



CERTIFICATION TEST REPORT

Report Number. : 12672932-E2V2

Applicant : ALIVECOR
444 CASTRO STREET
MOUNTAIN VIEW, CA 94043, U.S.A.

Model : AC-019

FCC ID : 2ASFFAC019

EUT Description : ECG SYSTEM

Test Standard(s) : FCC 47 CFR PART 1 SUBPART I
FCC 47 CFR PART 1 SUBPART J
INDUSTRY CANADA RSS – 102 ISSUE 5

Date Of Issue:
February 19, 2019

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NVLAP Lab code: 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2/11/2019	Initial Issue	--
V1	2/19/2019	Updated Section 7 to address TCB's questions	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ALIVECOR
444 CASTRO STREET
MOUNTAIN VIEW, CA 94043, U.S.A.

EUT DESCRIPTION: ECG SYSTEM

MODEL: AC-019

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
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Prepared By:



TINA CHU
SENIOR PROJECT ENGINEER
UL Verification Services Inc.

2. METHODOLOGY

SAR test exclusion in accordance with KDB 447498 and ISED RSS 102.

3. REFERENCES

Output power, Duty cycle and Antenna gain data is excerpted from the applicable test report or client declarations.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
<input type="checkbox"/> Chamber A (ISED:2324B-1)	<input type="checkbox"/> Chamber D (ISED:22541-1)	<input type="checkbox"/> Chamber I (ISED: 2324A-5)
<input type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input checked="" type="checkbox"/> Chamber J (ISED: 2324A-6)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	<input checked="" type="checkbox"/> Chamber K (ISED: 2324A-1)
	<input type="checkbox"/> Chamber G (ISED:22541-4)	<input type="checkbox"/> Chamber L (ISED: 2324A-3)
	<input type="checkbox"/> Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

5. EUT DESCRIPTION

The EUT is a handheld ECG system with BLE function, it is powered by a lithium coin cell battery. As the user to antenna separation distance is unspecified the distance was assumed to be 0mm. The peak antenna gain is -2dBi.

6. OUTPUT POWER

EUT has a maximum conducted average output power of 2dbm (1.58mW) under normal and extreme environmental conditions.

7. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

7.1. 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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot \sqrt{f(\text{GHz})} \leq 3.0$, 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

This test exclusion is 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.

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:

1. $\{[\text{Power allowed at numeric threshold for 50 mm}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz
 - $f_{(\text{MHz})}$ is the RF channel transmit frequency in MHz
2. $\{[\text{Power allowed at numeric threshold for 50 mm}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

SAR Exclusion Calculations Table for Portable Devices (separation distance < 50mm)

Antenna	Tx	Frequency (MHz)	Avg Output power ^{Note 1}		Separation distances (mm)	Threshold Value
			dBm	mW		
Main	Bluetooth	2480	2.00	2.00	5	0.6

Note 1: The listed power is the maximum declared maximum average output power including manufacturing maximum tolerance rounded to the nearest mW.

Conclusion:

The computed value is < 7.5; therefore, Bluetooth qualifies for Standalone SAR test exclusion.

7.2. 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^{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

*For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation are multiplied by a factor of 2.5

The minimum antenna to user distance that will be encountered in normal use is 0mm. This results in an exemption limit of 10mW at 2480 MHz.

The exemption limit of 10mW was derived through linear interpolation of the values at 2450 MHz and 3500 MHz

As the maximum output power is 1.58mW the EUT qualifies for SAR test exclusion.

END OF REPORT