NORTHWEST EMC

Onity Inc., A Division of UTCFS

HT34 RFID BTLE

FCC 15.225:2015

Report # ONIT0006.1

NVLAP Lab Code: 200630-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: October 09, 2015
Onity Inc., A Division of UTCFS
Model: HT34 RFID BTLE
For a complete model list, reference document P/N 10104094P1
(DOC, HT34 RFID BTLE MODEL LIST)

Radio Equipment Testing

Standards

Specification	Method
FCC 15.225:2015	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 2015.2.19

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

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and 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.

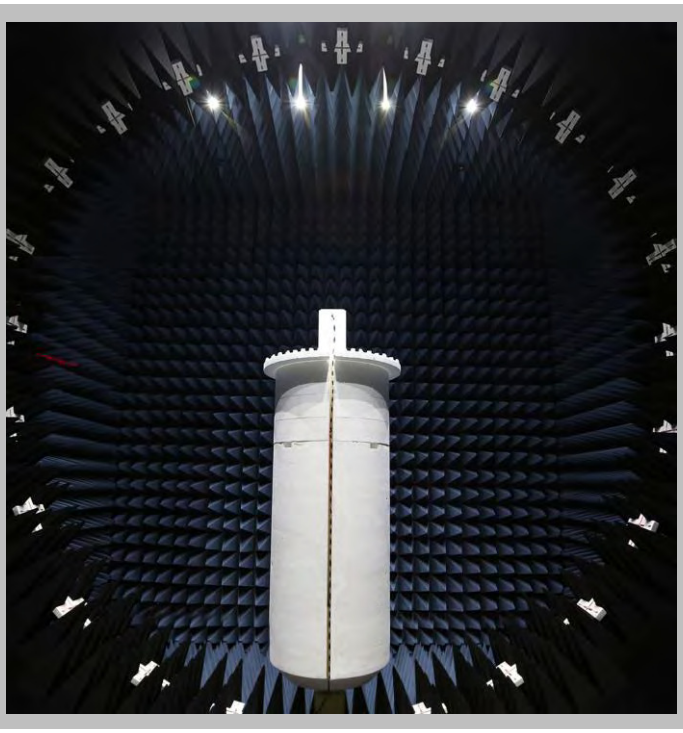
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

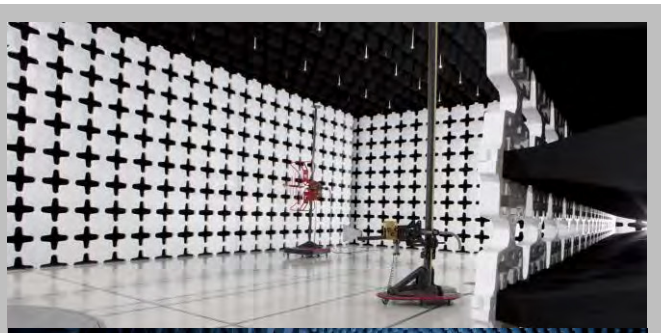
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%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

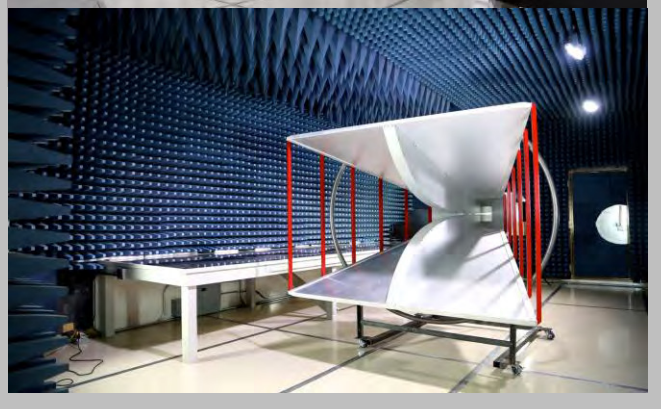
FACILITIES

NORTHWEST EMC
REV 2015.2.19

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 9801 (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
Industry 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

NORTHWEST EMC
2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Onity Inc., A Division of UTCFS
Address:	4001 Fairview Industrial Drive
City, State, Zip:	Salem, OR 97302-1142
Test Requested By:	Mike Gersztyn
Model:	HT34 RFID BTLE
First Date of Test:	September 18, 2015
Last Date of Test:	October 09, 2015
Receipt Date of Samples:	August 31, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
RFID card controlled lock w/ DirectKey module

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

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ONIT0006- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RFID Door lock	Onity Inc., A Division of UTCFS	HT34 RFID BTLE	None

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/18/2015	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	9/18/2015	Field Strength of Spurious Emissions less than 30 MHz	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	10/9/2015	Field Strength of Spurious Emissions greater than 30 MHz	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	10/9/2015	Frequency Stability	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

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

Continuous Tx at 13.56MHz.

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ONIT0006 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	12.5 MHz	Stop Frequency	14.5 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	None	10m Test Distance Cable	EVL	5/11/2015	12 mo
Antenna, Loop	EMCO	6502	AOA	6/24/2014	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4443A	AFB	3/17/2015	12 mo

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.

