



FCC CERTIFICATION

TEST REPORT

for the

SENSEONICS, INCORPORATED

FCC ID: 2AHYA-3402

WLL REPORT# 19441-01 REV 2

Prepared for:

Senseonics, Incorporated

20451 Seneca Meadows Parkway

Germantown, Maryland 20876

Prepared By:

Washington Laboratories, Ltd.

4840 Winchester Boulevard

Frederick, Maryland 21703



Testing Certificate AT-1448



FCC Certification

Test Report

for the

Senseonics, Incorporated
Transmitter - Phoenix2

FCC ID: 2AHYA-3402

November 4, 2025

WLL Report# 19441-01 REV 2

Prepared by:

Richard Quarcoo
EMC Test Engineer

Reviewed by:

Steven D. Koster
President



Abstract

This report has been prepared on behalf of Senseonics, Incorporated to support the attached Application for Equipment Authorization. The test report and application are submitted for an Intentional Radiator under Part 15.225 of the FCC Rules current at the time of testing and Regulations and Innovation, Science and Economic Development (ISED) Canada Spectrum Management and Telecommunications Policy. This Certification Test Report documents the test configuration and test results for the Senseonics, Incorporated Transmitter - Phoenix2.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 4840 Winchester Boulevard, Frederick, MD 21703. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD.

Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Testing Certificate AT-1448 as an independent FCC test laboratory. (ISED Canada number 3035A).

The Senseonics, Incorporated Transmitter - Phoenix2 complies with the limits for an intentional radiator device under FCC Part 15.225.

Revision History	Description of Change	Date
Rev 0	Initial Release	November 4, 2025
REV 1	Corrected FCC ID and Part number	November 21, 2025
REV 2	Comments from ACB	January 30, 2025



Table of Contents

Abstract	iii
Table of Contents	iv
List of Tables	v
List of Figures	v
1 Introduction	6
1.1 Compliance Statement	6
1.2 Test Scope	6
1.3 Contract Information	6
1.4 Test and Support Personnel	6
2 Equipment Under Test	7
2.1 EUT Identification & Description	7
2.2 Test Configuration	8
2.3 Support Equipment	9
2.4 Testing Algorithm	9
2.5 Test Location	9
2.6 Test Deviations	9
2.6.1 Deviations to the Standard	9
2.7 Measurements	10
2.7.1 References	10
2.8 Measurement Uncertainty	10
3 Test Equipment	12
4 Test Results	13
4.1 Occupied Bandwidth: FCC §15.225, §2.1049	13
4.2 Radiated Spurious Emissions: FCC §15.225, §15.209	15
4.2.1 Test Procedure	15
4.2.2 Test Results	16
4.3 Frequency Stability: FCC §15.225, §2.1055,	19
4.3.1 Test Procedure	19
4.3.2 Test Results	19



List of Tables

Table 1: Device Summary	7
Table 2: System Configuration List.....	8
Table 3: Support Equipment	9
Table 4: Expanded Uncertainty List	11
Table 5: Test Equipment List.....	12
Table 6: Occupied Bandwidth Results.....	13
Table 7: Radiated Spurious Emissions Limits	15
Table 8: 30m Measurement Extrapolation.....	16
Table 9: Radiated Emissions below 30MHz, NFC Fundamental, 3meter measurement distance	17
Table 10: Radiated Emissions below 30MHz, NFC Fundamental, 10meter measurement distance	17
Table 11: Radiated Emissions above 30MHz	18
Table 12: Frequency Stability Test Data	20

List of Figures

Figure 1: Test Configuration.....	8
Figure 2: Occupied Bandwidth	14



1 Introduction

1.1 Compliance Statement

The Senseonics, Incorporated Transmitter - Phoenix2 complies with the limits for a Class B digital device and FCC Part 15.

