NORTHWEST EMC

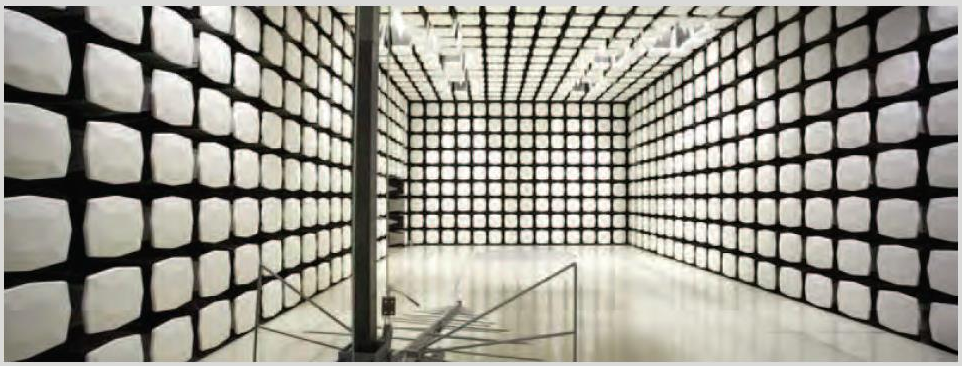
Senseonics Incorporated

Phoenix

FCC 15.225:2016

13.56 MHz RFID Radio

Report # MINN0064.2



NVLAP TESTING

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: September 15, 2016
Senseonics Incorporated
Model: Phoenix

Radio Equipment Testing

Standards

Specification	Method
FCC 15.225:2016	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
6.4	Field Strength of Fundamental	Yes	Pass	
6.4	Field Strength of Spurious Emissions Less Than 30 MHz	Yes	Pass	
6.5	Field Strength of Spurious Emissions Greater Than 30 MHz	Yes	Pass	
6.8	Frequency Stability	Yes	Pass	

Deviations from Test Standards

None

Approved By:

Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2016.7.25

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Validated by the European Commission as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

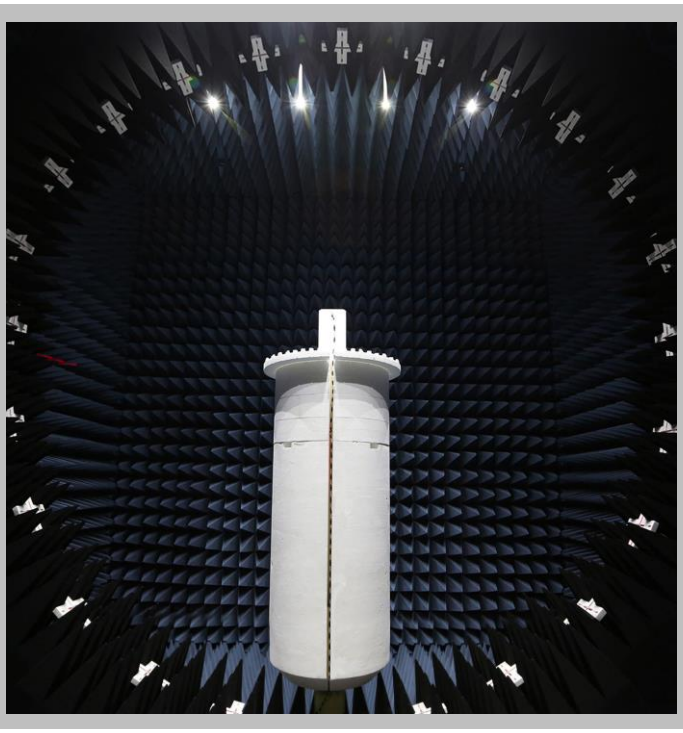
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

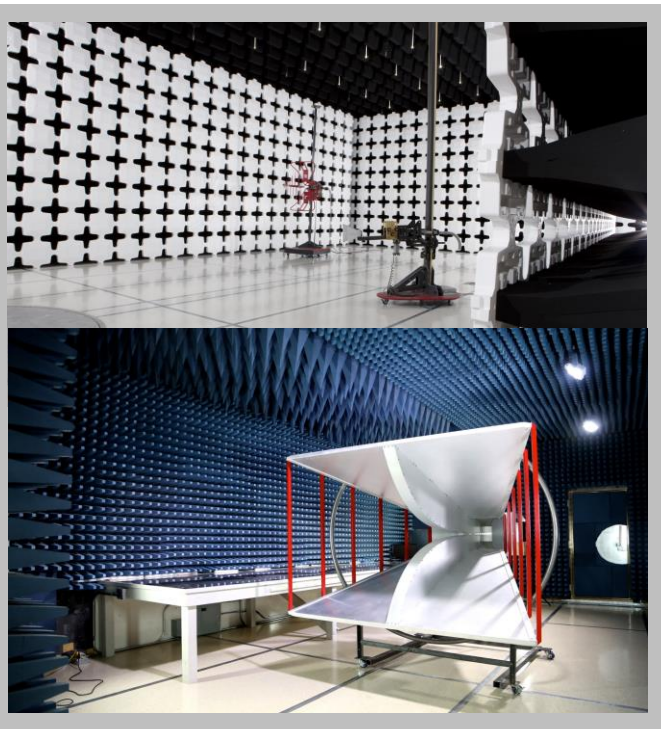
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES

NORTHWEST EMC
REV 2016.7.25

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157





PRODUCT DESCRIPTION

2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Senseonics Incorporated
Address:	20451 Seneca Meadows Parkway
City, State, Zip:	Germantown, MD 20876
Test Requested By:	Steve Takata of Minnetronix, Inc.
Model:	Phoenix
First Date of Test:	September 9, 2016
Last Date of Test:	September 15, 2016
Receipt Date of Samples:	August 30, 2016
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Transmitter for glucose monitoring system

Testing Objective:
To demonstrate compliance to FCC Part 15.225 specifications.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration MINN0064- 4

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Phoenix Transmitter	Senseonics Incoporated	DBR #3657 S07	00144

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Latitude (Laptop)	Dell	N13-13-04-002	6430U
Charging Base (Phoenix)	Senseonics Incoporated	CM-0003-94-5	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter (Laptop)	Dell	06C3W2	CN-06C3W2-72438-62P-390B-A02

