

NORTHWEST EMC

EA Technology Ltd

UltraTEV Plus2 (UTP2)

FCC 15.207:2016

FCC 15.225:2016

13.56 MHz Radio

Report # ELEM0010.1



NVLAP Lab Code: 201049-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report may only be duplicated in its entirety

CERTIFICATE OF TEST

Last Date of Test: September 15, 2016
EA Technology Ltd
Model: UltraTEV Plus2 (UTP2)

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2016 FCC 15.225:2016	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
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:



Jeremiah Darden, 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

Revision Number		Description	Date	Page Number
00		None		

ACCREDITATIONS AND AUTHORIZATIONS

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

Measurement Uncertainty

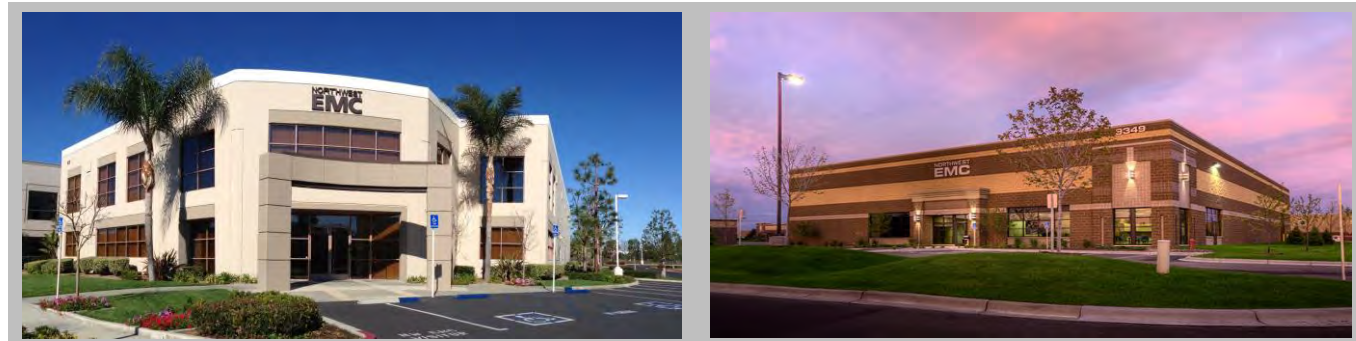
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement 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 QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty ($K=2$) can be found included as part of the applicable test description page. 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.

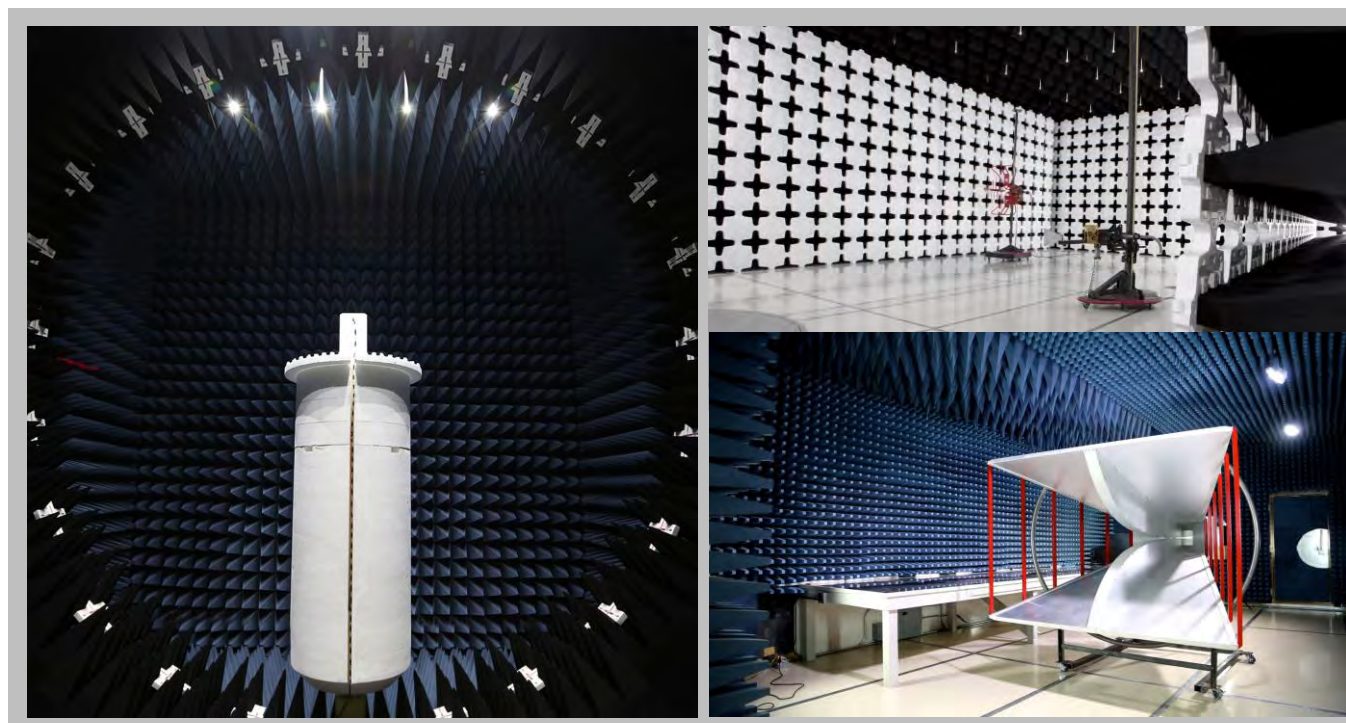
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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)	4.9 dB	-4.9 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th 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/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	EA Technology Ltd
Address:	Capenhurst Technology Park, Capenhurst
City, State, Zip:	Chester CH1 6ES United Kingdom
Test Requested By:	Richard Squires-Thornton
Model:	UltraTEV Plus2 (UTP2)
First Date of Test:	September 8, 2016
Last Date of Test:	September 15, 2016
Receipt Date of Samples:	September 6, 2016
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
The UTP2 is a handheld instrument for detecting and measuring Partial Discharge (PD) in electrical assets, through measurement of Transient Earth Voltages, Ultrasonic emissions and Current pulses. The UTP2 is a handheld instrument and conveys the captured information to the user both visually via the colour LCD touch screen, and audibly via optional headphones connected via the headphone jack.
Testing Objective:
To demonstrate compliance to FCC Part 15.225 specifications.

CONFIGURATIONS

Configuration ELEM0010- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Handheld Partial Discharge Instrument	EA Technology	UltraTEV Plus2 (UTP2)	0148

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Adapter (Instrument)	Stontronics	DSA-10PFP-05	TRA-028382-95

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB to micro-USB	No	0.9m	Yes	Handheld Partial Discharge Instrument	AC/DC Adapter

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/8/2016	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	9/8/2016	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	9/8/2016	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	9/9/2016	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.
5	9/15/2016	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

AC POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARF	6/22/2016	6/22/2017
Cable - Conducted Cable Assembly	Northwest EMC	TXA, HHZ, TQR	TXAA	5/17/2016	5/17/2017
LISN	Solar Electronics	9252-50-R-24-BNC	LJK	9/21/2016	9/21/2017

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

ELEM0010-2

MODES INVESTIGATED

Charging Mode

AC POWERLINE CONDUCTED EMISSIONS

EUT:	UltraTEV Plus2 (UTP2)	Work Order:	ELEM0010
Serial Number:	0148	Date:	09/23/2016
Customer:	EA Technology Ltd	Temperature:	23.6°C
Attendees:	None	Relative Humidity:	44.5%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	ELEM0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	20	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

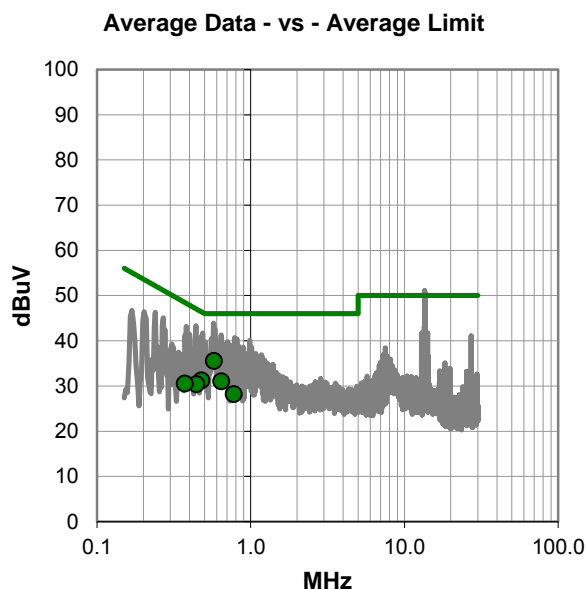
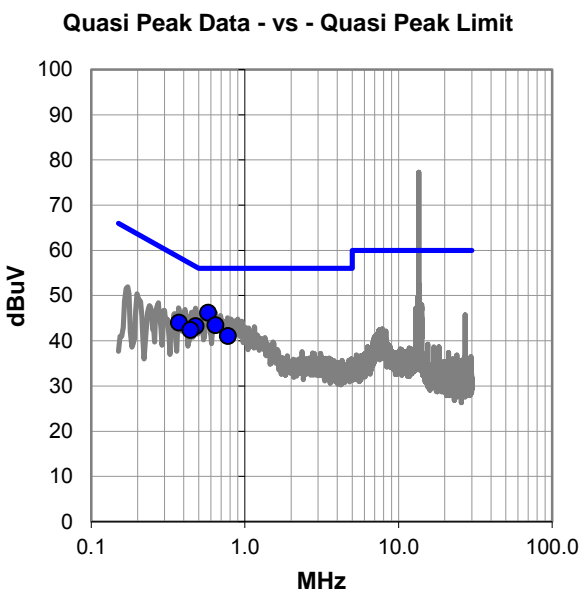
EUT transmitting at 13.56 MHz. Antenna connected.

EUT OPERATING MODES

Charging Mode

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #20

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.578	26.3	19.9	46.2	56.0	-9.8
0.644	23.5	19.9	43.4	56.0	-12.6
0.478	23.4	19.8	43.2	56.4	-13.2
0.372	24.2	19.8	44.0	58.5	-14.5
0.442	22.6	19.8	42.4	57.0	-14.6
0.777	21.1	19.9	41.0	56.0	-15.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.578	15.6	19.9	35.5	46.0	-10.5
0.644	11.1	19.9	31.0	46.0	-15.0
0.478	11.4	19.8	31.2	46.4	-15.2
0.442	10.6	19.8	30.4	47.0	-16.6
0.777	8.3	19.9	28.2	46.0	-17.8
0.372	10.7	19.8	30.5	48.5	-18.0

CONCLUSION

Pass

Jonathan Kiefer

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	UltraTEV Plus2 (UTP2)	Work Order:	ELEM0010
Serial Number:	0148	Date:	09/23/2016
Customer:	EA Technology Ltd	Temperature:	23.6°C
Attendees:	None	Relative Humidity:	44.5%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	ELEM0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	21	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

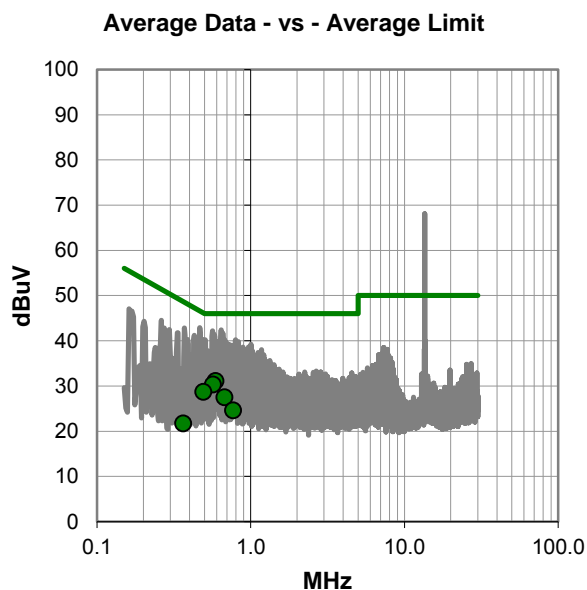
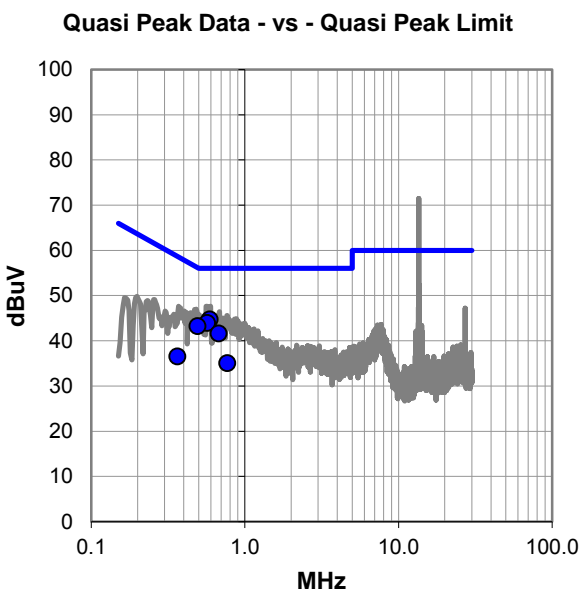
EUT transmitting at 13.56 MHz. Antenna connected.