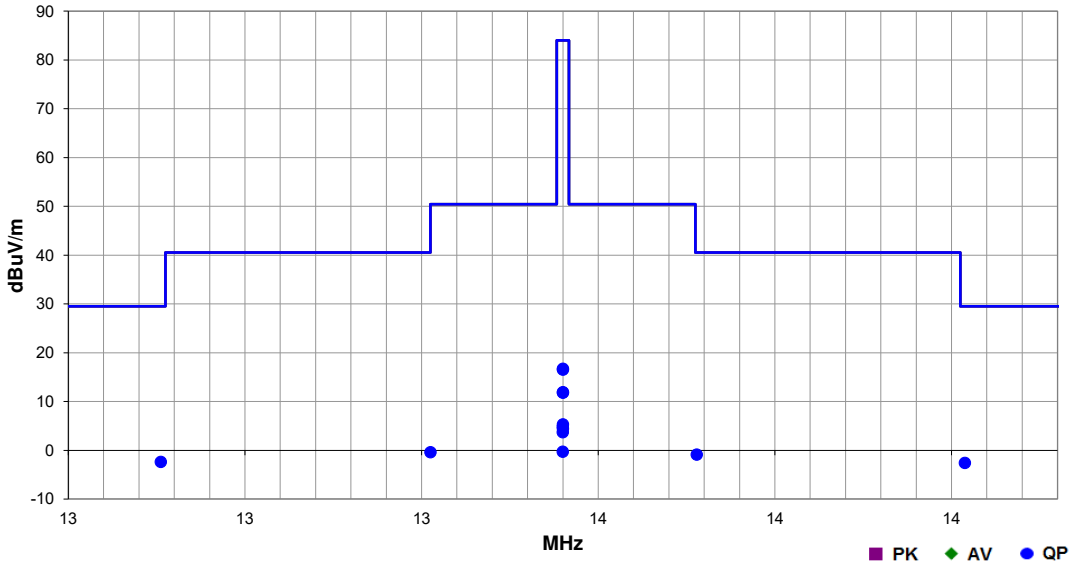
As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of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

FIELD STRENGTH OF FUNDAMENTAL

Work Order:	ONIT0006	**Date:**	09/18/15		
Project:	None	**Temperature:**	21.8 °C		
Job Site:	EV11	**Humidity:**	43.4% RH		
Serial Number:	None	**Barometric Pres.:**	1012.2 mbar	**Tested by:**	Cole Ghizzone, Brandon Hobbs
EUT:	HT34 RFID BTLE				
Configuration:	1				
Customer:	Onity Inc., A Division of UTCFS				
Attendees:	Mike Gersztyn				
EUT Power:	Battery				
Operating Mode:	Continuous Tx at 13.56MHz.				
Deviations:	None				
Comments:	See data comments for EUT orientation.				

Test Specifications	**Test Method**
FCC 15.225:2015	ANSI C63.10:2013

Run #	0	**Test Distance (m)**	10	**Antenna Height(s)**	1m	**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
13.105	5.9	10.8	1.0	29.0	10.0	0.0	See Comments	QP	-19.1	-2.4	29.5	-31.9	Ant. Perp to floor and perp to EUT, EUT On Side
14.015	5.7	10.8	1.0	36.0	10.0	0.0	See Comments	QP	-19.1	-2.6	29.5	-32.1	Ant. Perp to floor and perp to EUT, EUT On Side
13.410	7.9	10.8	1.0	247.0	10.0	0.0	See Comments	QP	-19.1	-0.4	40.5	-40.9	Ant. Perp to floor and perp to EUT, EUT On Side
13.712	7.4	10.8	1.0	41.0	10.0	0.0	See Comments	QP	-19.1	-0.9	40.5	-41.4	Ant. Perp to floor and perp to EUT, EUT On Side
13.560	25.0	10.8	1.0	282.0	10.0	0.0	See Comments	QP	-19.1	16.7	84.0	-67.3	Ant. Perp to floor and perp to EUT, EUT On Side
13.560	24.8	10.8	1.0	291.0	10.0	0.0	See Comments	QP	-19.1	16.5	84.0	-67.5	Ant. Perp to floor and perp to EUT, EUT Vert
13.560	20.2	10.8	1.0	29.0	10.0	0.0	See Comments	QP	-19.1	11.9	84.0	-72.1	Ant. Perp to floor and para to EUT, EUT On Side
13.560	20.1	10.8	1.0	21.0	10.0	0.0	See Comments	QP	-19.1	11.8	84.0	-72.2	Ant. Perp to floor and para to EUT, EUT Vert
13.560	13.6	10.8	1.0	290.0	10.0	0.0	See Comments	QP	-19.1	5.3	84.0	-78.7	Ant. Para to floor and perp to EUT, EUT Vert
13.560	13.1	10.8	1.0	265.0	10.0	0.0	See Comments	QP	-19.1	4.8	84.0	-79.2	Ant. Para to floor and perp to EUT, EUT On Side
13.560	12.7	10.8	1.0	303.0	10.0	0.0	See Comments	QP	-19.1	4.4	84.0	-79.6	Ant. Perp to floor and para to EUT, EUT Horz
13.560	12.0	10.8	1.0	295.0	10.0	0.0	See Comments	QP	-19.1	3.7	84.0	-80.3	Ant. Perp to floor and perp to EUT, EUT Horz
13.560	8.0	10.8	1.0	200.0	10.0	0.0	See Comments	QP	-19.1	-0.3	84.0	-84.3	Ant. Para to floor and perp to EUT, EUT Horz

FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHz

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

Continuous Tx at 13.56MHz.

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ONIT0006-1

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	None	10m Test Distance Cable	EVL	5/11/2015	12 mo
Antenna, Loop	EMCO	6502	AOA	6/24/2014	24 mo
Spectrum Analyzer	Agilent	E4443A	AFB	3/17/2015	12 mo

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.

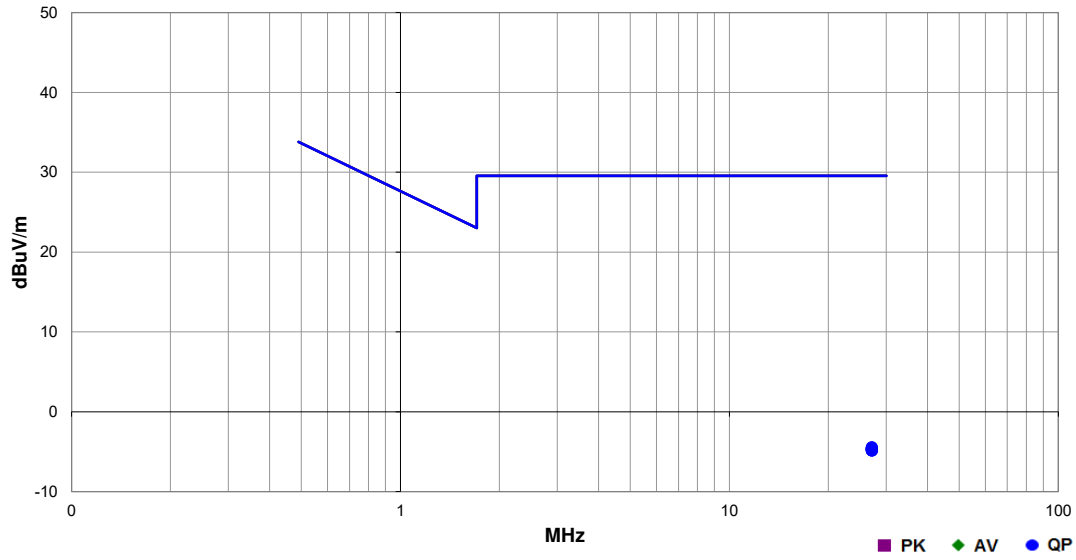
As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of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