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Extender	No	1.5m	No	USB Cable	Latitude (Laptop)
USB Cable	No	80cm	Yes	Charging Base (Phoenix)	USB Extender
AC Cable (Laptop)	No	1.6m	No	AC Adapter (Laptop)	AC Mains
DC Cable (Laptop)	No	80cm	No	AC Adapter (Laptop)	Latitude (Laptop)

Configuration MINN0064- 5

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Phoenix Transmitter	Senseonics Incoporated	DBR #3657 S07	00144

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Latitude (Laptop)	Dell	N13-13-04-002	6430U
Charging Base (Phoenix)	Senseonics Incoporated	CM-0003-94-5	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Extender	No	1.5m	No	USB Cable	Latitude (Laptop)
USB Cable	No	80cm	Yes	Charging Base (Phoenix)	USB Extender

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration MINN0064- 6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hybrid Phoenix Transmitter	Senseonics Incoporated	DBR #3657 S07	00144

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Power Supply	EZ	TQK	TQK

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	1.3m	No	Hybrid Phoenix Transmitter	TQK
USB Cable	No	80cm	Yes	Charging Base (Phoenix)	Unterminated

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/9/2016	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	9/9/2016	Field Strength of Spurious Emissions Less than 30MHz	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	9/13/2016	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	9/15/2016	Field Strength of Spurious Emissions Greater than 30MHz	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

FIELD STRENGTH OF FUNDAMENTAL

PSA-ESCI 2016.07.22

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Active NFC Tx at 13.56MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MINN0064 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	12.9 MHz	Stop Frequency	14.3 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	MN04 Horn Cables	MNE	2/26/2016	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	6/17/2016	12 mo
Antenna	ETS Lindgren	6502	AOB	4/28/2015	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

While scanning, fundamental carrier from the EUT was maximized by rotating the EUT, adjusting the measurement antenna height and orientation in 3 orthogonal planes, the EUT and/or associated antenna is positioned in 3 orthogonal planes (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

FIELD STRENGTH OF FUNDAMENTAL

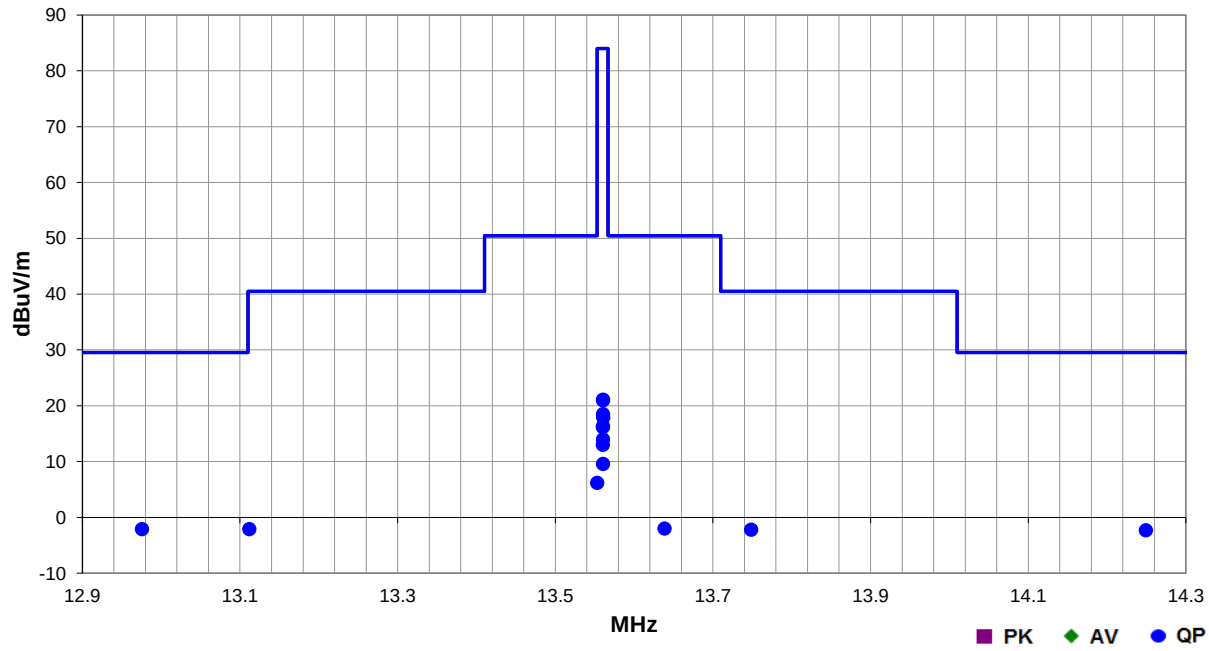
NORTHWEST EMC

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	MINN0064	**Date:**	09/09/16		
Project:	None	**Temperature:**	22.1 °C		
Job Site:	MN04	**Humidity:**	56.5% RH		
Serial Number:	00144	**Barometric Pres.:**	1013 mbar	**Tested by:**	Trevor Buls, Kyle McMullan
EUT:	Phoenix				
Configuration:	4				
Customer:	Senseonics Incorporated				
Attendees:	Carlos Gonzalez				
EUT Power:	Battery				
Operating Mode:	Active NFC Tx at 13.56MHz				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.225:2016	ANSI C63.10:2013

