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RF Exposure Evaluation Report

Report No.: CQASZ20200600469E-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 III
Brand Name: bomaker
FCC ID: 2AS9DTAPIO3
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-06-03
Date of Test: 2020-06-03 to 2020-07-02
Date of Issue: 2020-07-02
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
CQASZ20200600469E-02	Rev.01	Initial report	2020-07-02

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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:	Huizhou Clinav Industrial Development Limited
Address of Factory:	2 nd Fool, Clinav Industrial Building, Yuanzhou Road, Shangnan Village, Yuanzhou Town, Boluo County, Huizhou City, Guangdong, China

3.2 General Description of EUT

Product Name:	2.1CH SOUNDBAR SYSTEM	
Model No.:	Tapio III	
Trade Mark:	bomaker	
Hardware Version:	SR253AD-32-80-MAIN V3.0	
Software Version:	SR253AD_93D4(1)	
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:	MV FrequencyTool v0.2.6 (manufacturer declare)	
Antenna Type:	PCB antenna	
Antenna Gain:	3.38dBi	
Power Supply:	1# Adapter: MODEL: RC0653-2402500CU INPUT: 100-240V~50/60Hz 1.5A OUTPUT: 24V 2500mA	2# Adapter: MODEL: P240W2500UG INPUT: 100-240V~50/60Hz 1.2A OUTPUT: 24V 2500mA 60W

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)	-4.320	-5.0±1	-4.0	0.398
Middle(2441MHz)	-6.300	-7.0±1	-6.0	0.251
Highest(2480MHz)	-8.590	-9.5±1	-8.5	0.141
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-4.390	-5.0±1	-4.0	0.398
Middle(2441MHz)	-6.250	-7.0±1	-6.0	0.251
Highest(2480MHz)	-8.630	-9.5±1	-8.5	0.141
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-4.390	-5.0±1	-4.0	0.398
Middle(2441MHz)	-6.300	-7.0±1	-6.0	0.251
Highest(2480MHz)	-8.730	-9.5±1	-8.5	0.141

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-4.320	-5.0±1	-4.0	0.398	0.123	3.0
Middle (2441MHz)	-6.300	-7.0±1	-6.0	0.251	0.078	
Highest (2480MHz)	-8.590	-9.5±1	-8.5	0.141	0.044	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200600469E-01.