Microsoft Corporation

1514

FCC 15.407:2012

FCC 15.207:2012

Report #: MCSO1631.1 Rev. 1

Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

WTD 12.5.23

Last Date of Test: December 14, 2012
Microsoft Corporation
Model: 1514

Emissions

Test Description	Specification	Test Method	Pass/Fail
Emission Bandwidth	FCC 15.407:2012	ANSI C63.10:2009	Pass
Peak Transmit Power	FCC 15.407:2012	ANSI C63.10:2009	Pass
Peak Power Spectral Density	FCC 15.407:2012	ANSI C63.10:2009	Pass
Peak Excursion	FCC 15.407:2012	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.407:2012	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.407:2012	ANSI C63.10:2009	Pass
Spurious Radiated Emission	FCC 15.407:2012	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2012	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

REV 2012.08.02

Revision Number	Description	Date	Page Number
01	Emissions Bandwidth Antenna AB was in the report twice. Fixed one to be just Antenna A.	12-21-12	13-38

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

REV 2012.05.24

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 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.

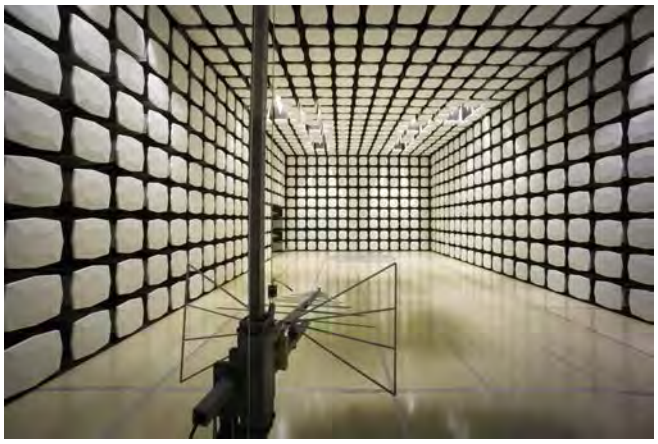
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

LOCATIONS

REV 2012.08.03

Oregon	California	New York	Minnesota	Washington
Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs SU01-SU07 14128 339th 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



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Test Requested By:	Mike Boucher
Model:	1514
First Date of Test:	November 5, 2012
Last Date of Test:	December 14, 2012
Receipt Date of Samples:	October 29, 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):
A Hand held computing device with 802.11b/g/a/n and Bluetooth radios.

Testing Objective:
To demonstrate compliance under FCC 15.407 for operation in the 5.2 GHz, 5.3 GHz, and 5.6 GHz bands.

CONFIGURATIONS

Configuration MCSO1631- 1

Software/Firmware Running during test	
Description	**Version**
MS Windows	8
Wifi Tool	1.0.8.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hand Held Computing Device	Microsoft Corporation	1514	000012424053

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	PA-2480-06MX	0D21033282239
USB Ethernet Adapter	Cisco	USB300M	CU906M703795

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	Lenovo	ThinkPad T420s	R9-PMLAF

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone	No	1.2m	No	Hand Held Computing Device	Earbuds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Hand Held Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Hand Held Computing Device
HD Video Cable	Yes	1.9m	No	Hand Held Computing Device	Unterminated
Ethernet	No	1.0m	No	SB Ethernet Adapter	Remote Laptop
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATIONS

Configuration MCSO1631- 2

Software/Firmware Running during test	
Description	**Version**
MS Windows	8
Wifi Tool	1.0.8.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hand Held Computing Device	Microsoft Corporation	1514	000092324253

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	PA-2480-06MX	0D21033282239
USB Ethernet Adapter	Cisco	USB300M	CU906M703795

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	Lenovo	ThinkPad T420s	R9-PMLAF

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone	No	1.2m	No	Hand Held Computing Device	Earbuds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Hand Held Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Hand Held Computing Device
HD Video Cable	Yes	1.9m	No	Hand Held Computing Device	Unterminated
Ethernet	No	1.0m	No	SB Ethernet Adapter	Remote Laptop
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATIONS

Configuration MCSO1638- 1

Software/Firmware Running during test	
Description	**Version**
Wifi Tool	1.0.8.24
MS Windows	8

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hand Held Computing Device	Microsoft Corporation	1514	000109423753
Keyboard	Microsoft Corporation	11468626	000570221351

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote PC	Lenovo	L420	7854CT0

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC mains	Yes	1.0m	No	AC Mains	Hand Held Computing Device
USB adapter	Yes	.2m	No	Hand Held Computing Device	Ethernet CAT 5 Cable
Ethernet CAT 5 Cable	No	1.0m	No	USB adapter	Remote PC
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATIONS

Configuration MCSO1638- 2

Software/Firmware Running during test	
Description	**Version**
Wifi Tool	1.0.8.24
MS Windows	8

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Hand Held Computing Device	Microsoft Corporation	1514	000109423753
Keyboard	Microsoft Corporation	11468626	000570221351

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Power Supply	Topward Electric	TPS-2000	946425
Remote PC	Lenovo	L420	7854CT0

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Digital Multi-Meter	Tektronix	DMM912	AL2807

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC mains	Yes	1.0m	No	AC Mains	Hand Held Computing Device
USB adapter	Yes	.2m	No	Hand Held Computing Device	Ethernet CAT 5 Cable
Ethernet CAT 5 Cable	No	2.5m	No	USB adapter	Remote PC
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1638- 4

Software/Firmware Running during test	
Description	**Version**
Wifi Tool	1.0.8.24
MS Windows	8

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Keyboard	Microsoft Corporation	11468626	000570221351
Hand Held Computing Device	Microsoft Corporation	1514	000070724253

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote PC	Lenovo	L420	7854CT0

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC mains	Yes	1.0m	No	AC Mains	Hand Held Computing Device
USB adapter	Yes	.2m	No	Hand Held Computing Device	Ethernet CAT 5 Cable
Ethernet CAT 5 Cable	No	1.0m	No	USB adapter	Remote PC
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/5/2012	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.
2	11/6/2012	Band Edge Compliance	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	11/6/2012	Peak Excursion	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	11/6/2012	Emission Bandwidth	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	11/13/2012	AC Powerline Conducted Emissions	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.
6	11/16/2012	Spurious Radiated Emission	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.
7	12/12/2012	Peak Power Spectral Density	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.
8	12/14/2012	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Emission Bandwidth

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section D was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:
- Span = approximately 1.5 to 2 times the emission bandwidth, centered on the transmit channel.
- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- A peak detector was used.

The spectrum analyzer Occupied Bandwidth measurement function was then used to measure 26 dB emission bandwidth.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT is operating on antenna port A only.

Emission Bandwidth

EUT:	1514			**Work Order:**	MCSO1638
Serial Number:	000109423753			**Date:**	11/06/12
Customer:	Microsoft Corporation			**Temperature:**	22°C
Attendees:	None			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	1018
Tested by:	Brandon Hobbs Rod Peloquin	**Power:**	110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for b, g and n modes