Run #	13	**Test Distance (m)**	10	**Antenna Height(s)**	1(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12.976	6.3	10.7	1.0	264.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.1	29.5	-31.6	EUT On Side
14.249	6.1	10.7	1.0	61.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.3	29.5	-31.8	EUT On Side
13.112	6.3	10.7	1.0	108.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.1	40.5	-42.6	EUT On Side
13.749	6.1	10.8	1.0	91.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.2	40.5	-42.7	EUT On Side
13.553	14.5	10.8	1.0	223.0	10.0	0.0	Perp to EUT	QP	-19.1	6.2	50.5	-44.3	EUT On Side
13.639	6.3	10.8	1.0	234.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.0	50.5	-52.5	EUT On Side
13.561	29.4	10.8	1.0	170.0	10.0	0.0	Perp to EUT	QP	-19.1	21.1	84.0	-62.9	EUT On Side
13.561	29.3	10.8	1.0	264.0	10.0	0.0	Perp to EUT	QP	-19.1	21.0	84.0	-63.0	EUT Horz
13.561	26.8	10.8	1.0	21.0	10.0	0.0	Par to Floor	QP	-19.1	18.5	84.0	-65.5	EUT On Side
13.561	26.2	10.8	1.0	266.0	10.0	0.0	Par to Floor	QP	-19.1	17.9	84.0	-66.1	EUT Horz
13.561	24.6	10.8	1.0	282.0	10.0	0.0	Par to EUT	QP	-19.1	16.3	84.0	-67.7	EUT On Side
13.560	24.5	10.8	1.0	4.0	10.0	0.0	Par to EUT	QP	-19.1	16.2	84.0	-67.8	EUT Horz
13.560	22.3	10.8	1.0	275.0	10.0	0.0	Perp to EUT	QP	-19.1	14.0	84.0	-70.0	EUT Vert
13.560	21.3	10.8	1.0	237.0	10.0	0.0	Par to Floor	QP	-19.1	13.0	84.0	-71.0	EUT Vert
13.561	17.9	10.8	1.0	64.0	10.0	0.0	Par to EUT	QP	-19.1	9.6	84.0	-74.4	EUT Vert

FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ

PSA-ESCI 2016.07.22

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting NFC at 13.56MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MINN0064 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	9 kHz	Stop Frequency	30 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	MN04 Horn Cables	MNE	2/26/2016	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	6/17/2016	12 mo
Antenna	ETS Lindgren	6502	AOB	4/28/2015	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and orientation in 3 orthogonal planes, the EUT and/or associated antenna is positioned in 3 orthogonal planes (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

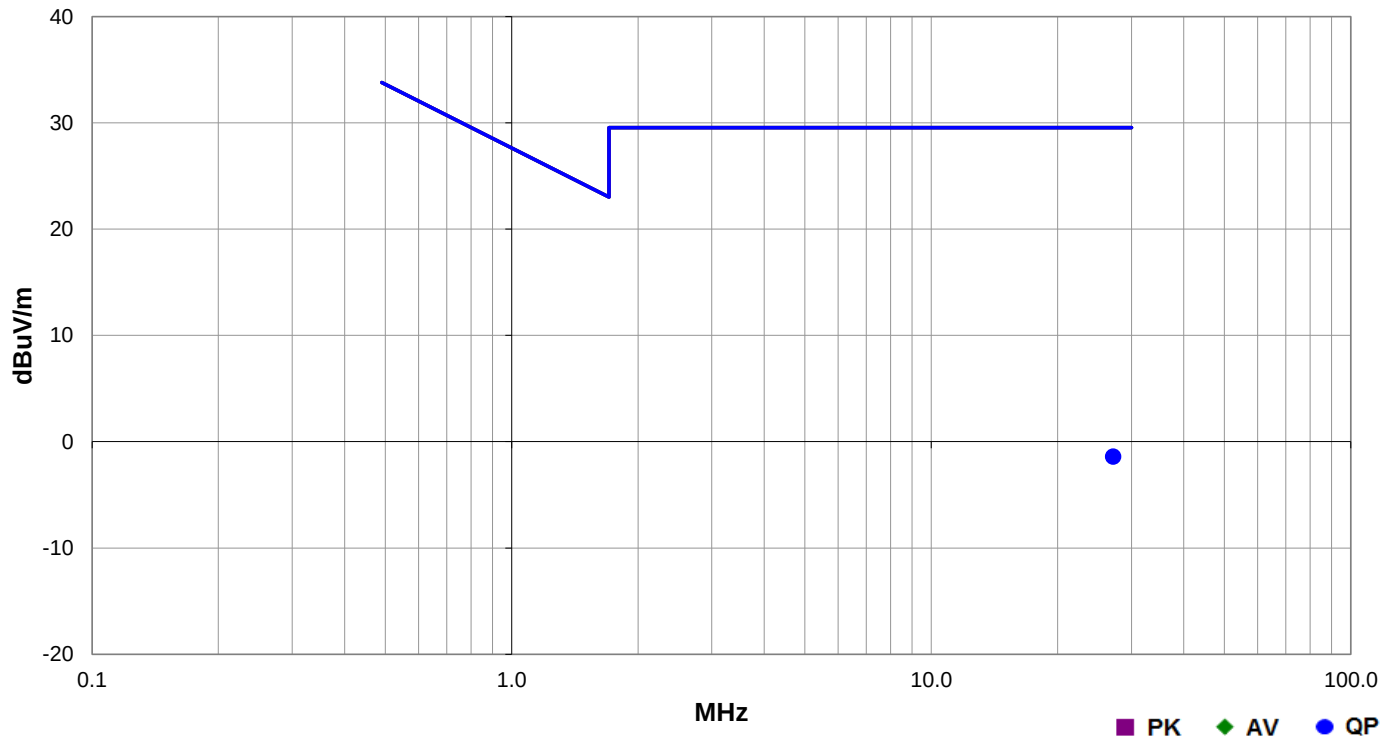
FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHZ

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	MINN0064	**Date:**	09/09/16	Trevor Buls	
Project:	None	**Temperature:**	22.1 °C		
Job Site:	MN04	**Humidity:**	56.5% RH		
Serial Number:	00144	**Barometric Pres.:**	1013 mbar	**Tested by:**	Trevor Buls, Kyle McMullan
EUT:	Phoenix				
Configuration:	5				
Customer:	Sensonics Incorporated				
Attendees:	Carlos Gonzalez				
EUT Power:	Battery				
Operating Mode:	Transmitting NFC at 13.56MHz				
Deviations:	None				
Comments:	Perp to EUT, EUT on Side				

Test Specifications	**Test Method**
FCC 15.225:2016	ANSI C63.10:2013

Run #	21	**Test Distance (m)**	10	**Antenna Height(s)**	1(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
27.120	8.4	9.3	1.0	166.0	10.0	0.0	Perp to EUT	QP	-19.1	-1.4	29.5	-30.9

FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ

PSA-ESCI 2016.07.22

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting NFC at 13.56MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MINN0064 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	1000 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Generator - Signal	Agilent	N5183A	TIK	10/17/2014	36 mo
Power Sensor	Agilent	N8481A	SQN	8/15/2016	12 mo
Meter - Power	Agilent	N1913A	SQL	8/15/2016	12 mo
Antenna - Dipole	EMCO	3121C-DB4	ADI	2/10/2016	36 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	6/17/2016	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/7/2015	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	1/6/2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/10/2015	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2013).