1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed in accordance with ANSI C63.10-2020/Cor 1-2021 standard. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

Test Specification	Specific Description	Result	Modifications (Y/N)
CFR47 Part 15.209	Radiated Emissions, General requirements	Pass	N
CFR47 Part 15.225	Field Strength	Pass	N
CFR47 Part 15.225	Frequency Stability	Pass	N
CFR47 Part 2.1049	Occupied Bandwidth	Pass	N

1.3 Contract Information

Customer: Senseonics, Incorporated
Purchase Order Number: 42294
Quotation Number: 75304A

1.4 Test and Support Personnel

Washington Laboratories, LTD Richard Quarcoo
Customer Representative Pavel Beresnev



2 Equipment Under Test

2.1 EUT Identification & Description

Table 1: Device Summary

Model(s) Tested:	Phoenix2 Transmitter 102985-200
EUT Specifications:	
Manufacturer:	Senseonics Incorporated
FCC ID:	2AHYA-3402
IC:	ST25R3911B for NFC
FCC Rule Parts:	§15.225
Frequency Range:	13.553-13.567 MHz
Number of Channels:	1
Output Power:	Fixed
Modulation type(s):	AM
Occupied Bandwidth:	0.864 kHz
Keying:	ASK
Antenna Connector:	N/A
Antenna Type	NFC: PCB inductive loop
Power Source & Voltage:	Primary: 3.8Vdc, Battery Powered Secondary: AC/DC Wall adapter

The Senseonics, Incorporated Transmitter - Phoenix2 is a body-worn transmitter for glucose monitoring.



2.2 Test Configuration

The Transmitter - Phoenix2 was configured to transmit at 13.56MHz with a BLE connection via a phone application.

Table 2: System Configuration List

Name / Description	Model Number	Part Number	Serial Number	Revision
Phoenix2	LBL-103118-01	102985	700240	03

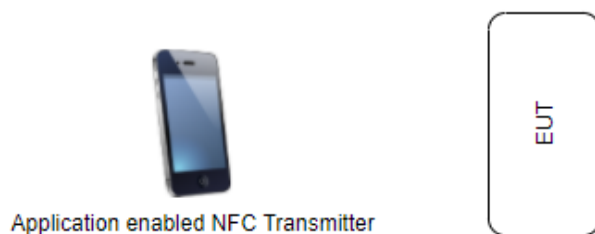


Figure 1: Test Configuration



2.3 Support Equipment

Table 3: Support Equipment

Item	Model/Part Number	Serial Number
Phone	Apple I-phone5	N/a

2.4 Testing Algorithm

The Transmitter - Phoenix2 was tested in a paired TX On Mode (13.56MHz 0.5 second) via a BLE connection.

2.5 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Frederick, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. The ISED Canada OATS number for Washington Laboratories, Ltd. is 3035A. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Testing Certificate AT-1448 as an independent FCC test laboratory.

2.6 Test Deviations

2.6.1 Deviations to the Standard

There were no deviations to the requirements established in the specification.



2.7 Measurements

2.7.1 References

ANSI C63.2 (Jan-2016) Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 (Jan 2014) American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10-2020/Cor 1-2021 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

2.8 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 (R2002) with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm \sqrt{\frac{a^2}{div_a^2} + \frac{b^2}{div_b^2} + \frac{c^2}{div_c^2} + \dots}$$

Where u_c = standard uncertainty
 $a, b, c, \dots$ = individual uncertainty elements
 div_a, b, c = the individual uncertainty element divisor based on the probability distribution
Divisor = 1.732 for rectangular distribution
Divisor = 2 for normal distribution
Divisor = 1.414 for trapezoid distribution



Equation 2: Expanded Uncertainty

$$U = ku_c$$

Where:

U = expanded uncertainty

k = coverage factor

k ≤ 2 for 95% coverage (ANSI/NCSL Z540-2 Annex G)

uc = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 4 below.

Table 4: Expanded Uncertainty List

Scope	Standard(s)	Expanded Uncertainty
Conducted Emissions	CISPR11, CISPR22, CISPR32, CISPR14, FCC Part 15	±2.63 dB
Radiated Emissions	CISPR11, CISPR22, CISPR32, CISPR14, FCC Part 15	±4.55 dB



3 Test Equipment

Table 5 shows a list of the test equipment used for measurements along with the calibration information.

