF Exposure Evaluation for FCC ID: 2AIOC-BTWB88

Refer user manual this device is a Bluetooth earbud, and this device was designed used in portable devices that the minimum distance between human's body is **5mm**. Based on the 47CFR 2.1093, this device belongs to portable device. The definition of the category as following:

Portable Derives:

CFR Title 47 § 2.1093(b)

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

FCC KDB 447498 D01 General RF Exposure Guidance v06 Limit

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0$$
 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

Where

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and

for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Test data

BLUETOOTH									
Mode	GFSK			π/4-DQPSK			8-DPSK		
	Low	Middle	High	Low	Middle	High	Low	Middle	High
Peak Power (dBm)	-0.79	-1.39	-1.80	1.44	-0.90	0.35	2.00	1.54	1.00
Note: This report listed the worst case peak power value, please refer to RF test report for more details.									

Turn-up power

Mode	Range (dBm)
Bluetooth	(-2.0) - (3.0)

FCC exclusion condition= $[2 \text{ mW}/5 \text{ mm}] \cdot [\sqrt{2.40 \text{ GHz}}] = 0.62 < 3.0$

RF Exposure Evaluation Result: **Pass**

Note: More power data, Please refer to the RF report.

RF Exposure Evaluation for IC ID: 11525A-040056

According to RSS-102 Issue 5 section 2.5, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to **5 mm**, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table.

Exemption Limits (mW)					
Frequency (MHz)	At separation distance of ≤ 5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 30 mm
≤ 300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW
Frequency (MHz)	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥ 50 mm
≤ 300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	315 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

BLUETOOTH			
Mode	GFSK (BLE)		
	Low Channel	Middle Channel	High Channel
Peak Power (dBm)	2.28	2.15	1.23
Antenna Gain (dBi)			
EIRP (dBm)			
Note: This report listed the worst case peak power value, please refer to RF test report for more details.			

Mode	BLE
Range (dBm)	1.10-2.40

The EUT is **Bluetooth Tracker**, which closes to the user (at separation distance of ≤ 5 mm). The maximum power of Bluetooth is: **2.40 (dBm) = 1.74 (mW)**, which is less than the exclusion threshold limit (**4mW**), the evaluation for **Bluetooth Tracker** is pass.

RF Exposure Evaluation Result: **Pass**

Note: More power data, please refer to the RF report.