



# Radio Frequency Exposure Evaluation Report

**FOR:**

BI Incorporated

**Model Number:**

TAD-200

**Product Description:**

Transdermal Alcohol Detector, continuously monitors for alcohol consumption through a noninvasive skin sensor worn on a client's ankle. TAD also includes radio frequency monitoring capabilities so clients can be monitored for curfews and alcohol use with the same device. If a client drinks alcohol while wearing

**FCC ID:** CSQTAD200

**IC ID:** 1499A-TAD200

**Applied Rules and Standards:**

CFR 47 Part 2 (2.1093),

FCC KDB 447498 D01 General RF Exposure Guidance v06

ISED RSS-102 Issue 5

**Report #:** EMC\_BIINC\_020\_22001\_FCC\_ISED\_SAR\_EX

**DATE:** 2023-02-13



A2LA Accredited

IC recognized #  
3462B-1

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## 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 ISEDC RSS-102 Issue 5.

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

Company	Description	Model #
BI Incorporated	Transdermal Alcohol Detector, continuously monitors for alcohol consumption through a noninvasive skin sensor worn on a client's ankle. TAD also includes radio frequency monitoring capabilities so clients can be monitored for curfews and alcohol use with the same device. If a client drinks alcohol while wearing	TAD-200

### Responsible for Testing Laboratory:

2023-02-13	Compliance	Arndt Stoecker (Director of Regulatory Service)	
Date	Section	Name	Signature

### Responsible for the Report:

2023-02-13	Compliance	Cheng Song (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

<b>Company Name:</b>	CETECOM Inc.
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<b>Street Address:</b>	411 Dixon Landing Road
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<b>Lab Manager:</b>	Arndt Stoecker
<b>Responsible Project Leader:</b>	Cathy Palacios

### 2.2. Identification of the Client / Manufacturer

<b>Client's Name:</b>	BI Incorporated
<b>Street Address:</b>	6265 Gunbarrel Ave.
<b>City/Zip Code</b>	Boulder, CO 80301
<b>Country</b>	USA

<b>Manufacturer's Name:</b>	Same as Client
<b>Manufacturers Address:</b>	
<b>City/Zip Code</b>	
<b>Country</b>	

### 3. Equipment under Assessment

<b>Model No</b>	TAD-200
<b>HW Version</b>	VER 1.05
<b>SW Version</b>	VER 1.05
<b>FCC-ID</b>	CSQTAD200
<b>IC ID</b>	1499A-TAD200
<b>PMN</b>	TAD-200
<b>Product Description</b>	Transdermal Alcohol Detector, continuously monitors for alcohol consumption through a noninvasive skin sensor worn on a client's ankle. TAD also includes radio frequency monitoring capabilities so clients can be monitored for curfews and alcohol use with the same device. If a client drinks alcohol while wearing
<b>Device Category</b>	<input type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Mixed Mobile and Portable
<b>Radio Information</b>	<b><u>Periodic radio</u></b> <ul style="list-style-type: none"> <li>• Frequency of operation: 318.2MHz</li> </ul> <b><u>WLAN:</u></b> <ul style="list-style-type: none"> <li>• Module: UBlox Nina-W151</li> <li>• FCC ID: XPYNINAW15 / IC Cert: 8595A-NINAW15</li> </ul>
<b>Minimum distance of antenna or radiating parts to user</b>	5mm
<b>Power Supply/ Rated Operating Voltage Range</b>	3.3 V (nom)
<b>Operating Temperature Range</b>	Tmin: -5 °C / Tmax: 55 °C
<b>Sample Revision</b>	<input type="checkbox"/> Prototype <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
<b>Exposure Category</b>	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled

#### 4. FCC and ISEDC Exemption Limits for Routine Evaluation

##### 4.1. FCC SAR test exclusions per KDB 447498

KDB 447498 D01 General RF Exposure Guidance v06 Section: 4.3.1.  
 Standalone SAR test exclusion considerations states

- 4) 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:

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

- $f(\text{GHz})$  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*.

The test exclusions are applicable only when the minimum *test separation distance* is  $\leq 50$  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. ISEDC SAR test exclusions per IC RSS-102 Issue 5

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.

**Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance**

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of $\leq 5$ 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
$\leq 300$	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 $\geq 50$ mm
$\leq 300$	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

## 5. Stand-alone Transmission SAR Exclusion Evaluation

Periodic Operating Radio 318.2MHz

FCC Standalone Transmission SAR Exclusion Calculations						
Frequency (GHz)	EIRP (mW)	AVG Output Power corrected by duty cycle factor(mW)	Distance(mm)	P1/D*SQRT(F) at $\leq 5$ mm	1-g $\leq 3.0$	Result
0.3182	0.32	0.0001	5	1.12818E-05	Yes	Pass

ISED Standalone Transmission SAR Exclusion Calculations					
Frequency (GHz)	EIRP (mW)	AVG Output Power corrected by duty cycle factor(mW)	Distance(mm)	Limit *1	Result
0.3182	0.32	0.0001	5	68.7	Pass

WLAN

FCC Standalone Transmission SAR Exclusion Calculations						
Frequency (GHz)	EIRP (mW)	AVG Output Power corrected by duty cycle factor(mW)	Distance(mm)	P1/D*SQRT(F) at $\leq 5$ mm	1-g $\leq 3.0$	Result
2.467	70.80	0.06	5	0.018848024	Yes	Pass

ISED Standalone Transmission SAR Exclusion Calculations					
Frequency (GHz)	EIRP (mW)	AVG Output Power corrected by duty cycle factor(mW)	Distance(mm)	Limit *1	Result
2.467	70.80	0.06	5	3.97	Pass

## 6. Revision History

<b>Date</b>	<b>Report Name</b>	<b>Changes to report</b>	<b>Report prepared by</b>
2023-02-13	EMC_BIINC_020_22001_FCC_ISED_SAR_EX	Initial	Cheng Song