



Synapse Strategic Product Development LLC

xTP

FCC 15.225:2012

Report #: SYNA0105



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: October 10, 2012
Synapse Strategic Product Development LLC
Model: xTP

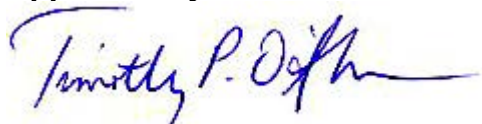
Emissions

Test Description	Specification	Test Method	Pass/Fail
Field Strength of Fundamental	FCC 15.225:2012	ANSI C63.10:2009	Pass
Field Strength of Spurious Emissions < 30 MHz	FCC 15.225:2012	ANSI C63.10:2009	Pass
Field Strength of Spurious Emissions > 30 MHz	FCC 15.225:2012	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.225:2012	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200630-0

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

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.

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. This Report may only be duplicated in its entirety. 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.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

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 Guide 65 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

KCC / 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.

Hong Kong

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

Vietnam

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

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>

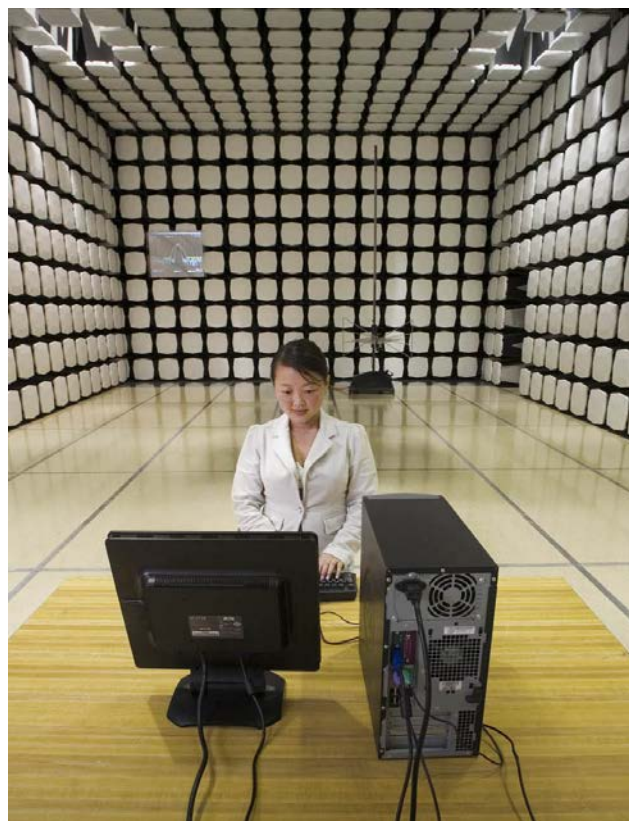
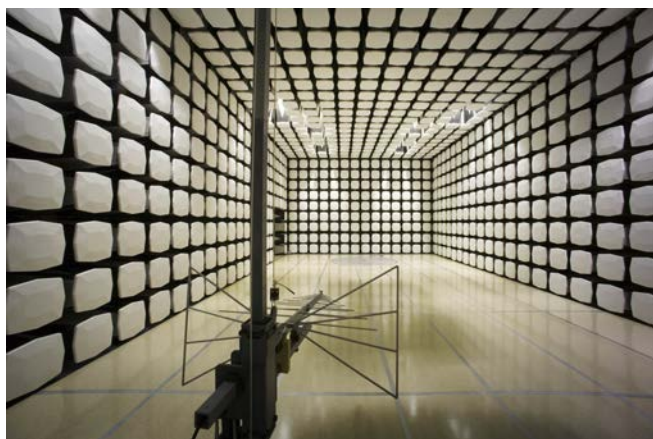


REV 2012.08.03

LOCATIONS



Oregon Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs SU01-SU07 14128 339 th Ave. SE Sultan, WA 98294 (360) 793-8675
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1



Client and Equipment Under Test (EUT) Information

Company Name:	Synapse Strategic Product Development LLC
Address:	1511 6th Ave. 4th Floor
City, State, Zip:	Seattle, WA 98101
Test Requested By:	Brian Piquette
Model:	xTP
First Date of Test:	October 09, 2012
Last Date of Test:	October 10, 2012
Receipt Date of Samples:	September 24, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
RFID reader with an integrated user interface that allows a user tap a RFID tag against the face of the device and receives a pass/fail response through the UI.
Clocks and Oscillators of the EUT:
Assume <108MHz
Testing Objective:
Seeking system approval under FCC 15.225.

Configuration SYNA0105- 1

Software/Firmware Running during test	
Description	Version
puTTY	Release 0.61

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
xTP Case	Synapse Strategic Product Development LLC	Rizzo	DVT-006
xTP Head	Synapse Strategic Product Development LLC	Camilla	DVT-019

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Power Supply	Mastech	HY3005C	HY3005C
Laptop Computer	Apple	MacBook Pro i7	C02GF3E3DV7M

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
CAT-6	No	6.0m	No	xTP Case	Laptop Computer
DC Power	No	4.7m	No	xTP Case	DC Power Supply
AC Power	No	2.0m	No	DC Power Supply	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	10/9/2012	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	10/9/2012	Field Strength of Spurious Emissions < 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	10/9/2012	Field Strength of Spurious Emissions > 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	10/10/2012	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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 at 13.56MHz, 100% modulation, 99% duty cycle

POWER SETTINGS INVESTIGATED

24VDC

CONFIGURATIONS INVESTIGATED

SYNA0105 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	13.11 MHz	Stop Frequency	14.01 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
EV11 Cables	N/A	3m Test Distance Cables	EVM	3/15/2012	12 mo
Antenna, Loop	EMCO	6502	AOA	6/28/2011	24 mo
Spectrum Analyzer	Agilent	E4443A	AFB	1/31/2012	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

MEASUREMENT UNCERTAINTY

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

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.