EUT OPERATING MODES

Charging Mode

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #21

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.589	24.8	19.9	44.7	56.0	-11.3
0.569	24.0	19.9	43.9	56.0	-12.1
0.492	23.4	19.8	43.2	56.1	-12.9
0.676	21.7	19.9	41.6	56.0	-14.4
0.768	15.1	19.9	35.0	56.0	-21.0
0.363	16.7	19.8	36.5	58.7	-22.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.589	11.2	19.9	31.1	46.0	-14.9
0.569	10.4	19.9	30.3	46.0	-15.7
0.492	8.9	19.8	28.7	46.1	-17.4
0.676	7.6	19.9	27.5	46.0	-18.5
0.768	4.7	19.9	24.6	46.0	-21.4
0.363	1.9	19.8	21.7	48.7	-27.0

CONCLUSION

Pass



Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	UltraTEV Plus2 (UTP2)	Work Order:	ELEM0010
Serial Number:	0148	Date:	09/23/2016
Customer:	EA Technology Ltd	Temperature:	23.6°C
Attendees:	None	Relative Humidity:	44.5%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	ELEM0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	22	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

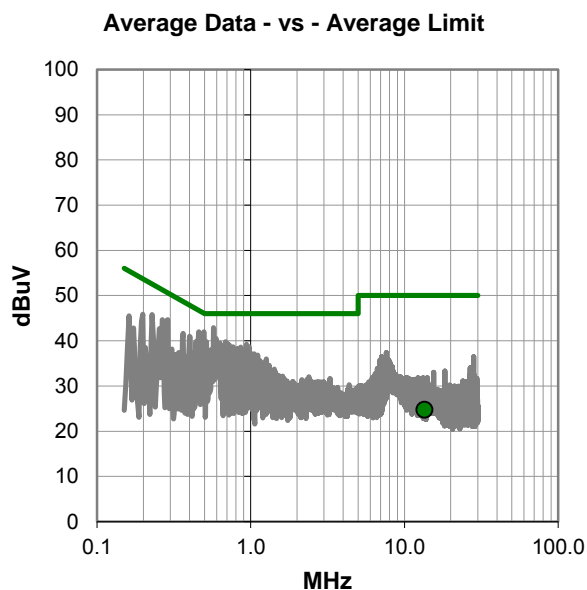
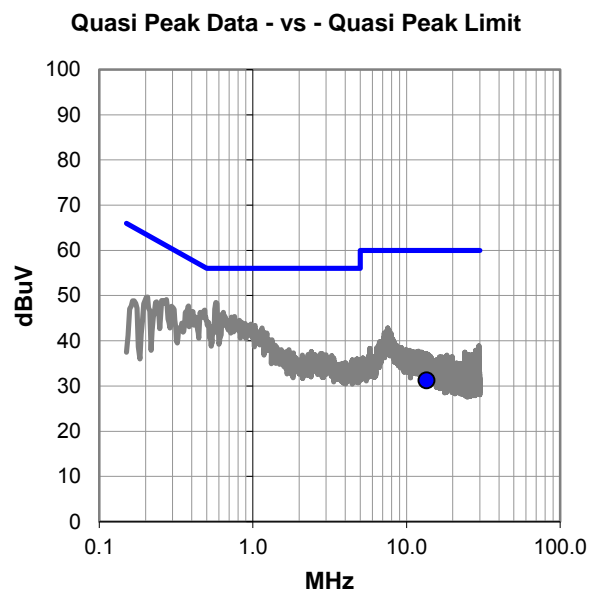
EUT transmitting at 13.56 MHz. Antenna disconnected.

EUT OPERATING MODES

Charging Mode

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #22

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.553	11.0	20.2	31.2	60.0	-28.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.553	4.5	20.2	24.7	50.0	-25.3

CONCLUSION

Pass



Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	UltraTEV Plus2 (UTP2)	Work Order:	ELEM0010
Serial Number:	0148	Date:	09/23/2016
Customer:	EA Technology Ltd	Temperature:	23.6°C
Attendees:	None	Relative Humidity:	44.5%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	ELEM0010-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	23	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

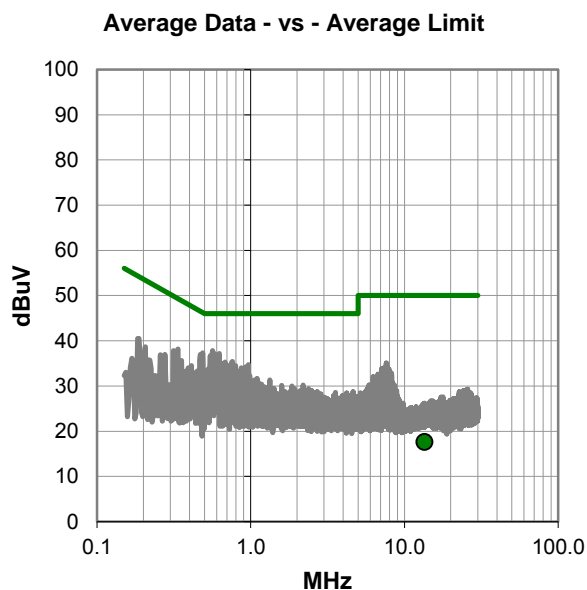
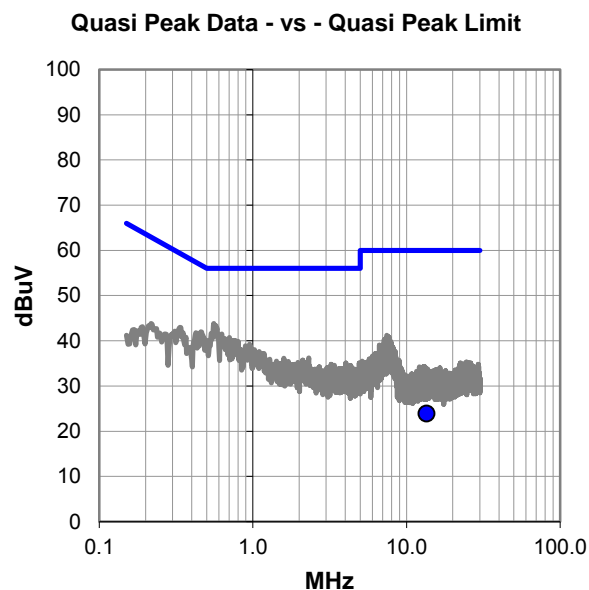
EUT transmitting at 13.56 MHz. Antenna disconnected.

EUT OPERATING MODES

Charging Mode

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #23

Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.552	3.7	20.2	23.9	60.0	-36.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.552	-2.6	20.2	17.6	50.0	-32.4

CONCLUSION

Pass



Tested By

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

NFC Charging Mode

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

ELEM0010 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency 10 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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 mo
Antenna	ETS Lindgren	6502	AZM	6/24/2016	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	5/31/2016	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.

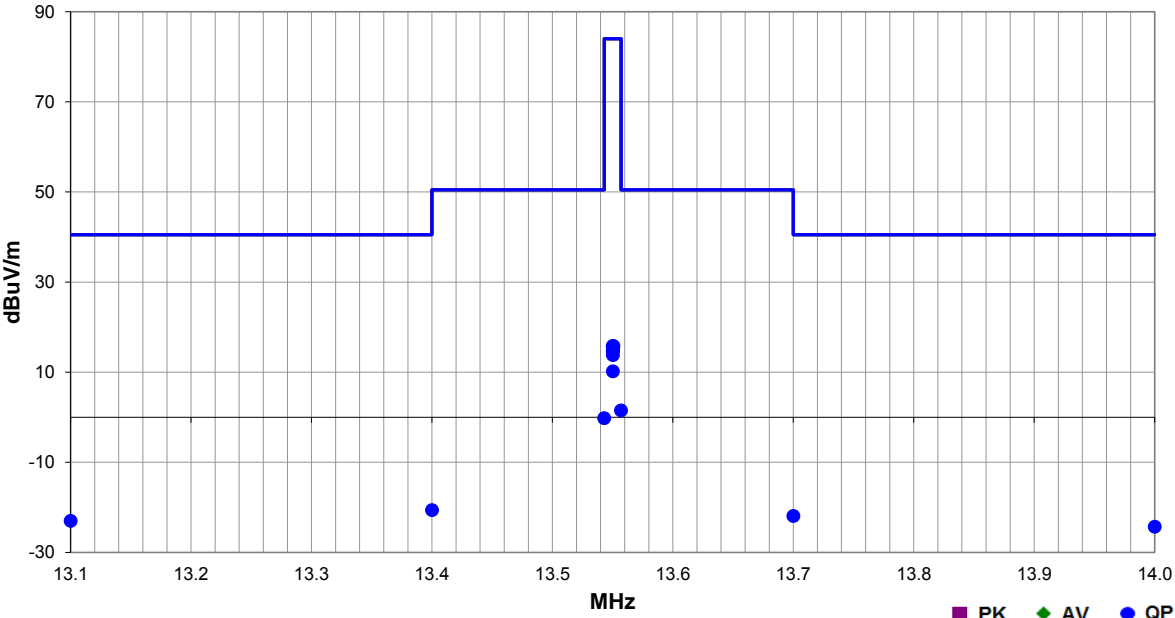
As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of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

FIELD STRENGTH OF FUNDAMENTAL

Work Order:	ELEM0010	Date:	09/08/16	
Project:	None	Temperature:	23.5 °C	
Job Site:	TX02	Humidity:	51% RH	
Serial Number:	0148	Barometric Pres.:	1019 mbar	
EUT:	UltraTEV Plus2 (UTP2)			
Configuration:	2			
Customer:	EA Technology Ltd			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	NFC Charging Mode			
Deviations:	None			
Comments:	QP data at 13.56MHz and band edges. 3m test distance. 40dB/decade adjustment factor.			

Test Specifications	FCC 15.225:2016	Test Method	ANSI C63.10:2013
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Run #	26	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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
13.567	31.3	10.2	1.0	159.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	1.5	50.5	-49.0	EUT On Side
13.553	29.6	10.2	1.0	156.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-0.2	50.5	-50.7	EUT On Side
13.410	9.2	10.2	1.0	152.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-20.6	40.5	-61.1	EUT On Side
13.710	7.9	10.2	1.0	153.9	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-21.9	40.5	-62.4	EUT On Side
13.110	6.8	10.2	1.0	82.9	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-23.0	40.5	-63.5	EUT On Side
14.010	5.6	10.1	1.0	27.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-24.3	40.5	-64.8	EUT On Side
13.560	45.6	10.2	1.0	147.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	15.8	84.0	-68.2	EUT On Side
13.561	45.6	10.2	1.0	207.9	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	15.8	84.0	-68.2	EUT On Side
13.560	45.3	10.2	1.0	7.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	15.5	84.0	-68.5	EUT On Side
13.560	45.1	10.2	1.0	196.9	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	15.3	84.0	-68.7	EUT Horizontal

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

NFC Charging Mode

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

ELEM0010 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency 10 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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	5/31/2016	12 mo
Antenna	ETS Lindgren	6502	AZM	6/24/2016	24 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

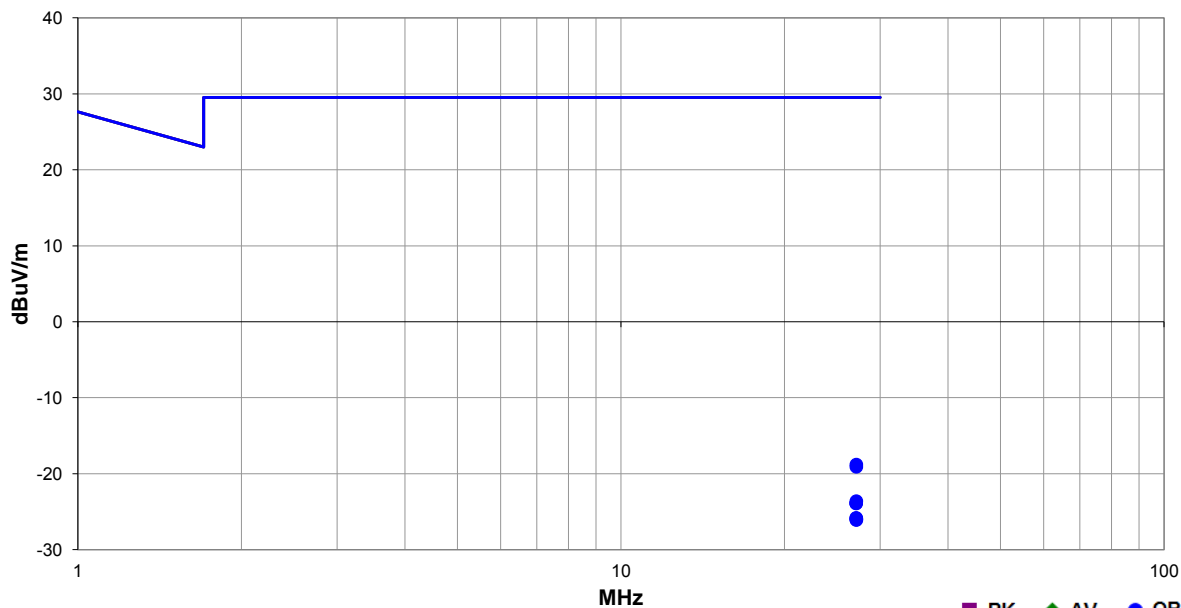
**NORTHWEST
EMC**

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0010	Date:	09/08/16	
Project:	None	Temperature:	23.5 °C	
Job Site:	TX02	Humidity:	51% RH	
Serial Number:	0148	Barometric Pres.:	1019 mbar	
EUT:		UltraTEV Plus2 (UTP2)		
Configuration:	2			
Customer:	EA Technology Ltd			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	NFC Charging Mode			
Deviations:	None			
Comments:	QP data for 2nd harmonic 27.12MHz. 3m test distance. 40dB/decade adjustment factor.			