DEVIATIONS FROM TEST STANDARD

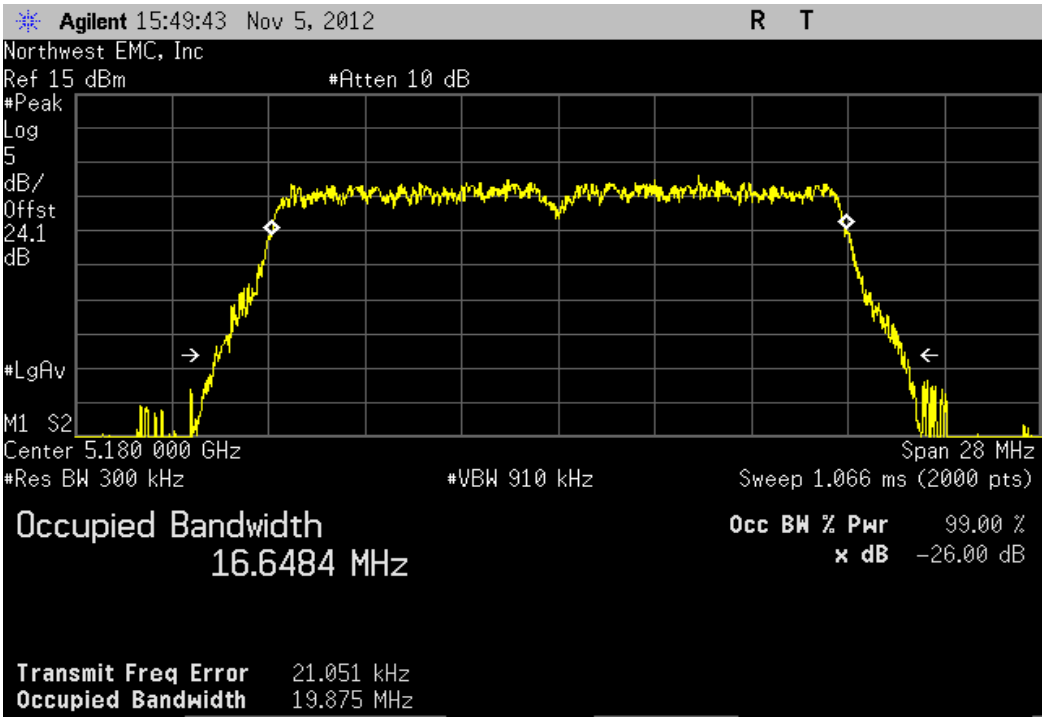
None

Configuration #	1	Signature

		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	19.875 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.973 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.787 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.841 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.841 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.813 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.83 MHz	> 500 kHz	Pass
	802.11(a) 36 Mbps			
	Ch 36, Low Channel 5180 MHz	19.875 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.796 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.893 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.905 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.89 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.968 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.82 MHz	> 500 kHz	Pass
	802.11(a) 54 Mbps			
	Ch 36, Low Channel 5180 MHz	19.835 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.804 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.857 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.987 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.915 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.917 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.885 MHz	> 500 kHz	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	21.681 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	21.614 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	21.895 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	21.82 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	21.795 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	21.769 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	21.788 MHz	> 500 kHz	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	22.048 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	21.955 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	21.919 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	21.658 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	21.618 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	22.005 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	22.177 MHz	> 500 kHz	Pass
40 MHz				
	802.11(n) MCS0			
	Ch 36/40, Low Channel 5190 MHz	40.833 MHz	> 500 kHz	Pass
	Ch 44/48, High Channel 5230 MHz	40.805 MHz	> 500 kHz	Pass
	Ch 52/56, Low Channel 5270 MHz	40.753 MHz	> 500 kHz	Pass
	Ch 60/64, High Channel 5310 MHz	40.703 MHz	> 500 kHz	Pass
	Ch 100/104, Low Channel 5510 MHz	40.893 MHz	> 500 kHz	Pass
	Ch 132/136, High Channel 5670 MHz	40.844 MHz	> 500 kHz	Pass
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	41.085 MHz	> 500 kHz	Pass
	Ch 44/48, High Channel 5230 MHz	41.016 MHz	> 500 kHz	Pass
	Ch 52/56, Low Channel 5270 MHz	41.06 MHz	> 500 kHz	Pass
	Ch 60/64, High Channel 5310 MHz	41.065 MHz	> 500 kHz	Pass
	Ch 100/104, Low Channel 5510 MHz	41.054 MHz	> 500 kHz	Pass
	Ch 132/136, High Channel 5670 MHz	41.029 MHz	> 500 kHz	Pass

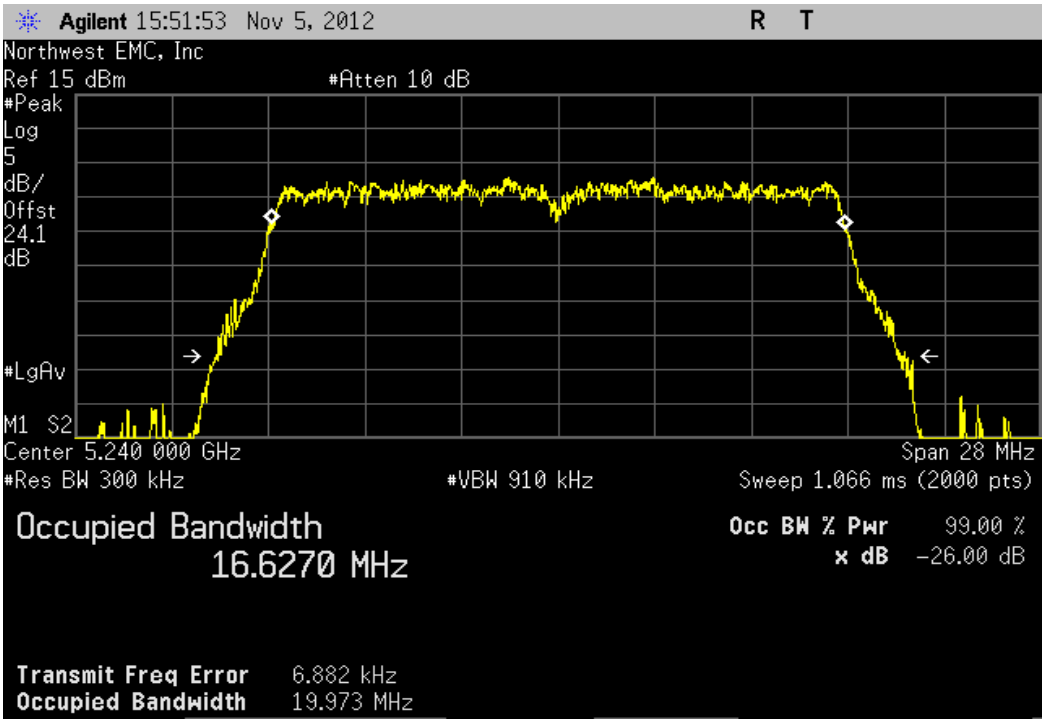
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				19.875 MHz	> 500 kHz	Pass



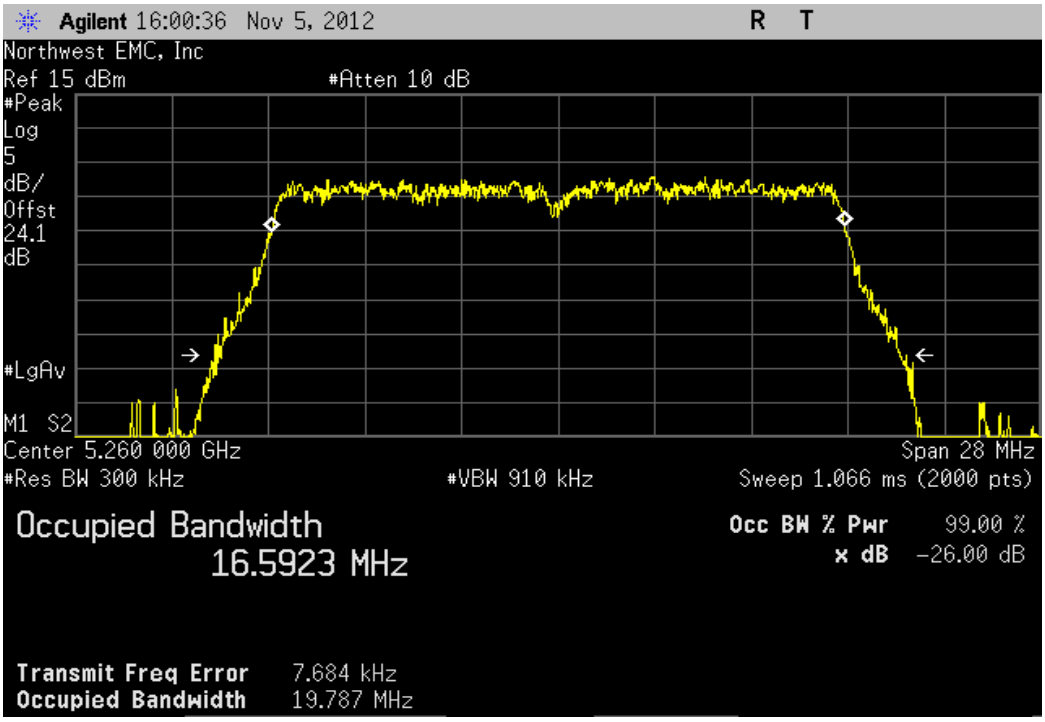
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				19.973 MHz	> 500 kHz	Pass