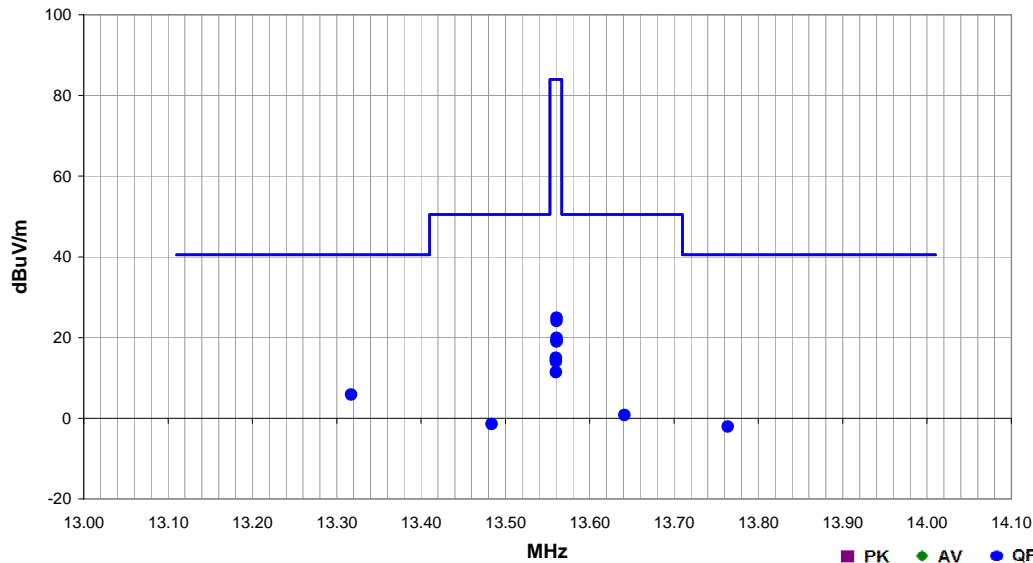
FIELD STRENGTH OF FUNDAMENTAL

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	SYNA0105	Date:	10/09/12	
Project:	None	Temperature:	21.7 °C	
Job Site:	EV11	Humidity:	31% RH	
Serial Number:	DVT-006, DVT-019	Barometric Pres.:	1020 mbar	
EUT:	xTP			
Configuration:	1			
Customer:	Synapse Strategic Product Development LLC			
Attendees:	Bill Standing			
EUT Power:	24VDC			
Operating Mode:	Transmitting at 13.56MHz, 100% modulation, 99% duty cycle			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.225:2012	ANSI C63.10:2009

Run #	3	Test Distance (m)	10	Antenna Height(s)	1-4m	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
13.317	13.4	11.6	1.0	84.0	10.0	0.0	Horz	QP	-19.1	5.9	40.5	-34.6	Ant perp ground, perp EUT, EUT On Side B
13.764	5.4	11.6	1.0	26.0	10.0	0.0	Horz	QP	-19.1	-2.1	40.5	-42.6	Ant perp ground, perp EUT, EUT On Side B
13.641	8.3	11.6	1.0	275.0	10.0	0.0	Horz	QP	-19.1	0.8	50.5	-49.7	Ant perp ground, perp EUT, EUT On Side B
13.484	6.1	11.6	1.0	227.0	10.0	0.0	Horz	QP	-19.1	-1.4	50.5	-51.9	Ant perp ground, perp EUT, EUT On Side B
13.561	32.4	11.6	1.0	287.0	10.0	0.0	Horz	QP	-19.1	24.9	84.0	-59.1	Ant perp ground, perp EUT, EUT On Side B
13.561	31.6	11.6	1.0	263.0	10.0	0.0	Horz	QP	-19.1	24.1	84.0	-59.9	Ant perp ground, perp EUT, EUT On Side A
13.561	27.4	11.6	1.0	295.0	10.0	0.0	Horz	QP	-19.1	19.9	84.0	-64.1	Ant perp ground, perp EUT, EUT Vertical
13.561	26.6	11.6	1.0	363.0	10.0	0.0	Horz	QP	-19.1	19.1	84.0	-64.9	Ant perp ground, para EUT, EUT On Side A
13.561	26.5	11.6	1.0	19.0	10.0	0.0	Horz	QP	-19.1	19.0	84.0	-65.0	Ant perp ground, para EUT, EUT On Side B
13.560	22.5	11.6	1.0	296.0	10.0	0.0	Vert	QP	-19.1	15.0	84.0	-69.0	Ant para ground, perp EUT, EUT On Side B
13.560	22.0	11.6	1.0	291.0	10.0	0.0	Vert	QP	-19.1	14.5	84.0	-69.5	Ant para ground, perp EUT, EUT On Side A
13.560	21.5	11.6	1.0	209.0	10.0	0.0	Horz	QP	-19.1	14.0	84.0	-70.0	Ant perp ground, para EUT, EUT Vertical
13.560	18.9	11.6	1.0	277.0	10.0	0.0	Vert	QP	-19.1	11.4	84.0	-72.6	Ant para ground, perp EUT, EUT Vertical

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 at 13.56MHz, 100% modulation, 99% duty cycle

POWER SETTINGS INVESTIGATED

24VDC

CONFIGURATIONS INVESTIGATED

SYNA0105 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 490 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
EV11 Cables	N/A	3m Test Distance Cables	EVM	3/15/2012	12 mo
Antenna, Loop	EMCO	6502	AOA	6/28/2011	24 mo
Spectrum Analyzer	Agilent	E4443A	AFB	1/31/2012	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

MEASUREMENT UNCERTAINTY

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

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.



