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RF Exposure Evaluation Report

Report No. : CQASZ20190700554E-02
Applicant: ZAGG Inc.
Address of Applicant: 910 West Legacy Center Way, Midvale, UT, United States, 84047, USA
Equipment Under Test (EUT):
EUT Name: Braven BRV-MINI Speaker
Model No.: BBRVSBS40
Brand Name: BRAVEN
FCC ID: QTG-BAADMIN
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-07-06
Date of Test: 2019-07-06 to 2019-07-22
Date of Issue: 2019-07-22
Test Result : PASS*

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

Tested By:

Tom Chen.

(Tom chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190700554E-02	Rev.01	Initial report	2019-07-22

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3 General Information

3.1 Client Information

Applicant:	ZAGG Inc.
Address of Applicant:	910 West Legacy Center Way, Midvale, UT, United States, 84047, USA
Manufacturer:	ZAGG Inc.
Address of Manufacturer:	910 West Legacy Center Way, Midvale, UT, United States, 84047, USA

3.2 General Description of EUT

Product Name:	Braven BRV-MINI Speaker
Model No.:	BBRV SBS40
Trade Mark:	BRAVEN
Hardware Version:	VA.0
Software Version:	V1.3
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.2
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:	Bluetooth RF test Tool (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	lithium battery:DC3.7V, Charge by DC5V

Note: Only one model number: BBRVSBS40, but it comes in four colors (black, blue, red, gray)

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)	-0.260	-1.0±1	0	1.000
Middle(2441MHz)	0.850	0±1	1.0	1.259
Highest(2480MHz)	2.440	1.5±1	2.5	1.778
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	2.460	1.5±1	2.5	1.778
Middle(2441MHz)	3.610	3.0±1	4.0	2.512
Highest(2480MHz)	5.210	4.5±1	5.5	3.548
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	3.180	2.5±1	3.5	2.239
Middle(2441MHz)	4.270	3.5±1	4.5	2.818
Highest(2480MHz)	5.690	5.0±1	6.0	3.981

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)	3.180	2.5±1	3.5	2.239	0.69	3.0
Middle (2441MHz)	4.270	3.5±1	4.5	2.818	0.88	
Highest (2480MHz)	5.690	5.0±1	6.0	3.981	1.25	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190700554E-01