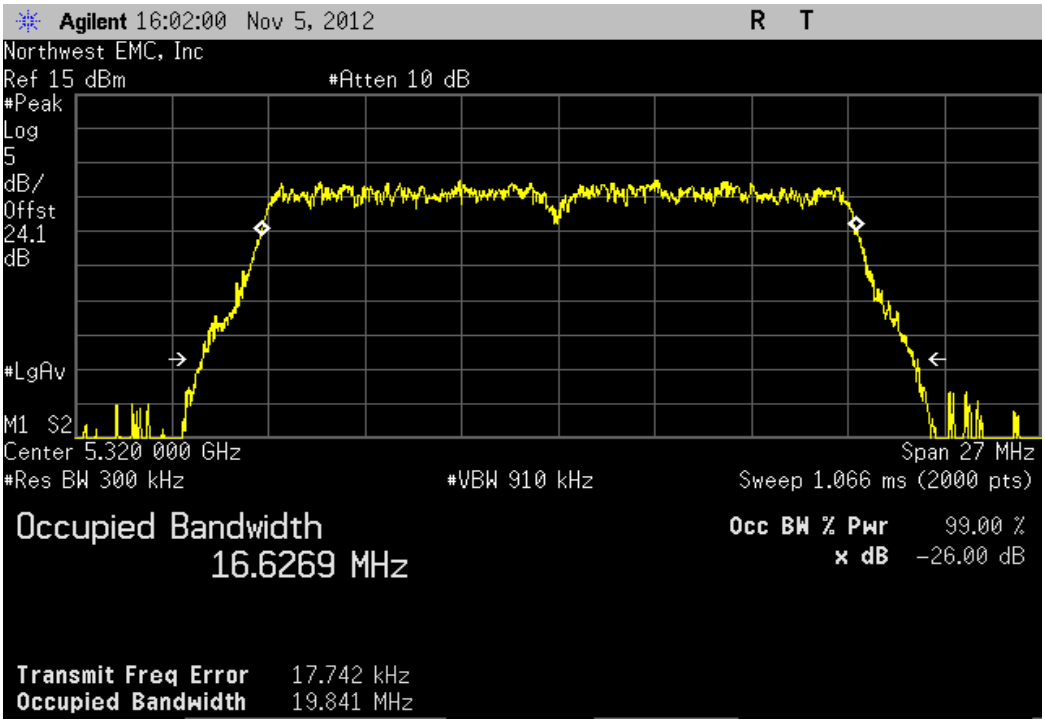
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.787 MHz	> 500 kHz	Pass



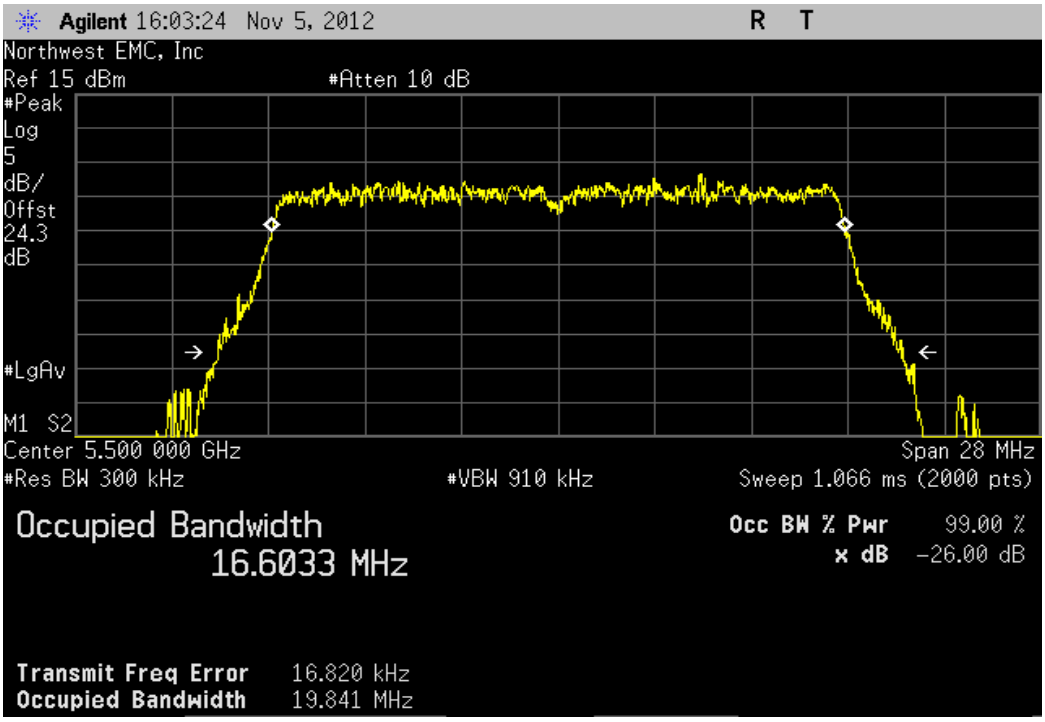
20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				19.841 MHz	> 500 kHz	Pass



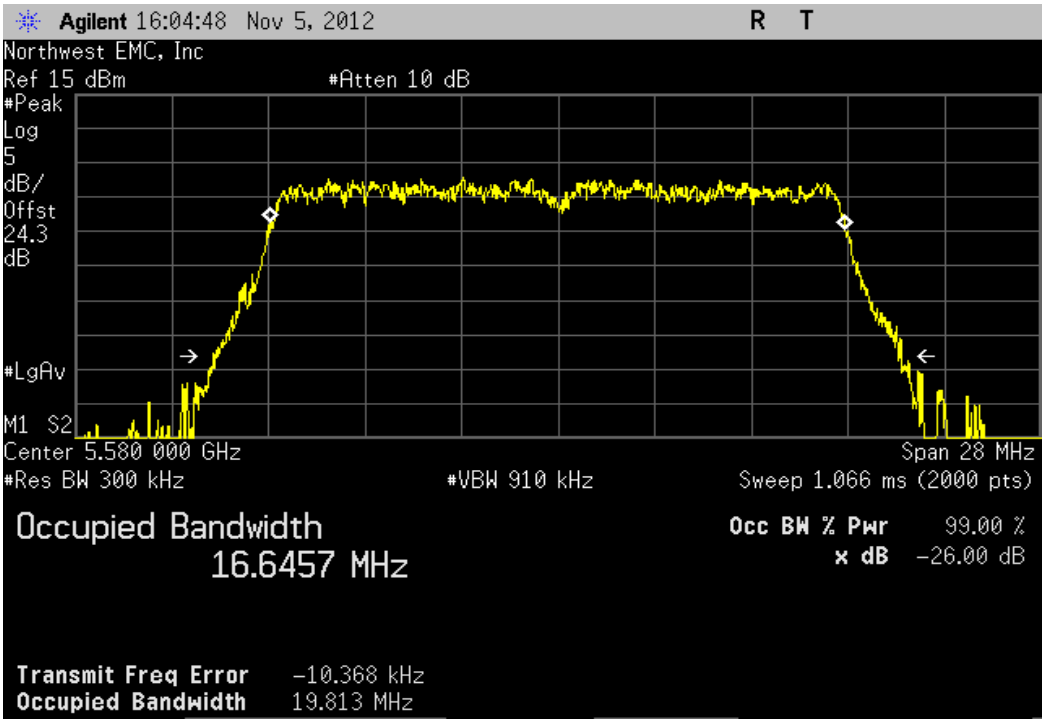
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				19.841 MHz	> 500 kHz	Pass