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

Run #	29	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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
27.121	12.5	8.7	1.0	242.0	3.0	0.0	Para/GND, Perp/EUT	QP	-40.0	-18.8	29.5	-48.3	EUT Horizontal
27.120	12.2	8.7	1.0	255.0	3.0	0.0	Para/GND, Para/EUT	QP	-40.0	-19.1	29.5	-48.6	EUT On Side
27.121	7.7	8.7	1.0	298.9	3.0	0.0	Perp/GND, Perp/EUT	QP	-40.0	-23.6	29.5	-53.1	EUT Horizontal
27.116	7.4	8.7	1.0	109.0	3.0	0.0	Perp/GND, Perp/EUT	QP	-40.0	-23.9	29.5	-53.4	EUT On Side
27.117	7.4	8.7	1.0	141.9	3.0	0.0	Para/GND, Para/EUT	QP	-40.0	-23.9	29.5	-53.4	EUT Vertical
27.115	5.5	8.7	1.0	237.9	3.0	0.0	Para/GND, Para/EUT	QP	-40.0	-25.8	29.5	-55.3	EUT On Side
27.124	5.4	8.7	1.0	303.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-25.9	29.5	-55.4	EUT Vertical
27.122	5.3	8.7	1.0	157.0	3.0	0.0	Para/GND, Para/EUT	QP	-40.0	-26.0	29.5	-55.5	EUT Horizontal
27.119	5.2	8.7	1.0	32.0	3.0	0.0	Perp/GND, Para/EUT	QP	-40.0	-26.1	29.5	-55.6	EUT Vertical

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

NFC Charging Mode

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

ELEM0010 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	140 MHz
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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
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	9/12/2016	12 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	5/31/2016	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	4/13/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 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 C63.10:2013).

FIELD STRENGTH OF SPURIOUS EMISSIONS GREATER THAN 30 MHz

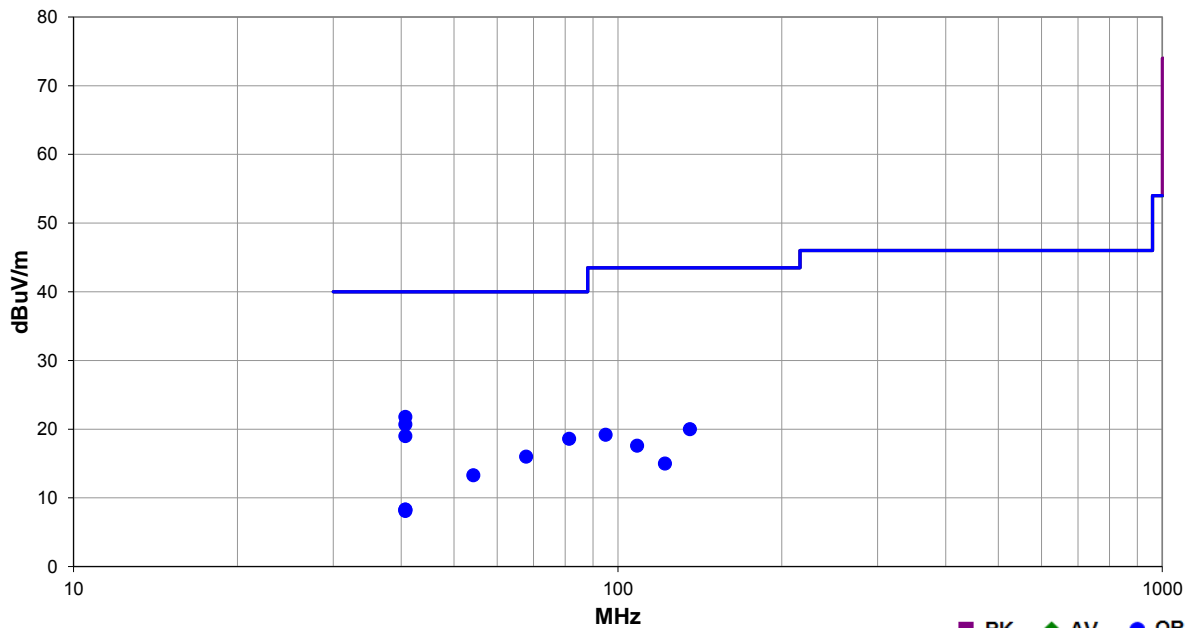
**NORTHWEST
EMC**

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0010	Date:	09/08/16	<i>Jonathan Kiefer</i>
Project:	None	Temperature:	23.4 °C	
Job Site:	TX02	Humidity:	51.4% RH	
Serial Number:	0148	Barometric Pres.:	1019 mbar	
Tested by: Jonathan Kiefer				
EUT:	UltraTEV Plus2 (UTP2)			
Configuration:	2			
Customer:	EA Technology Ltd			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	NFC Charging Mode			
Deviations:	None			
Comments:	QP data for harmonics greater than 30 MHz. 13.56 MHz fundamental frequency.			

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

Run #	25	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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
40.678	51.2	-29.4	1.0	87.9	3.0	0.0	Vert	QP	0.0	21.8	40.0	-18.2	EUT Horizontal
40.678	50.1	-29.4	1.0	325.0	3.0	0.0	Vert	QP	0.0	20.7	40.0	-19.3	EUT On Side
40.684	48.4	-29.4	1.0	127.0	3.0	0.0	Vert	QP	0.0	19.0	40.0	-21.0	EUT Vertical
81.365	50.9	-32.3	1.0	27.9	3.0	0.0	Vert	QP	0.0	18.6	40.0	-21.4	EUT Horizontal
135.604	50.4	-30.4	1.0	55.0	3.0	0.0	Vert	QP	0.0	20.0	43.5	-23.5	EUT Horizontal
67.802	48.2	-32.2	1.0	224.0	3.0	0.0	Vert	QP	0.0	16.0	40.0	-24.0	EUT Horizontal
94.915	50.6	-31.4	1.0	28.9	3.0	0.0	Vert	QP	0.0	19.2	43.5	-24.3	EUT Horizontal
108.482	47.8	-30.2	1.0	106.9	3.0	0.0	Vert	QP	0.0	17.6	43.5	-25.9	EUT Horizontal
54.236	46.4	-33.1	1.0	111.0	3.0	0.0	Vert	QP	0.0	13.3	40.0	-26.7	EUT Horizontal
122.044	46.3	-31.3	1.0	138.0	3.0	0.0	Vert	QP	0.0	15.0	43.5	-28.5	EUT Horizontal
40.681	37.7	-29.4	3.3	342.0	3.0	0.0	Horz	QP	0.0	8.3	40.0	-31.7	EUT Horizontal
40.683	37.7	-29.4	3.7	255.0	3.0	0.0	Horz	QP	0.0	8.3	40.0	-31.7	EUT On Side
40.683	37.5	-29.4	2.9	296.0	3.0	0.0	Horz	QP	0.0	8.1	40.0	-31.9	EUT Vertical

FREQUENCY STABILITY

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
Transformer	Mastech	5KVA-110V/250V	XPU	NCR	NCR
Probe - Near Field Set	ETS Lindgren	7405	IPS	NCR	NCR
Thermometer	Omegaette	HH311	DTX	4/3/2015	4/3/2018
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBH	NCR	NCR
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017
Meter - Multimeter	Fluke	77-IV	MLT	9/25/2014	9/25/2017

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 transmitting at an unmodulated carrier frequency.

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 $\pm 0.01\%$ is equivalent to 100 ppm

The formula to check for compliance is:

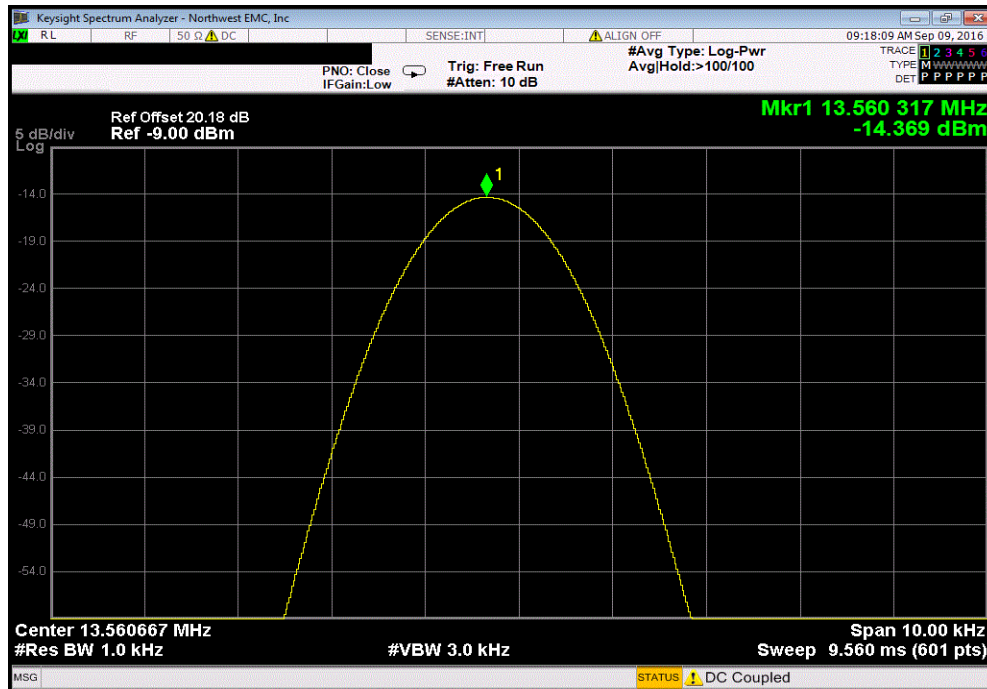
$$\text{ppm} = (\text{Measured Frequency} / \text{Measured Nominal Frequency} - 1) * 1,000,000$$

