



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640
Fax: +86-755-26648637
Website: www.cqa-cert.com

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RF Exposure Evaluation Report

Report No. : CQASZ20180600079E-02

Applicant: Wonders Technology Co.,Ltd

Address of Applicant: 4/F, Tower A, 3rd Building, Tian'an Cloud Park, Bantian Avenue, Longgang District, Shenzhen 518129, China

Manufacturer: Wonders Technology Co.,Ltd

Address of Manufacturer: 4/F, Tower A, 3rd Building, Tian'an Cloud Park, Bantian Avenue, Longgang District, Shenzhen 518129, China

Equipment Under Test (EUT):

Product: Outdoor Bluetooth Speaker

Model No.: WB-97, 7198-68

Test Model No.: WB-97

Brand Name: N/A

FCC ID: WC2-WB97

Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2018-06-22 to 2018-07-02

Date of Issue: 2018-07-02

Test Result : PASS*

Tested By:

Martin Lee

(Martin Lee)

Reviewed By:

Jack Ai

(Jack Ai)

Approved By:

Jack Ai

(Jack Ai)



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180600079E-02	Rev.01	Initial report	2018-07-02

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3 General Information

3.1 Client Information

Applicant:	Wonders Technology Co.,Ltd
Address of Applicant:	4/F, Tower A, 3rd Building, Tian'an Cloud Park, Bantian Avenue, Longgang District, Shenzhen 518129, China
Manufacturer:	Wonders Technology Co.,Ltd
Address of Manufacturer:	4/F, Tower A, 3rd Building, Tian'an Cloud Park, Bantian Avenue, Longgang District, Shenzhen 518129, China

3.2 General Description of EUT

Product Name:	Outdoor Bluetooth Speaker
Model No.:	WB-97, 7198-68
Test Model No.:	WB-97
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	portable production
Test Software of EUT:	Bluetooth MP Tool (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	lithium battery:DC3.7V, 1400mAh, 5.18Wh, Charge by DC5.0V

All model: WB-97, 7198-68

Only the model WB-97 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being 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

For BT:

Measurement Data

GFSK mode	
Test channel	Peak Output Power (dBm)
Lowest	-4.760
Middle	-4.510
Highest	-5.060
$\pi/4$ DQPSK mode	
Test channel	Peak Output Power (dBm)
Lowest	-5.590
Middle	-5.640
Highest	-6.130
8DPSK mode	
Test channel	Peak Output Power (dBm)
Lowest	-5.540
Middle	-5.470
Highest	-5.970

The Max Conducted Peak Output Power is -4.510dBm in highest channel(2.441GHz);

The best case gain of the antenna is 0dBi.

EIRP= -4.510dBm + 0dBi = -4.510dBm

-4.510dBm logarithmic terms convert to numeric result is nearly 0.354mW

According to the formula. calculate the EIRP test result:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$$

General RF Exposure = $(0.354\text{mW} / 5 \text{ mm}) \times \sqrt{2.441\text{GHz}} = 0.11$ ①

SAR requirement:

S= 3.0

② ;

① < ②.

So the SAR report is not required.

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20180600079E-01