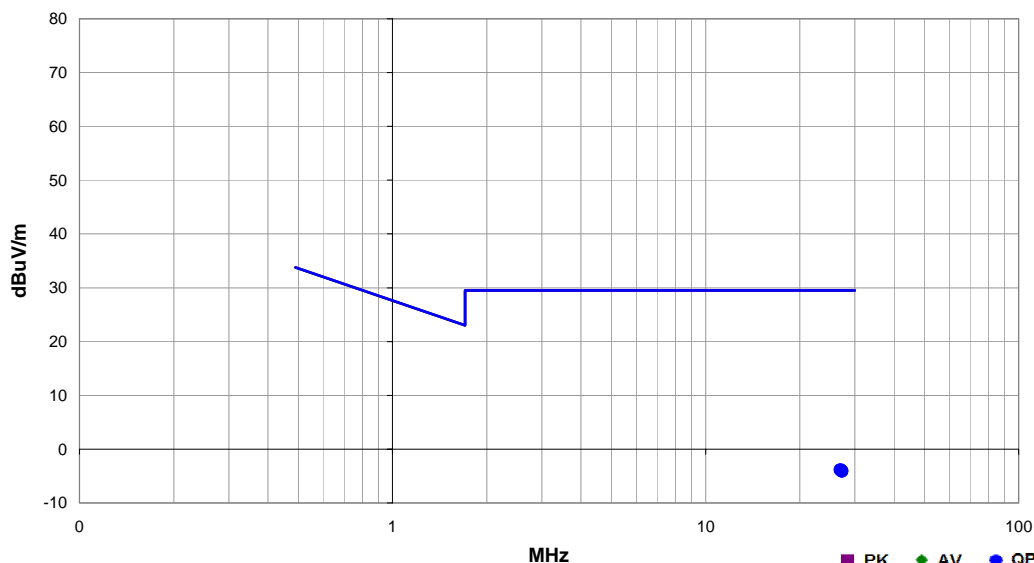
FIELD STRENGTH OF SPURIOUS EMISSIONS < 30MHz

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	SYNA0105	Date:	10/09/12			
Project:	None	Temperature:	21.7 °C			
Job Site:	EV11	Humidity:	31% RH			
Serial Number:	DVT-006, DVT-019	Barometric Pres.:	1020 mbar			
EUT:		xTP			Tested by:	Carl Engholm, Rod Peloquin
Configuration:						1
Customer:						Synapse Strategic Product Development LLC
Attendees:						Bill Standing
EUT Power:						24VDC
Operating Mode:						Transmitting at 13.56MHz, 100% modulation, 99% duty cycle
Deviations:						None
Comments:						None

Test Specifications	Test Method
FCC 15.225:2012	ANSI C63.10:2009

Run #	4	Test Distance (m)	10	Antenna Height(s)	1-4m	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
27.070	5.5	9.8	1.0	2.0	10.0	0.0	Vert	QP	-19.1	-3.8	29.5	-33.3	Ant para ground, perp EUT, EUT Vertical
26.876	5.4	9.8	1.0	-5.0	10.0	0.0	Vert	QP	-19.1	-3.9	29.5	-33.4	Ant para ground, perp EUT, EUT On Side A
26.886	5.4	9.8	1.0	77.0	10.0	0.0	Horz	QP	-19.1	-3.9	29.5	-33.4	Ant perp ground, perp EUT, EUT On Side A
26.993	5.4	9.8	1.0	277.0	10.0	0.0	Vert	QP	-19.1	-3.9	29.5	-33.4	Ant para ground, perp EUT, EUT On Side B
27.250	5.4	9.7	1.0	9.0	10.0	0.0	Horz	QP	-19.1	-4.0	29.5	-33.5	Ant perp ground, perp EUT, EUT Vertical
27.151	5.3	9.7	1.0	361.0	10.0	0.0	Horz	QP	-19.1	-4.1	29.5	-33.6	Ant perp ground, para EUT, EUT Vertical
27.258	5.3	9.7	1.0	218.0	10.0	0.0	Horz	QP	-19.1	-4.1	29.5	-33.6	Ant perp ground, perp EUT, EUT On Side B
27.362	5.3	9.7	1.0	279.0	10.0	0.0	Horz	QP	-19.1	-4.1	29.5	-33.6	Ant perp ground, para EUT, EUT On Side A
27.247	5.2	9.7	1.0	154.0	10.0	0.0	Horz	QP	-19.1	-4.2	29.5	-33.7	Ant perp ground, para EUT, EUT On Side B



FIELD STRENGTH OF SPURIOUS EMISSIONS > 30MHz

PSA-ESCI 2012.09.25

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MODES OF OPERATION

Transmitting at 13.56MHz, 100% modulation, 99% duty cycle

POWER SETTINGS INVESTIGATED

24VDC

CONFIGURATIONS INVESTIGATED

SYNA0105 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	1000 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
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	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

MEASUREMENT UNCERTAINTY

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

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 C63.4).



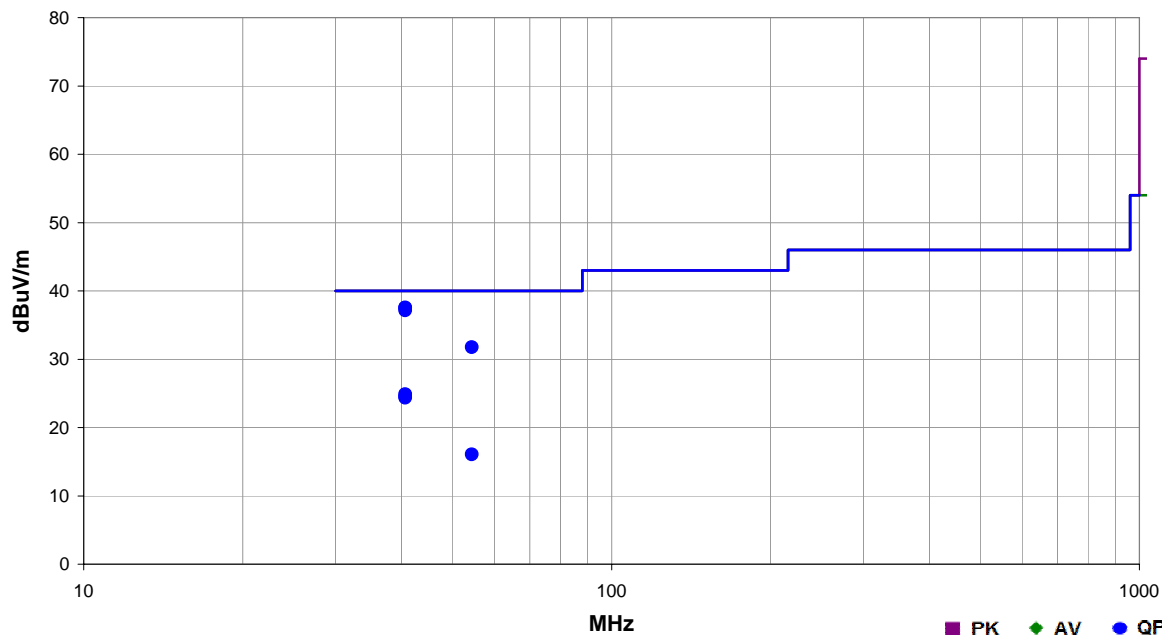
FIELD STRENGTH OF SPURIOUS EMISSIONS > 30MHz

