



## 15.247 RF Exposure Evaluation

On

Kuvee Smart Bottle  
FCC ID: 2AIDY-SBK-07

**Customer Name:** Kuvee, Inc.

**Customer P.O:** Trans ID# 32D218963W764582D

**Date of Report:** June 30, 2016

**Test Report No:** R-6096N-3

**Test Start Date:** June 27, 2016

**Test Finish Date:** June 27, 2016

**Test Technician:** T. Hannemann

**Report Approved By:** S. Wentworth

**Report Prepared By:** T. Hannemann

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## Technical Information

**Report Number:** R-6096N-3

**Customer:** Kuvee, Inc.

**Address:** 125 Kingston, St.  
Boston, MA 02111

**Manufacturer:** Plexus Manufacturing Solutions

**Manufacturer Address:** Paseo del Norte 4640 Technology Park  
45010 Zapopan, JAL, Mexico

**Test Sample:** Kuvee Smart Bottle

**Model Number:** SBK-07

**Serial Number:** KV16050003

**FCC ID:** 2AIDY-SBK-07  
Digital Transmission – Direct Sequence Spread Spectrum

**Type:** Transmitter

**Power Requirements:** 120 VAC, 60 Hz

**Power Supply:** AC Adapter, Motorola, SSW-2222US

**Frequency of Operation:** 2402.0 to 2480.0 MHz

**Equipment Class:** DTS

**Antenna Type:** Internal Antenna, 2.8 dBi (1.905 numeric)

**Equipment Use:** Internet Connected Smart Bottle

### Test Specification:

FCC Rules and Regulations Part 15, Subpart C, Section 15.247

### Procedure:

FCC KDB 447498 D01 General RF Exposure Guidance v06    October 23, 2015  
865664 D02 RF Exposure Reporting v01r02

### Test Facility:

Retlif Testing Laboratories  
101 New Boston Road  
Goffstown, NH 03045

FCC Registered Test Site Number: 90899



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## Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.



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Scott Wentworth  
Branch Manager  
NVLAP Approved Signatory



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Todd Hannemann  
EMC Test Engineer  
iNARTE Certified Technician ATL-0255-T

### Non-Warranty Provision

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## Revision History

Revisions to this document are listed below; the latest revised document supersedes all previous issues of this document:

<b>Revision</b>	<b>Date</b>	<b>Pages Affected</b>
-	June 30, 2016	Original Release



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For 100 MHz to 6 GHz and test separation distances  $\leq$  50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

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

$\leq 3.0$  for 1-g SAR, and  $\leq 7.5$  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 calculation
- The result is rounded to one decimal place for comparison

Frequency (MHz)	Channel Bandwidth (MHz)	Peak Conducted Power (mW)	Average Conducted Power (mW)
2412	20	93.54	25.76
2440	20	90.16	25.90
2462	20	84.72	23.77
2422	40	81.66	18.60
2432	40	81.26	18.66
2452	40	80.35	17.79

**NOTE:** The device utilizes IEEE 802.11(Wi-Fi) in three (3) applications defined below. The slowest data speed for IEEE 802.11(Wi-Fi) is 1Mbps. All calculations are utilizing 1Mbps as a worst case scenario.

**Application 1:** Wi-Fi is utilized to upload statistics to the servers. This occurs once every 10 minutes when there is data waiting to be sent to the servers. The data is queued while the user is interacting with the Kuvee Smart Bottle. These interactions are uploaded to the server once every 10 minutes. A typical user will generate about 25 events per pour with approximately 7.6 seconds per pouring interaction. A user will pour an estimated 6 servings per bottle generating 150 events. Approximately 100 bytes per event will be generated.

- 150 events X 100 bytes per event = 15000 bytes (15 k)
- 15 k / 1Mbps = 0.015 Seconds to complete the transaction

**Application 2:** Wi-Fi is utilized to order product (wine) from the manufacturer (Kuvee). This occurs when the user presses the button to submit the order. During a typical transaction, the user will be handling the bottle for approximately 28 seconds while exploring the wine list, prior to this event. Events generated during the handling and purchase transaction will cause approximately 1200 bytes (1.2 k) of data.

- 1.2 Kbytes / 1Mbps = 0.0012 Seconds to complete the transaction



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**Application 3:** Wi-Fi is utilized to perform a software update or to the product list stored on the device. This process only occurs when the Kuvee Smart Bottle is placed on the charging dock and not being interfaced by the user. Therefore this SAR evaluation is not required for this application.

**Maximum Conducted Power:**

Frequency (MHz)	Channel Bandwidth (MHz)	Peak Conducted Power (mW)	Average Conducted Power (mW)
2412	20	93.54	25.76

**Time average power:**

Average power experienced by the user = max power x radio-on duty cycle during the operation.

**Application 1 (upload statistics):**

10 minutes of typical device handling generates 15 k of data

15 k / 1Mbps = 0.015 Seconds to complete the transaction

93.54mW (peak conducted power) X (0.015/600 sec) = 0.0023 mW

0.0023 mW \* 1.905 (numeric Antenna Gain) = 0.004455 mW (maximum radiated power)

**Application 2 (order product):**

28 seconds of device handling to order product generates 1.2 k of data

1.2 Kbytes / 1Mbps = 0.0012 Seconds to complete the transaction.

93.54 mW (peak conducted power) X (0.0012/28 sec) = 0.0040 mW

0.0040 mW \* 1.905 (numeric Antenna Gain) = 0.007637 mW (maximum radiated power)

**SAR Test Exclusion Thresholds:**

Frequency (GHz)	Max. Power <sup>1</sup> rounded to the nearest mW	Min. test separation distance (mm)	SAR test exclusion calculation value <sup>2</sup>	10-g extremity SAR test exclusion thresholds	Evaluation Results
2.412	1.0	5	0.3	7.5	Complies

<sup>1</sup> Max. power obtained from time average power.

<sup>2</sup> Calculation of the SAR test exclusion thresholds. (base on 10-g extremity SAR exclusion thresholds) rounded to one decimal

**Result:**

The time average power is below the SAR test exclusion power thresholds. The EUT is exempt from SAR testing.



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