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Report Template Version: V04

Report Template Revision Date: 2018-07-06

RF Exposure Evaluation Report

Report No.: CQASZ20200600545E-02
Applicant: GuangDong Substanbo Technology Co.,Ltd.
Address of Applicant: Room 2508, Bd.4, Tianan yungu 2nd Industrial Park, Longgang District Shenzhen, China.
Equipment Under Test (EUT):
EUT Name: 2.1CH SOUNDBAR SYSTEM
Model No.: Tapio V
Brand Name: bomaker
FCC ID: 2AS9DTAPIO5
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-06-15
Date of Test: 2020-06-15 to 2020-06-29
Date of Issue: 2020-06-29
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
CQASZ20200600545E-02	Rev.01	Initial report	2020-06-29

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3 General Information

3.1 Client Information

Applicant:	GuangDong Substanbo Technology Co.,Ltd.
Address of Applicant:	Room 2508, Bd.4, Tianan yungu 2nd Industrial Park, Longgang District Shenzhen, China.
Manufacturer:	GuangDong Substanbo Technology Co.,Ltd.
Address of Manufacturer:	Room 2508, Bd.4, Tianan yungu 2nd Industrial Park, Longgang District Shenzhen, China.
Factory:	SHENZHEN MENGXIANG TECHNOLOGY CO.,LTD.
Address of Factory:	Shenzhen New District of Longhua City,Dalang street,Tong Fu village industrial zone,16 building 3floor

3.2 General Description of EUT

Product Name:	2.1CH SOUNDBAR SYSTEM
Model No.:	Tapio V
Trade Mark:	bomaker
Hardware Version:	1.0
Software Version:	V5.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	BT_Tool (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	1.7dBi
Power Supply:	Adapter: MODEL NO.: CW1802330RE INPUT: 100-240V~50/60Hz 1.2A MAX OUTPUT: 18V 2330mA

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)	-3.030	-4.0±1	-3.0	0.501
Middle(2441MHz)	-4.230	-5.0±1	-4.0	0.398
Highest(2480MHz)	-4.990	-5.5±1	-4.5	0.355
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.780	-1.5±1	-0.5	0.891
Middle(2441MHz)	-2.050	-3.0±1	-2.0	0.631
Highest(2480MHz)	-2.880	-3.5±1	-2.5	0.562
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.260	-1.0±1	0	1.000
Middle(2441MHz)	-1.580	-2.5±1	-1.5	0.708
Highest(2480MHz)	-2.420	-3.0±1	-2.0	0.631

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)	-0.260	-1.0±1	0	1.000	0.310	3.0
Middle (2441MHz)	-1.580	-2.5±1	-1.5	0.708	0.221	
Highest (2480MHz)	-2.420	-3.0±1	-2.0	0.631	0.199	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200600545E-01.