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	SYNA0105	Date:	10/09/12	<i>Rocky Le Pelouin</i>	
Project:	None	Temperature:	21.7 °C		
Job Site:	EV01	Humidity:	31% RH		
Serial Number:	DVT-006, DVT-019	Barometric Pres.:	1020 mbar		
EUT:		xTP		Tested by:	Carl Engholm, Rod Peloquin
Configuration:	1				
Customer:	Synapse Strategic Product Development LLC				
Attendees:	Bill Standing				
EUT Power:	24VDC				
Operating Mode:	Transmitting at 13.56MHz, 100% modulation, 99% duty cycle				
Deviations:	None				
Comments:	None				

Test Specifications	Test Method
FCC 15.225:2011	ANSI C63.10:2009

Run #	1	Test Distance (m)	3	Antenna Height(s)	1-4m	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
40.690	40.4	-2.8	1.0	69.0	3.0	0.0	Vert	QP	0.0	37.6	40.0	-2.4	EUT Vertical
40.688	40.3	-2.8	1.0	73.0	3.0	0.0	Vert	QP	0.0	37.5	40.0	-2.5	EUT On Side A
40.688	40.0	-2.8	1.0	57.0	3.0	0.0	Vert	QP	0.0	37.2	40.0	-2.8	EUT On Side B
54.381	39.0	-7.2	1.6	24.0	3.0	0.0	Vert	QP	0.0	31.8	40.0	-8.2	EUT Vertical
40.688	27.7	-2.8	2.4	300.0	3.0	0.0	Horz	QP	0.0	24.9	40.0	-15.1	EUT Vertical
40.688	27.4	-2.8	3.5	271.0	3.0	0.0	Horz	QP	0.0	24.6	40.0	-15.4	EUT On Side B
40.688	27.2	-2.8	3.1	233.0	3.0	0.0	Horz	QP	0.0	24.4	40.0	-15.6	EUT On Side A
54.366	23.3	-7.2	2.1	308.0	3.0	0.0	Horz	QP	0.0	16.1	40.0	-23.9	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.	Interval
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	NCR	0
Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	NCR	0
Humidity Temperature Meter	Omegaette	HH311	DTX	3/29/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12

MEASUREMENT UNCERTAINTY

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of the nominal voltage. A DC lab supply was used to vary the supply voltage.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-20° to +50° C) and at 10°C intervals.

The measurement was made with a direct connection between the EUT antenna port and the test equipment. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

