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RF Exposure Evaluation Report

Report No. : CQASZ20190800786E-02
Applicant: Shenzhen Yuangu Technology Co.,Ltd
Address of Applicant: 701 Building 1 1970 Science and Technology Park Minzhi Community, Longhua, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Bluetooth Speaker
All Model No.: SC211, SC214, SC215, XS01, SA1, SA2, SA3, SA4, SA5, SA6, SA7
Test Model No.: SC211
Brand Name: Muzili
FCC ID: 2ATWG-SC211
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-08-22
Date of Test: 2019-08-22 to 2019-08-30
Date of Issue: 2019-08-30
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

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190800786E-02	Rev.01	Initial report	2019-08-30

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Yuangu Technology Co.,Ltd
Address of Applicant:	701 Building 1 1970 Science and Technology Park Minzhi Community, Longhua, Shenzhen, China
Manufacturer:	DONGGUAN HI-TECH ELECTRONICE INDUSTRIAL CO.,LTD
Address of Manufacturer:	Hi-Tech Industrial Park, 1ST Tian Sha Rd, Ke Yuan Cheng, Tang Xia Town, Dongguan, China

3.2 General Description of EUT

Product Name:	Bluetooth Speaker
All Model No.:	SC211, SC214, SC215, XS01, SA1, SA2, SA3, SA4, SA5, SA6, SA7
Test Model No.:	SC211
Trade Mark:	Muzili
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Test Software of EUT:	BT_Tool (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0.94dBi
Power Supply:	lithium battery:DC3.7V, Charge by DC5.0V

Note:

All model: SC211, SC214, SC215, XS01, SA1, SA2, SA3, SA4, SA5, SA6, SA7

Only the model SC211 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being the color of appearance and model name.

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

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-9.310	-10.0±1	-9.0	0.126
Middle(2441MHz)	-10.840	-11.5±1	-10.5	0.089
Highest(2480MHz)	-11.490	-12.0±1	-11.0	0.079
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-7.150	-8.0±1	-7.0	0.200
Middle(2441MHz)	-8.760	-9.0±1	-8.0	0.158
Highest(2480MHz)	-9.380	-10.0±1	-9.0	0.126
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-6.980	-7.5±1	-6.5	0.224
Middle(2441MHz)	-8.540	-9.0±1	-8.0	0.158
Highest(2480MHz)	-9.200	-10.0±1	-9.0	0.126

Worst case: 8DPSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-6.980	-7.5±1	-6.5	0.224	0.069	3.0
Middle (2441MHz)	-8.540	-9.0±1	-8.0	0.158	0.050	
Highest (2480MHz)	-9.200	-10.0±1	-9.0	0.126	0.040	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190800786E-01