FIELD STRENGTH OF SPURIOUS EMISSIONS LESS THAN 30 MHz

Work Order:	ONIT0006	**Date:**	09/18/15		
Project:	None	**Temperature:**	23 °C		
Job Site:	EV11	**Humidity:**	41% RH		
Serial Number:	None	**Barometric Pres.:**	1010 mbar	**Tested by:**	Cole Ghizzone, Brandon Hobbs
EUT:	HT34 RFID BTLE				
Configuration:	1				
Customer:	Onity Inc., A Division of UTCFS				
Attendees:	Mike Gersztyn				
EUT Power:	Battery				
Operating Mode:	Continuous Tx at 13.56MHz.				
Deviations:	None				
Comments:	See Data comments for EUT orientation				

Test Specifications	**Test Method**
FCC 15.225:2015	ANSI C63.10:2013

Run #	11	**Test Distance (m)**	10	**Antenna Height(s)**	1m	**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
27.117	5.7	8.9	1.0	109.0	10.0	0.0	Vert	QP	-19.1	-4.4	29.5	-34.0	Ant. Para to floor and perp to EUT, EUT On Side
27.118	5.5	8.9	1.0	197.0	10.0	0.0	Horz	QP	-19.1	-4.6	29.5	-34.2	Ant. Perp to floor and perp to EUT, EUT Vert
27.118	5.5	8.9	1.0	59.0	10.0	0.0	Vert	QP	-19.1	-4.6	29.5	-34.2	Ant. Para to floor and perp to EUT, EUT Horz
27.119	5.5	8.9	1.0	194.0	10.0	0.0	Horz	QP	-19.1	-4.6	29.5	-34.2	Ant. Perp to floor and perp to EUT, EUT On Side
27.124	5.5	8.9	1.0	287.0	10.0	0.0	Horz	QP	-19.1	-4.6	29.5	-34.2	Ant. Perp to floor and perp to EUT, EUT Horz
27.116	5.4	8.9	1.0	246.0	10.0	0.0	Vert	QP	-19.1	-4.7	29.5	-34.3	Ant. Para to floor and perp to EUT, EUT Vert
27.120	5.3	8.9	1.0	142.0	10.0	0.0	Horz	QP	-19.1	-4.8	29.5	-34.4	Ant. Perp to floor and para to EUT, EUT Vert
27.121	5.3	8.9	1.0	72.0	10.0	0.0	Vert	QP	-19.1	-4.8	29.5	-34.4	Ant. Para to floor and para to EUT, EUT On Side
27.124	5.3	8.9	1.0	349.0	10.0	0.0	Horz	QP	-19.1	-4.8	29.5	-34.4	Ant. Perp to floor and para to EUT, EUT Horz

FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHz

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

Continuous Tx at 13.56MHz.

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ONIT0006 - 1

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2/10/2015	12 mo
Cable	N/A	Bilog Cables	EVA	2/10/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2/10/2015	12 mo
Antenna - Biconilog	EMCO	3141	AXE	8/29/2014	24 mo

TEST DESCRIPTION

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

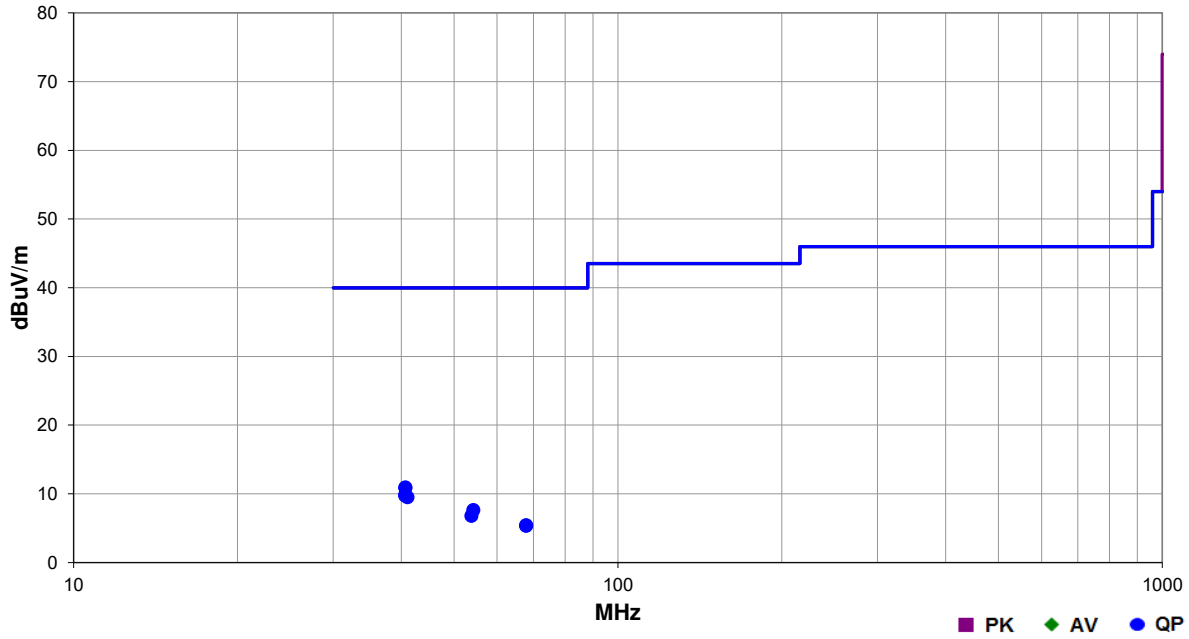
While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHz