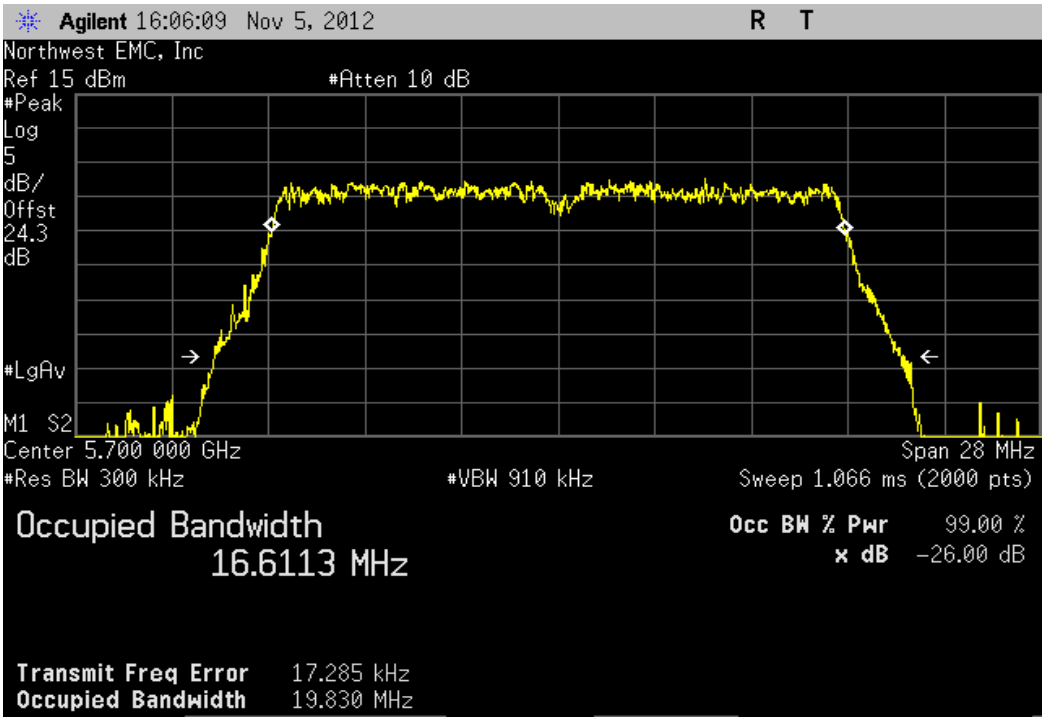
20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.813 MHz	> 500 kHz	Pass



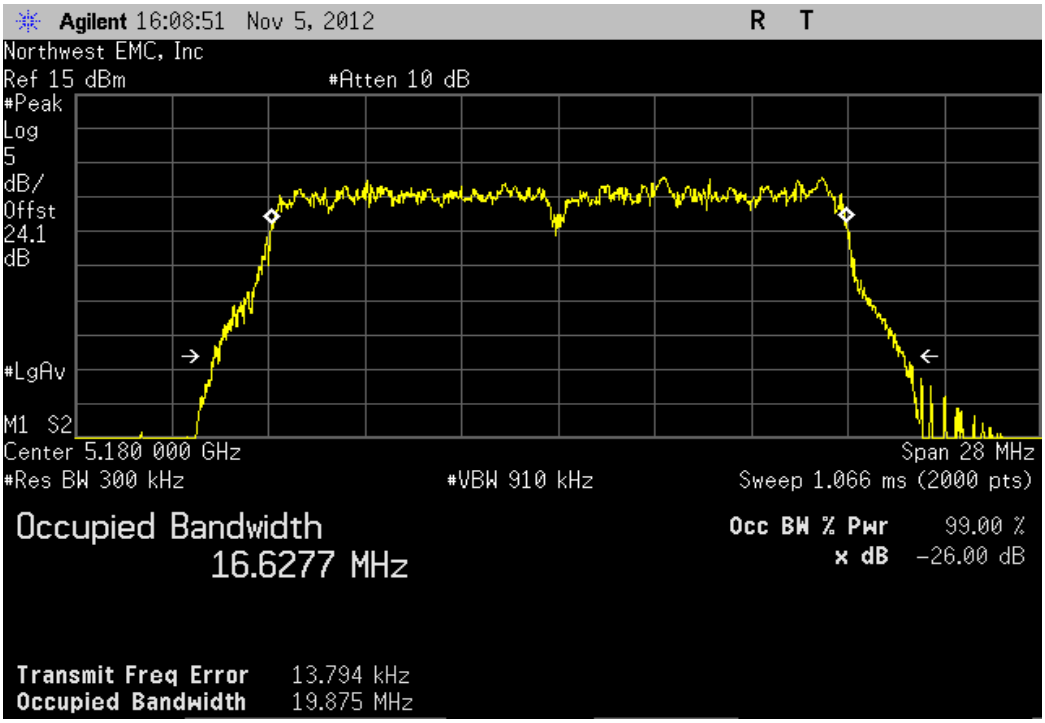
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				19.83 MHz	> 500 kHz	Pass



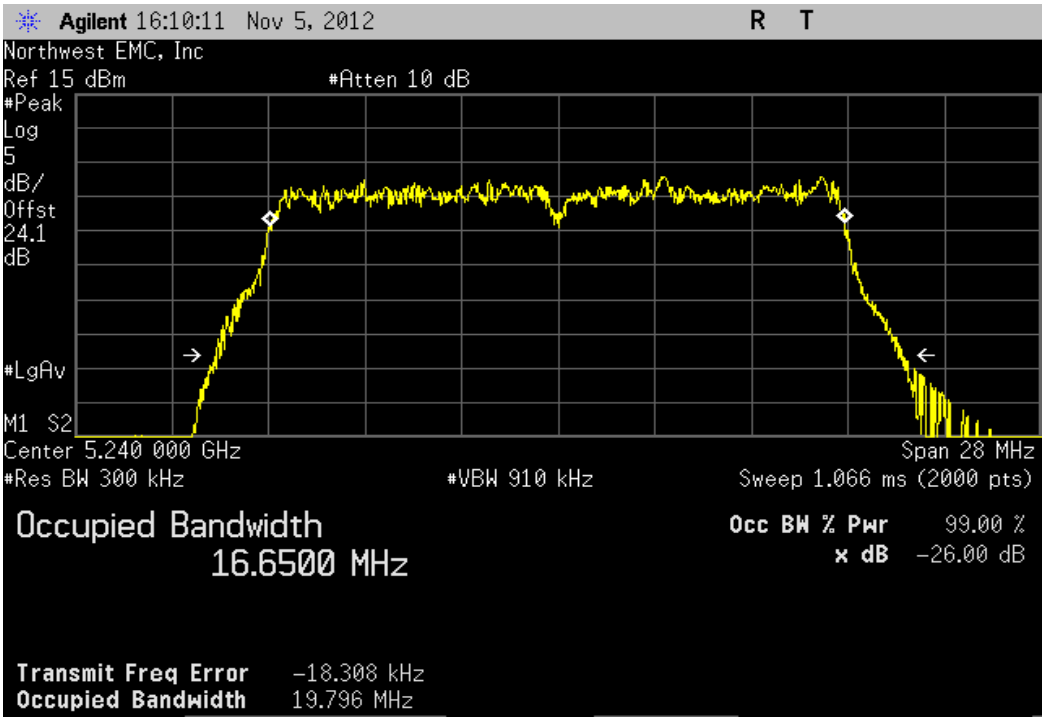
20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				19.875 MHz	> 500 kHz	Pass



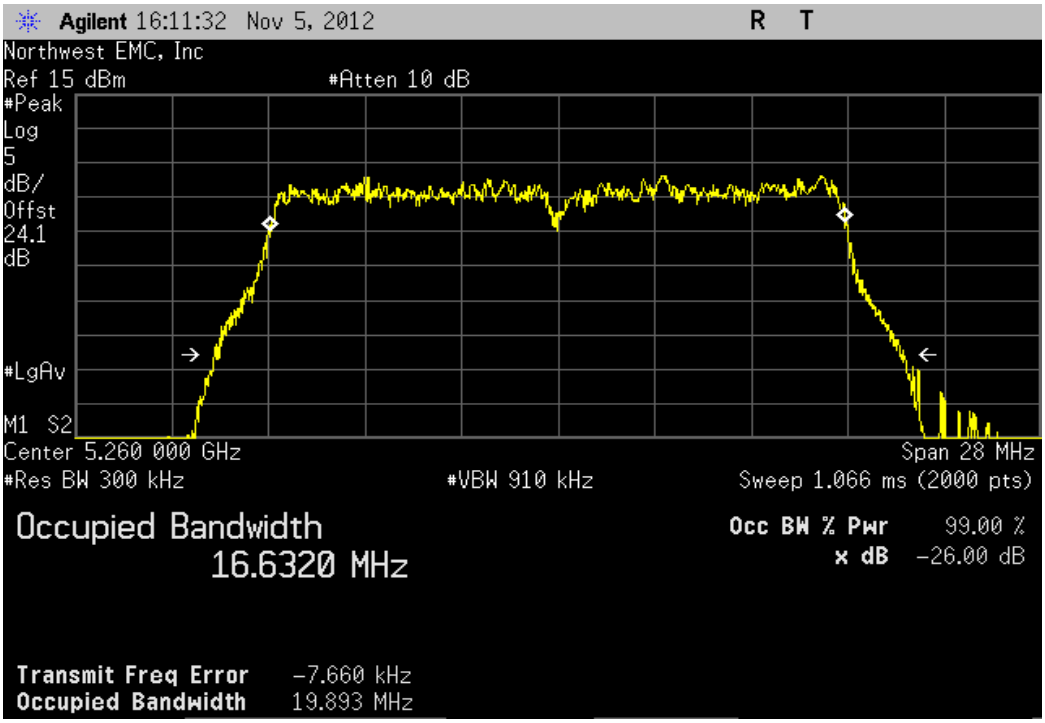
20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				19.796 MHz	> 500 kHz	Pass



