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RF Exposure Evaluation Report

Report No.:	CQASZ20201101427E-02
Applicant:	TECH-AUDIO CO., LTD
Address of Applicant:	NO.3, TungShih li, Ping Cheng Tao Yuan, Taiwan.
Equipment Under Test (EUT):	
Product:	WIRED/WIRELESS SPEAKER
Model No.:	FS-WSLR1
Brand Name:	N/A
FCC ID:	2AABM-FSWSLR1
Standards:	47 CFR Part 1.1307
	47 CFR Part 2.1091
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2020-12-09
Date of Test:	2020-12-09 to 2020-12-29
Date of Issue:	2020-12-29
Test Result :	**PASS***

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

Tested By: Martin Lee

(Martin Lee)

Reviewed By: Ares Liu

(Ares Liu)

Approved By: Sheek Luo

(Sheek Luo)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20201101427E-02	Rev.01	Initial report	2020-12-29

2 Contents

3 General Information

3.1 Client Information

Applicant:	TECH-AUDIO CO., LTD
Address of Applicant:	NO.3, TungShih li, Ping Cheng Tao Yuan, Taiwan.
Manufacturer:	Atlantic Technology
Address of Manufacturer:	343 Vanderbilt Avenue, Norwood, MA 02062-5060
Factory:	Xiamen Tech-Sound CO.,Ltd
Address of Factory:	NO.170,Ji Yin Road, Tong An District , Xiamen , China.

3.2 General Description of EUT

Product Name:	WIRED/WIRELESS SPEAKER
Model No.:	FS-WSLR1
Trade Mark:	N/A
Hardware Version:	REV1.0
Software Version:	skaa-rx-Tech_Audio_JE0722-develop-v2.5.0-95-ge7203217-untested_2.tcf
Test sample No:	CQASZ20201101427E#1
Operation Frequency:	2403.5MHz~2477.3MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	FSK
Transfer Rate:	1Mbps
BW:	2.5MHz
Number of Channel:	49
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	SKAA (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	3.3dBi
Power Supply:	AC 100-240V, 50/60Hz 0.5A

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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.

4.1.2 Test Procedure

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

4.2 1.1.3 EUT RF Exposure Evaluation

1)For SKAA

Antenna Gain: 3.3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.14 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

FSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2403.5MHz)	15.150	14.5±1.0	15.5	35.481
Middle(2440.4MHz)	16.280	15.5±1.0	16.5	44.668
Highest(2477.3MHz)	16.770	16.0±1.0	17.0	50.119

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
50.119	3.3	0.0213	1.0	PASS

Note: 1) Refer to report No. CQASZ20201101427E-01 for EUT test Max Conducted Peak Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(50.119*2.14)/(4*3.1416*20^2)=0.0213$