Work Order:	ONIT0006	**Date:**	10/09/15		
Project:	None	**Temperature:**	22.4 °C		
Job Site:	EV01	**Humidity:**	48% RH		
Serial Number:	None	**Barometric Pres.:**	1015 mbar	**Tested by:**	Brandon Hobbs
EUT:	HT34 RFID BTLE				
Configuration:	1				
Customer:	Onity Inc., A Division of UTCFS				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Continuous Tx at 13.56MHz.				
Deviations:	None				
Comments:	See Data comments for EUT orientation				

Test Specifications	**Test Method**
FCC 15.209:2015	ANSI C63.10:2013

Run #	6	**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
40.697	17.4	-6.5	1.0	241.0	3.0	0.0	Vert	QP	0.0	10.9	40.0	-29.1	EUT Vertical
40.688	17.3	-6.4	1.0	319.0	3.0	0.0	Vert	QP	0.0	10.9	40.0	-29.1	EUT On Side
40.667	16.3	-6.4	3.7	113.0	3.0	0.0	Horz	QP	0.0	9.9	40.0	-30.1	EUT Horizontal
40.703	16.2	-6.5	1.0	50.0	3.0	0.0	Horz	QP	0.0	9.7	40.0	-30.3	EUT On Side
40.727	16.2	-6.5	1.0	302.0	3.0	0.0	Horz	QP	0.0	9.7	40.0	-30.3	EUT Vertical
41.060	16.1	-6.6	2.5	32.0	3.0	0.0	Vert	QP	0.0	9.5	40.0	-30.5	EUT Horizontal
54.247	17.7	-10.1	1.0	149.0	3.0	0.0	Vert	QP	0.0	7.6	40.0	-32.4	EUT Vertical
53.825	16.8	-10.0	1.0	112.0	3.0	0.0	Horz	QP	0.0	6.8	40.0	-33.2	EUT Horizontal
67.822	16.7	-11.3	1.0	152.0	3.0	0.0	Vert	QP	0.0	5.4	40.0	-34.6	EUT Vertical
67.847	16.6	-11.3	1.0	38.0	3.0	0.0	Horz	QP	0.0	5.3	40.0	-34.7	EUT Horizontal

FREQUENCY STABILITY

NORTHWEST EMC

XMit 2015.01.14

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.	Interval (mos)
Meter - Multimeter	Tektronix	DMM912	MMH	2/5/2013	36
Thermometer	Omegaette	HH311	DTY	1/21/2015	36
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBI	NCR	0
Power Supply - DC	Topward	TPS-2000	TPD	NCR	0
Probe - Near Field Set	EMCO	7405	IPD	NCR	0
Attenuator	S.M. Electronics	SA26B-20	AUY	7/14/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	3/10/2015	12

TEST DESCRIPTION

A near field measurement was made between the EUT's integral antenna and a 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 poling.

Per the frequency stability requirements for rule part 2.1055 the primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

FREQUENCY STABILITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	**HT34 RFID BTLE**			**Work Order:**	**ONIT0006**
Serial Number:	**None**			**Date:**	**10/09/15**
Customer:	**Onity Inc., A Division of UTCFS**			**Temperature:**	**23.3°C**
Attendees:	**None**			**Humidity:**	**49%**
Project:	**None**			**Barometric Pres.:**	**1015.7**
Tested by:	**Brandon Hobbs**	**Power:**	**Battery (6VDC Nominal)**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	**Test Method**
FCC 15.225:2015	ANSI C63.10:2013

COMMENTS

The EUT was operating at 100% duty cycle.

