



Maximum Permissible Exposure Evaluation

FCC ID: ZRR-L210K

1. Client Information

Applicant	:	Shenzhen Adition Audio Science & Technology CO., LTD.
Address	:	Floor1-5, No.2 Building, Huidebao Industrial Park, No.11, Second Industrial Zone, Baihua Community, Guangming Sub-district, Guangming District, Shenzhen City, China
Manufacturer	:	Shenzhen Adition Audio Science & Technology CO., LTD.
Address	:	Floor1-5, No.2 Building, Huidebao Industrial Park, No.11, Second Industrial Zone, Baihua Community, Guangming Sub-district, Guangming District, Shenzhen City, China

2. General Description of EUT

EUT Name	:	2.1CH Karaoke Soundbar	
Models No.	:	L210K	
Model Different	:	----	
Brand Name	:	Larksound	
Product Description	:	Operation Frequency:	Bluetooth 4.2(BDR+EDR): 2402MHz~2480MHz
	:	Number of Channel:	79 channels
	:	RF Output Power:	3.08dBm (Max)
	:	Antenna Gain:	2.5dBi PCB Antenna
	:	Modulation Type:	GFSK(1Mbps) π /4-DQPSK(2Mbps) 8-DPSK(3Mbps)
Power Rating	:	Adapter(GW48W-180250UH) Input: 100-240V~50/60Hz 1.2A Output: 18V2.5A 45.0W	
Software Version	:	N/A	
Hardware Version	:	N/A	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the MPE report used the EUT-2(RW-C-202204-0285-1-2#).	

MPE Calculations for Bluetooth

1. Antenna Gain:

PCB Antenna: 2.5dBi.

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

4. Test Result:

Bluetooth(BDR+EDR) MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm ²) [S]
GFSK	1	2402	3.08	3±1	4	2.5	20	0.0008
		2441	2.93	2±1	3	2.5	20	0.0007
		2480	1.10	1±1	2	2.5	20	0.0005
π/4-DQPSK	1	2402	3.07	3±1	4	2.5	20	0.0008
		2441	2.81	2±1	3	2.5	20	0.0007
		2480	0.94	0±1	1	2.5	20	0.0004
8-DPSK	1	2402	2.84	2±1	3	2.5	20	0.0007
		2441	2.88	2±1	3	2.5	20	0.0007
		2480	1.04	1±1	2	2.5	20	0.0005

Note:

N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For Bluetooth(BDR+EDR): 2402~2480MHz
MPE limit S: 1mW/ cm²

The MPE is calculated as $0.0008mW / cm^2 < limit 1mW / cm^2$. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

6. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----