FREQUENCY STABILITY

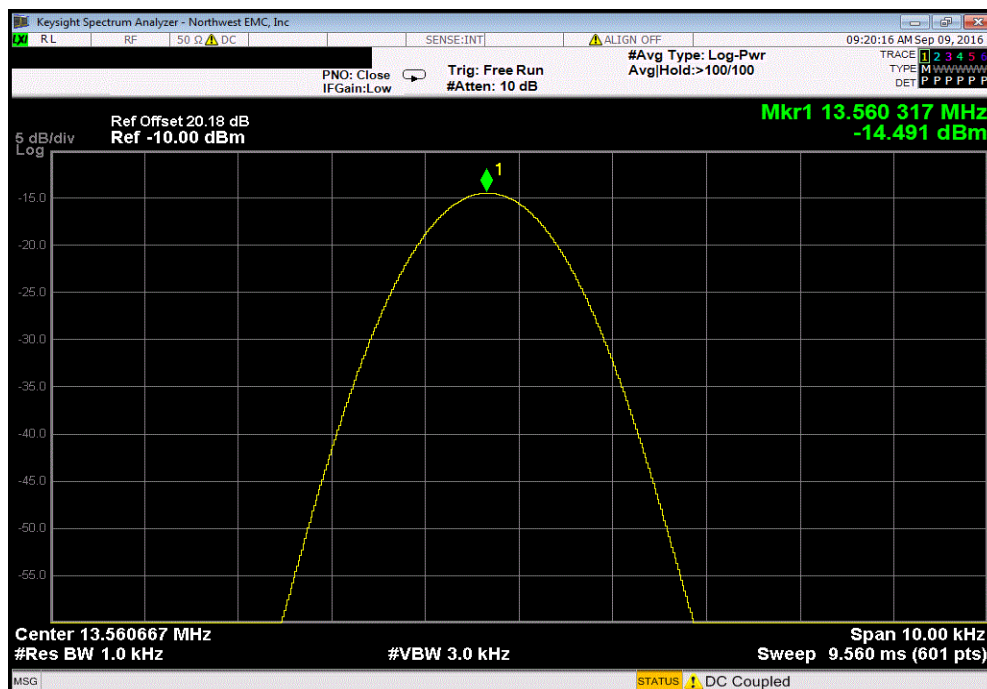
EUT: UltraTEV Plus2 (UTP2)		Work Order: ELEM0010	
Serial Number: 0148		Date: 09/09/16	
Customer: EA Technology Ltd		Temperature: 23.5 °C	
Attendees: None		Humidity: 44.9% RH	
Project: None		Barometric Pres.: 1021 mbar	
Tested by: Jonathan Kiefer		Power: 110VAC/60Hz	
		Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.225:2016		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Jonathan Kiefer</i>	
		Measured Value (MHz)	Assigned Value (MHz)
		Error (ppm)	Limit (ppm)
			Results
13.56 MHz			
Temperature Variation			
-20 °C (Low)			
	Start Up	13.560317	13.56
	After 2 Minutes	13.560317	13.56
	After 5 Minutes	13.560317	13.56
	After 10 Minutes	13.560317	13.56
-10 °C			
	Start Up	13.560317	13.56
	After 2 Minutes	13.560317	13.56
	After 5 Minutes	13.560317	13.56
	After 10 Minutes	13.560317	13.56
0 °C			
	Start Up	13.560317	13.56
	After 2 Minutes	13.560317	13.56
	After 5 Minutes	13.560317	13.56
	After 10 Minutes	13.560317	13.56
10 °C			
	Start Up	13.56030033	13.56
	After 2 Minutes	13.560317	13.56
	After 5 Minutes	13.560317	13.56
	After 10 Minutes	13.56031633	13.56
20 °C (Nominal)			
	Start Up	13.560267	13.56
	After 2 Minutes	13.56026667	13.56
	After 5 Minutes	13.560267	13.56
	After 10 Minutes	13.560267	13.56
30 °C			
	Start Up	13.560267	13.56
	After 2 Minutes	13.560267	13.56
	After 5 Minutes	13.56025033	13.56
	After 10 Minutes	13.56025033	13.56
40 °C			
	Start Up	13.560217	13.56
	After 2 Minutes	13.560217	13.56
	After 5 Minutes	13.560217	13.56
	After 10 Minutes	13.560217	13.56
50 °C (High)			
	Start Up	13.560217	13.56
	After 2 Minutes	13.5602	13.56
	After 5 Minutes	13.56020033	13.56
	After 10 Minutes	13.5602	13.56
Voltage Variation			
Voltage: 115%			
	Start Up	13.56021667	13.56
Voltage: 100%			
	Start Up	13.56020033	13.56
Voltage: 85%			
	Start Up	13.560217	13.56

FREQUENCY STABILITY

13.56 MHz, Temperature Variation, -20 °C (Low), Start Up						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	

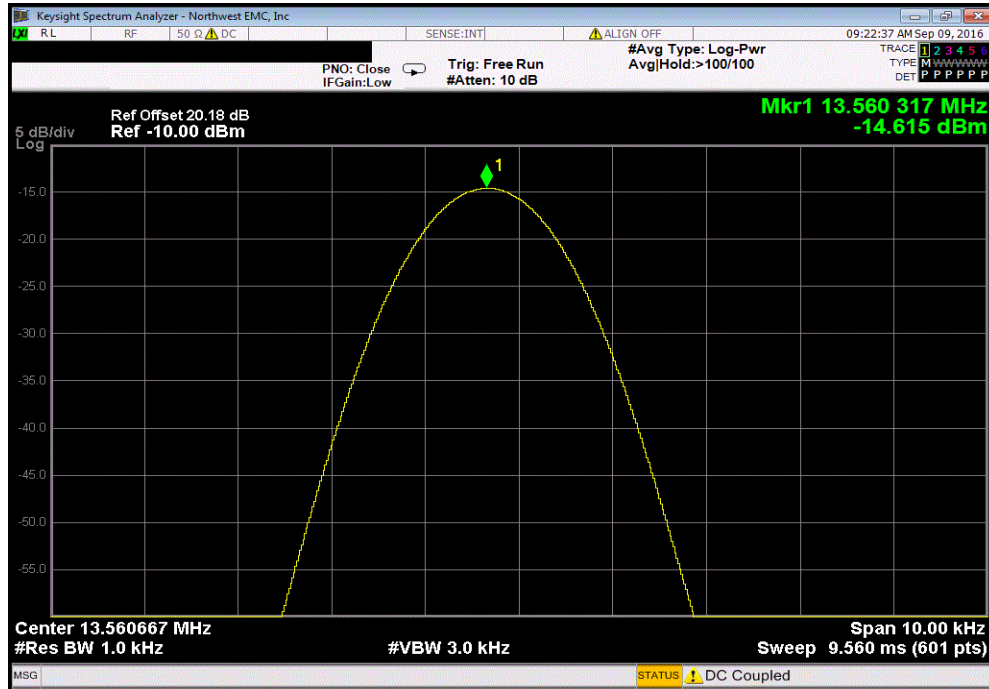


13.56 MHz, Temperature Variation, -20 °C (Low), After 2 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	

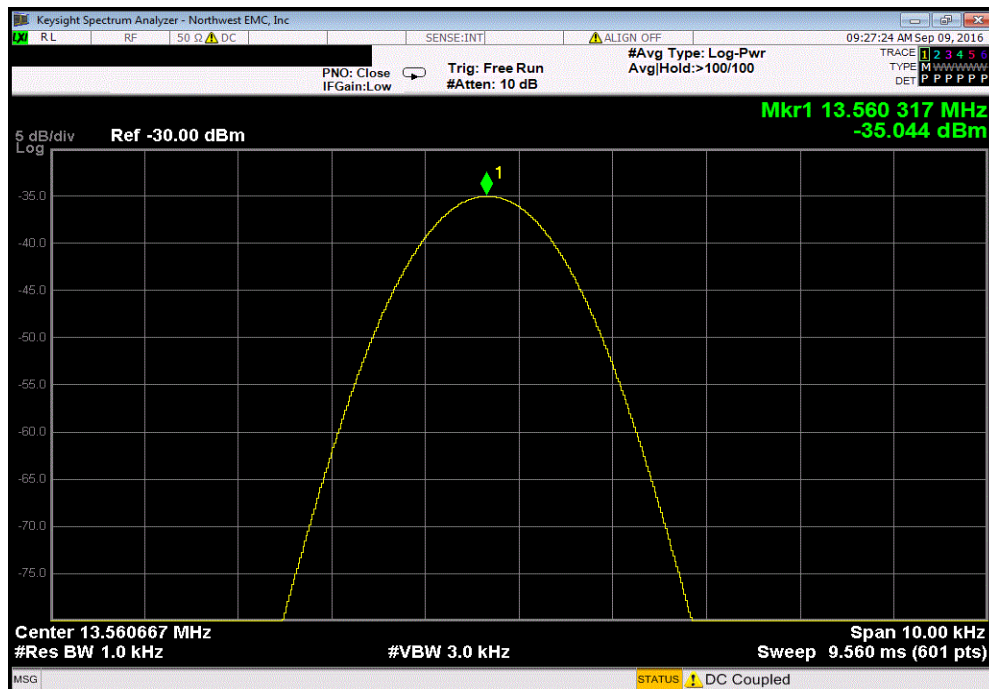


FREQUENCY STABILITY

13.56 MHz, Temperature Variation, -20 °C (Low), After 5 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	



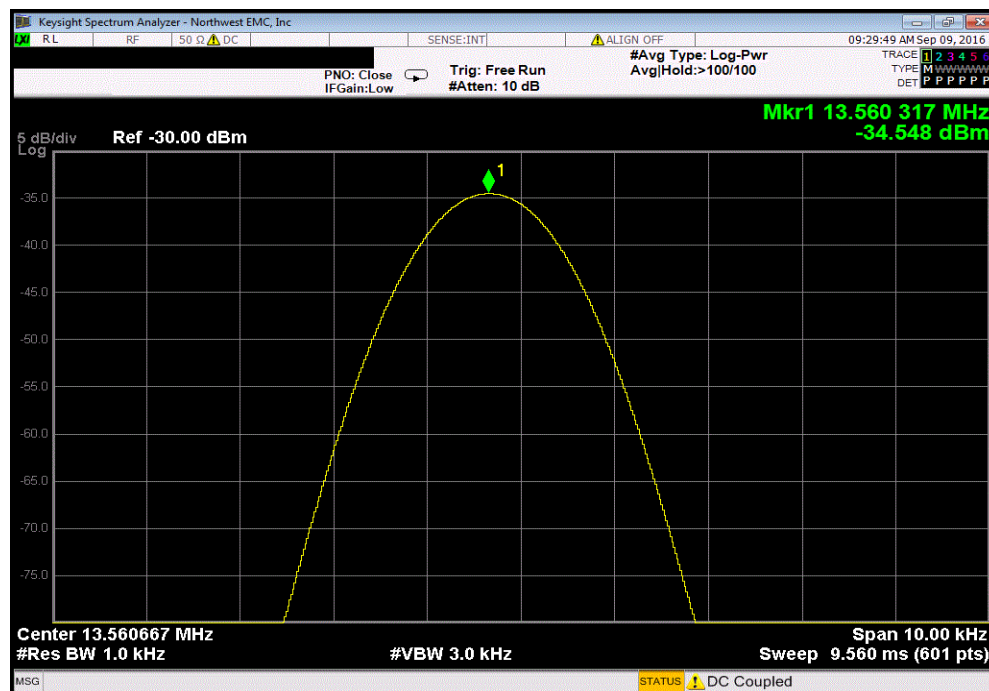
13.56 MHz, Temperature Variation, -20 °C (Low), After 10 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	



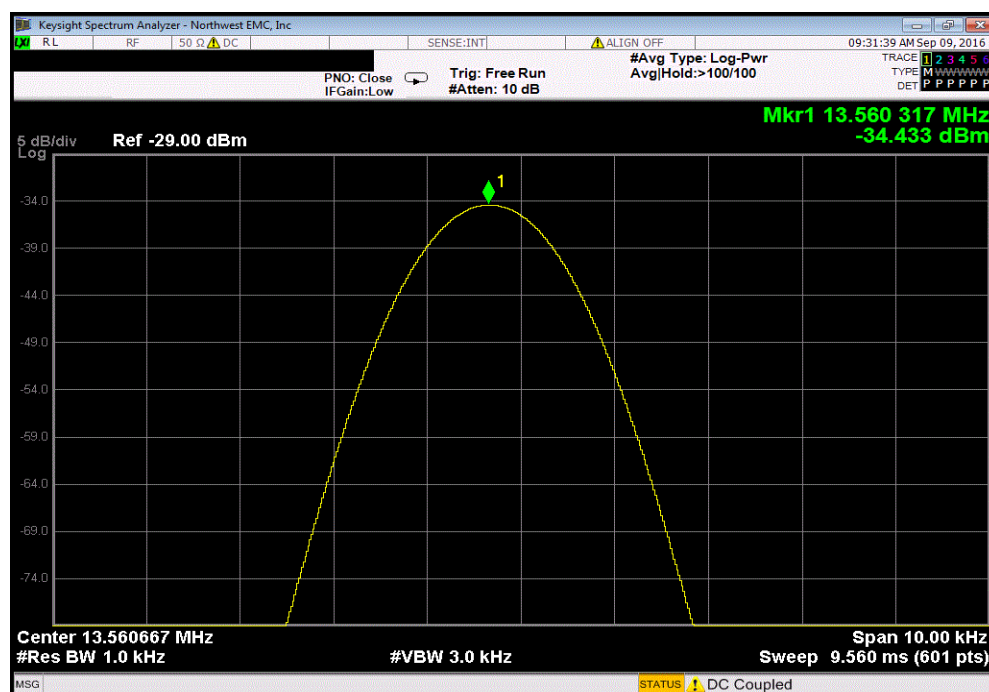
**NORTHWEST
EMC**

XMit 2016.05.06

13.56 MHz, Temperature Variation, -10 °C , Start Up					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560317	13.56	23.4	100	Pass