Table 5: Test Equipment List

Test Name: Radiated Emissions		Test Date(s):	10/08/2025
Asset #	Manufacturer/Model	Description	Cal. Due
00823	AGILENT N9010A	EXA SPECTRUM ANALYZER	6/21/2026
00644	SUNOL SCIENCES CORPORATION JB1 925-833-9936	BICONALOG ANTENNA	12/2/2026
00276	ELECTRO-METRICS BPA-1000	RF PRE-AMPLIFIER	4/18/2026
00031	EMCO 6502	ANTENNA ACTIVE LOOP	6/17/2027
00865	STORM 874-0101-036	LOW LOSS, HF COAXIAL CABLE	6/6/2026
00825	CABLE ASSOCIATES MTC1010	SMA COAXIAL CABLE, 6 METERS	6/17/2026
00806	MINI-CIRCUITS CBL-6FT-SMSM	6FT SMA -SMA	6/17/2026
00731	NARDA 4779-3	2W, 3DB ATTENUATOR	6/6/2026
00942	AGILENT MXA-N9020A	SPECTRUM ANALYZER	12/26/2026
00330	WLL CE SITE CABLE	BNC COAXIAL CABLE	7/15/2026
00497	WLL RG-223	CABLE COAXIAL BNC 1.0M	2/14/2026
00896	CABLE ASSOCIATES MFR-3BMP6	LOW LOSS SMA COAXIAL CABLE	1/15/2026
00179	EMCO 7405	PROBE NEAR FIELD KIT	CNR



4 Test Results

4.1 Occupied Bandwidth: FCC §15.225, §2.1049

Occupied bandwidth measurement was performed by coupling the output of the EUT to the input of a spectrum analyzer using a near field probe. Table 4 provides a summary of the Occupied Bandwidth Results.