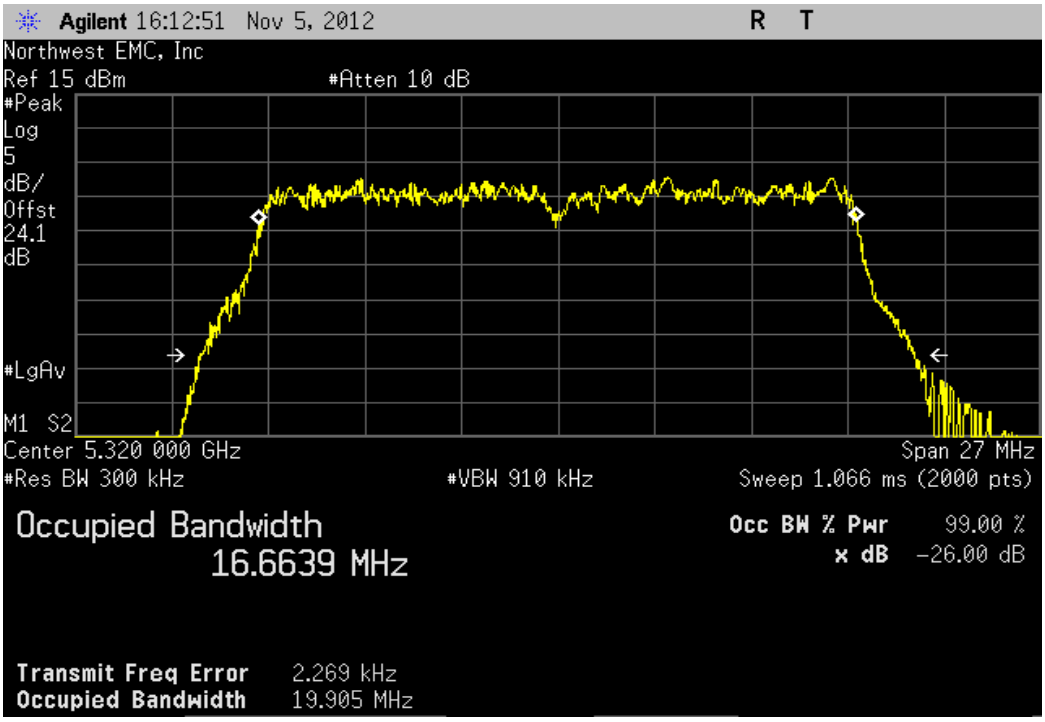
20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.893 MHz	> 500 kHz	Pass



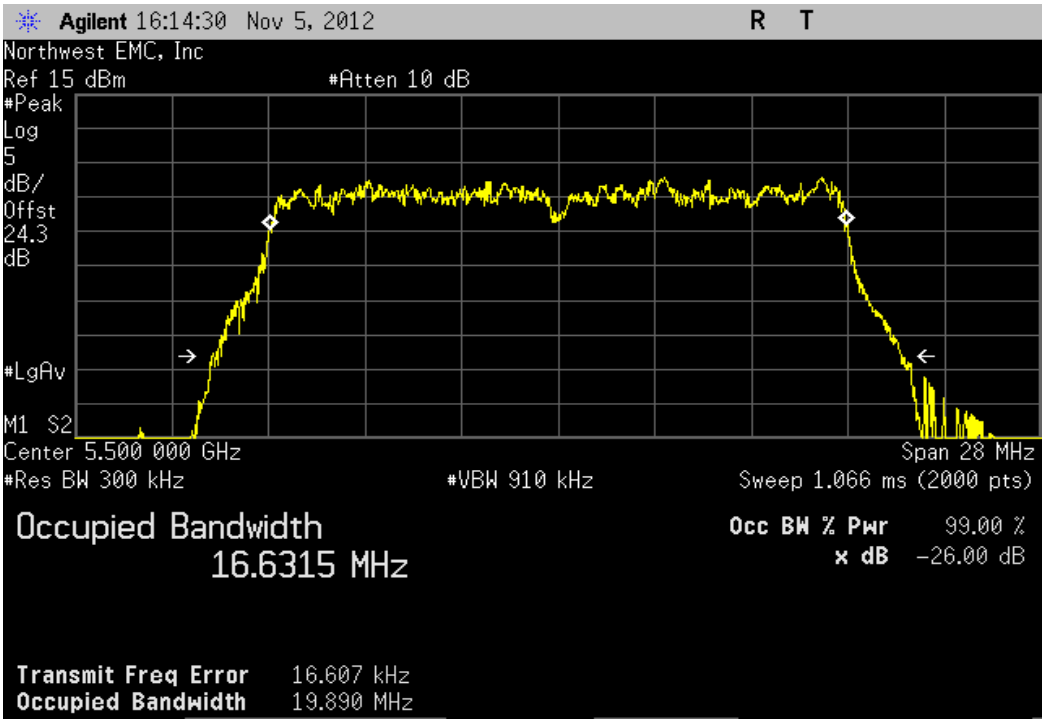
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				19.905 MHz	> 500 kHz	Pass



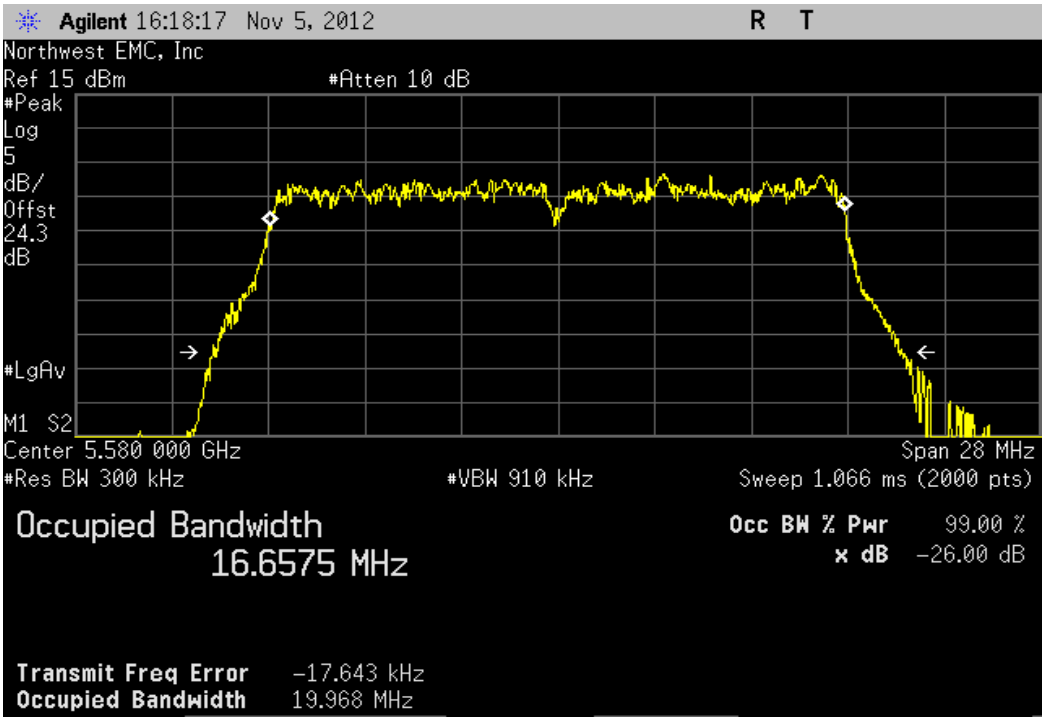
20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				19.89 MHz	> 500 kHz	Pass