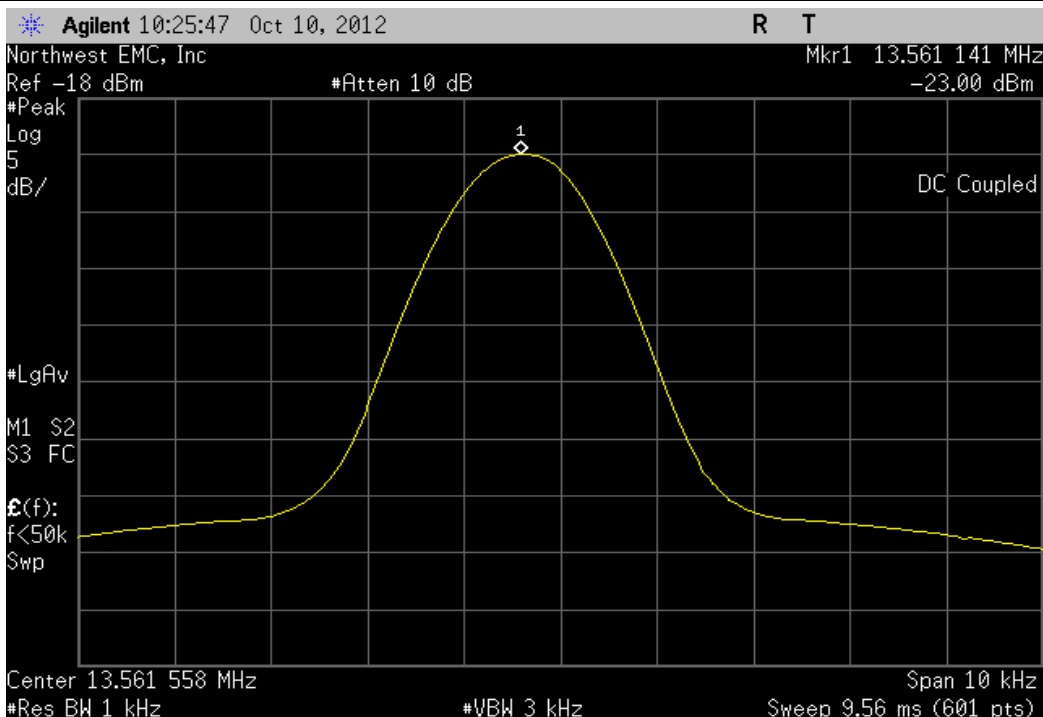


Frequency Stability

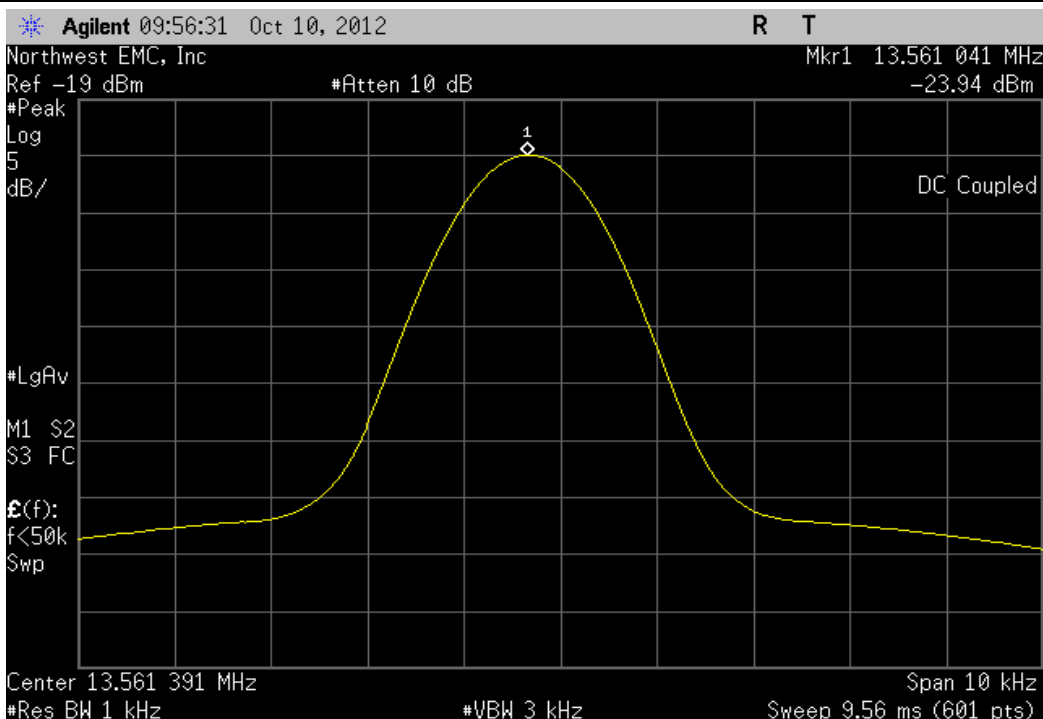
XMit 2012.09.20
PsaTx 2012.09.10

EUT: xTP		Work Order: SYNA0105				
Serial Number: DVT-006, DVT-019		Date: 10/10/12				
Customer: Synapse Strategic Product Development LLC		Temperature: 22.5°C				
Attendees: Bill Standing		Humidity: 33%				
Project: None		Barometric Pres.: 1016.9				
Tested by: Carl Engholm, Rod Peloquin		Power: 24VDC				
Job Site: EV06						
TEST SPECIFICATIONS		Test Method				
FCC 15.225:2012		ANSI C63.10:2009				
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	2	Signature <i>Rocky Le Pellego</i>				
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
Center Frequency, 13.56 MHz						
Temperature: +50°		13.561141	13.56	84.14	100	Pass
Temperature: +40°		13.561041	13.56	76.77	100	Pass
Temperature: +30°		13.561023	13.56	75.44	100	Pass
Temperature: +20°		13.561073	13.56	79.13	100	Pass
Temperature: +10°		13.561023	13.56	75.44	100	Pass
Temperature: 0°		13.561024	13.56	75.52	100	Pass
Temperature: -10°		13.561024	13.56	75.52	100	Pass
Temperature: -20°		13.561024	13.56	75.52	100	Pass
Voltage Nominal: 24 VDC		13.561023	13.56	75.44	100	Pass
Voltage Low: 20.4 VDC, 85%		13.561008	13.56	74.34	100	Pass
Voltage High: 27.6 VDC, 115%		13.561023	13.56	75.44	100	Pass

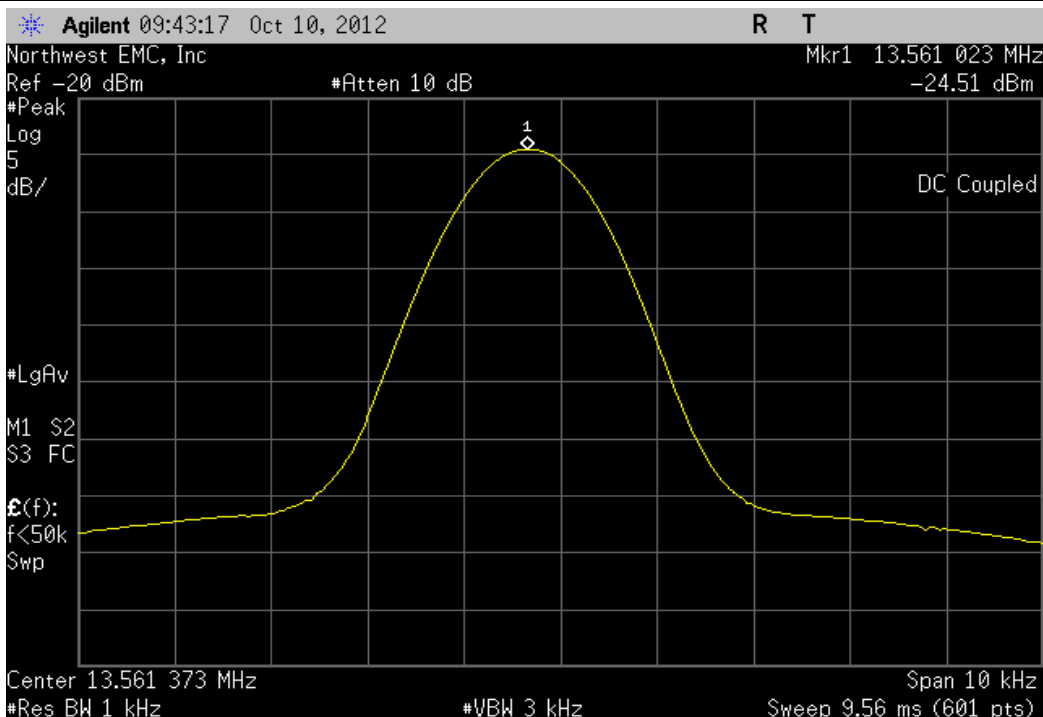
Center Frequency, 13.56 MHz, Temperature: +50°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561141	13.56	84.14	100	Pass



