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Report No.: SZEM140900540803

Page: 1 of 8

SAR Evaluation Report

Application No:	SZEM1409005408RF
Applicant:	Shenzhen Baojia Battery Technology Co.,Ltd
Manufacturer/ Factory:	Shenzhen Baojia Battery Technology Co.,Ltd
Product Name:	PLAYBULB Colour
Model No.(EUT):	BTL100C
Trade Mark:	Mipow
FCC ID:	SL7BTL100C
Standards:	47 CFR Part 1.1307 (2014) 47 CFR Part 2.1093 (2014) KDB447498D01 General RF Exposure Guidance v05
Date of Receipt:	2014-09-30
Date of Test:	2014-10-14 to 2014-10-23
Date of Issue:	2015-01-22

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

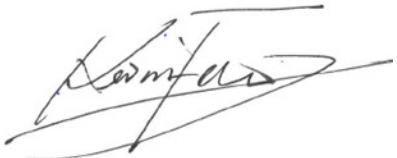
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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2015-01-22		Original

Authorized for issue by:			
Tested By		2014-10-23	
	(Eric Fu) /Project Engineer	Date	
Prepared By		2015-01-22	
	(Linlin Lv) /Clerk	Date	
Checked By		2015-01-27	
	(Kevin Feng) /Reviewer	Date	

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4 General Information

4.1 Client Information

Applicant:	Shenzhen Baojia Battery Technology Co.,Ltd
Address of Applicant:	Block A, Yonghe Road, Tongfuyu Industrial Zone, Fuyong, Baoan District, Shenzhen City, China ("6/F, Building A, Yibaolai Industry Zone, Qiaotou, Fuyong, Bao'an District, Shenzhen, Guangdong,China" is another legal place for business activities)
Manufacturer/ Factory:	Shenzhen Baojia Battery Technology Co.,Ltd
Address of Manufacturer/ Factory:	Block A, Yonghe Road, Tongfuyu Industrial Zone, Fuyong, Baoan District, Shenzhen City, China ("6/F, Building A, Yibaolai Industry Zone, Qiaotou, Fuyong, Bao'an District, Shenzhen, Guangdong,China" is another legal place for business activities)

4.2 General Description of EUT

Product Name:	PLAYBULB Colour
Model No.:	BTL100C
Trade Mark:	Mipow
Frequency Range:	2402MHz to 2480MHz
Bluetooth Version:	V4.0 dual mode
Sample Type:	Fixed production
Test Power Grade:	0 for BLE mode 100,15 for Classic mode (manufacturer declare)
Test Software of EUT:	Bluetest3 (manufacturer declare)
Power Supply:	AC 100-240V 50-60Hz 0.6A 9W
Test Voltage:	AC 120V 60Hz
For BLE mode	
Modulation Type:	GFSK
Number of Channels:	40
Antenna Type:	Integral
Antenna Gain:	3.81dBi
For Classic mode	
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Antenna Type:	Integral
Antenna Gain:	3.1dBi

4.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

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No tests were sub-contracted.

4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v05

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.

5.1.2 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:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ 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

5.1.3 EUT RF Exposure

For BLE mode

The Max Conducted Peak Output Power is 1.44dBm in Highest channel(2.480 GHz);

The best case gain of the antenna is 3.81 dBi

$$\text{EIRP} = 1.44\text{dBm} + 3.81\text{dBi} = 5.25\text{dBm}$$

5.25dBm logarithmic terms convert to numeric result is nearly 3.3497 mW

According to the formula. calculate the EIRP test result:

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

$$\text{General RF Exposure} = (3.3497 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.480 \text{ GHz}} = 1.0550 \text{ ①}$$

SAR requirement:

$$S = 3.0 \text{ ② ;}$$

$$\text{①} < \text{②}.$$

So the SAR report is not required.

For Classic mode

The Max Conducted Peak Output Power is 2.45dBm in Middle channel(2.441 GHz);

The best case gain of the antenna is 3.1dBi

EIRP= 2.45dBm + 3.1dBi = 5.55dBm

5.55dBm logarithmic terms convert to numeric result is nearly 3.5892 mW

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 = $(3.5892 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.441 \text{ GHz}} = 1.1215$ ①

SAR requirement:

S= 3.0 ② ;

① < ②.

So the SAR report is not required.

For both the Bluetooth module transmitting simultaneously

3.3497mW+3.5892mW=6.9389mW

According to the formula. calculate the EIRP test result:

At Highest channel:

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

General RF Exposure = $(6.9389 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.480 \text{ GHz}} = 2.1855$ ①

SAR requirement:

S= 3.0 ② ;

① < ②.

So the SAR report is not required.

6 EUT Constructional Details

6.1 Appendix A - Photographs of EUT Constructional Details