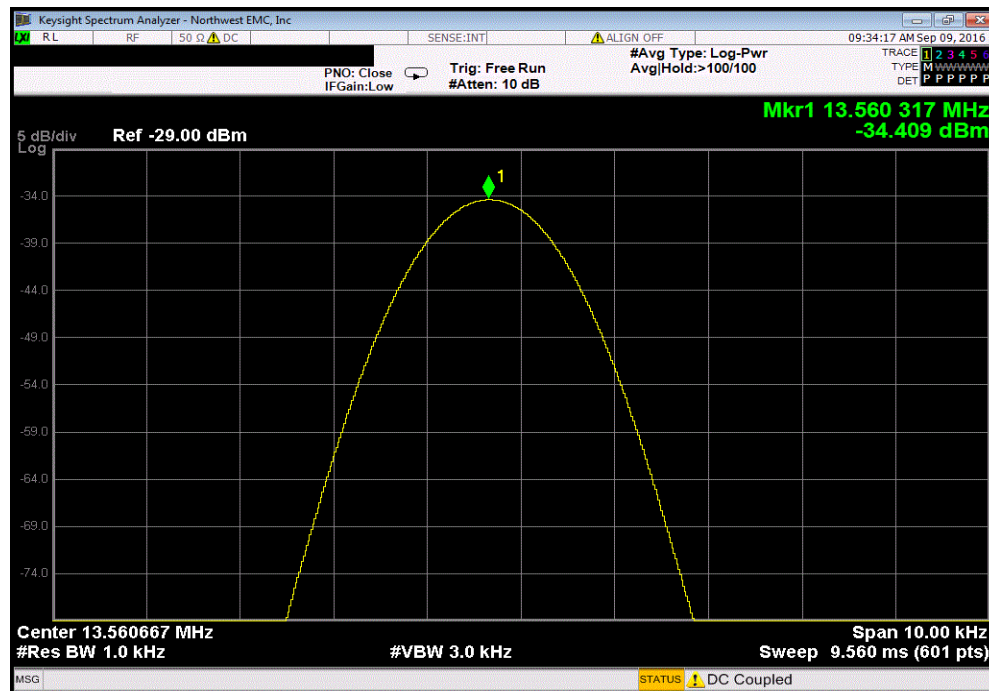
13.56 MHz, Temperature Variation, -10 °C , After 2 Minutes					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560317	13.56	23.4	100	Pass



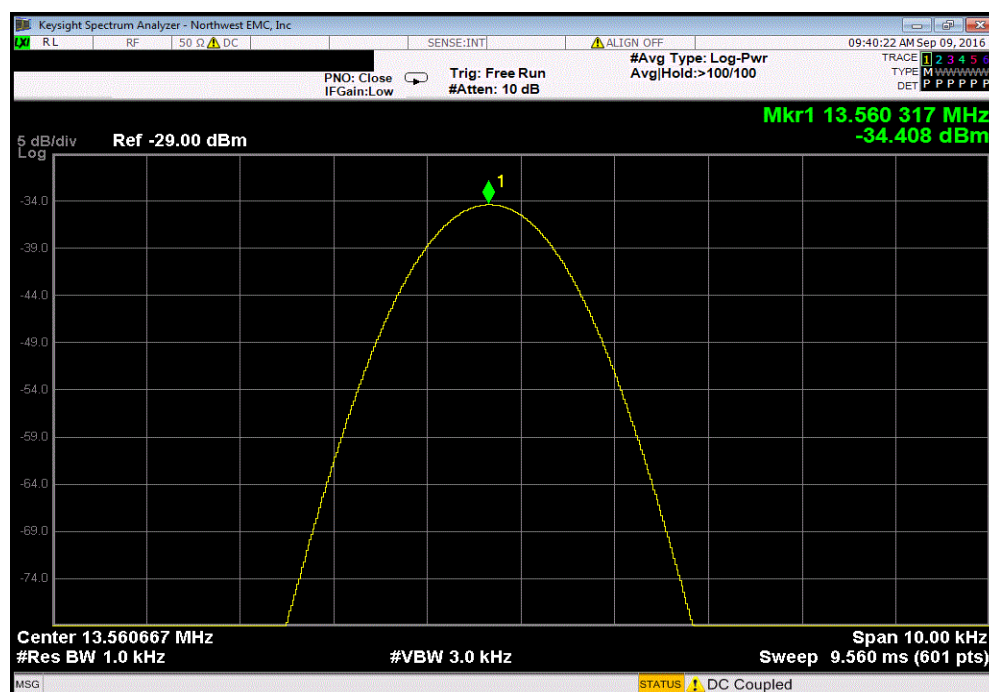
**NORTHWEST
EMC**

XMit 2016.05.06

13.56 MHz, Temperature Variation, -10 °C , After 5 Minutes					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
13.560317	13.56	23.4	100	Pass	

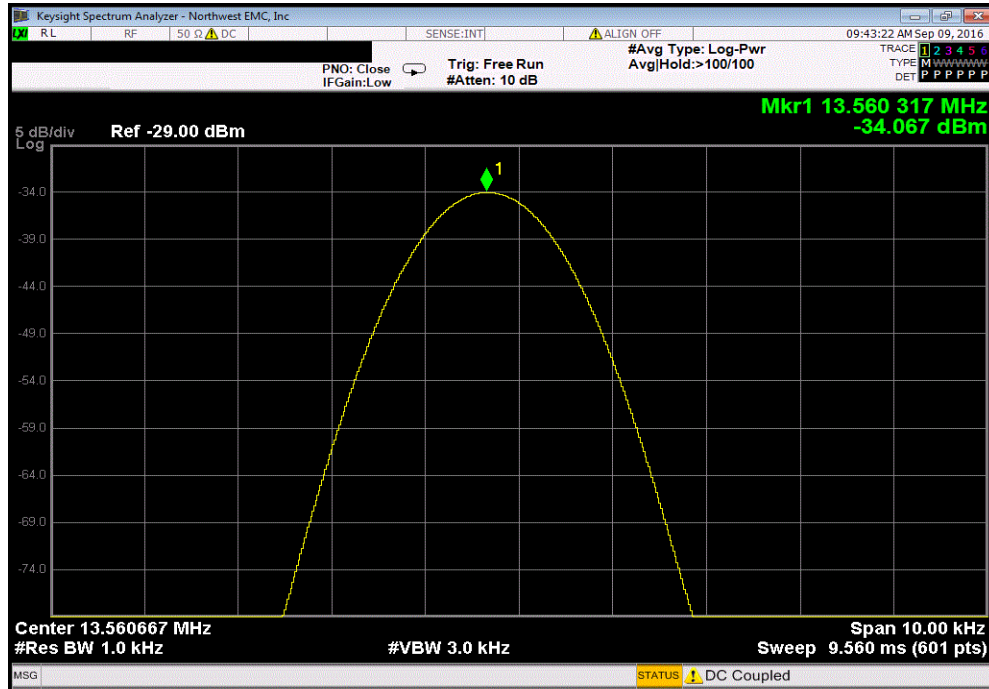


13.56 MHz, Temperature Variation, -10 °C , After 10 Minutes					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560317	13.56	23.4	100	Pass

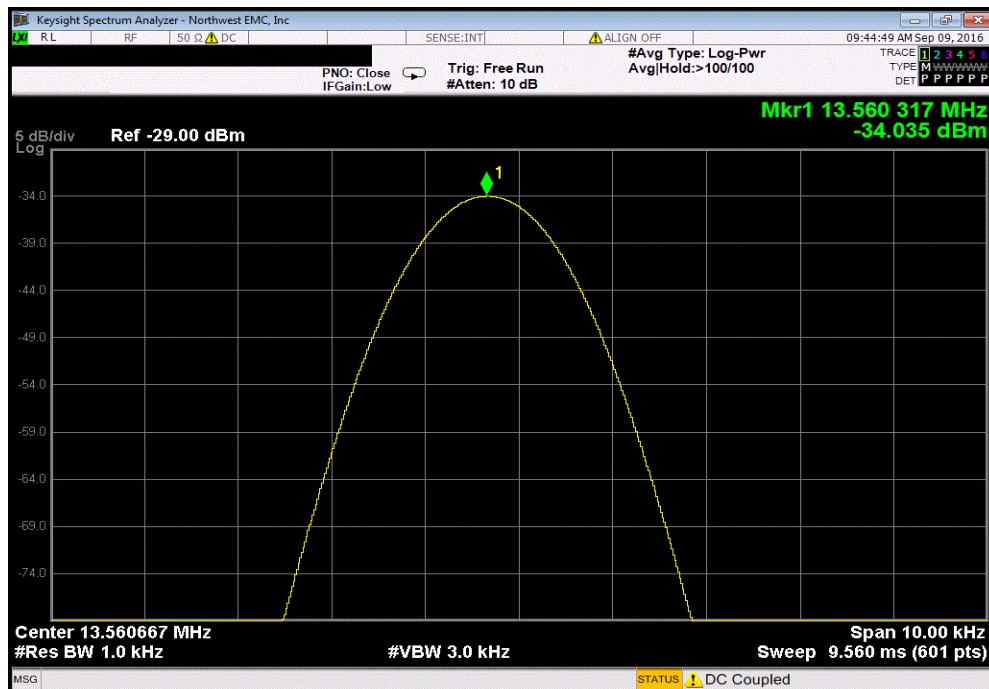


FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 0 °C , Start Up						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	



13.56 MHz, Temperature Variation, 0 °C , After 2 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	



**NORTHWEST
EMC**

XMit 2016.05.06

Keysight Spectrum Analyzer - Northwest EMC, Inc

09:48:42 AM Sep 09, 2016

RL RF 50 Ω DC SENSE:INT ALIGN OFF

PNO: Close IFGain:Low Trig: Free Run #Atten: 10 dB #Avg Type: Log-Pwr AvgHold:>100/100

TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P

5 dB/div Log Ref -29.00 dBm

Mkr1 13.560 317 MHz -34.025 dBm

Center 13.560667 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

MSG STATUS DC Coupled

Keysight Spectrum Analyzer - Northwest EMC, Inc

09:53:47 AM Sep 09, 2016

SENSE:INT

ALIGN OFF

PNO: Close IF Gain: Low

Trig: Free Run #Atten: 10 dB

#Avg Type: Log-Pwr Avg/Hold: >100/100

TRACE 1 2 3 4 5 6

TYPE M

DET P P P P P P

5 dB/div Log

Ref -29.00 dBm

Mkr1 13.560 317 MHz -34.012 dBm

Center 13.560667 MHz

#Res BW 1.0 kHz

#VBW 3.0 kHz

Span 10.00 kHz

Sweep 9.560 ms (601 pts)

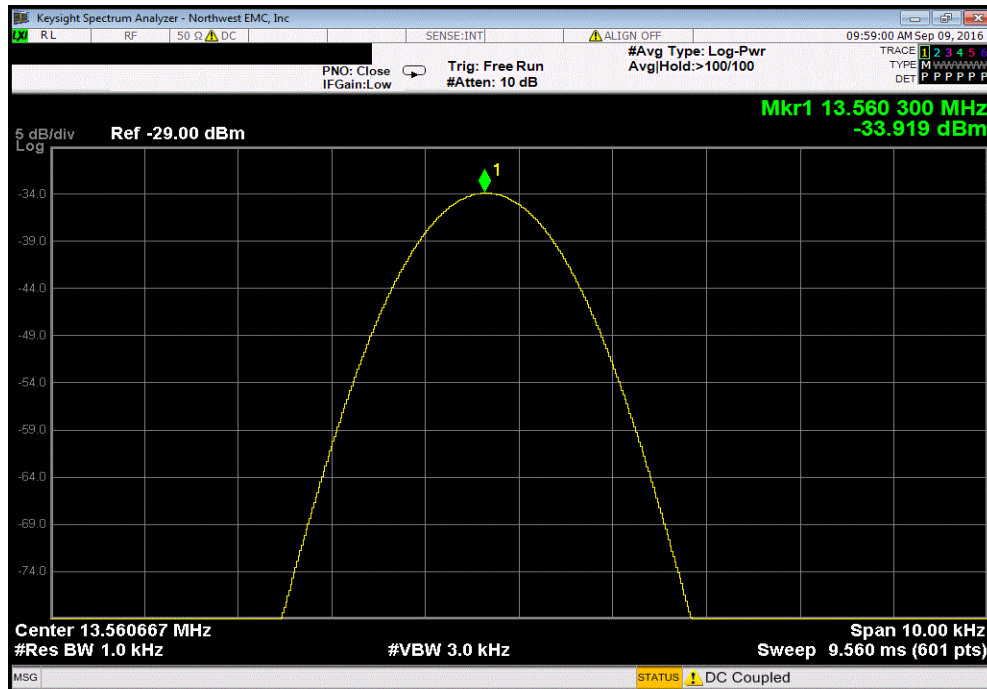
MSG

STATUS

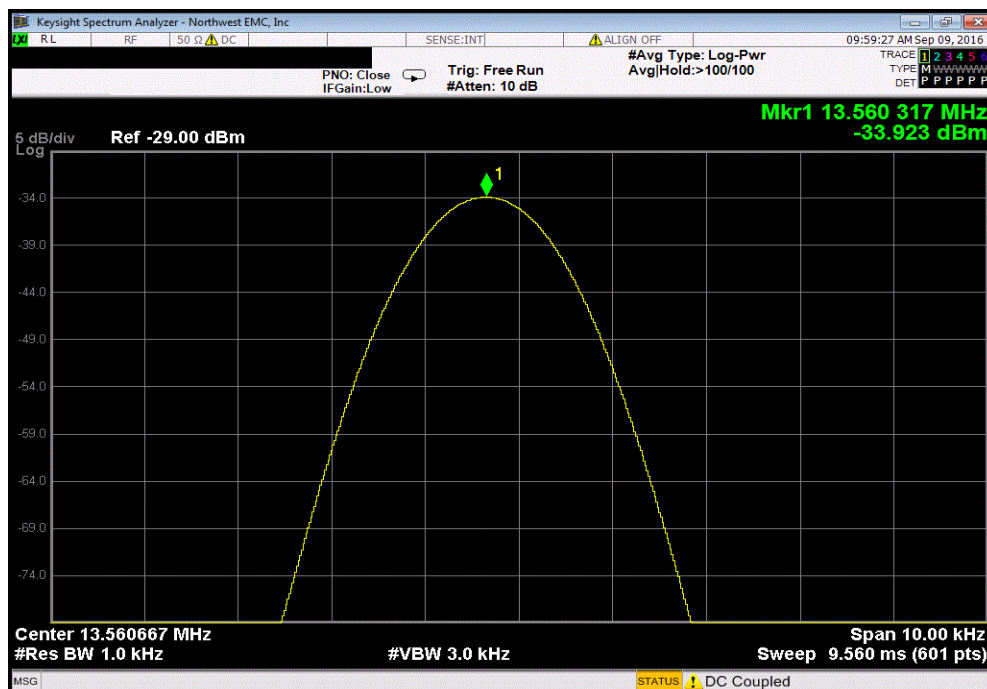
DC Coupled

FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 10 °C, Start Up					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
13.56030033	13.56	22.2	100	Pass	

