



Radio Frequency Exposure Evaluation Report

FOR:

iRhythm Technologies, Inc.

Model Name:

A101A5001

Product Description:

Zio AT ECG Patch

FCC ID: 2AFBP-AT17P

IC ID: N/A

Applied Rules and Standards:

CFR 47 Part 2 (2.1093),

FCC KDB 447498 D01 General RF Exposure Guidance v06

ISED Canada RSS-102 Issue 5

Report number: EMC_IRHYT-008-17001_SAR-EX_PATCH

DATE: 2017-05-09



A2LA Accredited

IC recognized #
3462B-1

CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.

Phone: + 1 (408) 586 6200 • Fax: + 1 (408) 586 6299 • E-mail: info@cetecom.com • <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

Contents

1. Assessment	3
2. Administrative Data	4
2.1. Identification of the Testing Laboratory Issuing the Test Report	4
2.2. Identification of the Client / Manufacturer	4
3. Equipment under Assessment	5
4. FCC and ISED Canada Exemption Limits for Routine Evaluation	6
4.1. FCC SAR test exclusions by KDB 447498 D01 General RF Exposure Guidance v06	6
4.2. IC SAR test exclusions are set by IC RSS-102 Issue 5	6
5. Stand-Alone SAR Evaluation Exclusion.....	6
6. Revision History.....	7

1. Assessment

The following device was evaluated against the limits for general population uncontrolled exposure specified in CFR 47 Part 2.1093 according to SAR evaluation exclusion requirements specified in FCC regulation as listed in KDB 447498, and ISED Canada RSS-102 Issue 5.

The device meets the requirements for SAR exclusion for touch distance as stipulated by the above given FCC/ISED rules.

Company	Description	Model #
iRhythm Technologies, Inc.	Zio AT ECG Patch	A101A5001

Responsible for Testing Laboratory:

Dr. Peter Nevermann			
2017-05-09	RC&E	(Director Radio Communications and EMC)	
Date	Section	Name	Signature

Responsible for the Report:

Cindy Li			
2017-05-09	RC&E	(EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.

CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Director Radio Com. and EMC:	Peter Nevermann
Responsible Project Leader:	Cindy Li

2.2. Identification of the Client / Manufacturer

Applicant's Name:	iRhythm Technologies, Inc.
Street Address:	650 Townsend St # 500
City/Zip Code	San Francisco, CA 94103
Country	USA
Contact Person:	Matt Ho, Chase Hathaway

3. Equipment under Assessment

Model No:	A101A5001
HW Version :	A101A6001.02
SW Version :	Application firmware: 170407 Patch MAX32621 Production 2.1.4.4.hex BLE firmware : 160914 Patch CC2640 Production 2.1.1.8.hex
FCC-ID :	2AFBP-AT17P
IC-ID:	N/A
HVIN:	N/A
PMN:	N/A
Product Description:	Zio AT ECG Patch
Frequency Range / number of channels:	Nominal band: 2402 MHz – 2480 MHz; Center to center: 2402 MHz (Ch 0) – 2480 MHz (Ch 39), 40 channels
Type(s) of Modulation:	Bluetooth version 4.0, Low Energy, GFSK modulation.
Modes of Operation:	Bluetooth LE. Based on TI chip CC2640
Antenna Information:	PCB trace antenna. Gain -1.1dBi for 2480MHz. Gain determined from measured EIRP and measured conducted power
Max. declared Output Powers conducted:	2dBm declared in operational description and used during testing.
Power Supply/ Rated Operating Voltage Range:	2 Lithium Manganese Dioxide Coin Cells (2.7V – 3.2V)
Operating Temperature Range	2 °C to 40 °C
Other Radios included in the device:	N/A
Sample Revision	<input checked="" type="checkbox"/> Prototype Unit <input type="checkbox"/> Production Unit <input type="checkbox"/> Pre-Production

4. FCC and ISSED Canada Exemption Limits for Routine Evaluation

4.1. FCC SAR test exclusions by KDB 447498 D01 General RF Exposure Guidance v06

KDB 447498 Section: 4.3.1. Standalone SAR test exclusion considerations

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

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR, 30 where}$$

- $f(\text{GHz})$ 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 values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

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 according to 4.1 f) is applied to determine SAR test exclusion.

4.2. IC SAR test exclusions are set by IC RSS-102 Issue 5

IC RSS-102 Section: 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.

For a device operating at 2.45GHz the SAR evaluation exemption limit at distance 5mm or less is 4mW

5. Stand-Alone SAR Evaluation Exclusion

According to KDB 447498, SAR evaluation can be excluded if the following equation is satisfied:

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

- The maximum RF channel power for the device under evaluation is 4.1dBm = 2.6mW.

Using the above equation:

$$[(2.6 \text{ mW}) / (5 \text{ mm})] \cdot [\sqrt{2.480 \text{ GHz}}] = 0.82$$

Conclusion:

- SAR testing for FCC is excluded because above SAR exclusion calculation result for this transmitter is less than the 3.0 exclusion threshold numerical value for 1-g SAR
- SAR testing for ISSED Canada is excluded because the maximum power of 2.6 mW is less than the 4 mW threshold in RSS 102.

6. Revision History

Date	Report Name	Changes to report	Report prepared by
2017-05-09	EMC_IRHYT-008-17001_SAR-EX	Initial version	Cindy Li