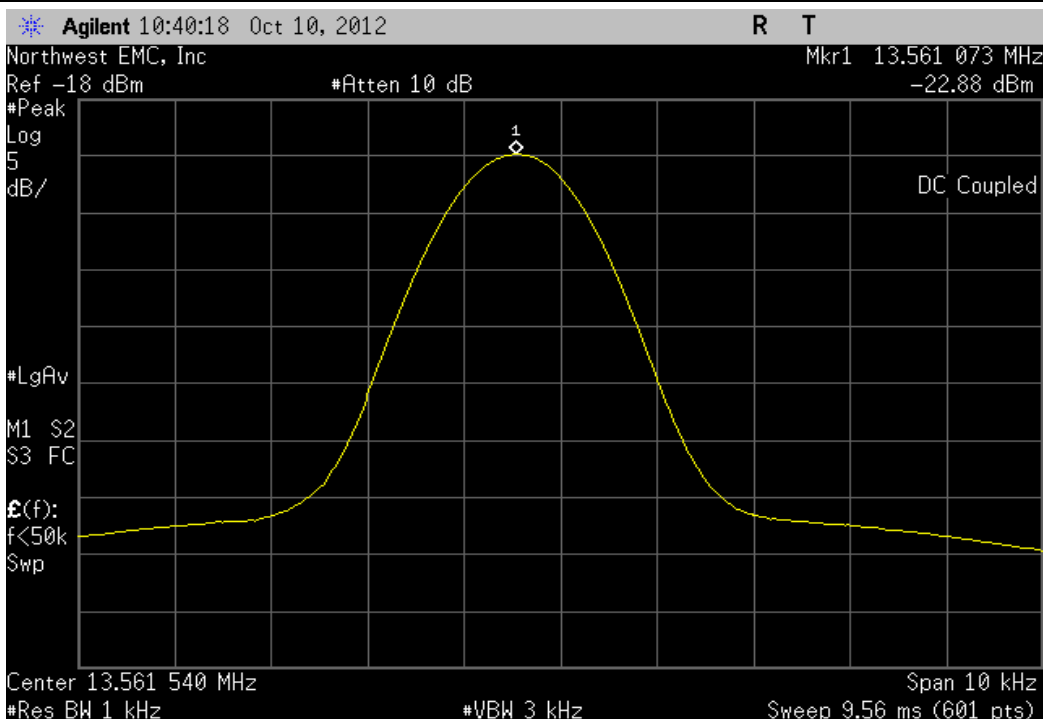
Center Frequency, 13.56 MHz, Temperature: +40°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561041	13.56	76.77	100	Pass



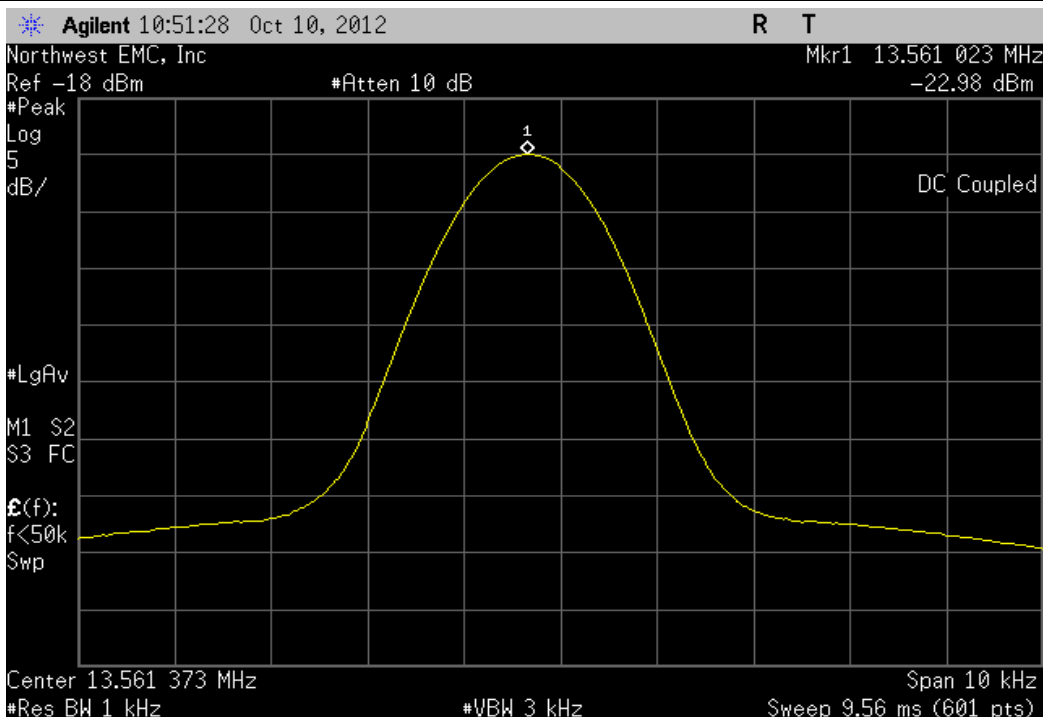
Center Frequency, 13.56 MHz, Temperature: +30°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561023	13.56	75.44	100	Pass



