



RF EXPOSURE Test Report

Report No.: MTi230508005-04E3
Date of issue: 2023-12-12
Applicant: Changsha Hotone Audio Co., Ltd
Product: Bluetooth Modeling Amplifier
Model(s): AP-30WH(Pulze), AP-30BK(Pulze)
FCC ID: 2AHJSAP-30

Shenzhen Microtest Co., Ltd.

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Test Result Certification	
Applicant:	Changsha Hotone Audio Co., Ltd
Address:	Room 201, East Block, Hunan University Science Park, No.186, Guyuan Rd. Yue Lu District, Changsha, China.
Manufacturer:	Changsha Hotone Audio Co., Ltd
Address:	Room 201, East Block, Hunan University Science Park, No.186, Guyuan Rd. Yue Lu District, Changsha, China.
Product description	
Product name:	Bluetooth Modeling Amplifier
Trademark:	Hotone
Model name:	AP-30WH(Pulze)
Serial Model:	AP-30BK(Pulze)
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-11-06 to 2023-12-08
Test result:	Pass

Test Engineer	:	
		(Maleah Deng)
Reviewed By	:	
		(Leon Chen)
Approved By	:	
		(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: -3.19 dBi

R=20cm

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

Antenna gain Numeric= $10^{(dBi/10)}=10^{(-3.19/10)}=0.48$

BT:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/c m ²)
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	2.44	2±1	3	1.995	-3.19	0.48	0.0002	1
2441		1.77	1±1	2	1.585	-3.19	0.48	0.0002	1
2480		2.29	2±1	3	1.995	-3.19	0.48	0.0002	1
2402	π/4-DQPSK	2.38	2±1	3	1.995	-3.19	0.48	0.0002	1
2441		1.64	1±1	2	1.585	-3.19	0.48	0.0002	1
2480		2.23	2±1	3	1.995	-3.19	0.48	0.0002	1
2402	8DPSK	2.49	2±1	3	1.995	-3.19	0.48	0.0002	1
2441		1.8	1±1	2	1.585	-3.19	0.48	0.0002	1
2480		2.35	2±1	3	1.995	-3.19	0.48	0.0002	1

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	2.18	2±1	3	1.995	-3.19	0.48	0.0002	1
2440		1.72	1±1	2	1.585	-3.19	0.48	0.0002	1
2480		2.07	2±1	3	1.995	-3.19	0.48	0.0002	1
2402	BLE-2M	2.06	2±1	3	1.995	-3.19	0.48	0.0002	1
2440		1.63	1±1	2	1.585	-3.19	0.48	0.0002	1
2480		1.95	1±1	2	1.585	-3.19	0.48	0.0002	1

Conclusion:

For the max result: 0.0002≤ 1.0 test exclusion threshold, No SAR is required.

----END OF REPORT----