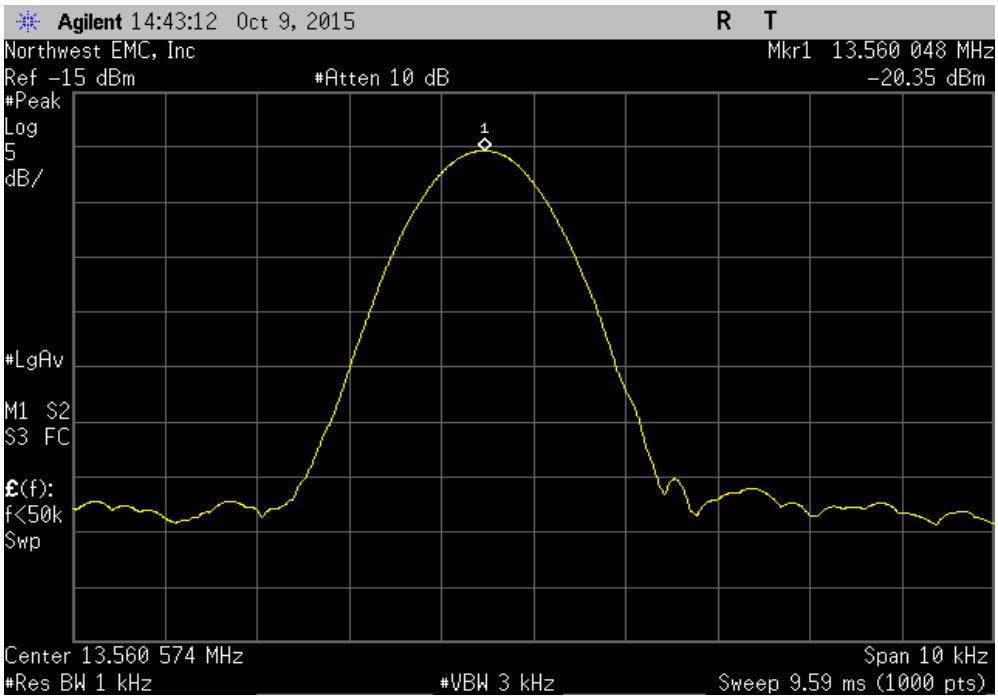
DEVIATIONS FROM TEST STANDARD

None

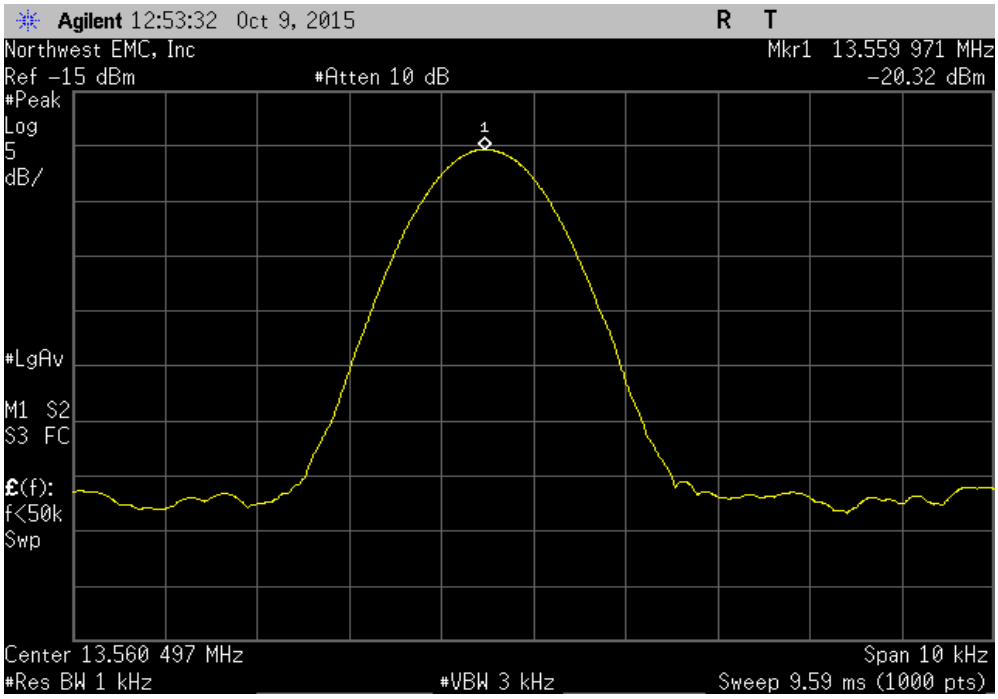
Configuration #	**1**	*Signature*

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz RFID					
Voltage: 115%	13.560048	13.56	3.5	100	Pass
Voltage: 100%	13.559971	13.56	2.1	100	Pass
Voltage: 85%	13.560028	13.56	2.1	100	Pass
Temperature: +50°	13.559977	13.56	1.7	100	Pass
Temperature: +40°	13.559981	13.56	1.4	100	Pass
Temperature: +30°	13.559965	13.56	2.6	100	Pass
Temperature: +20°	13.559979	13.56	1.6	100	Pass
Temperature: +10°	13.55997	13.56	2.2	100	Pass
Temperature: 0°	13.560021	13.56	1.6	100	Pass
Temperature: -10°	13.560031	13.56	2.3	100	Pass
Temperature: -20°	13.559997	13.56	0.2	100	Pass
Temperature: -30°	13.559975	13.56	1.8	100	Pass

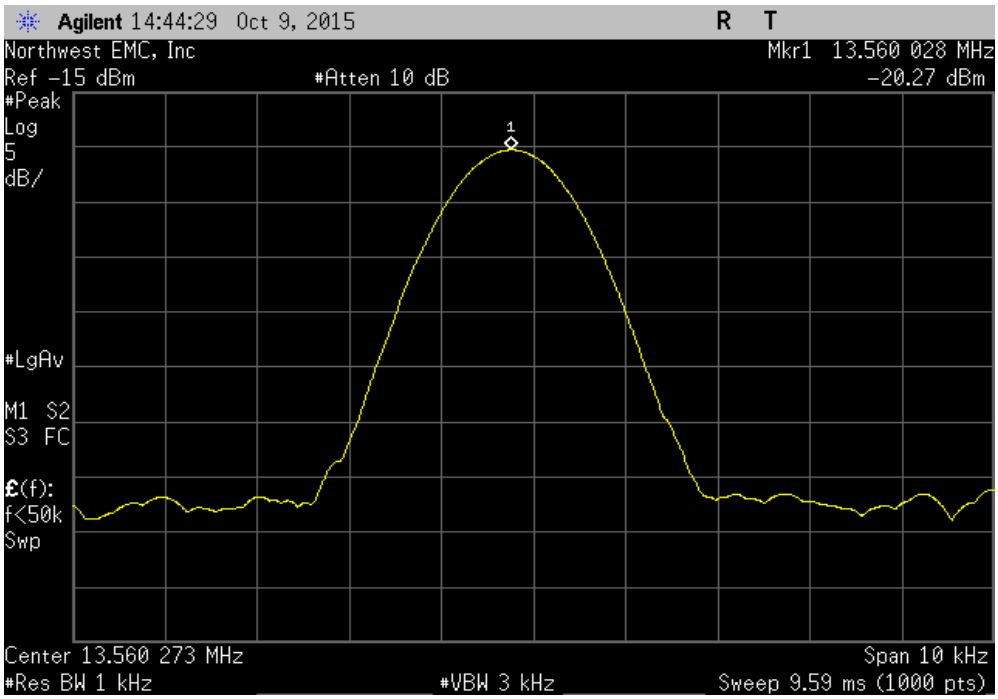
13.56 MHz RFID, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560048	13.56	3.5	100	Pass