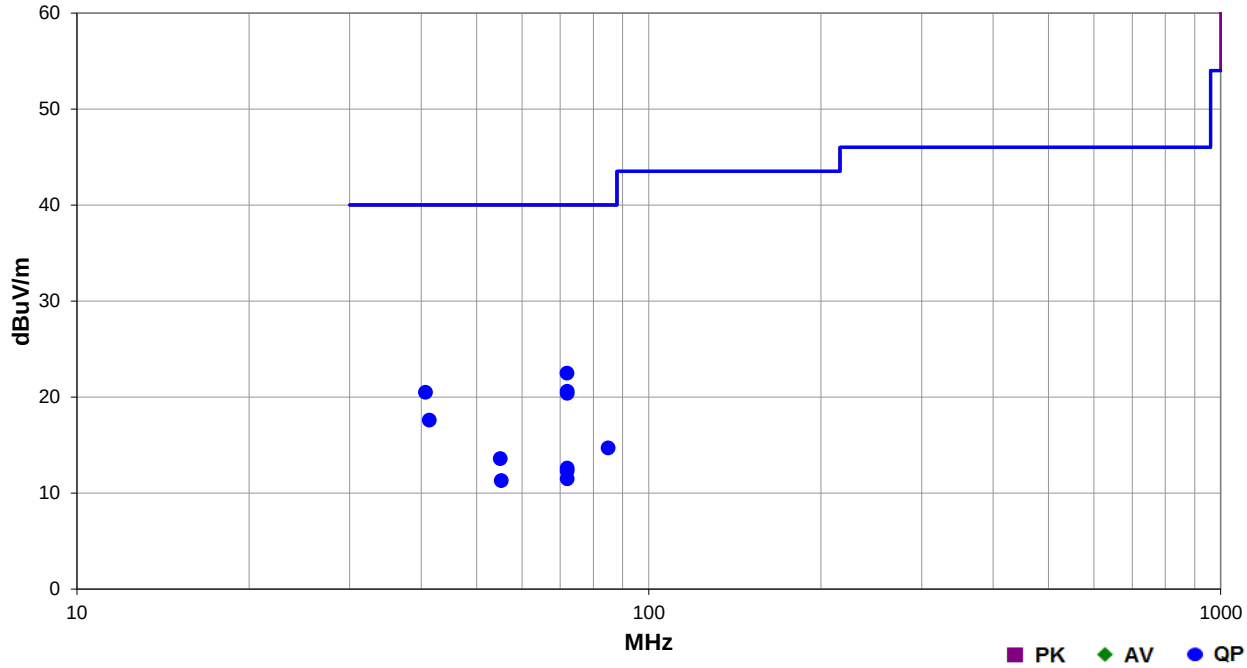
FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHZ

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	MINN0064	**Date:**	09/15/16		
Project:	None	**Temperature:**	23.3 °C		
Job Site:	MN05	**Humidity:**	58.7% RH		
Serial Number:	00144	**Barometric Pres.:**	1022 mbar	**Tested by:**	Cole Ghizzone, Kyle McMullan
EUT:	Phoenix				
Configuration:	4				
Customer:	Senseonics Incorporated				
Attendees:	Carlos Gonzalez				
EUT Power:	Battery				
Operating Mode:	Transmitting NFC at 13.56MHz				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.225:2016	ANSI C63.10:2013

Run #	2	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
71.953	32.2	-9.7	1.5	89.0	3.0	0.0	Vert	QP	0.0	22.5	40.0	-17.5	Tx EUT Horz
71.962	30.3	-9.7	1.2	146.0	3.0	0.0	Vert	QP	0.0	20.6	40.0	-19.4	Tx EUT On Side
40.683	19.9	0.6	1.0	96.0	3.0	0.0	Vert	QP	0.0	20.5	40.0	-19.5	Tx EUT Horz
72.002	30.1	-9.7	1.2	114.0	3.0	0.0	Vert	QP	0.0	20.4	40.0	-19.6	Tx EUT Vert
41.327	17.3	0.3	1.0	201.0	3.0	0.0	Horz	QP	0.0	17.6	40.0	-22.4	Tx EUT Vert
84.869	23.9	-9.2	1.5	167.1	3.0	0.0	Vert	QP	0.0	14.7	40.0	-25.3	Tx EUT Horz
54.968	19.5	-5.9	1.0	95.1	3.0	0.0	Vert	QP	0.0	13.6	40.0	-26.4	Tx EUT Horz
71.973	22.3	-9.7	4.0	67.0	3.0	0.0	Horz	QP	0.0	12.6	40.0	-27.4	Tx EUT Vert
71.972	22.0	-9.7	3.6	107.0	3.0	0.0	Horz	QP	0.0	12.3	40.0	-27.7	Tx EUT Horz
71.965	21.2	-9.7	1.9	107.0	3.0	0.0	Horz	QP	0.0	11.5	40.0	-28.5	Tx EUT On Side
55.218	17.2	-5.9	1.0	56.0	3.0	0.0	Horz	QP	0.0	11.3	40.0	-28.7	Tx EUT Vert

FREQUENCY STABILITY

XMit 2016.05.06

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Meter - Multimeter	Fluke	117	MLS	1/20/2014	1/20/2017
Power Supply - DC	EZ Digital Co., Ltd.	GP-4030D	TQK	NCR	NCR
Thermometer	Omega Engineering, Inc.	HH311	DUB	11/3/2014	11/3/2017
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-32-3.5-SCT/AC	TBF	10/21/2015	10/21/2016
Probe - Near Field Set	ETS Lindgren	7405	IPO	NCR	NCR
Block - DC	Fairview Microwave	SD3379	AMI	9/18/2015	9/18/2016
Attenuator	S.M. Electronics	SA26B-20	RFW	2/26/2016	2/26/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFG	6/17/2016	6/17/2017

TEST DESCRIPTION

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously polling.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -20 ° to +50° C and at 10°C intervals.

