

# RF Exposure Evaluation Report

## 1 RF EXPOSURE

Product Name: Powered Bluetooth BookShelf Speakers  
 Model No.: AT-SP3X  
 FCC ID: JFZ-ATSP3X

## 2. RF Exposure Evaluation

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

### 2.1 LIMITS

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

Table 1 to § 1.1310(e)(1)–Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30–300	61.4	0.163	1.0	<6
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	<30
30–300	27.5	0.073	0.2	<30
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

F= Frequency in MHz Friis Formula

Friis transmission formula:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot R^2)$  Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

## 2.2 EUT RF EXPOSURE EVALUATION

BT ANT1: 2.34dBi;

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.7 in linear scale.

The Max Conducted Peak Output Power data refer to report Report No.: POCE240222002RF001

Test channel (MHz)	Conducted Power (dBm)	Tune-up (dbm)	Maximum tune-up Power (dbm)	Maximum tune-up Power (mW)	Calculated value (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402	5.54	6±1.0	7.0	5.012	0.00171	1.0
2440	5.37	6±1.0	7.0	5.012	0.00171	1.0
2480	5.64	6±1.0	7.0	5.012	0.00171	1.0

Remark:

$$1. P_d = (P_{out} * G) / (4 * \pi * R^2) = (5.012 * 1.714) / (4 * 3.1416 * 20 * 20) = 0.00171, \quad G = 10^{gain/10} = 1.714$$

2. EUT BT module is more than 20cm away from the human body.

## 2.3 Conclusion

Calculated value is less than the limit value of 1.0mW/cm<sup>2</sup>, so there is no sar requirement.