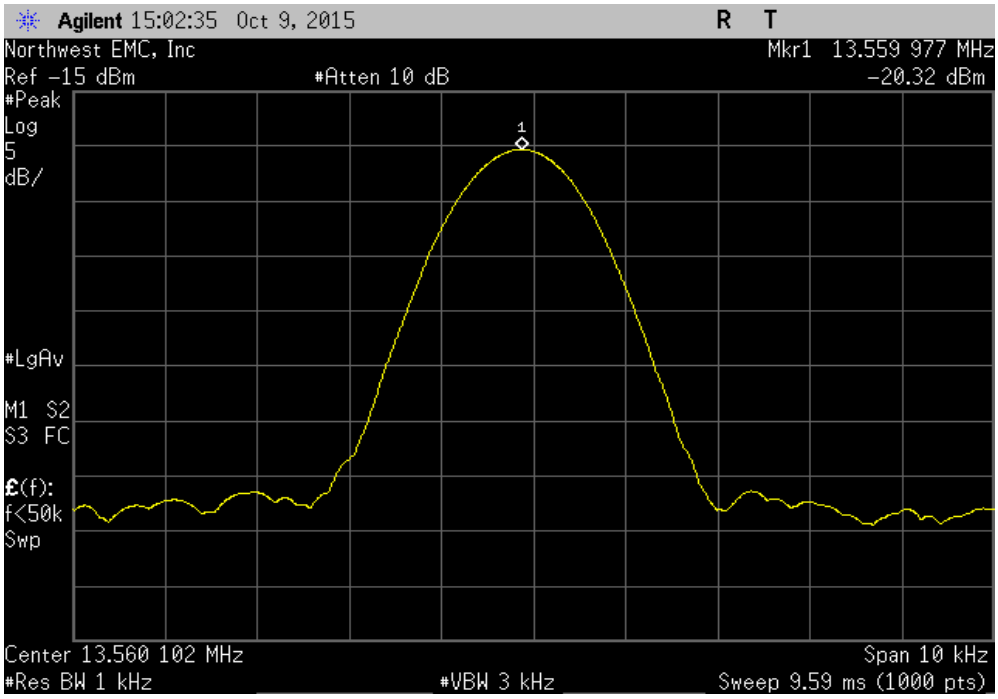
13.56 MHz RFID, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559971	13.56	2.1	100	Pass



13.56 MHz RFID, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560028	13.56	2.1	100	Pass



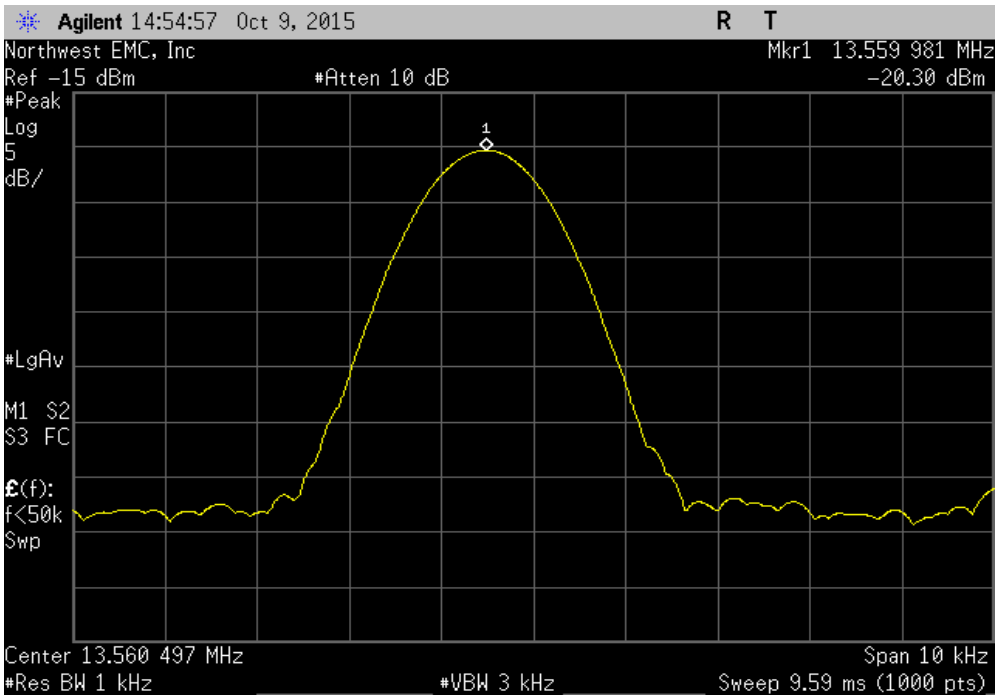
13.56 MHz RFID, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559977	13.56	1.7	100	Pass