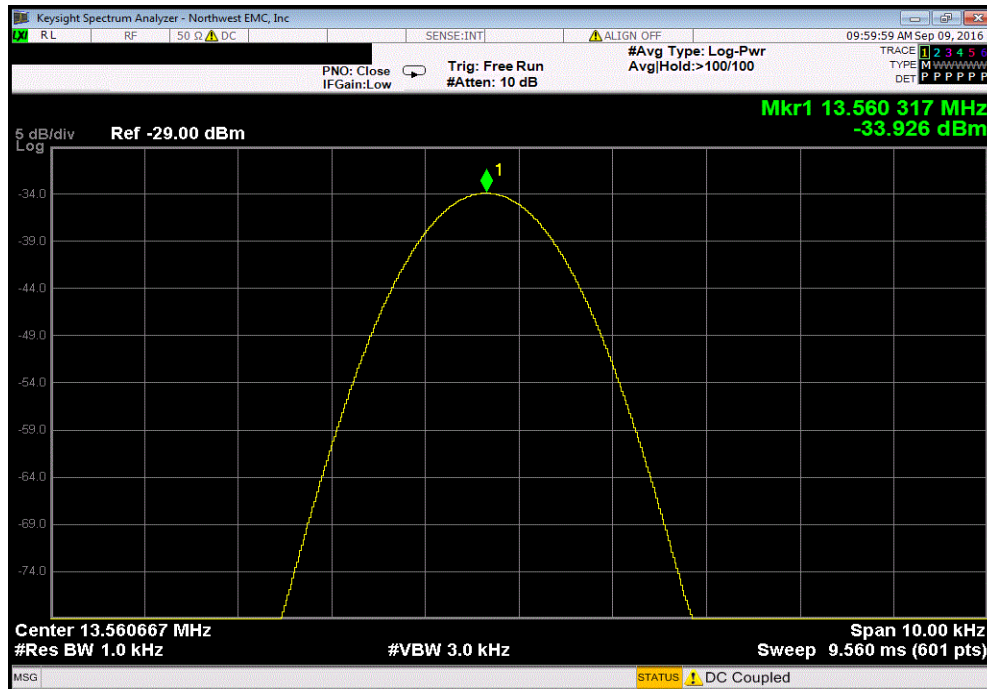


13.56 MHz, Temperature Variation, 10 °C, After 2 Minutes					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
13.560317	13.56	23.4	100	Pass	

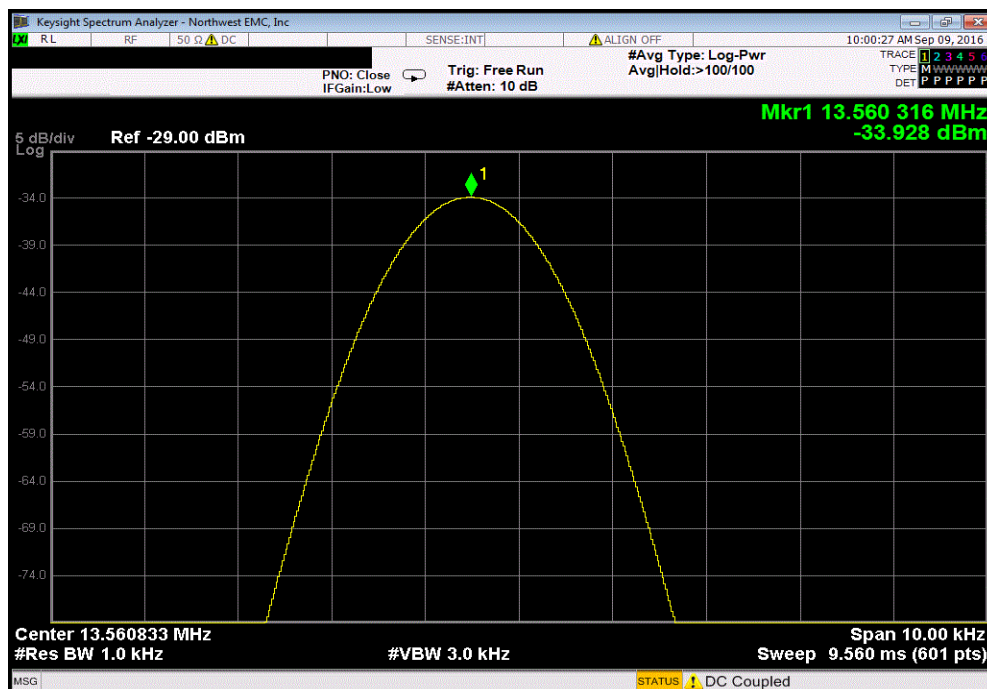


FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 10 °C , After 5 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560317	13.56	23.4	100	Pass	

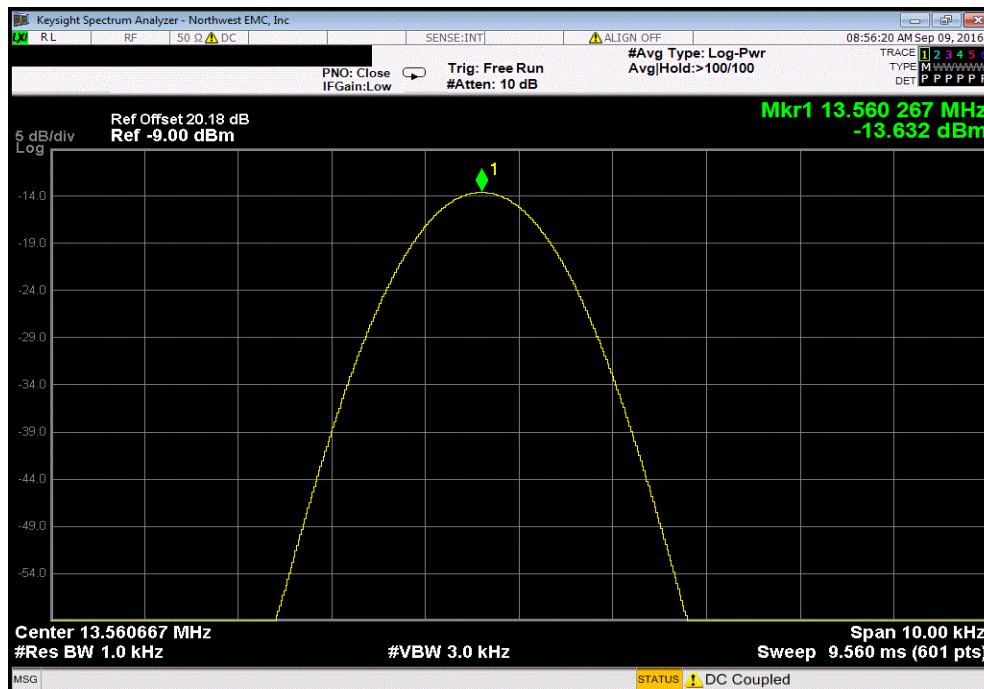


13.56 MHz, Temperature Variation, 10 °C , After 10 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.56031633	13.56	23.3	100	Pass	

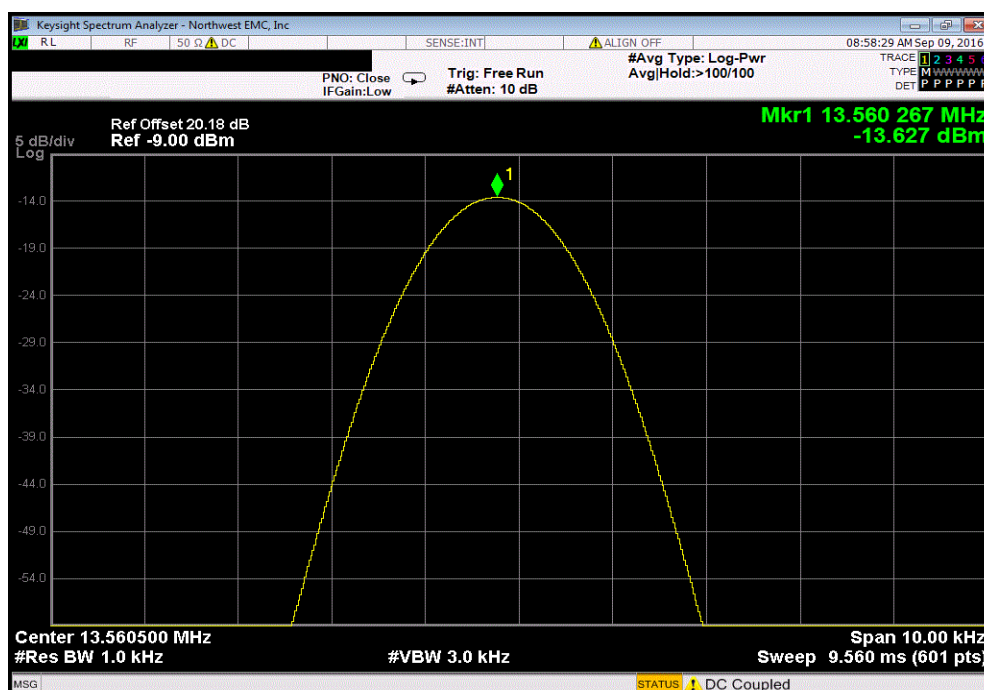


FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 20 °C (Nominal), Start Up						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560267	13.56	19.7	100	Pass	

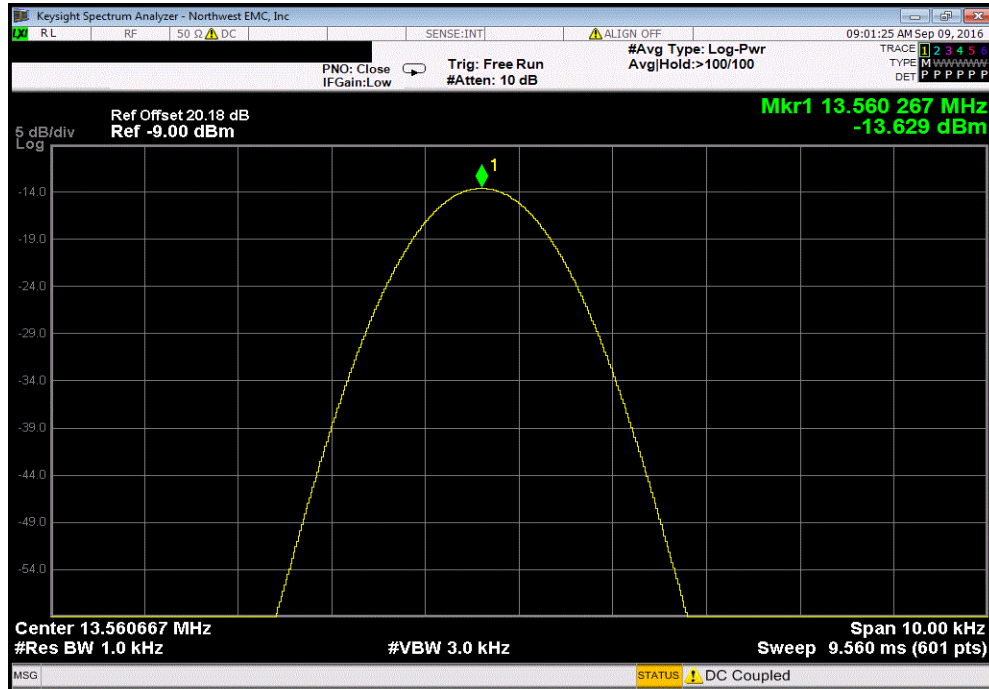


13.56 MHz, Temperature Variation, 20 °C (Nominal), After 2 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.56026667	13.56	19.7	100	Pass	