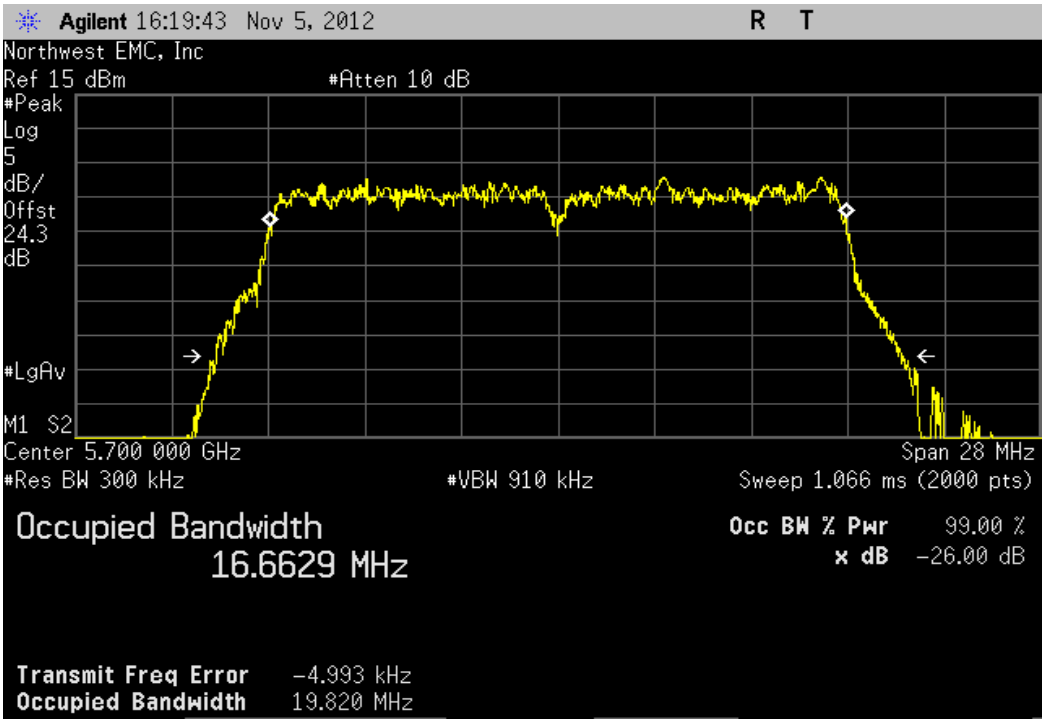
20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.968 MHz	> 500 kHz	Pass



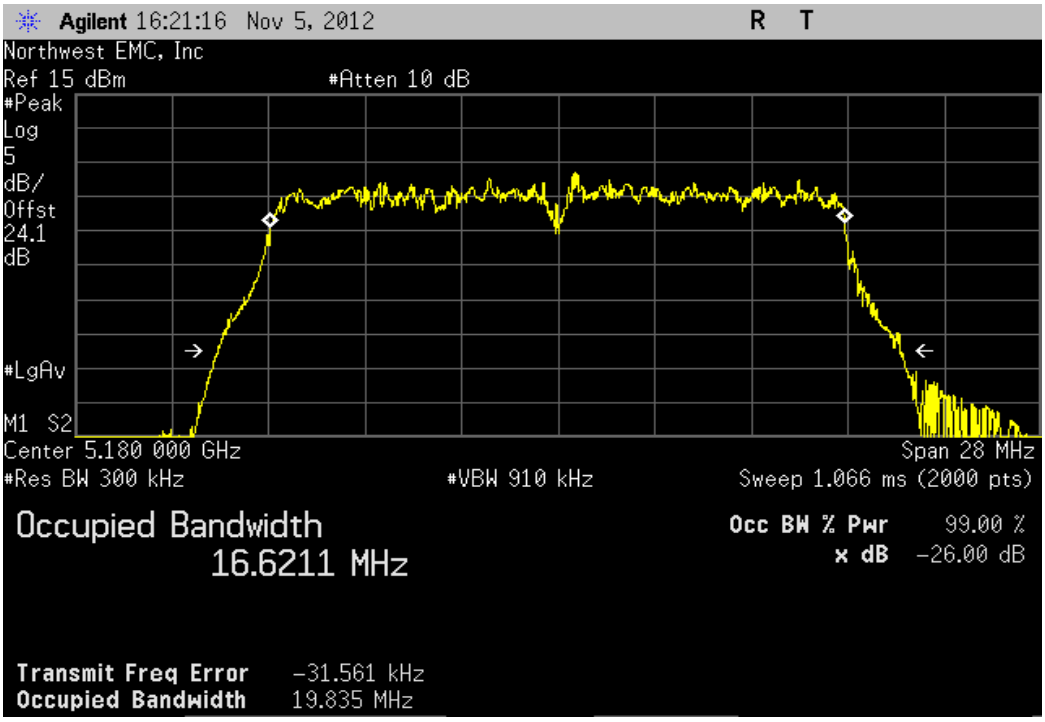
20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				19.82 MHz	> 500 kHz	Pass



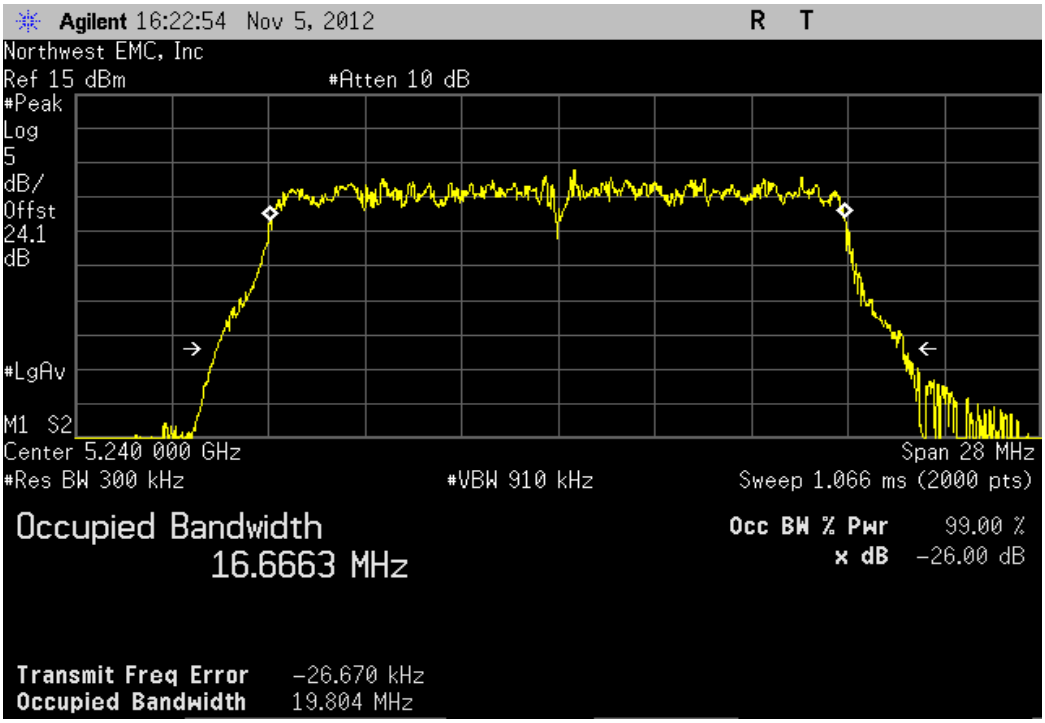
20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				19.835 MHz	> 500 kHz	Pass