The requirement of a frequency tolerance of ±0.01% is equivalent to 100 ppm
The formula to check for compliance is:

ppm = (Measured Frequency / Measured Nominal Frequency - 1) * 1,000,000

FREQUENCY STABILITY

NORTHWEST EMC

XMit 2016.05.06

EUT:	Phoenix			**Work Order:**	MINN0064
Serial Number:	00144			**Date:**	09/13/16
Customer:	Senseonics Incorporated			**Temperature:**	23 °C
Attendees:	Steve Takata			**Humidity:**	57.8% RH
Project:	None			**Barometric Pres.:**	1013 mbar
Tested by:	Cole Ghizzone, Kyle McMullan	**Power:**	4.2VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	**Test Method**
FCC 15.225:2016	ANSI C63.10:2013

COMMENTS

None

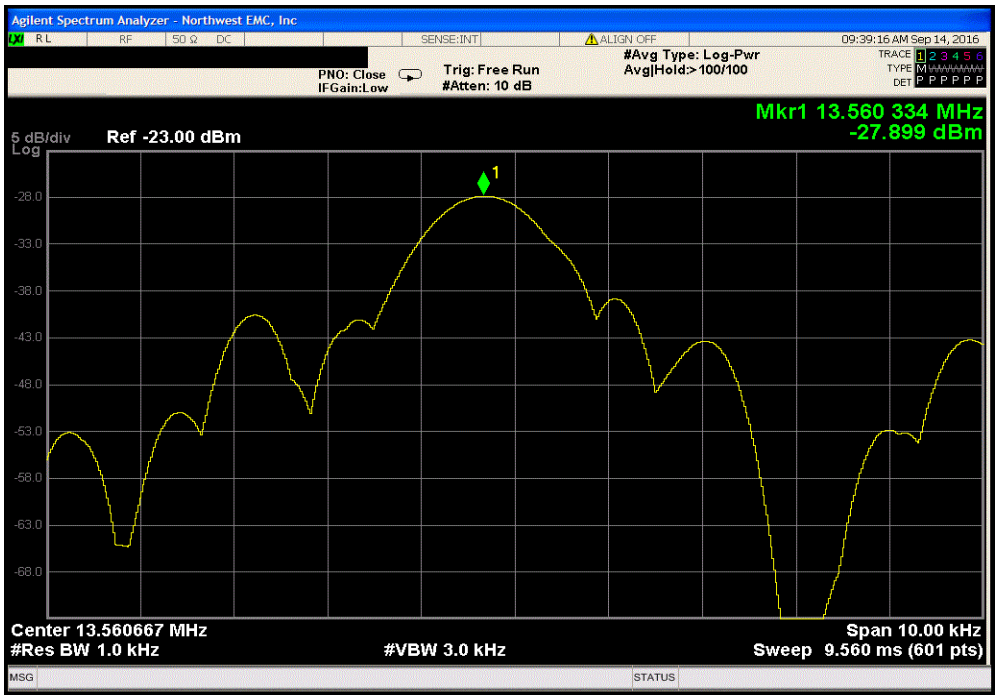
DEVIATIONS FROM TEST STANDARD

None

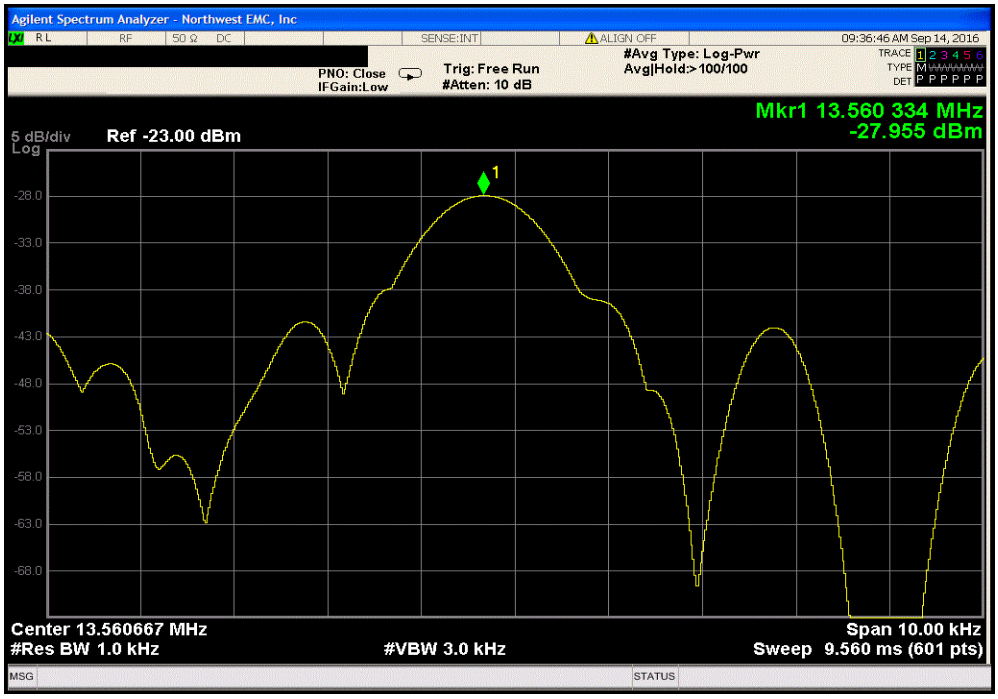
Configuration #	6	*Signature*

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz					
Voltage: 115%	13.56033367	13.56	24.6	100	Pass
Voltage: 100%	13.56033367	13.56	24.6	100	Pass
Voltage: 85%	13.56033367	13.56	24.6	100	Pass
Temperature: +50°	13.560317	13.56	23.4	100	Pass
Temperature: +40°	13.56033367	13.56	24.6	100	Pass
Temperature: +30°	13.56040033	13.56	29.5	100	Pass
Temperature: +20°	13.56046633	13.56	34.4	100	Pass
Temperature: +10°	13.560534	13.56	39.4	100	Pass
Temperature: 0°	13.56066667	13.56	49.2	100	Pass
Temperature: -10°	13.56063333	13.56	46.7	100	Pass
Temperature: -20°	13.56060067	13.56	44.3	100	Pass

13.56 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56033367	13.56	24.6	100	Pass