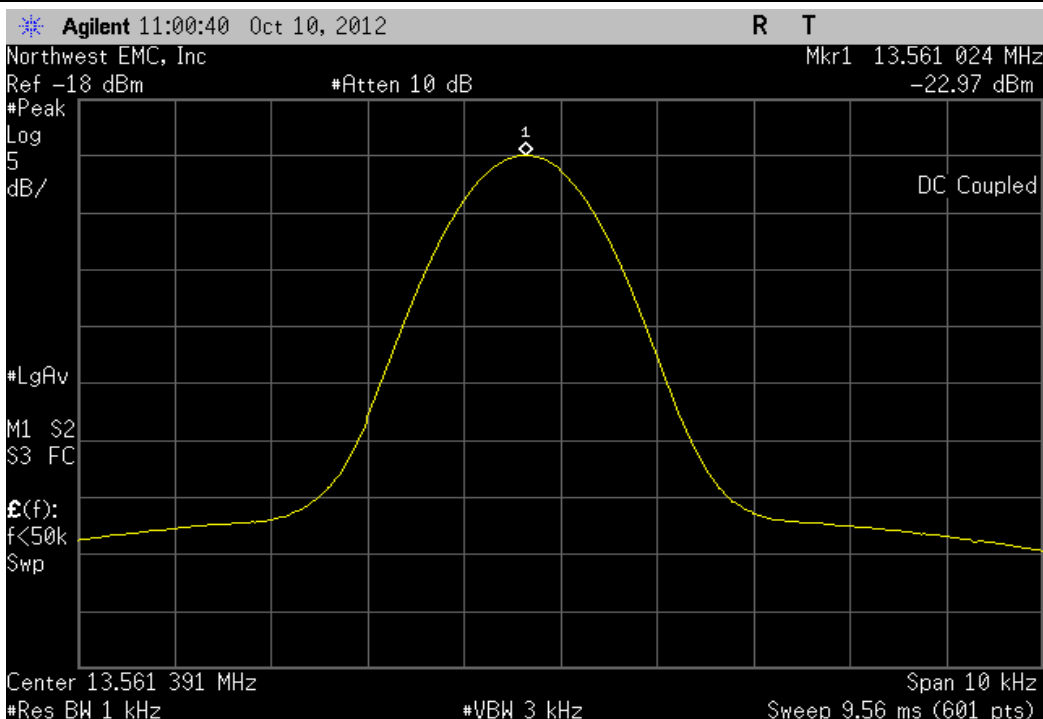
Center Frequency, 13.56 MHz, Temperature: +20°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561073	13.56	79.13	100	Pass



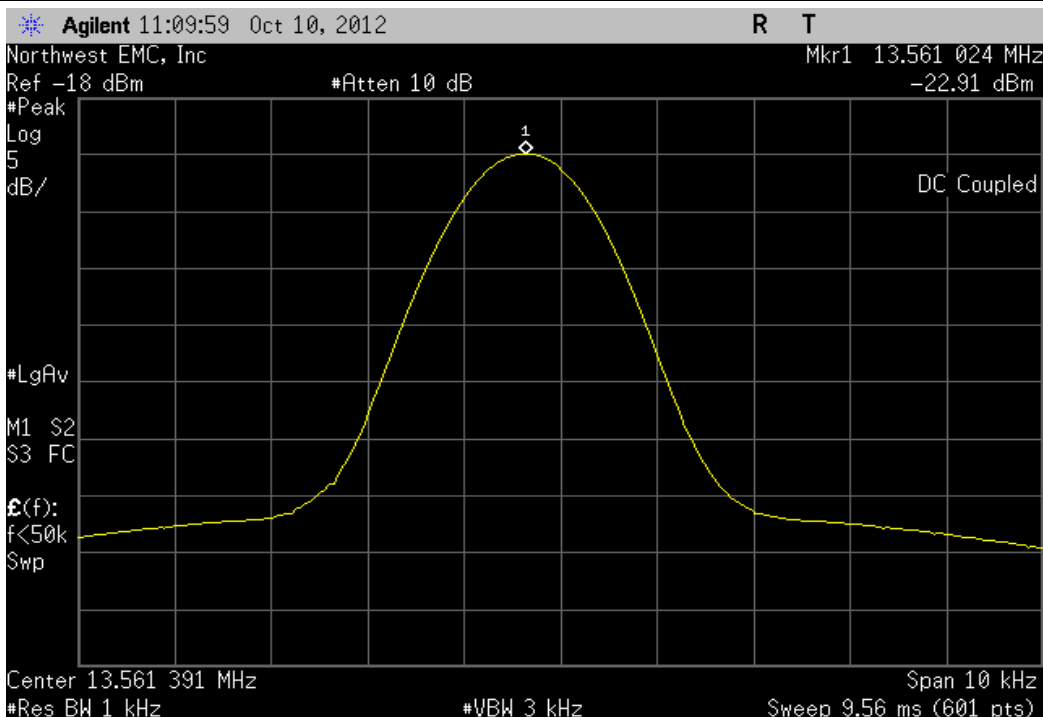
Center Frequency, 13.56 MHz, Temperature: +10°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561023	13.56	75.44	100	Pass



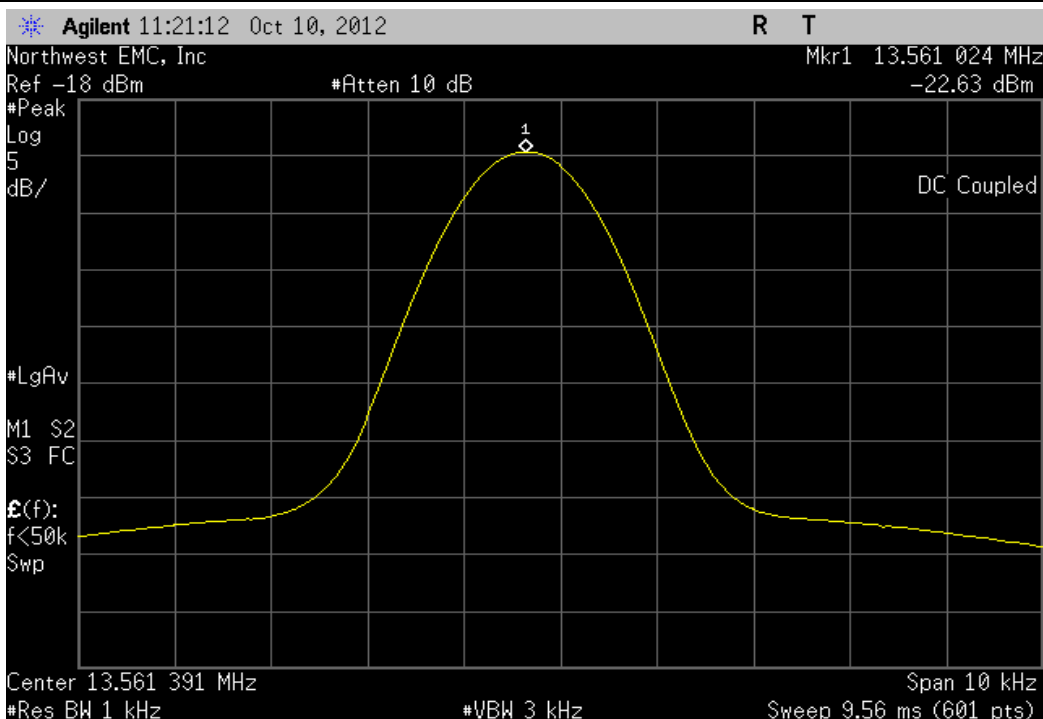
Center Frequency, 13.56 MHz, Temperature: 0°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561024	13.56	75.52	100	Pass