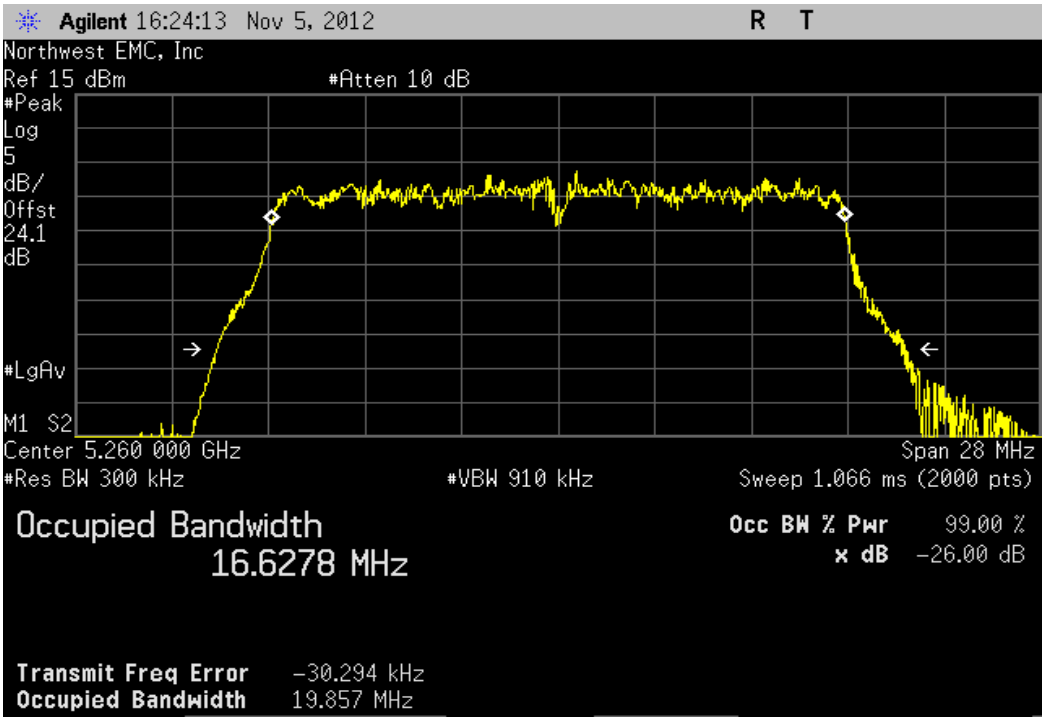
20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				19.804 MHz	> 500 kHz	Pass



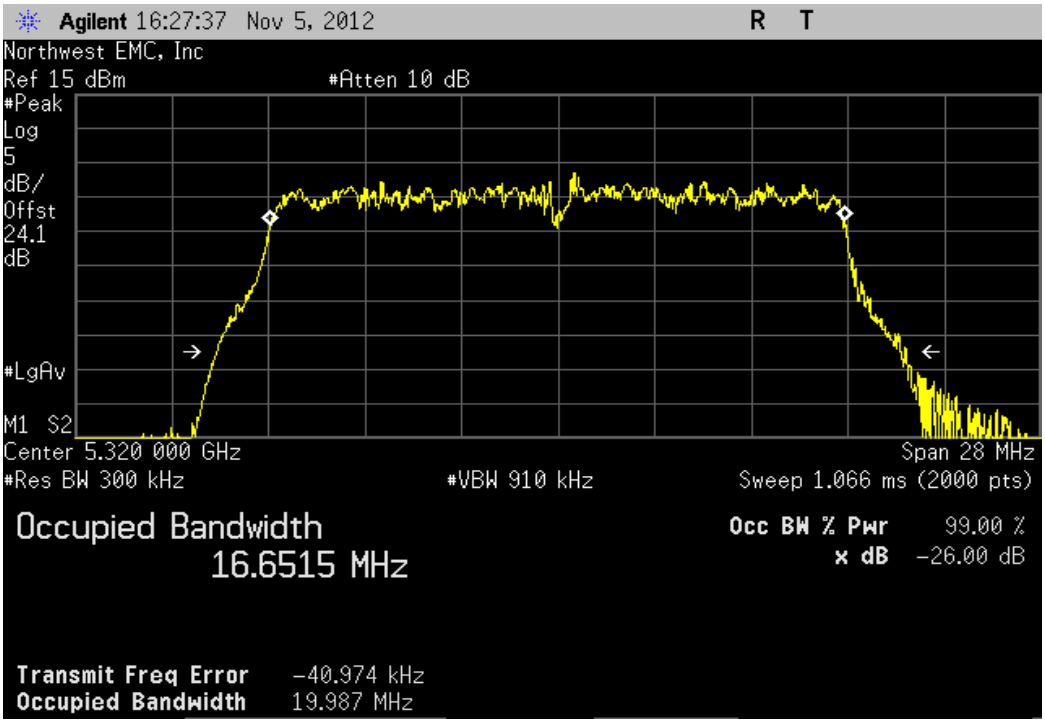
20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.857 MHz	> 500 kHz	Pass



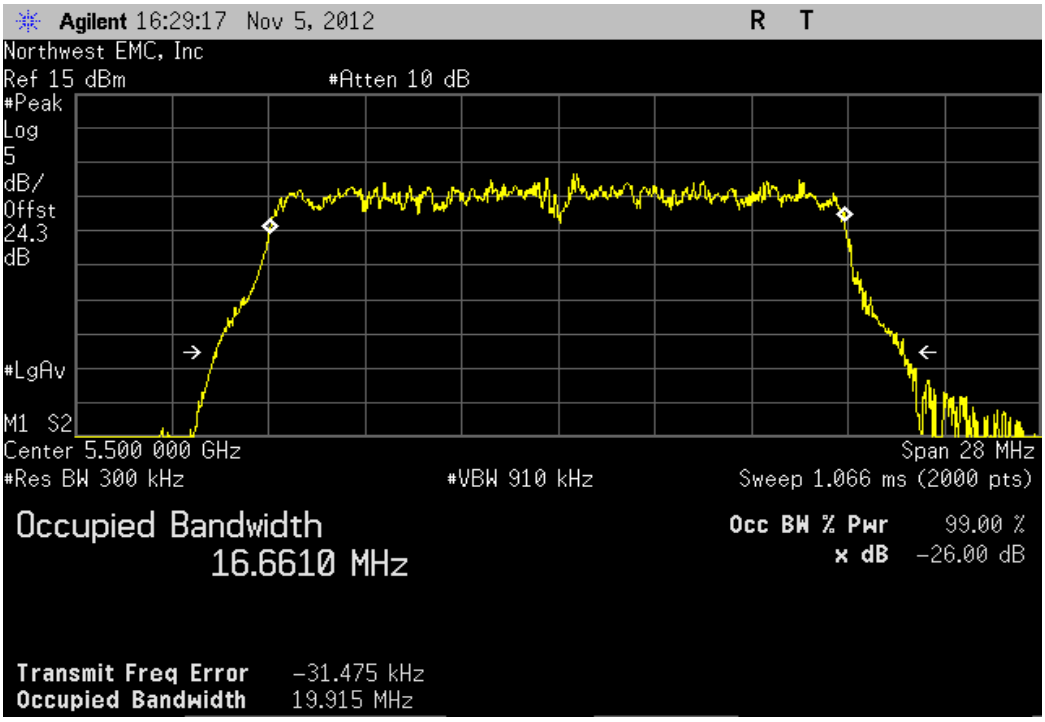
20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				19.987 MHz	> 500 kHz	Pass



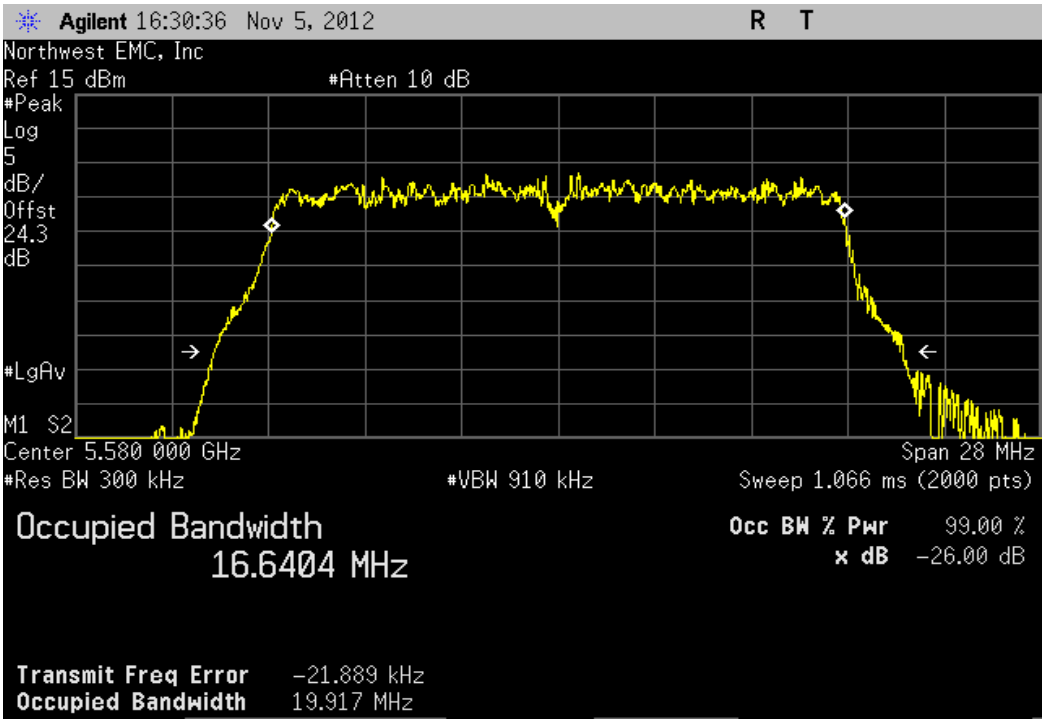
20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				19.915 MHz	> 500 kHz	Pass



