



Radio Frequency Exposure Evaluation Report

FOR:
Soberlink

Model Name:
Connect

Product Description:
Mobile breathalyzer

FCC ID: 2ATA4-CNCT01
IC ID: N/A

Applied Rules and Standards:
CFR 47 Part 2.1093 and RSS-102 Issue 5
FCC KDB 447498 D01 General RF Exposure Guidance v06

Test Report #: SAR_EX_SOBER_007_19001_FCC_ISED

DATE: 2019-07-23



A2LA Accredited
IC recognized #
3462B-1

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1. Assessment

The following device meets the limits of 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 the relevant ISED Canada standard RSS-RSS102, as it has been evaluated against the standards mentioned above under this section.

Responsible for Testing Laboratory:

2019-07-23	Compliance	C Cindy Li (Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

2019-07-23	Compliance	Chin Ming Lui (Associate 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
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Country	USA
Telephone:	+1 (408) 586 6200
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Compliance Manager:	Cindy Li
Responsible Project Manager:	Sangeetha Sivaraman

2.2. Identification of the Client

Applicant's Name:	Soberlink
Street Address:	10805 Holder St Ste. 245
City/Zip Code	Cypress, CA 90630
Country	USA

2.3. Identification of the Manufacturer

Applicant's Name:	
Street Address:	Same as Client
City/Zip Code	
Country	

3. Equipment under Assessment

Model No:	01
FWIN:	1.0
HVIN:	01
PMN:	Soberlink Connect
Hardware Version:	1.0
Software Version:	1.0
Minimum distance of antenna or radiating parts to user	5mm
Power Supply/ Rated Operating Voltage Range:	Low 4.4 VDC, Nominal 5 VDC, High 5.25 VDC
Operating Temperature Range:	Low 0° C, Nominal 25° C, High 50° C
Modes of Operation:	Bluetooth Low Energy (BTLE)
Radios included in the device:	<p>❖ <u>Bluetooth LE:</u></p> <ul style="list-style-type: none">• Module name: Silicon Labs• Model number: Blue Gecko SoC• Modulation: BT4.0• Version: 4.0 (LE)• Main Antenna:<ul style="list-style-type: none">▪ Type: PCB Trace▪ Location: Internal▪ Gain: 2.4 dBi▪ Operating Frequency: 2402 – 2480 MHz
EUT Dimensions [mm]:	103 x 70 x 156
Co-located Transmitters/ Antennas:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Exposure Category:	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled
Device Category:	<input type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Mixed Mobile and Portable
EUT Diameter:	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____
Sample Revision	<input type="checkbox"/> Prototype Unit; <input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production

4. FCC and ISED 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.

4.2. ISEDC SAR test exclusions per IC RSS-102 Issue 5

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.

• 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
≤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

• Table 1: SAR evaluation — Exemption limits for routine evaluation based on frequency and separation distance

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
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

- Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in [Table 1](#) are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

5. Stand-Alone SAR Evaluation Exclusion

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

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

FCC Standalone Transmission SAR Exclusion Calculations								
Frequency [GHz]	Max. Declared Output Power [dBm / mW]	EIRP [dBm / mW]	Source based duty cycle	Max EIRP corrected by duty cycle [mW]	Distance [mm]	P3/D*SQRT (F) at $\leq 5\text{mm}$	1-g ≤ 3.0	10-g ≤ 7.5
2.402	8 / 6.31	10.4 / 10.96	59.18%	6.49	5	0.84	Yes	Yes

- F: Frequency [GHz]
- Declared Antenna Gain = 2.4 dBi
- P1: Max. Declared Output Power
- P2: Equivalent Isotropically Radiated Power (EIRP) = P1 (dBm) + Declared Antenna Gain (dBi)
- P3: Max. EIRP corrected by duty cycle [mW] = EIRP (mW) x Source based duty cycle
- D: Distance [mm]
- SQRT(F): Square root(Frequency[GHz])

ISED Standalone Transmission SAR Exclusion Calculations								
Frequency [GHz]	Max. Declared Output Power [dBm / mW]	EIRP [dBm / mW]	Source based duty cycle	Max output power corrected by duty cycle [mW]	Distance [mm]	Limit *1 [mW]	Limit *2 [mW]	Limit *3 [mW]
2.402	8 / 6.31	10.4 / 10.96	59.18%	6.49	5	4.26	21.30	10.65

- *1: Limit by applying linear interpolation
- *2: 1-g (Limit multiplied by factor of 5)
- *3: 10-g (Limit multiplied by factor of 2.5)
- Limit *3 is applicable for this device

As the device will only be in contact with one's hand and transmitting during the breathalyser operation.

6. Revision History

Date	Report Name	Changes to report	Report prepared by
2019-07-23	SAR_EX_SOBER-007-19001_FCC_ISED	Initial Version	Chin Ming Lui