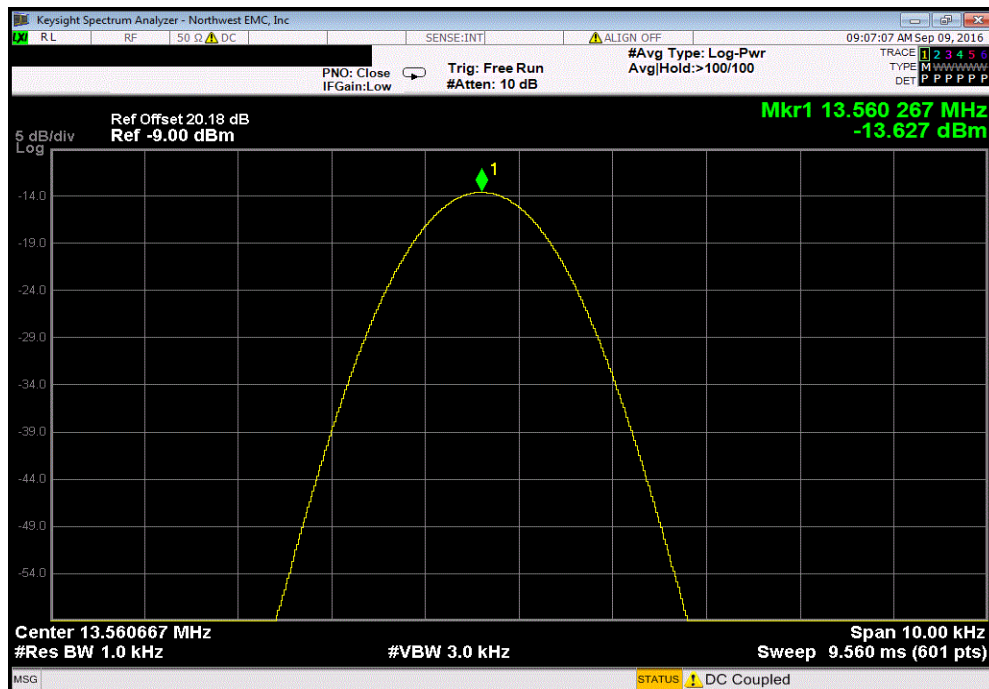


FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 20 °C (Nominal), After 5 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560267	13.56	19.7	100	Pass	



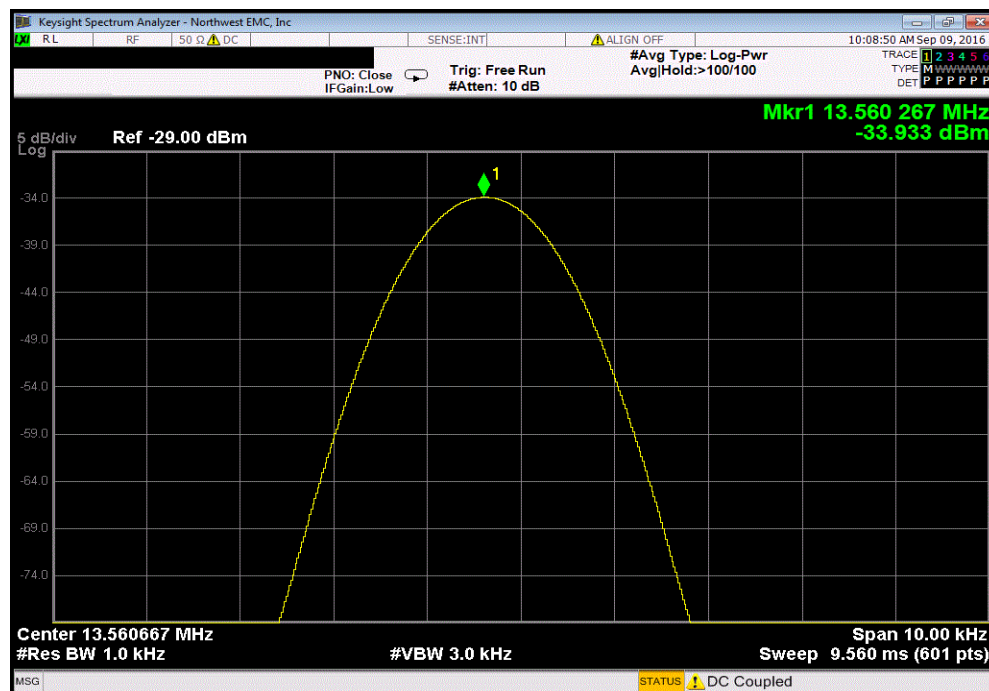
13.56 MHz, Temperature Variation, 20 °C (Nominal), After 10 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560267	13.56	19.7	100	Pass	



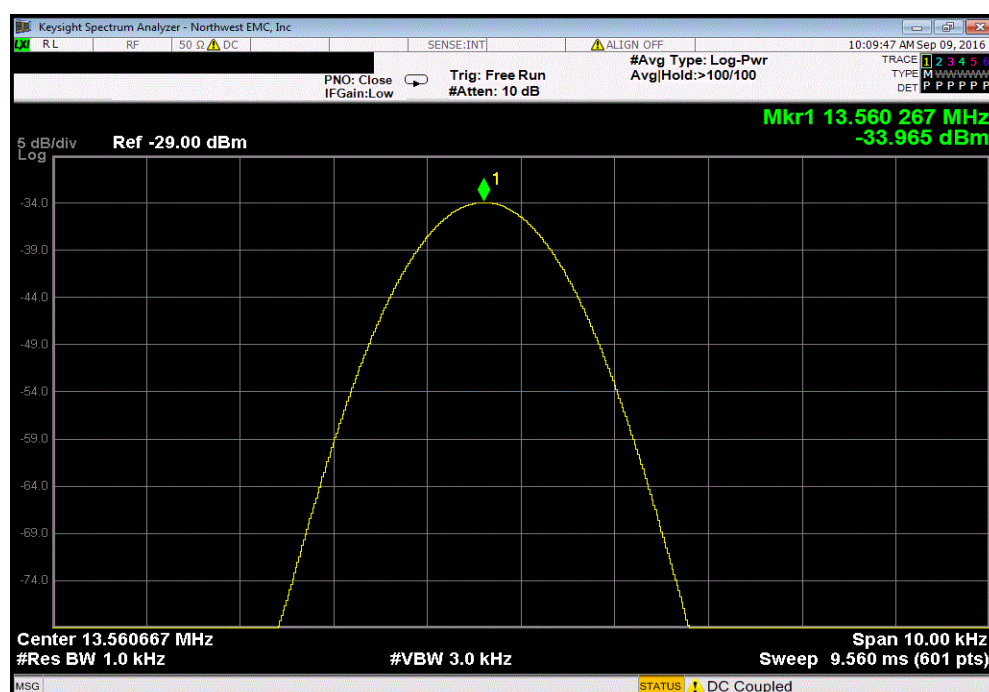
**NORTHWEST
EMC**

XMit 2016.05.06

13.56 MHz, Temperature Variation, 30 °C, Start Up					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560267	13.56	19.7	100	Pass



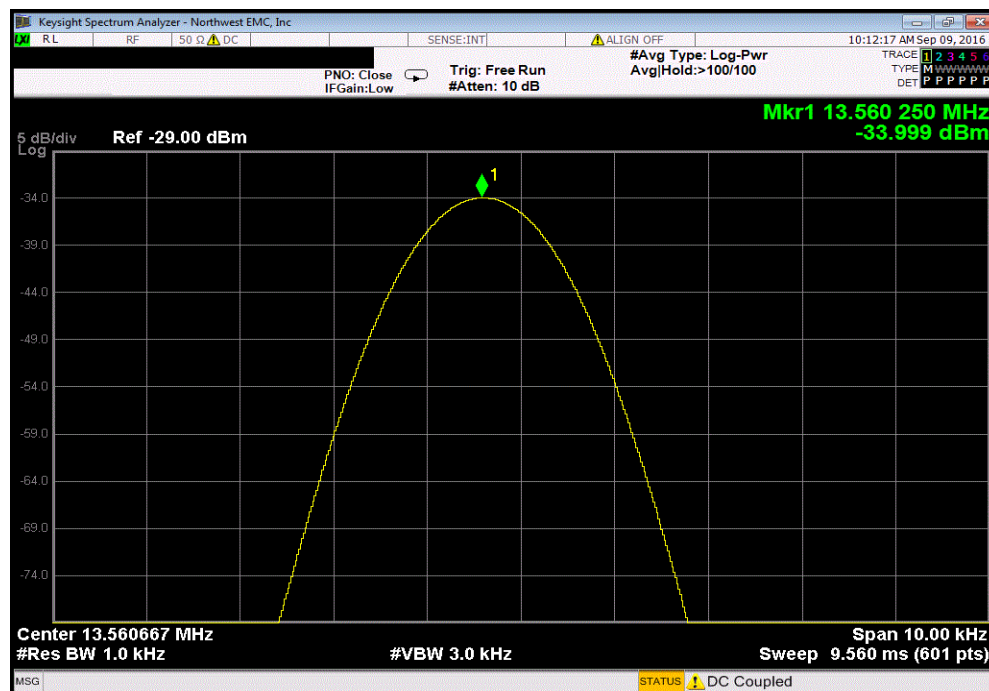
13.56 MHz, Temperature Variation, 30 °C. After 2 Minutes					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560267	13.56	19.7	100	Pass



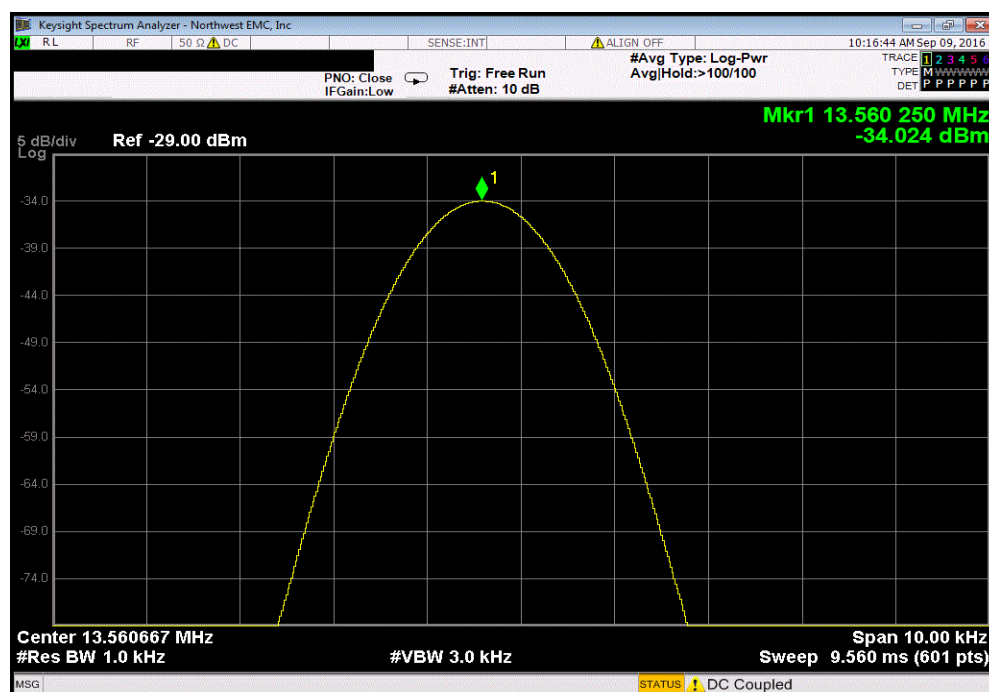
**NORTHWEST
EMC**

XMit 2016.05.06

13.56 MHz, Temperature Variation, 30 °C. After 5 Minutes					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
13.56025033	13.56	18.5	100	Pass	



13.56 MHz, Temperature Variation, 30 °C, After 10 Minutes					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.56025033	13.56	18.5	100	Pass



**NORTHWEST
EMC**

XMit 2016.05.06

Keysight Spectrum Analyzer - Northwest EMC, Inc

RL RF 50 Ω DC SENSE:INT ALIGN OFF 10:43:32 AM Sep 09, 2016

PNO: Close Trig: Free Run #Avt: 10 dB #Avg Type: Log-Pwr Avg|Hold: >100/100

TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P

5 dB/div Log Ref -29.00 dBm Mkr1 13.560 217 MHz -34.192 dBm

Center 13.560667 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

MSG STATUS DC Coupled

Keysight Spectrum Analyzer - Northwest EMC, Inc

RL RF 50 Ω DC SENSE:INT ALIGN OFF 10:45:40 AM Sep 09, 2016

PNO: Close IFGain:Low Trig: Free Run #Atten: 10 dB #Avg Type: Log-Pwr Avg|Hold:>100/100

