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Report Template Version: V03
Report Template Revision Date: Mar.1st, 2017

RF Exposure Evaluation Report

Report No. : CQASZ20191101113E-04
Applicant: Beijing Infomedia Electronic Technology Co., Ltd.
Address of Applicant: Room 401, Floor 4, Building 1, Block 5, Cuiwei Road No.2, Haidian District, Beijing, China
Equipment Under Test (EUT):
Product: Digital Audio Player
Model No.: PAW 6000
Brand Name: LOTOO
FCC ID: 2AFA5-PAW6000
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-11-01
Date of Test: 2019-11-01 to 2019-11-08
Date of Issue: 2019-11-08
Test Result : PASS*

Tested By:

Tom Chen.

(Tom chen)

Reviewed By:

Sheek, Luo

(Sheek Luo)

Approved By:

Jack Ai

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20191101113E-04	Rev.01	Initial report	2019-11-08

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3 General Information

3.1 Client Information

Applicant:	Beijing Infomedia Electronic Technology Co., Ltd.
Address of Applicant:	Room 401, Floor 4, Building 1, Block 5, Cuiwei Road No.2, Haidian District, Beijing, China
Manufacturer:	Beijing Infomedia Electronic Technology Co., Ltd.
Address of Manufacturer:	Room 401, Floor 4, Building 1, Block 5, Cuiwei Road No.2, Haidian District, Beijing, China

3.2 General Description of EUT

Product Name:	Digital Audio Player
Model No.:	PAW 6000
Trade Mark:	LOTOO
Hardware Version:	V1.0
Software Version:	V1.2.0.1
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Power Supply:	lithium battery:DC3.8V, Charge by DC5.0V

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	internal antenna with ipex connector
Antenna Gain:	2.0dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0
Modulation Type:	GFSK
Transfer Rate:	1Mbps
Number of Channel:	40
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	internal antenna with ipex connector
Antenna Gain:	2.0dBi

3.5 General Description of WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
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	IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps IEEE for 802.11n(HT40) : 13.5Mbps/27Mbps/40.5Mbps/54Mbps/81Mbps/108Mbps/121.5Mbps/135Mbps
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	internal antenna with ipex connector
Antenna Gain:	2.0dBi

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

1) For BT

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-2.300	-3.0±1	-2.0	0.631
Middle(2441MHz)	-3.300	-4.0±1	-3.0	0.501
Highest(2480MHz)	-3.500	-4.0±1	-3.0	0.501
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.270	-1.0±1	0	1.000
Middle(2441MHz)	-1.350	-2.0±1	-1.0	0.794
Highest(2480MHz)	-1.460	-2.0±1	-1.0	0.794
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.110	-0.5±1	0.5	1.122
Middle(2441MHz)	-1.040	-2.0±1	-1.0	0.794
Highest(2480MHz)	-1.240	-2.0±1	-1.0	0.794

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	0.110	-0.5±1	0.5	1.122	0.348	3.0
Middle (2441MHz)	-1.040	-2.0±1	-1.0	0.794	0.248	
Highest (2480MHz)	-1.240	-2.0±1	-1.0	0.794	0.250	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101113E-01

2) For BLE

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	3.42	2.5±1	3.5	2.239
Middle(2440MHz)	3.17	2.5±1	3.5	2.239
Highest(2480MHz)	3.53	3.0±1	4.0	2.512

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	3.42	2.5±1	3.5	2.239	0.694	3.0
Middle (2440MHz)	3.17	2.5±1	3.5	2.239	0.699	
Highest (2480MHz)	3.53	3.0±1	4.0	2.512	0.785	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101113E-02

3) For WIFI

Measurement Data

IEEE for 802.11b mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.7	8.0±1	9.0	7.943
Middle(2437MHz)	8.28	7.5±1	8.5	7.079
Highest(2462MHz)	8.52	8.0±1	9.0	7.943
IEEE for 802.11g mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	7.96	7.0±1	8.0	6.310
Middle(2437MHz)	8.51	8.0±1	9.0	7.943
Highest(2462MHz)	8.33	7.5±1	8.5	7.079
IEEE for 802.11n(HT20) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	7.52	7.0±1	8.0	6.310
Middle(2437MHz)	7.56	7.0±1	8.0	6.310
Highest(2462MHz)	7.82	7.0±1	8.0	6.310
IEEE for 802.11n(HT40) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	7.42	6.5±1	7.5	5.623
Middle(2437MHz)	7.74	7.0±1	8.0	6.310
Highest(2452MHz)	7.37	6.5±1	7.5	5.623

Worst case: 802.11b mode						
Channel	Average Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2412MHz)	8.7	8.0±1	9.0	7.943	2.467	3.0
Middle (2437MHz)	8.28	7.5±1	8.5	7.079	2.210	
Highest (2462MHz)	8.52	8.0±1	9.0	7.943	2.493	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101113E-03

WIFI, BDR, EDR and BLE can not simultaneous transmitting at same time.