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RF Exposure Evaluation Report

Report No. :	CQASZ20200100002E-02
Applicant:	TECH-AUDIO CO., LTD
Address of Applicant:	NO.3, TungShih li, Ping Cheng Tao Yuan, Taiwan.
Equipment Under Test (EUT):	
Product:	Compact Powered Wired/Wireless Subwoofers
Model No.:	FS-S65, FS-S8
Test Model No.:	FS-S65
Brand Name:	N/A
FCC ID:	2AABM-FSS65S8
Standards:	47 CFR Part 1.1307
	47 CFR Part 2.1093
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2020-03-14
Date of Test:	2020-03-14 to 2020-04-08
Date of Issue:	2020-04-08
Test Result :	**PASS***

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

Tested By: Tom Chen.

(Tom Chen)

Reviewed By: Sheek Luo

(Sheek Luo)

Approved By:

(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200100002E-02	Rev.01	Initial report	2020-04-08

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

3.2 General Description of EUT

Product Name:	Compact Powered Wired/Wireless Subwoofers
Model No.:	FS-S65, FS-S8
Test Model No.:	FS-S65
Trade Mark:	N/A
Hardware Version:	REV1.0 .
Software Version:	skaa-rx-TechAudio_JE0715-develop-v2.4.1-dev-1744-gd4f3f944-untested.tcf
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 Interior Antenna
Antenna Gain:	3.3dBi
Power Supply:	120V/60Hz

Model No.: FS-S65, FS-S8

Only the model FS-S65 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

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

For 5G WIFI

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)	15.290	14.5±1.0	15.5	35.481
Middle(2440.4MHz)	15.080	14.5±1.0	15.5	35.481
Highest(2477.3MHz)	14.900	14.0±1.0	15.0	31.623

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
35.481	3.3	0.0126	1.0	PASS

Note: 1) Refer to report No. CQASZ20191201313E-01 for EUT test Max Conducted Peak Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(35.481*2.14)/(4*3.1416*20^2)=0.0151$