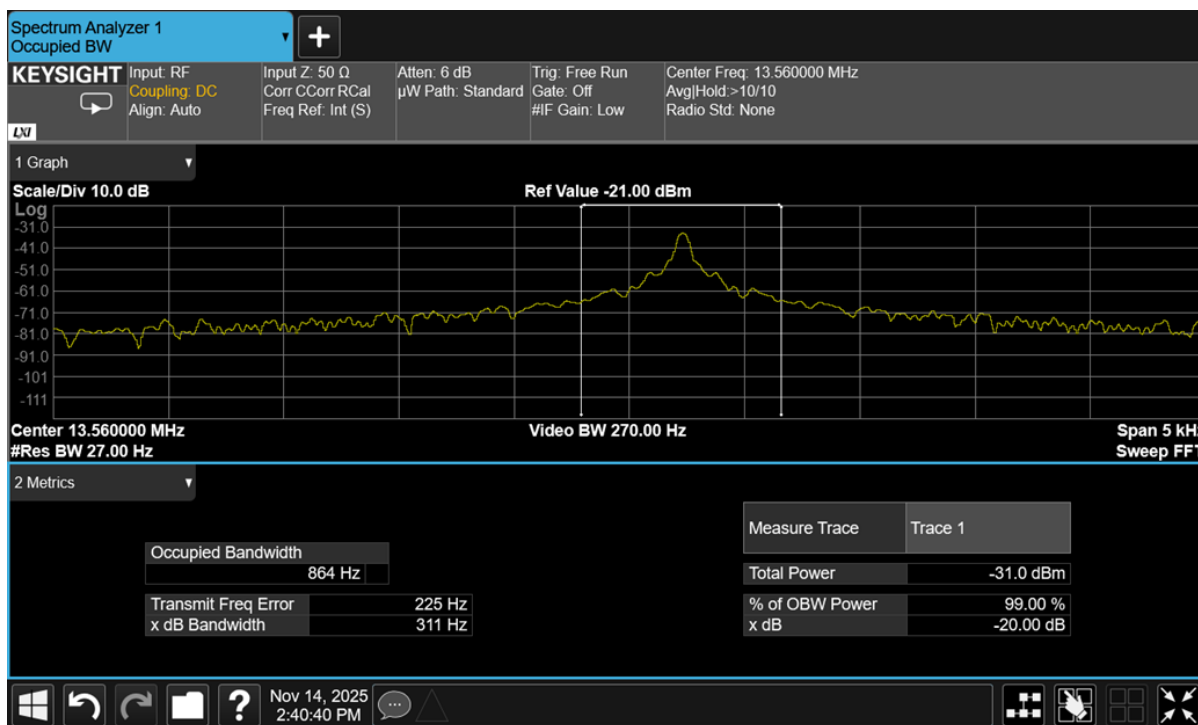
Table 6: Occupied Bandwidth Results

Frequency (MHz)	Bandwidth (kHz)	Limit	Pass/Fail
13.560	864 Hz	N/a	Pass

The occupied bandwidth was measured as shown



Figure 2: Occupied Bandwidth





4.2 Radiated Spurious Emissions: FCC §15.225, §15.209

Radiated emissions from the EUT must comply with the field strength limits as specified in FCC Part 15.225.

Table 7: Radiated Spurious Emissions Limits

Frequency (MHz)	Limit (μ V/m)	Rule Part Reference
13.553 - 13.567	15,848 (@ 30m)	§15.225(a)
13.410 – 13.553	334 (@ 30m)	§15.225(b)
13.567 – 13.710	334 (@ 30m)	§15.225(b)
13.110 – 13.410	106 (@ 30m)	§15.225(c)
13.710 – 14.010	106 (@ 30m)	§15.225(c)
1.705 – 13.110 14.010 – 30.0	30 (@ 30m)	§15.225(d)
30.00 – 88.00	100 (@ 3m)	§15.225(d)
88.00 – 216.00	150 (@ 3m)	§15.225(d)
216.00 – 960.00	200 (@ 3m)	§15.225(d)
Above 960	500 (@ 3m)	§15.225(d),

4.2.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on an Open Area Test Site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. For frequencies below 30MHz, the loop antenna was mounted on a tripod at a height of 1 meter and a distance of 10m from the EUT. The test loop antenna was rotated on its vertical axis and also placed horizontally in an effort to maximize the emissions. Highest Emissions in the direction of X, Y or Z azimuth of the loop antenna were recorded.

Above 30MHz, Biconical and log periodic broadband receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters at a distance of 3 meters from the EUT. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

Below 150 kHz, bandwidths used were 300Hz RBW and 10 kHz VBW. Between 150 kHz and 30MHz, bandwidths used were 10kHz RBW and 30kHz VBW. Above 30MHz, bandwidths used were 100 kHz RBW and 30kHz VBW.

Emissions were measured at 3m and at 10 m distance from the EUT using the Loop antenna.

A correction factor was used to adjust the 10-meter results to the equivalent result at 30 meters using the 40dB/decade roll-off.



Table 8: 30m Measurement Extrapolation

	30m Test Limit 334 (uV/m)=50.5 dBuV/m
Measurement Type	Extrapolated 30m Emissions Measurement
3m Measurement	3m Emissions Measurement (dBuV/m) - 40*Log (30/3) (dB)
10m Measurement	10m Emissions Measurement (dBuV/m) - 40*Log (30/10) (dB)

Emissions were scanned from 9 kHz to 1GHz, and emissions were measured using a QP and Peak detector. Worst case emissions are reported in the data table.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level):	VdB μ V
Antenna Factor (Ant Corr):	AFdB/m
Cable Loss Correction (Cable Corr):	CCdB
Amplifier Gain:	GdB (if applicable)
Electric Field (Corr Level):	EdB μ V/m = VdB μ V + AFdB/m + CCdB - GdB
To convert to linear units:	E μ V/m = antilog (EdB μ V/m/20)

4.2.2 Test Results

The EUT complies with the radiated emission requirements of §15.225. The following tables provide the test data.



Table 9: Radiated Emissions below 30MHz, NFC Fundamental, 3meter measurement distance

EUT Position (X, Y, & Z)	Antenna Position (X, Y, & Z)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Measured 3m Corr. Level (dBuV/m)	Extrapolated 30m Corr. Level (dBuV/m)	30m Limit (dBuV/m)	Margin (dB)	Detector
X	X	1.0	44.4	18.0	62.4	22.4	50.5	-28.1	Peak
X	Y	1.0	20.7	18.0	38.7	-1.3	50.5	-51.8	Peak
X	Z	1.0	35.9	18.0	53.9	13.9	50.5	-36.6	Peak
Y	X	1.0	30.4	18.0	48.4	8.4	50.5	-42.1	Peak
Y	Y	1.0	21.6	18.0	39.6	-0.4	50.5	-50.9	Peak
Y	Z	1.0	36.4	18.0	54.4	14.4	50.5	-36.1	Peak
Z	X	1.0	43.6	18.0	61.6	21.6	50.5	-28.9	Peak
Z	Y	1.0	22.1	18.0	40.1	0.1	50.5	-50.4	Peak
Z	Z	1.0	36.9	18.0	54.9	14.9	50.5	-35.6	Peak

