



RF EXPOSURE Test Report

Report No.: MTi230911005-09E3
Date of issue: 2023-11-20
Applicant: Guangzhou FiiO Electronics Technology CO., LTD
Product: HiFi Bluetooth Audio Receiver
Model(s): F3131B, F3132B, F3133B, F3134B, F3135B, F3136B,
F3137B, F3138B, F3139B, F3130B
FCC ID: R56-F30131

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Test Result Certification	
Applicant:	Guangzhou FiiO Electronics Technology CO., LTD
Address:	2/F, F Building, Hougang Industrial Zone, Shigang Huangshi West Road, Baiyun District, Guangzhou City, China.
Manufacturer:	Guangzhou FiiO Electronics Technology CO., LTD
Address:	2/F, F Building, Hougang Industrial Zone, Shigang Huangshi West Road, Baiyun District, Guangzhou City, China.
Product description	
Product name:	HiFi Bluetooth Audio Receiver
Trademark:	FiiO
Model name:	F3131B
Serial Model:	F3132B, F3133B, F3134B, F3135B, F3136B, F3137B, F3138B, F3139B, F3130B
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-09-13 to 2023-10-20
Test result:	Pass

Test Engineer	:	<i>Yanice Xie</i>
		(Yanice.Xie)
Reviewed By	:	<i>Leon Chen</i>
		(Leon Chen)
Approved By	:	<i>Tom Xue</i>
		(Tom Xue)

RF EXPOSURE EVALUATION

According to FCC 1.1310: 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 §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) 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 ²	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 * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm (20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

BT/BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

Antenna gain: 2 dBi

R=20cm

$mW=10^{(dBm/10)}$

Antenna gain Numeric= $10^{(dBi/10)}=10^{(2/10)}=1.58$

BT:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	6.15	6±1	7	5.012	2	1.58	0.0016	1
2441		5.7	6±1	7	5.012	2	1.58	0.0016	1
2480		6.44	6±1	7	5.012	2	1.58	0.0016	1
2402	π/4-DQPSK	8.43	8±1	9	7.943	2	1.58	0.0025	1
2441		7.86	7±1	8	6.310	2	1.58	0.0020	1
2480		8.73	8±1	9	7.943	2	1.58	0.0025	1
2402	8DPSK	9.06	9±1	10	10.000	2	1.58	0.0032	1
2441		8.49	8±1	9	7.943	2	1.58	0.0025	1
2480		9.3	9±1	10	10.000	2	1.58	0.0032	1

BLE:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	-6.17	-(6)±1	-5	0.316	2	1.58	0.0001	1
2440		-6.35	-(6)±1	-5	0.316	2	1.58	0.0001	1
2480		-5.96	-(5)±1	-4	0.398	2	1.58	0.0001	1
2402	BLE-2M	-6.29	-(6)±1	-5	0.316	2	1.58	0.0001	1
2440		-6.35	-(6)±1	-5	0.316	2	1.58	0.0001	1
2480		-6.08	-(6)±1	-5	0.316	2	1.58	0.0001	1

Conclusion:

For the max result: $0.0032 \leq 1.0$ SAR test exclusion threshold, No SAR is required.

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