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Report Template Version: V03

Report Template Revision Date: Mar.1st, 2017

RF Exposure Evaluation Report

Report No. : CQASZ20190700526E-02
Applicant: Battery-Biz inc.
Address of Applicant: 1380 Flynn Rd., Camarillo California, United States
Manufacturer: Battery-Biz inc.
Address of Manufacturer: 1380 Flynn Rd., Camarillo California, United States
Equipment Under Test (EUT):
Product: Lithium-Ion Jump-Starter
Model No.: DRLJS110B
Additional Model: DRBTLC (they are difference in model name only)
Brand Name: DURACELL
FCC ID: 2ATTPBTLC110B
IC: 25201- BTLC110B
Standards: 47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
RSS-102 Issue 5 March 2015
Date of Test: 2019-06-28 to 2019-07-03
Date of Issue: 2019-07-03
Test Result : **PASS***

Tested By:

Tom Chen.

Reviewed By:

*(Tom Chen)
Aaron Ma*

Approved By:

*(Aaron Ma)
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
CQASZ20190700526E-02	Rev.01	Initial report	2019-07-03

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3 General Information

3.1 Client Information

Applicant:	Battery-Biz inc.
Address of Applicant:	1380 Flynn Rd., Camarillo California, United States, 93012
Manufacturer:	Battery-Biz inc.
Address of Manufacturer:	1380 Flynn Rd., Camarillo California, United States, 93012

3.2 General Description of EUT

Product Name:	Lithium-Ion Jump-Starter
Model No.:	DRLJS110B
Trade Mark:	DURACELL
Hardware Version:	Ver.1.0
Software Version:	Ver.1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	5.0
Modulation Type:	GFSK
Transfer Rate:	1Mbps, 2Mbps
Number of Channel:	40
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	Direct Test Mode Tool (manufacturer declare)
Antenna Type:	PCB Antenna
Antenna Gain:	2dBi
EUT Power Supply:	Input: 5Vdc, 2A Output: 5Vdc, 2.4A

4 SAR Evaluation

4.1 FCC 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:

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

- f(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

For BLE:

Test mode : GFSK_1Mbps						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-1.06	-1.0	0	1.0	0.31	3.0
Middle (2440MHz)	-0.99	-0.5	0	1.0	0.31	
Highest (2480MHz)	-0.9	-0.5	0	1.0	0.31	
Conclusion: the calculated value ≤ 3.0 , SAR is exempted.						

Test mode : GFSK_2Mbps						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-1.07	-1.0	0	1.0	0.31	3.0
Middle (2440MHz)	-1	-1.0	0	1.0	0.31	
Highest (2480MHz)	-0.92	-0.5	0	1.0	0.31	
Conclusion: the calculated value ≤ 3.0 , SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190700526E-01

4.2 IC RF Exposure Compliance Requirement

4.2.1 Standard Requirement

According to RSS-102 Issue 5 March 2015

2.5.1 Exemption Limits for Routine Evaluation – SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

4.2.2 Limits

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

4.2.3 EUT RF Exposure

1) For BLE

Measurement Data

Test mode : GFSK_1Mbps					
Channel	Maximum Peak Conducted Output Power (dBm)	Antenna gain (dBi)	E.i.r.p. calculation value		Limit (mW)
			(dBm)	(mW)	
Lowest (2402MHz)	-1.06	2	0.94	1.24	<4mW
Middle (2440MHz)	-0.99	2	1.01	1.26	<4mW
Highest (2480MHz)	-0.9	2	1.1	1.29	<4mW
Conclusion: E.i.r.p. calculation value < limit, SAR is exempted.					

Test mode : GFSK_2Mbps					
Channel	Maximum Peak Conducted Output Power (dBm)	Antenna gain (dBi)	E.i.r.p. calculation value		Limit (mW)
			(dBm)	(mW)	
Lowest (2402MHz)	-1.07	2	0.93	1.24	<4mW
Middle (2440MHz)	-1	2	1	1.26	<4mW
Highest (2480MHz)	-0.92	2	1.08	1.28	<4mW
Conclusion: E.i.r.p. calculation value < limit, SAR is exempted.					

Remark: 1) The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20190700526E-01

2) EIRP= Max Conducted Peak Output Power + Antnna gain