TRACE 1 2 3 4 5 6 TYPE M M M M M M M M DET P P P P P P

5 dB/div Log Ref -29.00 dBm

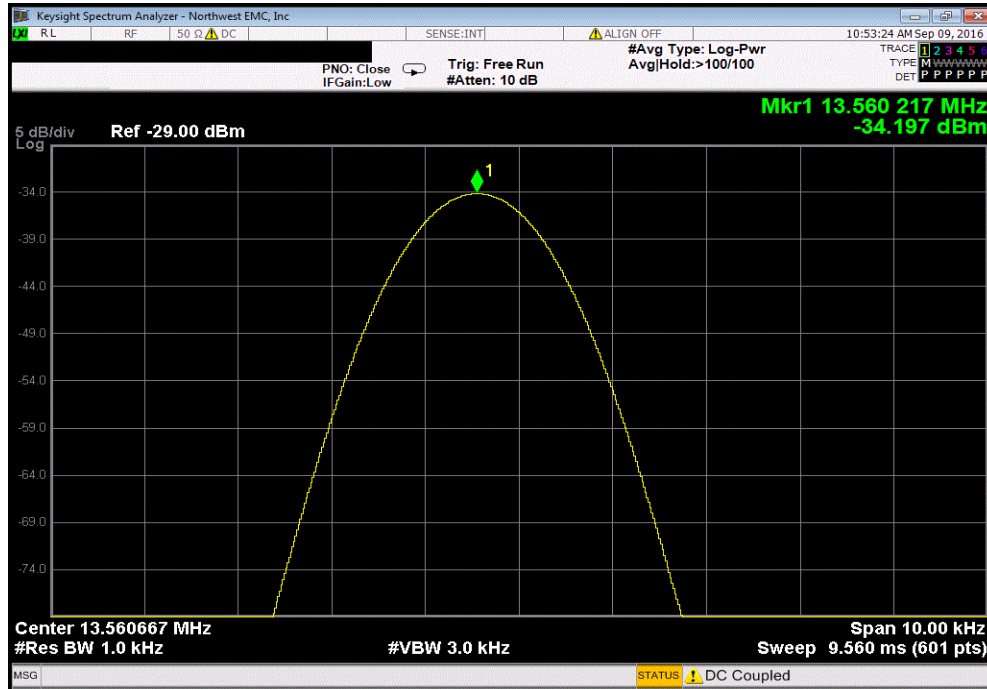
Mkr1 13.560 217 MHz -34.193 dBm

Center 13.560667 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

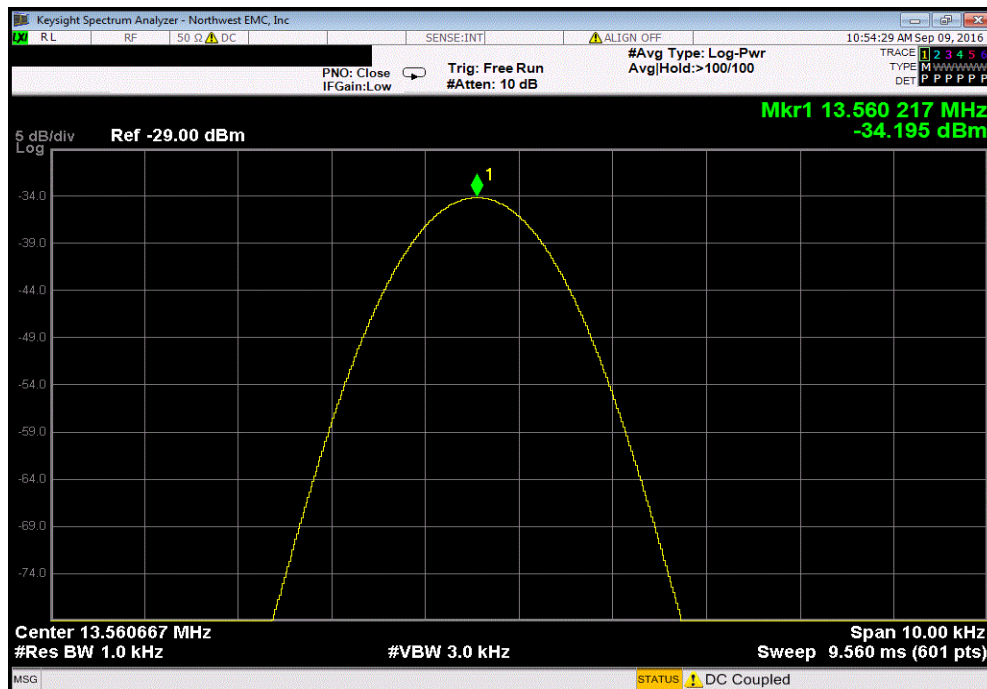
MSG STATUS DC Coupled

FREQUENCY STABILITY

13.56 MHz, Temperature Variation, 40 °C, After 5 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560217	13.56	16	100	Pass	



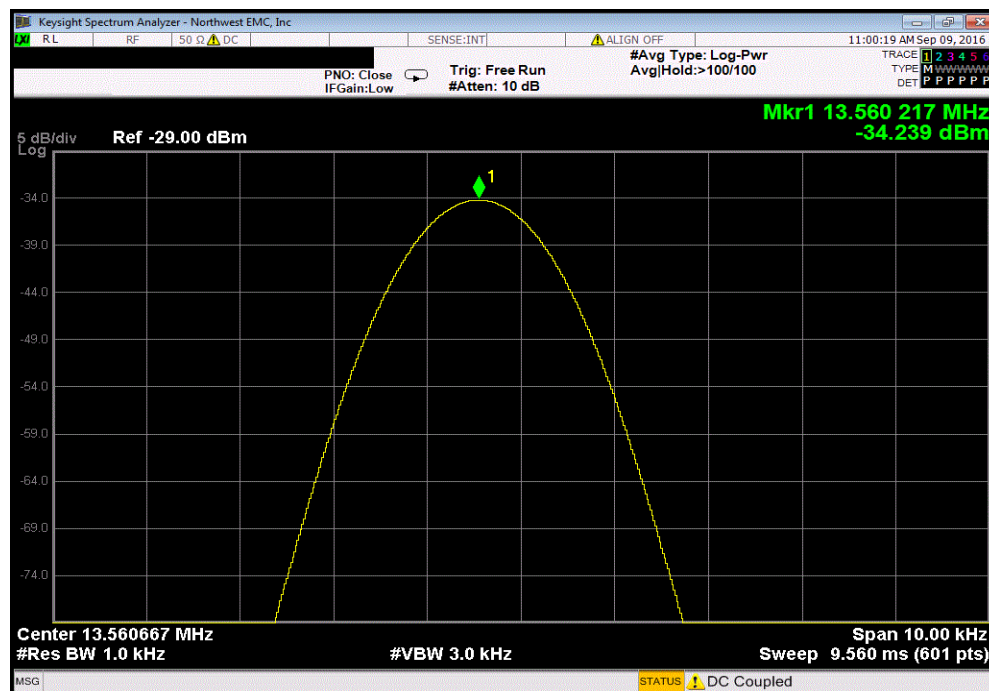
13.56 MHz, Temperature Variation, 40 °C, After 10 Minutes						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560217	13.56	16	100	Pass	



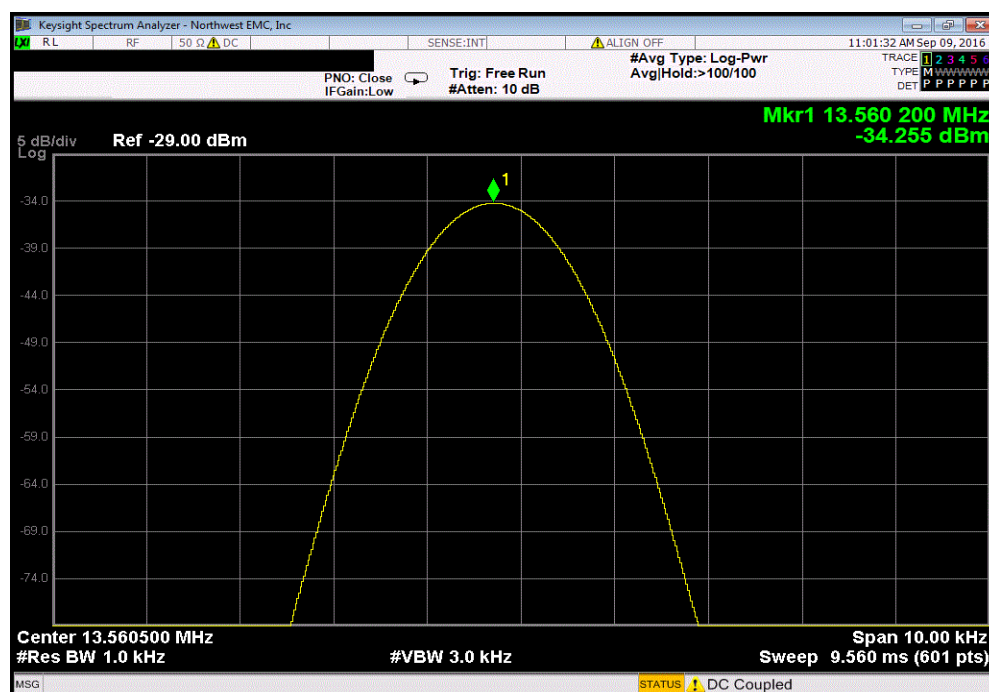
**NORTHWEST
EMC**

XMit 2016.05.06

13.56 MHz, Temperature Variation, 50 °C (High), Start Up					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.560217	13.56	16	100	Pass



13.56 MHz, Temperature Variation, 50 °C (High), After 2 Minutes					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
	13.5602	13.56	14.8	100	Pass



**NORTHWEST
EMC**

XMit 2016.05.06

Keysight Spectrum Analyzer - Northwest EMC, Inc

RL RF 50 Ω DC SENSE:INT ALIGN OFF 11:05:38 AM Sep 09, 2016

PNO: Close IFGain:Low Trig: Free Run #Aven: 10 dB #Avg Type: Log-Pwr AvgHold: >100/100

TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P

5 dB/div Log Ref -29.00 dBm Mkr1 13.560 200 MHz -34.280 dBm

Center 13.560667 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

MSG STATUS DC Coupled

Keysight Spectrum Analyzer - Northwest EMC, Inc

RL RF 50 Ω DC SENSE:INT ALIGN OFF 11:11:19 AM Sep 09, 2016

PNO: Close IFGain:Low Trig: Free Run #Atten: 10 dB #Avg Type: Log-Pwr AvgHold:>100/100

TRACE 1 2 3 4 5 6 TYPE M WWWWWW DET P P P P P P

5 dB/div Log Ref -29.00 dBm

Mkr1 13.560 200 MHz -34.310 dBm

The spectrum analyzer display shows a single peak at 13.560 MHz with a power level of -34.310 dBm. The peak is marked with a green diamond and the number 1. The frequency span is 10.00 kHz, and the resolution bandwidth (RBW) is 3.0 kHz. The center frequency is 13.560500 MHz. The reference level is -29.00 dBm. The display is in Log mode. The peak is labeled Mkr1.

Center 13.560500 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

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XMIT 2016.05.06

Keysight Spectrum Analyzer - Northwest EMC, Inc

12:12:57 PM Sep 09, 2016

TRACE 1 12.3450
TYPE MWWWWWW
DET P P P P P P

PNO: Close IF Gain: Low Trig: Free Run #Atten: 10 dB #Avg Type: Log-Pwr Avg/Hold: >100/100

5 dB/div Log Ref -29.00 dBm

Mkr1 13.560 217 MHz
-34.411 dBm

Center 13.560500 MHz
#Res BW 1.0 kHz
#VBW 3.0 kHz
Span 10.00 kHz
Sweep 9.560 ms (601 pts)

MSG STATUS DC Coupled

Keysight Spectrum Analyzer - Northwest EMC, Inc

RL RF 50 Ω DC SENSE:INT ALIGN OFF 12:11:07 PM Sep 09, 2016

PNO: Close IFGain:Low Trig: Free Run #Atten: 10 dB #Avg Type: Log-Pwr Avg|Hold:>100/100

TRACE 1 2 3 4 5 6 TYPE M M M M M M M M DET P P P P P P

5 dB/div Log Ref -29.00 dBm

Mkr1 13.560 200 MHz -34.272 dBm

Center 13.560667 MHz #Res BW 1.0 kHz #VBW 3.0 kHz Span 10.00 kHz Sweep 9.560 ms (601 pts)

MSG STATUS DC Coupled

FREQUENCY STABILITY

13.56 MHz, Voltage Variation, Voltage: 85%, Start Up						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	13.560217	13.56	16	100	Pass	

