



FCC Part 1 Subpart I
FCC Part 2 Subpart J
INDUSTRY CANADA RSS 102 ISSUE 5

RF EXPOSURE REPORT

FOR

NFC/ BLE CAPABLE ELECTRONIC DOOR-MOUNTED ACCESS CONTROL
PRODUCT

MODEL NUMBER: M1

FCC ID: 2AK5B-M1
IC: 22134-M1

REPORT NUMBER: R11464238-E5

ISSUE DATE: 2017-01-10

Prepared for
LATCHABLE, INC.
450 WEST 33RD STREET, 12TH FLOOR
NEW YORK, NY 10001, USA

Prepared by
UL LLC
12 LABORATORY DR.
RESEARCH TRIANGLE PARK, NC 27709 USA
TEL: (919) 549-1400

NVLAP[®]
TESTING

NVLAP LAB CODE 200246-0

Revision History

Ver.	Issue Date	Revisions	Revised By
1	2016-12-02	Initial Issue	Brian Kiewra
2	2016-12-22	Corrected FCC ID to 2AK5B-M1	Brian Kiewra
3	2017-01-04	Corrected output power used in calculations to correct maximum power	Brian Kiewra
4	2017-01-09	Added NFC and NFC+BLE evaluation in Section 5.2	Brian Kiewra
5	2017-01-10	Corrected Combined EIRP in Section 5.2	Brian Kiewra

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. REFERENCES	5
4. FACILITIES AND ACCREDITATION	5
5. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	6
5.1. FCC	6
5.2. INDUSTRY CANADA.....	7
END OF REPORT	7

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Latchable, Inc.
450 W. 33rd ST., 12th Floor
New York, NY 10001, USA

EUT DESCRIPTION: NFC/BLE Electronic Door-Mounted Access Control

MODEL: M1

SERIAL NUMBER: 290046000F51353235373138

DATE TESTED: 2016-11-10

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Pass
INDUSTRY CANADA RSS 102 ISSUE 5	Pass

UL, LLC calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL, LLC based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL, LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL, LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Approved & Released
For UL LLC By:



Jeffrey Moser
EMC Program Manager
UL – Consumer Technology Division

Calculated By:



Brian T. Kiewra
EMC Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

All calculations were made in accordance with FCC Parts 2.1091, 2.1093 and KDB 447498 D01 v06 and IC Safety Code 6, RSS 102 Issue 5.

3. REFERENCES

All measurements were made as documented in test reports R11464238-E1, R11464238-E2, and R11464238-E3 for operation in the 2.4 GHz band.

Output power, Duty cycle and Antenna gain data is excerpted from the applicable test reports.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Suite B, Perimeter Park Drive, Morrisville, NC 27560.

The onsite chambers are covered under Industry (ISED) Canada company address code 2180C with site numbers 2180C -1 through 2180C-4, respectively.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://www.nist.gov/nvlap/>.

5. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

5.1. FCC

SAR test exclusion in accordance with KDB 447498.

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:

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

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.

SAR Exclusion Calculations Table for Portable Devices (separation distance < 20 cm)

Antenna	Tx	Frequency (MHz)	Avg Output power		Separation distances (mm)	Calculated Threshold
			dBm	mW		
TI BLE	BLE	2402	1.75	1	5	0.3
Nordic BLE	BLE	2480	0.00	1	5	0.3
BLE Combined	BLE	2480	3.98	3	5	0.9

Conclusion:

The computed value is < 3 ; therefore, Bluetooth qualifies for Standalone SAR test exclusion.

Notes:

- 1) A tolerance value of $+0.5$ dB was included in the output power values above to cover the output power tolerance of $+/-0.5$ dB under extreme conditions in the real field as declared by the client.
- 2) The manufacturer configures output power so that the maximum power, after accounting for manufacturing tolerances, will never exceed the maximum power level measured.
- 3) The output power in the tables above is the maximum power per chain among various channels and various modes within the specific band.
- 4) The antenna gain in the tables above is the maximum antenna gain among various channels within the specified band.

5.2. INDUSTRY CANADA

The SAR exclusion table from RSS-102 issue 5 is reproduced below:

Table 1: SAR evaluation - exemption limits for routine evaluation based on frequency and separation distance.

Frequency MHz	Exemption Limits (mW)				
	At separation distance of ≤5mm	At separation distance of 10mm	At separation distance of 15mm	At separation distance of 20mm	At separation distance of 25mm
≤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 30mm	At separation distance of 35mm	At separation distance of 40mm	At separation distance of 45mm	At separation distance of ≥50mm
≤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

The minimum antenna to user distance that will be encountered in normal use for BLE is 6.15mm. This results in an exemption limit of 7mW at 2450MHz. The minimum antenna to user distance that will be encountered in normal use for NFC is 4.05mm. This results in an exemption limit of 71mW at ≤300MHz.

As the maximum BLE combined output power is 2.50mW (4.41mW EIRP), the maximum EIRP for NFC is 0mw, and the maximum BLE+NFC combined EIRP is 4.41mW the DUT qualifies for SAR test exclusion.

END OF REPORT