13.56 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56033367	13.56	24.6	100	Pass



FREQUENCY STABILITY

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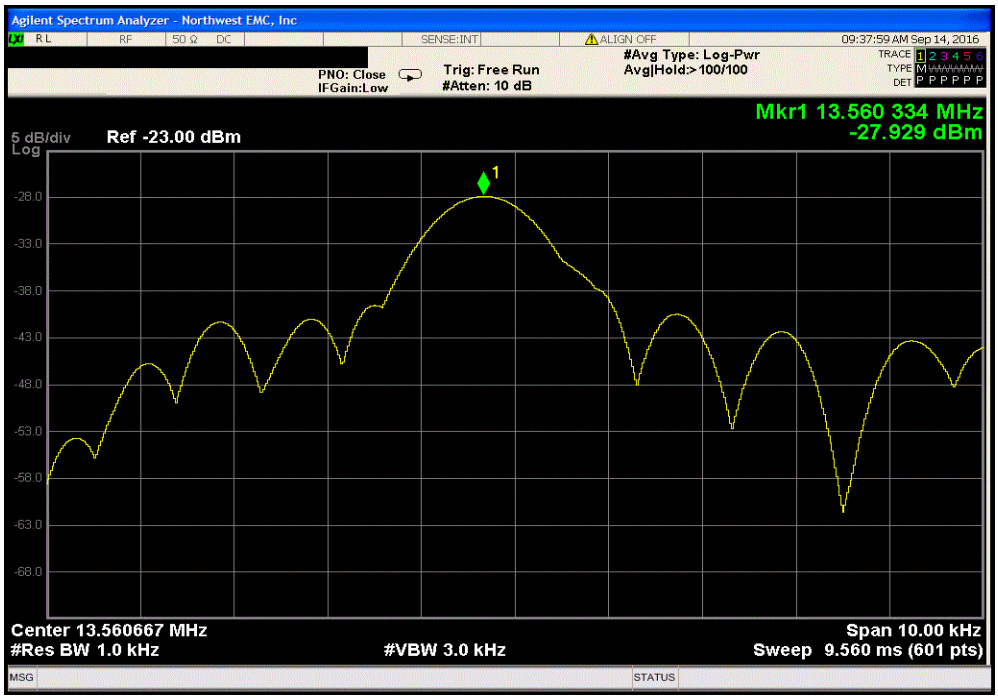
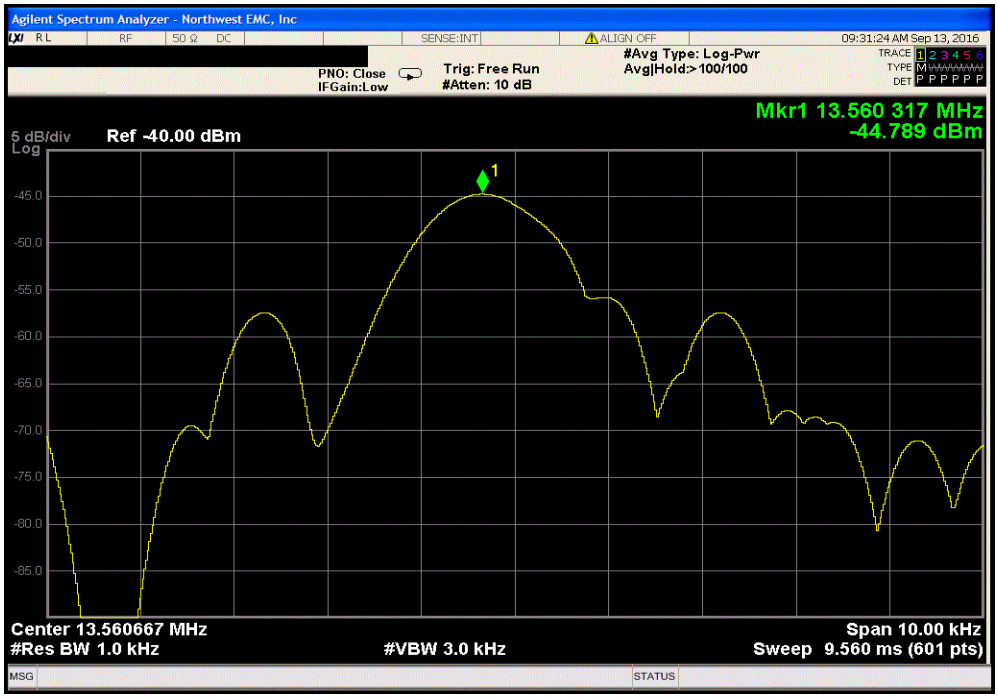
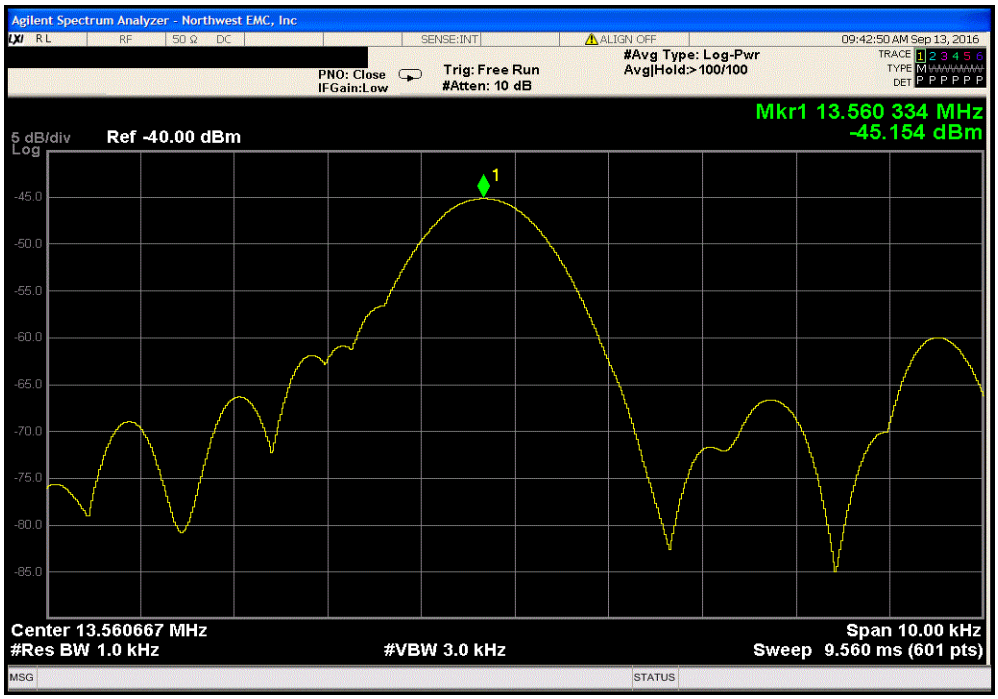
13.56 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56033367	13.56	24.6	100	Pass



