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RF Exposure Evaluation Report

Report No. : CQASZ20201100029EX-02
Applicant: COMCN ELECTRONICS LIMITED
Address of Applicant: No.1 YaHua Lane, QingShui Road, Longgang Street, Longgang District, Shenzhen, Guangdong, China
Equipment Under Test (EUT):
Product: Portable Wireless Speaker
All Model No.: COM 803, COM801, COM817, COM815, S30
Test Model No.: COM 803
Brand Name: AT&T
FCC ID: 2AIPW-COM0S30
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Test: 2020-10-29 to 2020-11-11
Date of Issue: 2020-12-11
Test Result : PASS*

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

Tested By:

Tiny You

(Tiny You)

Reviewed By:

Sheek, Luo

(Sheek Luo)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20201100029EX-02	Rev.01	Initial report	2020-12-11

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3 General Information

3.1 Client Information

Applicant:	COMCN ELECTRONICS LIMITED
Address of Applicant:	No.1 YaHua Lane, QingShui Road, Longgang Street, Longgang District, Shenzhen, Guangdong, China
Manufacturer:	COMCN ELECTRONICS LIMITED
Address of Manufacturer:	No.1 YaHua Lane, QingShui Road, Longgang Street, Longgang District, Shenzhen, Guangdong, China

3.2 General Description of EUT

Product Name:	Portable Wireless Speaker
All Model No.:	COM 803, COM801, COM817, COM815, S30
Test Model No.:	COM 803
Trade Mark:	AT&T
Hardware Version:	V1.0
Software Version:	V1.5
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4,.42(EDR)
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK
Transfer Rate:	1Mbps/2Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	FCCAssist 1.5
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	DC3.7V, Charge by DC5.0V

Note:

All model: COM 803, COM801, COM817, COM815, S30

Only the model COM 803 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being model name.

4 SAR 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is 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.

4.1.3 EUT RF Exposure

1) For BT

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest	-2.278	-2.5±1	-1.5	0.708
Middle	-2.429	-2.5±1	-1.5	0.708
Highest	-2.813	-2.5±1	-1.5	0.708
π/4DQPSK mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest	-0.986	-1.5±1	-0.5	0.891
Middle	-1.101	-1.5±1	-0.5	0.891
Highest	-1.545	-1.5±1	-0.5	0.891

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
0.891	0	0.0002	1.0	PASS

Note: 1) Refer to report No. CQASZ20201100029EX-01 for EUT test Max Conducted average Output Power value.

$$2) P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (0.891 \cdot 1) / (4 \cdot 3.1416 \cdot 20^2) = 0.0002$$