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Report Template Revision Date: Mar.1st, 2017

RF Exposure Evaluation Report

Report No. :	CQASZ20180500088E-02
Applicant:	Shenzhen SKY DRAGON Audio-video Technology Co. LTD
Address of Applicant:	B16,Laneway 3,Liuxian 2RD,District71,Baoan,Shenzhen, China
Manufacturer:	Shenzhen SKY DRAGON Audio-video Technology Co. LTD
Address of Manufacturer:	B16,Laneway 3,Liuxian 2RD,District71,Baoan,Shenzhen, China
Factory:	Huizhou Clinav Industrial Development Co., LTD
Address of Factory:	Shangnan Village Committee, Yuanzhou Town BoLuo County, Huizhou City, Guangdong, China
Equipment Under Test (EUT):	
Product:	Wireless Multi-room 2.1 Sound Bar
Model No.:	CK317, CK317X(X=A-Z), ITWFV678B
Test Model No.:	CK317
Brand Name:	Samesay, CKY, iLive
FCC ID:	ZJP-CK317
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 KDB447498D01 General RF Exposure Guidance v06
Date of Test:	2018-05-20 to 2018-05-30
Date of Issue:	2018-05-30
Test Result :	**PASS***

Tested By: Aaron Ma

(Aaron Ma)

Reviewed By: Owen Zhou

(Owen Zhou)

Approved By:

(Jack Ai)

SHENZHEN HUAXIA TESTING TECHNOLOGY CO.,LTD 华夏准测 APPROVED

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

2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180500088E-02	Rev.01	Initial report	2018-05-30

3 Contents

4 General Information

4.1 Client Information

Applicant:	Shenzhen SKY DRAGON Audio-video Technology Co. LTD
Address of Applicant:	B16,Laneway 3,Liuxian 2RD,District71,Baoan,Shenzhen, China
Manufacturer:	Shenzhen SKY DRAGON Audio-video Technology Co. LTD
Address of Manufacturer:	B16,Laneway 3,Liuxian 2RD,District71,Baoan,Shenzhen, China
Factory:	Huizhou Clinav Industrial Development Co.,LTD
Address of Factory:	Shangnan Village Committee,Yuanzhou Town BoLuo County, Huizhou City, Guangdong, China

4.2 General Description of EUT

Product Name:	Wireless Multi-room 2.1 Sound Bar
Model No.:	CK317, CK317X(X=A-Z), ITWFV678B
Trade Mark:	Samesay, CKY, iLive
Hardware version:	V1.5
Software version:	V24
Sample Type:	Mobile production
Power Supply:	Adaptor :JDA0301400200WUS Input:100-240V~50/60Hz 0.8A Output: DC14V 2.0A

4.3 General Description of WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz 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)
Test Software of EUT:	Ralink QA Test Program (manufacturer declare)
Antenna Type:	integral antenna
Antenna Gain:	2.3dBi

4.4 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	2.1+EDR
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79

Hopping Channel Type:	Adaptive Frequency Hopping systems
Test Software of EUT:	BK3256 RF Test_V1.3 (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—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 Exposures				
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
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	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
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4* Pi * R^2)$

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

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

5.1.2 Test Procedure

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

5.2 EUT RF Exposure Evaluation

1) For BT

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode	
Test channel	Peak Output Power (dBm)
Lowest(2402MHz)	0.21
Middle(2441MHz)	2.31
Highest(2480MHz)	2.40
π/4DQPSK mode	
Test channel	Peak Output Power (dBm)
Lowest(2402MHz)	-2.32
Middle(2441MHz)	-0.04
Highest(2480MHz)	-0.01
8DPSK mode	
Test channel	Peak Output Power (dBm)
Lowest(2402MHz)	-1.70
Middle(2441MHz)	0.48
Highest(2480MHz)	0.58

GFSK mode(worst case)

Channel	Frequency (MHz)	Max Conducted average Output Power (dBm)	Output Power to Antenna (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
Highest	2480	2.4	1.74	0	0.00035	1.0	PASS

Note: 1) Refer to report No. CQASZ20180500087E for EUT test Max Conducted Peak Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(1.74*1.0)/(4*3.1416*20^2)=0.00035$

2) For WIFI

Antenna Gain: 2.3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.7 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode	
Test channel	Average Output Power (dBm)
Lowest(2412MHz)	12.45
Middle(2437MHz)	12.49
Highest(2462MHz)	12.53
802.11g mode	
Test channel	Average Output Power (dBm)
Lowest(2412MHz)	10.24
Middle(2437MHz)	10.28
Highest(2462MHz)	10.31
802.11n(HT20)mode	
Test channel	Average Output Power (dBm)
Lowest(2412MHz)	8.14
Middle(2437MHz)	8.19
Highest(2462MHz)	8.18
802.11n(HT40)mode	
Test channel	Average Output Power (dBm)
Lowest(2422MHz)	7.18
Middle(2437MHz)	7.23
Highest(2452MHz)	7.21

802.11b(worst case)

Channel	Frequency (MHz)	Max Conducted average Output Power (dBm)	Output Power to Antenna (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
Highest	2462	12.53	17.91	2.3	0.00605	1.0	PASS

Note: 1) Refer to report No. CQASZ20180500088E-01 for EUT test Max Conducted average Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(17.91*1.7)/(4*3.1416*20^2)=0.00605$