

# RF Exposure Evaluation

## FCC ID: PIBB8

### 1. Client Information

**Applicant** : Audioengine LLC  
**Address** : 6500 River Place Blvd, Bldg 7, Ste 250 Austin , TX 78730  
**Manufacturer** : Shen zhen Hi-FiD Electronics Tech Co., Ltd  
**Address** : 4F, B7 Building, Hengfeng industrial City, Hezhou Village, Xixiang Town, Bao'an District, Shenzhen City, China

### 2. General Description of EUT

<b>EUT Name</b>	:	Audioengine 512 Portable Wireless Speaker	
<b>Models No.</b>	:	Audioengine 512	
<b>Product Description</b>	:	Operation Frequency:	Bluetooth V5.0(BLE): 2402~2480 MHz
		RF Output Power:	BLE: -1.140dBm 1M (GFSK):-0.996dBm 2M ( $\pi/4$ -DQPSK):-1.112dBm 3M (8-DPSK):-1.103dBm
		Antenna Gain:	0dBi PCB Antenna
<b>Power Supply</b>	:	DC Voltage supplied by USB cabel DC Voltage supplied by Li-ion battery	
<b>Power Rating</b>	:	DC 5.0V by USB cable DC 7.4V by 2200mAh Li-ion battery	
<b>Connecting I/O Port(S)</b>	:	Please refer to the User's Manual	

**Note:** More test information about the EUT please refer the RF Test Report.

## SAR Test Exclusion Calculations

1. FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

(1) Clause 4.3: General SAR test reduction and exclusion guidance

Sub clause 4.31: Standalone SAR test exclusion considerations

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance  $\leq 5$  mm are determined by:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 3.0 \text{ for 1-g SAR}}$$

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 7.5.0 \text{ for 10-g SAR}}$$



## 2. Calculation:

Test separation: 5mm						
BLE Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.140	-1±1	0	1	0.310	3.0
2.442	-1.463	-1±1	0	1	0.312	3.0
2.480	-1.958	-1±1	0	1	0.315	3.0
1M (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-0.996	-1±1	0	1	0.310	3.0
2.442	-1.408	-1±1	0	1	0.312	3.0
2.480	-1.862	-1±1	0	1	0.315	3.0
2M ( $\pi/4$ -DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.112	-1±1	0	1	0.310	3.0
2.442	-1.315	-1±1	0	1	0.312	3.0
2.480	-1.784	-1±1	0	1	0.315	3.0
3M (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.103	-1±1	0	1	0.310	3.0
2.442	-1.403	-1±1	0	1	0.312	3.0
2.480	-1.846	-1±1	0	1	0.315	3.0

So standalone SAR measurements are not required.

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