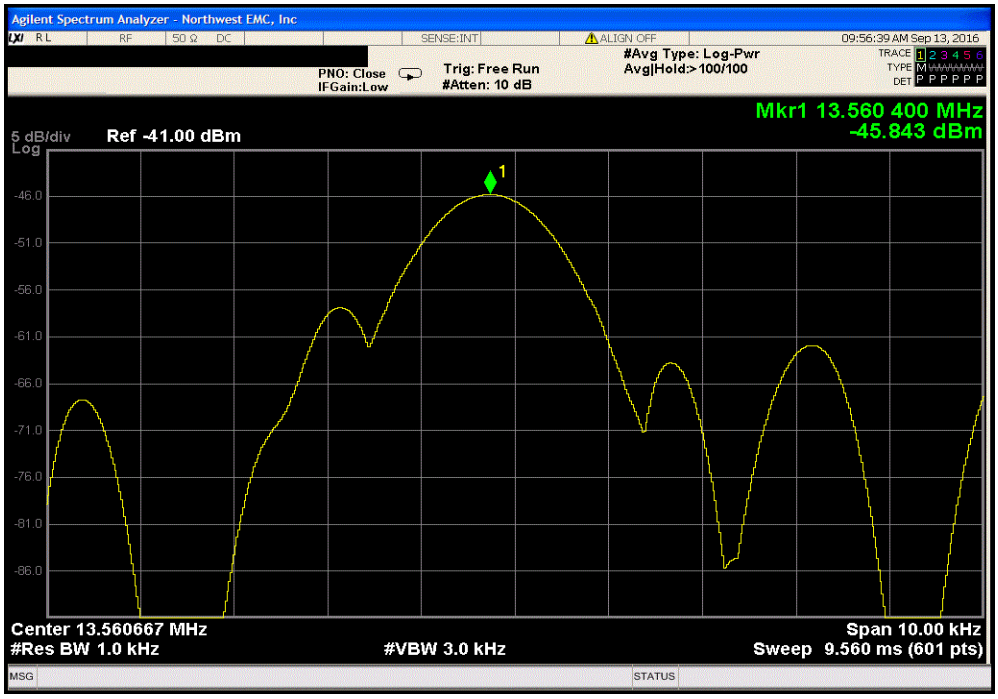
13.56 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560317	13.56	23.4	100	Pass



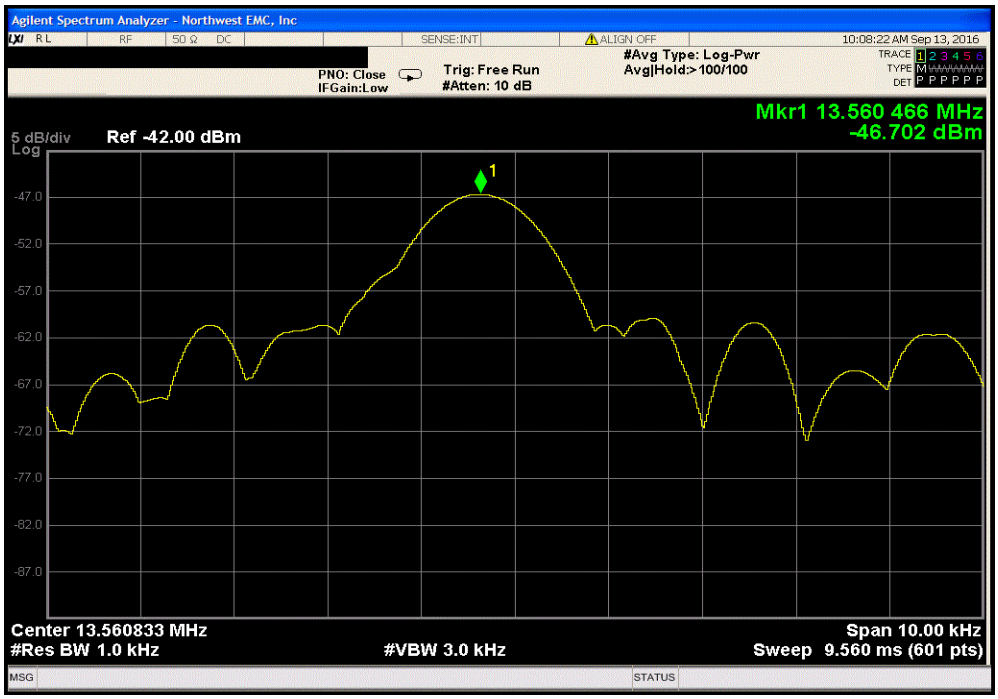
13.56 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56033367	13.56	24.6	100	Pass