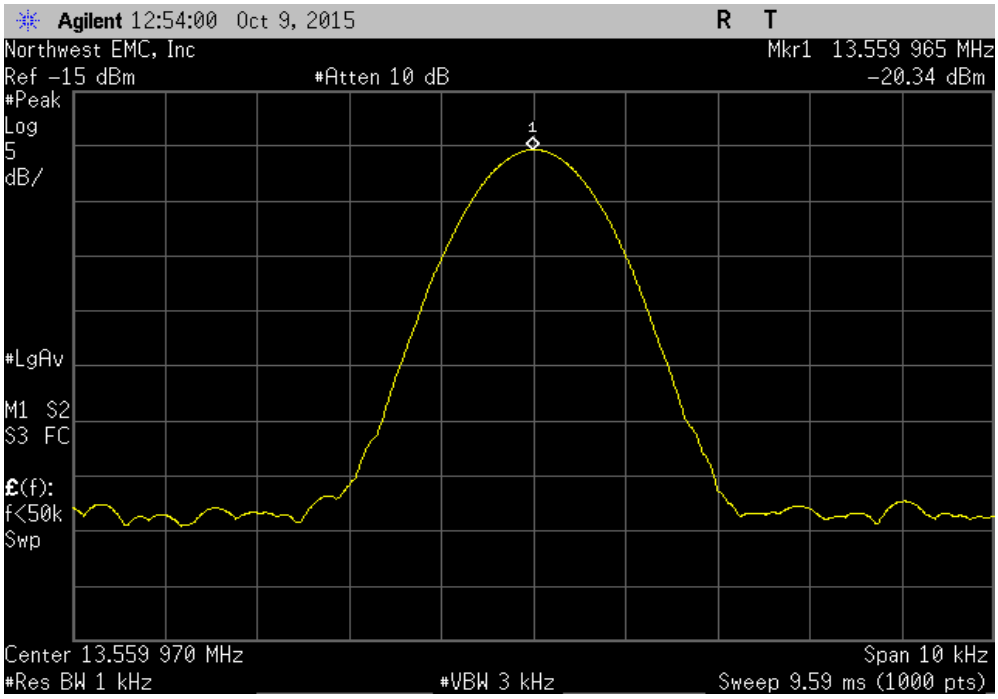
FREQUENCY STABILITY

XMit 2015.01.14

13.56 MHz RFID, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559981	13.56	1.4	100	Pass



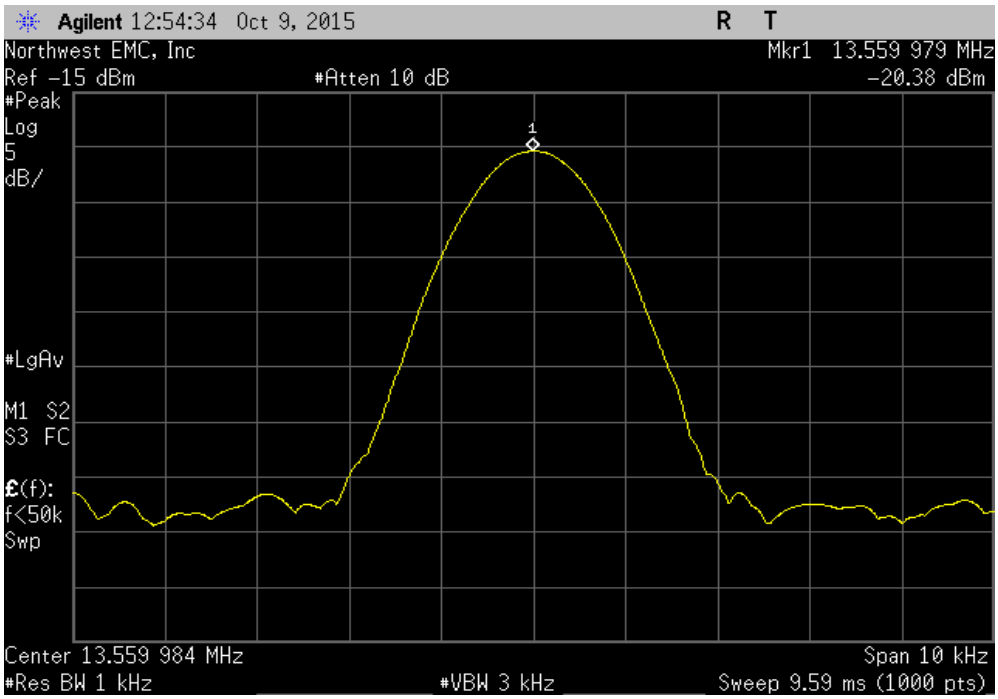
13.56 MHz RFID, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559965	13.56	2.6	100	Pass



