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RF Exposure Evaluation Report

Report No.: CQASZ20220901646E-02
Applicant: GuangDong Substanbo Technology Co., Ltd.
Address of Applicant: 2008, Building 4, Tianan Cloud Park Phase II, Bantian Street, Longgang District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: 2.0 CH SOUNDBAR SYSTEM
Model No.: Tapio I Pro
Test Model No.: Tapio I Pro
Brand Name: ULTIMEA
FCC ID: 2AS9D-TAPIOS
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt: 2022-09-21
Date of Test: 2022-09-21 to 2022-10-18
Date of Issue: 2022-11-08
Test Result: **PASS***

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

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Timo Lei

(Timo Lei)

Approved By:

Jack Ai

(Jack Ai)



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1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220901646E-02	Rev.01	Initial report	2022-11-08

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3 General Information

3.1 Client Information

Applicant:	GuangDong Substanbo Technology Co., Ltd.
Address of Applicant:	2008, Building 4, Tianan Cloud Park Phase II, Bantian Street, Longgang District, Shenzhen, China
Manufacturer:	GuangDong Substanbo Technology Co., Ltd.
Address of Manufacturer:	2008, Building 4, Tianan Cloud Park Phase II, Bantian Street, Longgang District, Shenzhen, China
Factory:	Shenzhen Hanhong Digital Technology Co., Ltd
Address of Factory:	Building A Room #303, Huafeng Internet - Innovation Technology Park, Gonghe Industry Road 107#, Xixiang Street, Baoan, Shenzhen, China

3.2 General Description of EUT

Product Name:	2.0 CH SOUNDBAR SYSTEM
Model No.:	Tapio I Pro
Test Model No.:	Tapio I Pro
Trade Mark:	ULTIMEA
Software Version:	V00001
Hardware Version:	V00001
EUT Power Supply:	Power by DC 19V 1.5A for adapter

3.3 General Description of BT Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.0
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
Antenna Type:	FrequencyToolv_0.1.8
Antenna Gain:	PCB antenna
Cable loss:	3.38dBi

Note:

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

The table applies to any RF source (i.e., single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator. For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave Dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

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 Classic

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	0.73	-1.42	-1.5±1	-0.5	0.89
Middle(2441MHz)	2.29	0.14	0±1	1.0	1.26
Highest(2480MHz)	1.76	-0.39	-0.5±1	0.5	1.12
π/4DQPSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	2.19	0.04	0±1	1.0	1.26
Middle(2441MHz)	4.34	2.19	2.5±1	3.5	2.24
Highest(2480MHz)	3.48	1.33	1.5±1	2.5	1.78
8DPSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	2.26	0.11	0±1	1.0	1.26
Middle(2441MHz)	4.39	2.24	2.5±1	3.5	2.24
Highest(2480MHz)	4.07	1.92	2.0±1	3.0	2.00

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20220901646E-01 for EUT test Max Conducted Peak Output Power value.

2) EUT's Bluetooth module is more than 20cm away from the human body.

*** END OF REPORT ***