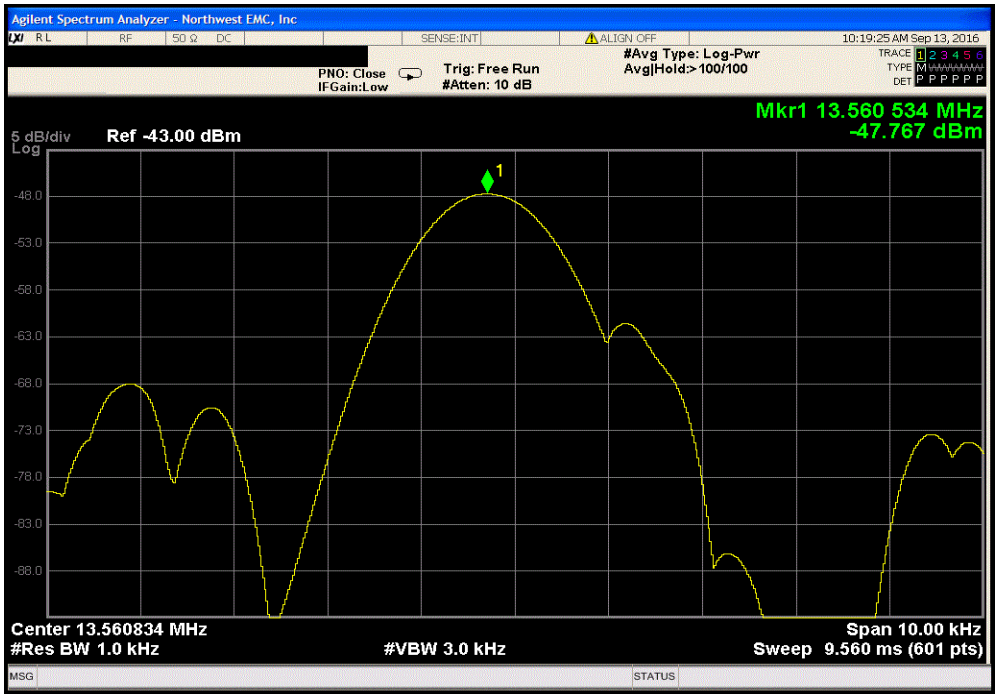
13.56 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56040033	13.56	29.5	100	Pass



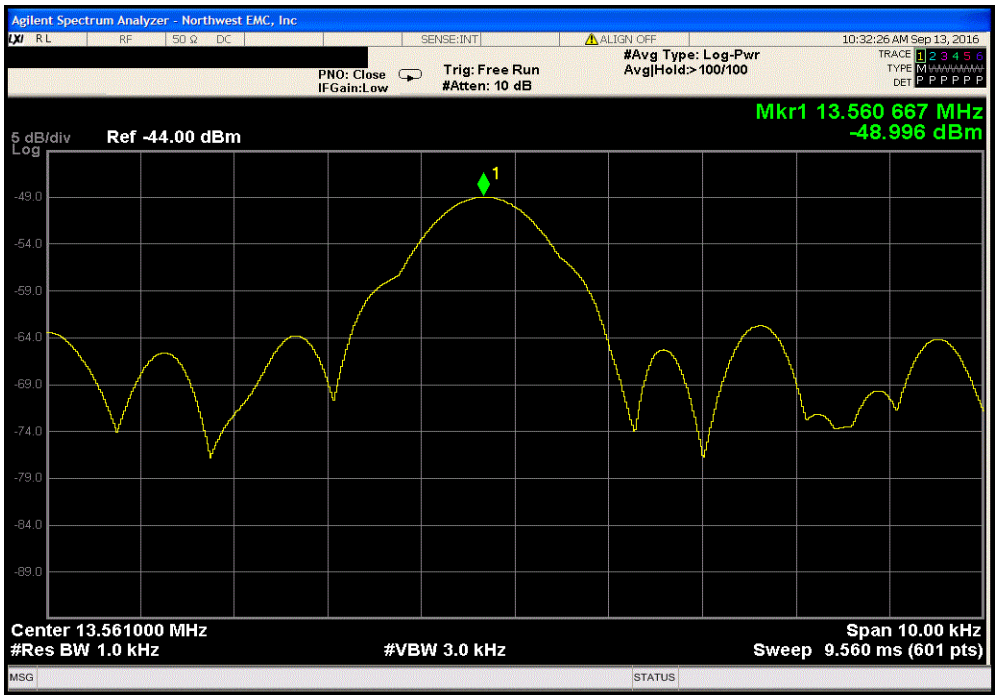
13.56 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56046633	13.56	34.4	100	Pass



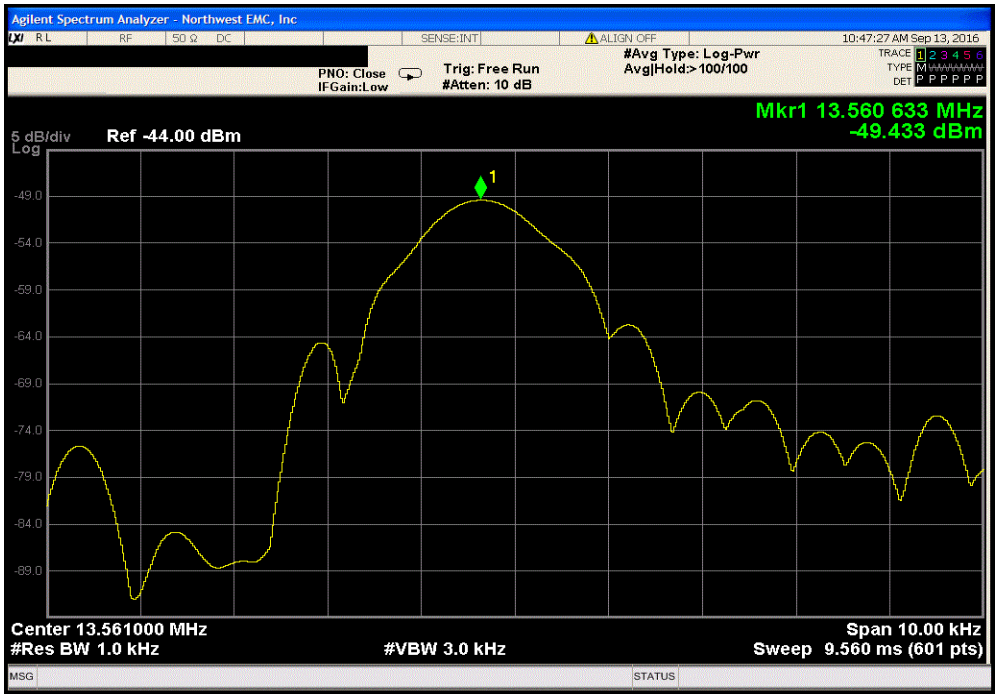
13.56 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560534	13.56	39.4	100	Pass



13.56 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56066667	13.56	49.2	100	Pass



13.56 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56063333	13.56	46.7	100	Pass



FREQUENCY STABILITY

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13.56 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.56060067	13.56	44.3	100	Pass