Table 10: Radiated Emissions below 30MHz, NFC Fundamental, 10meter measurement distance

EUT Position (X, Y, & Z)	Antenna Position (X, Y, & Z)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Measured 3m Corr. Level (dBuV/m)	Extrapolated 30m Corr. Level (dBuV/m)	30m Limit (dBuV/m)	Margin (dB)	Detector
X	X	1.0	26.0	18.0	44.0	24.9	50.5	-25.6	Peak
X	Y	1.0	18.0	18.0	36.0	16.9	50.5	-33.6	Peak
X	Z	1.0	17.6	18.0	35.6	16.5	50.5	-34.0	Peak
Y	X	1.0	19.1	18.0	37.1	18.0	50.5	-32.5	Peak
Y	Y	1.0	16.8	18.0	34.8	15.7	50.5	-34.8	Peak
Y	Z	1.0	15.6	18.0	33.6	14.5	50.5	-36.0	Peak
Z	X	1.0	16.7	18.0	34.7	15.6	50.5	-34.9	Peak
Z	Y	1.0	17.8	18.0	35.8	16.7	50.5	-33.8	Peak
Z	Z	1.0	15.4	18.0	33.4	14.3	50.5	-36.2	Peak



Table 11: Radiated Emissions above 30MHz

Frequency (MHz)	Detector	Meas (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Turn Table (deg)	Antenna (cm)
58.563	QPeak	17.21	(1) 40	-22.79	90	Vert, 150
66.304	QPeak	18.7	(1) 40	-21.3	90	Vert, 150
128.29	QPeak	23.904	(1) 43.5	-19.596	90	Horiz, 150
191.476	QPeak	22.27	(1) 43.5	-21.23	90	Vert, 150
359.553	QPeak	24.712	(1) 46	-21.288	90	Horiz, 150
628.38	QPeak	29.201	(1) 46	-16.799	90	Vert, 150



4.3 Frequency Stability: FCC §15.225, §2.1055,

Frequency as a function of temperature and voltage variation shall be maintained within the FCC-prescribed tolerances. Per §15.225(e).

4.3.1 Test Procedure

The temperature stability was measured with the unit in an environmental chamber used to vary the temperature of the sample. The sample was held at each temperature step to allow the temperature of the sample to stabilize.

The frequency stability of the transmitter was examined at the voltage extremes and for the temperature range of -20°C to +50°C. The carrier frequency was measured while the EUT was in the temperature chamber. The reference frequency of the EUT was measured at the ambient room temperature with the frequency counter.

The frequency stabilities can be maintained to a lesser temperature range provided that the transmitter is automatically inhibited from operating outside the lesser temperature range.

The RF carrier frequency shall not depart from the reference frequency (reference frequency is the frequency at 20°C and rated supply voltage) more than +/-1356 Hz.

The EUT was powered by 24Vdc voltage.

Per ANSI 63.10 the EUT was tested at each temperature at the turn on point, 2-minute point, 5-minute point, and 10-minute point.

4.3.2 Test Results

The EUT complies with the temperature stability requirements of the specified standards. Test results are given in



Table 12: Frequency Stability Test Data

Temperature (C)	Frequency (MHz)	Deviation (Hz)	Limit (+/- Hz)	Pass/Fail
18.3(ambient)	13.5603	0	1356	NA
-20	13.5603	0	1356	Pass
-10	13.56033	30	1356	Pass
0	13.56033	30	1356	Pass
10	13.56025	-50	1356	Pass
20	13.560425	125	1356	Pass
30	13.56018	-120	1356	Pass
40	13.56012	-180	1356	Pass
50	13.560065	-235	1356	Pass