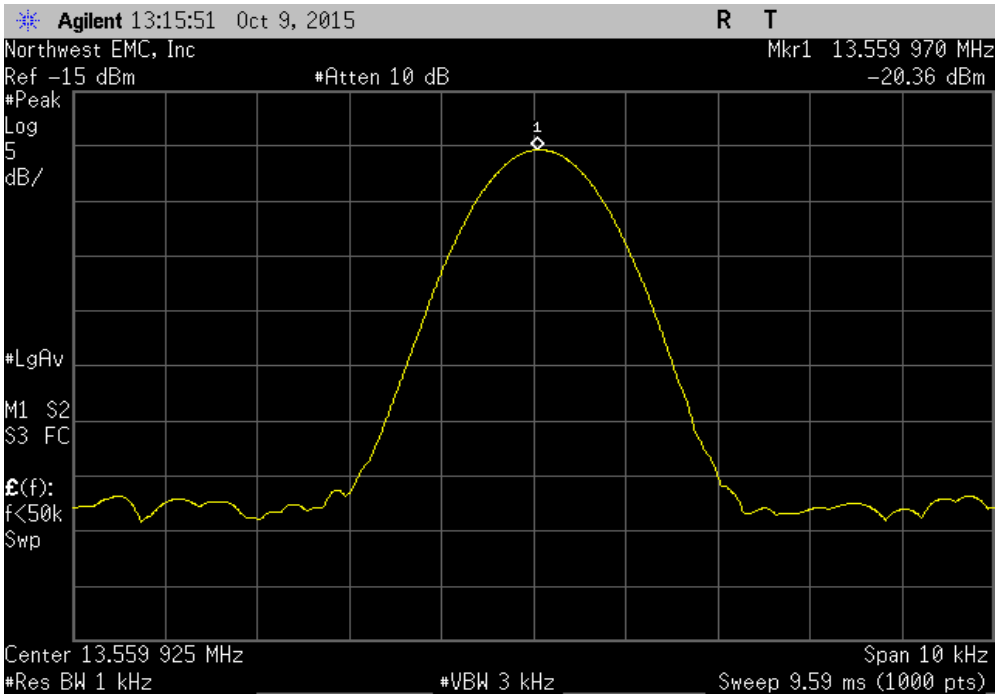
FREQUENCY STABILITY

XMit 2015.01.14

13.56 MHz RFID, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559979	13.56	1.6	100	Pass



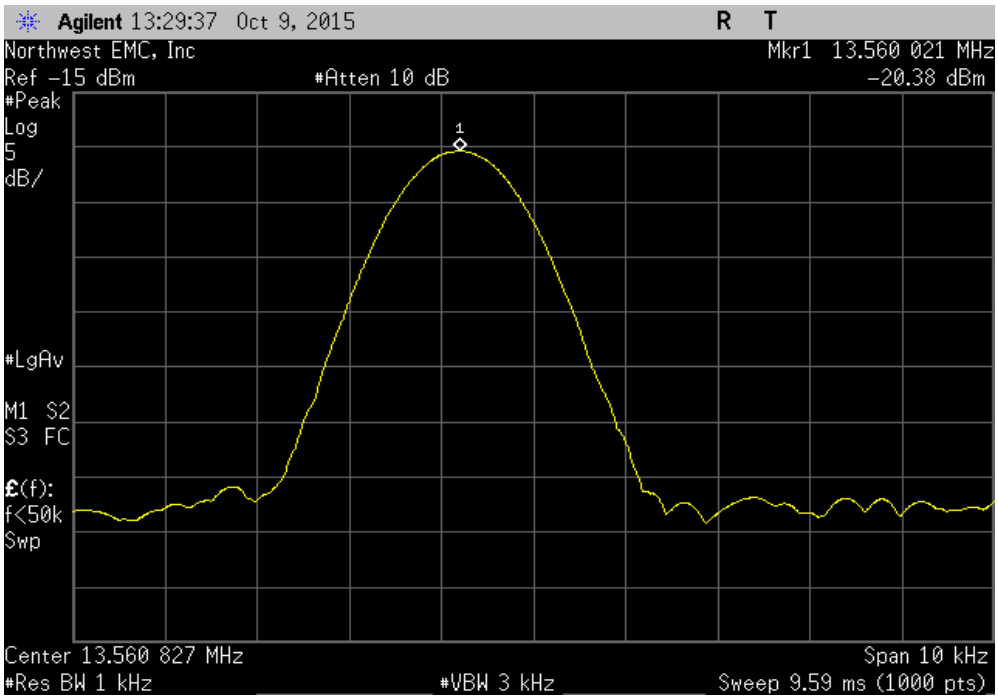
13.56 MHz RFID, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.55997	13.56	2.2	100	Pass



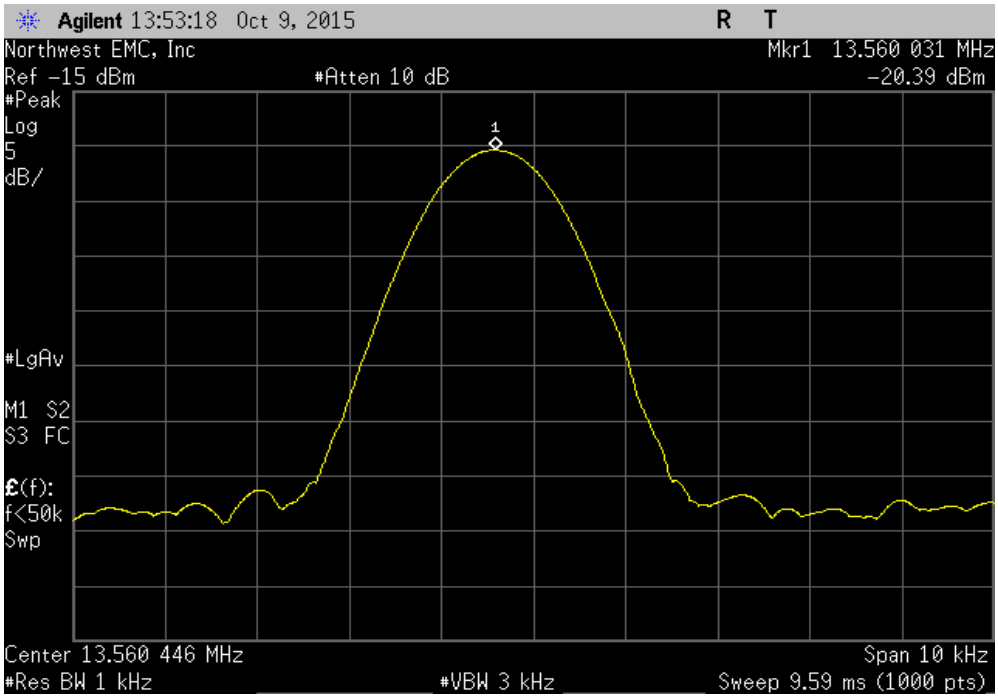
FREQUENCY STABILITY

XMit 2015.01.14

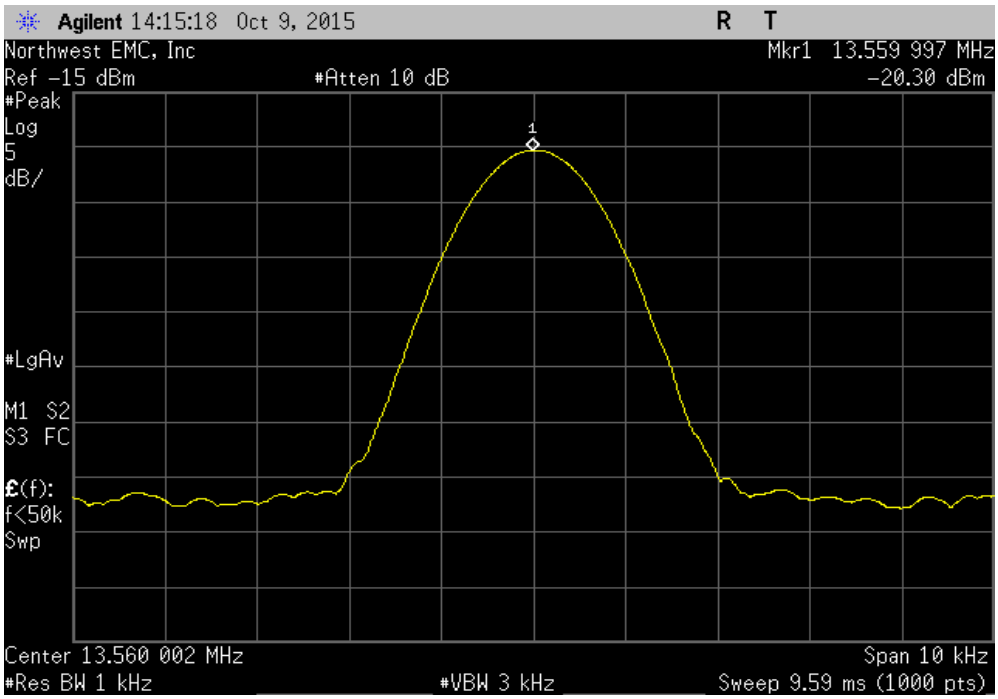
13.56 MHz RFID, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560021	13.56	1.6	100	Pass



13.56 MHz RFID, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.560031	13.56	2.3	100	Pass



13.56 MHz RFID, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559997	13.56	0.2	100	Pass



13.56 MHz RFID, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559975	13.56	1.8	100	Pass