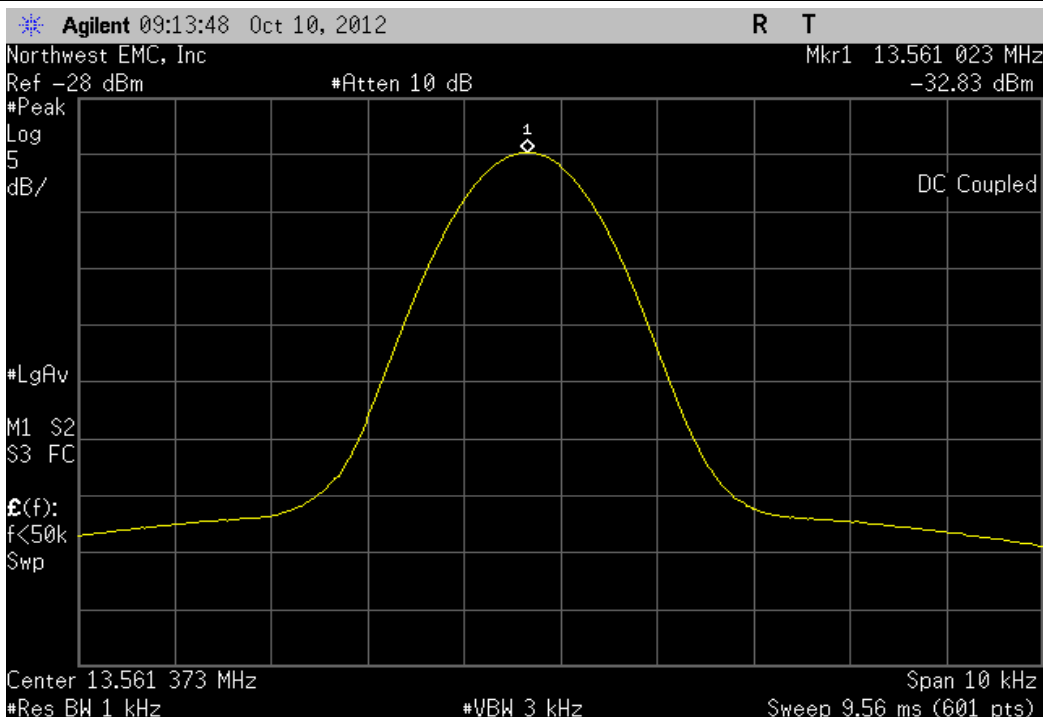
Center Frequency, 13.56 MHz, Temperature: -10°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561024	13.56	75.52	100	Pass



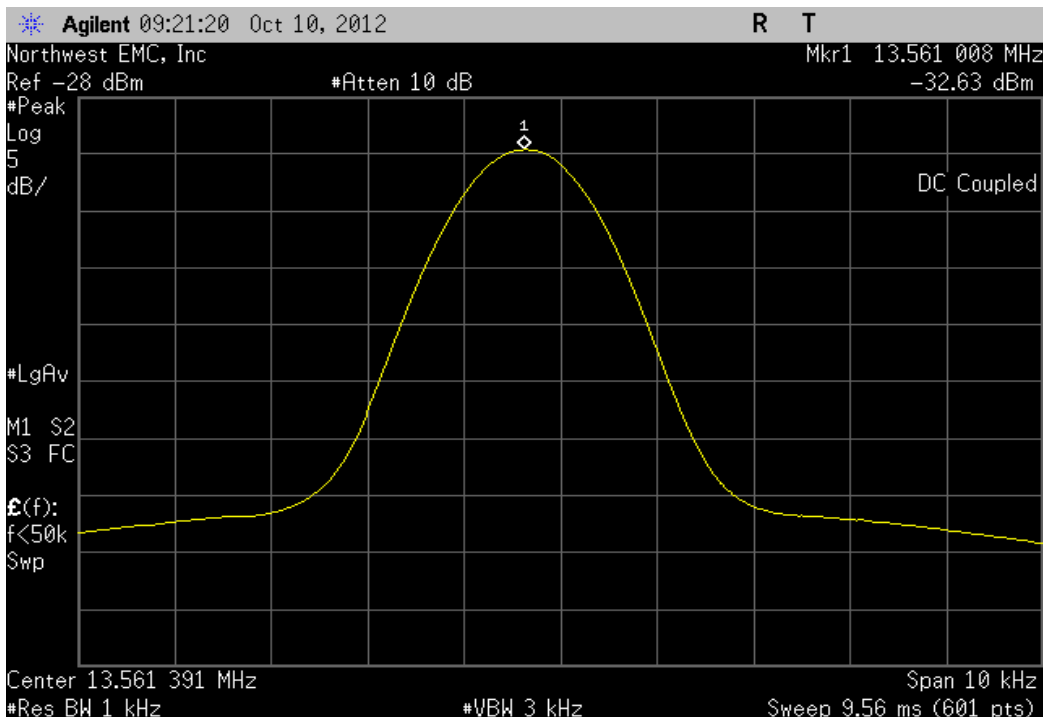
Center Frequency, 13.56 MHz, Temperature: -20°					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561024	13.56	75.52	100	Pass



Center Frequency, 13.56 MHz, Voltage Nominal: 24 VDC					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561023	13.56	75.44	100	Pass



Center Frequency, 13.56 MHz, Voltage Low: 20.4 VDC, 85%					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	13.561008	13.56	74.34	100	Pass



Center Frequency, 13.56 MHz, Voltage High: 27.6 VDC, 115%

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
13.561023	13.56	75.44	100	Pass