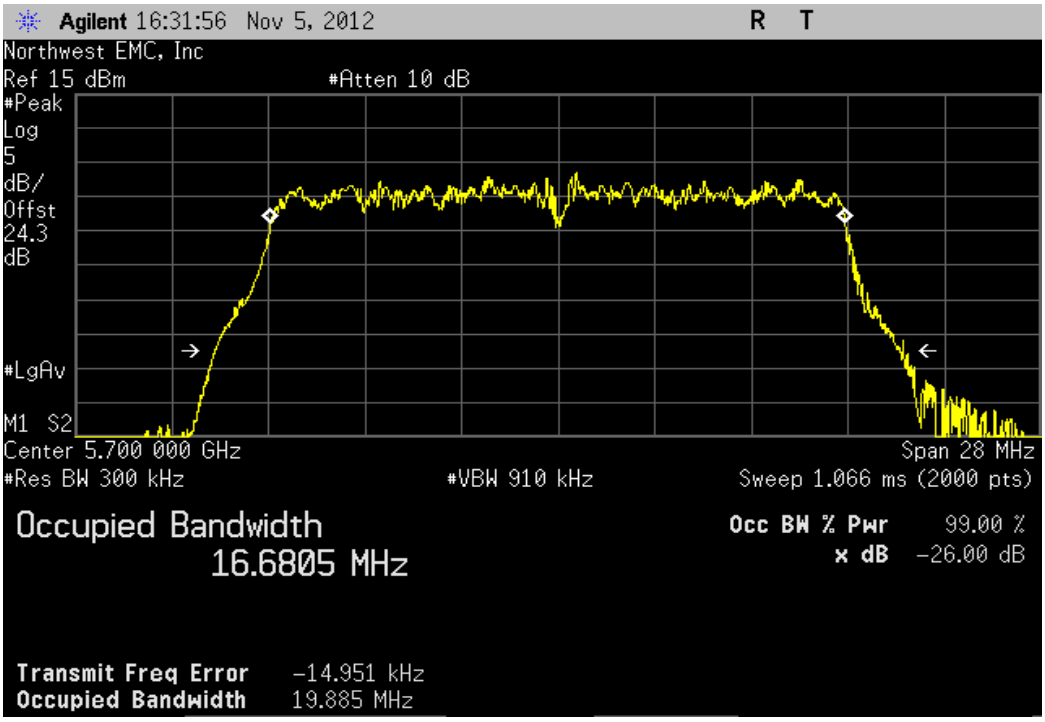
20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.917 MHz	> 500 kHz	Pass



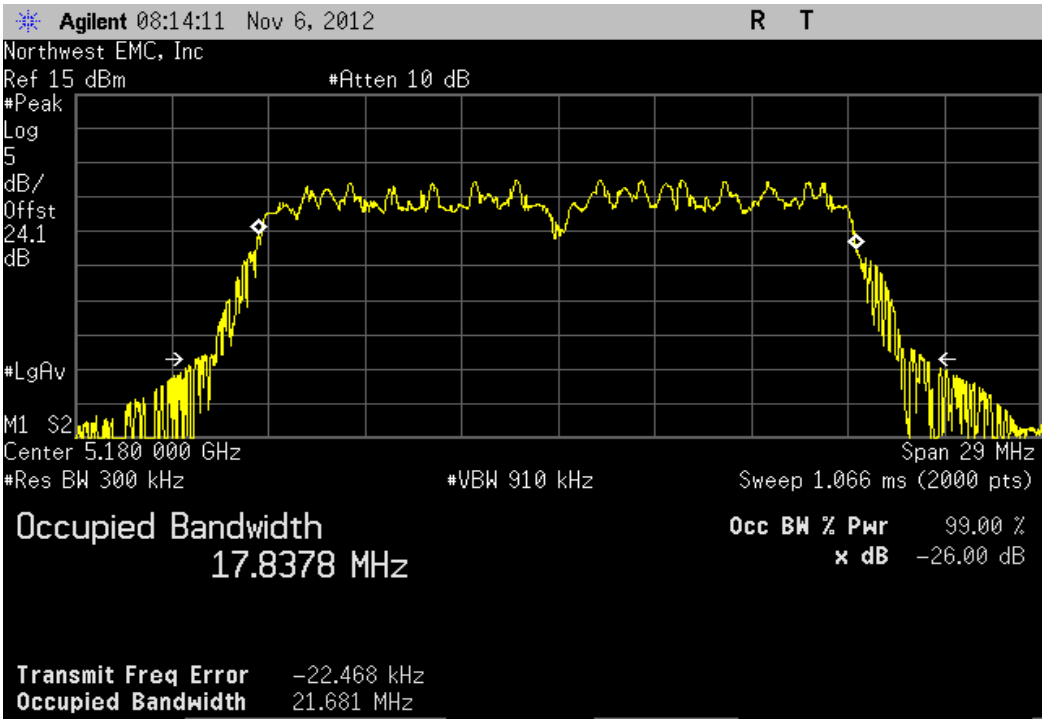
20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				19.885 MHz	> 500 kHz	Pass



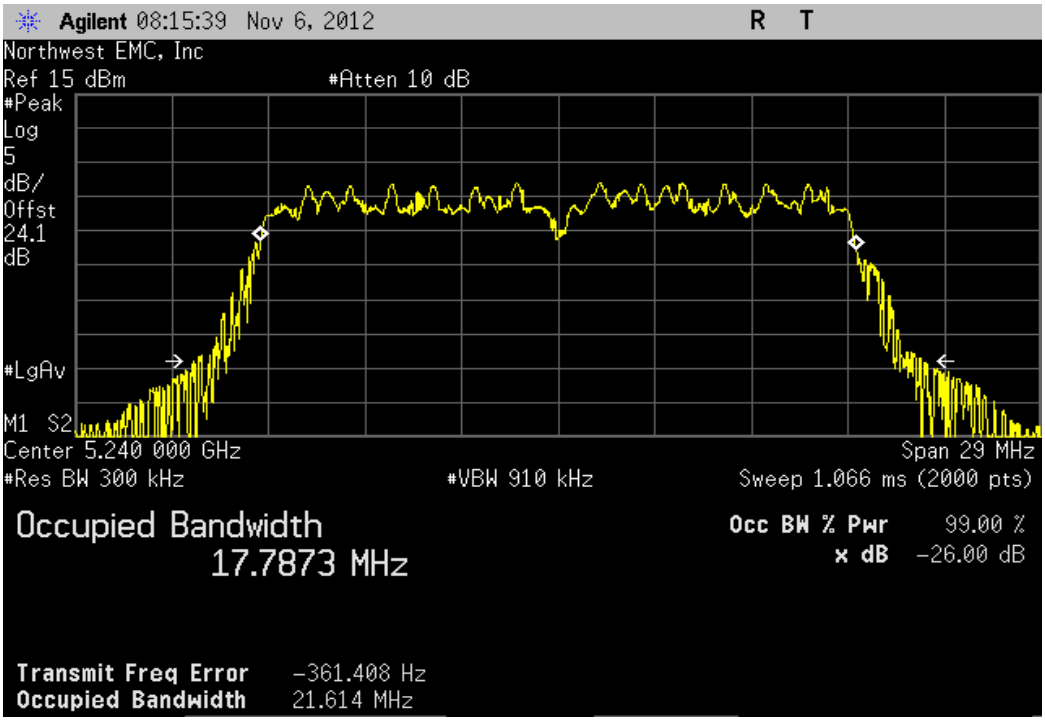
20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.681 MHz	> 500 kHz	Pass



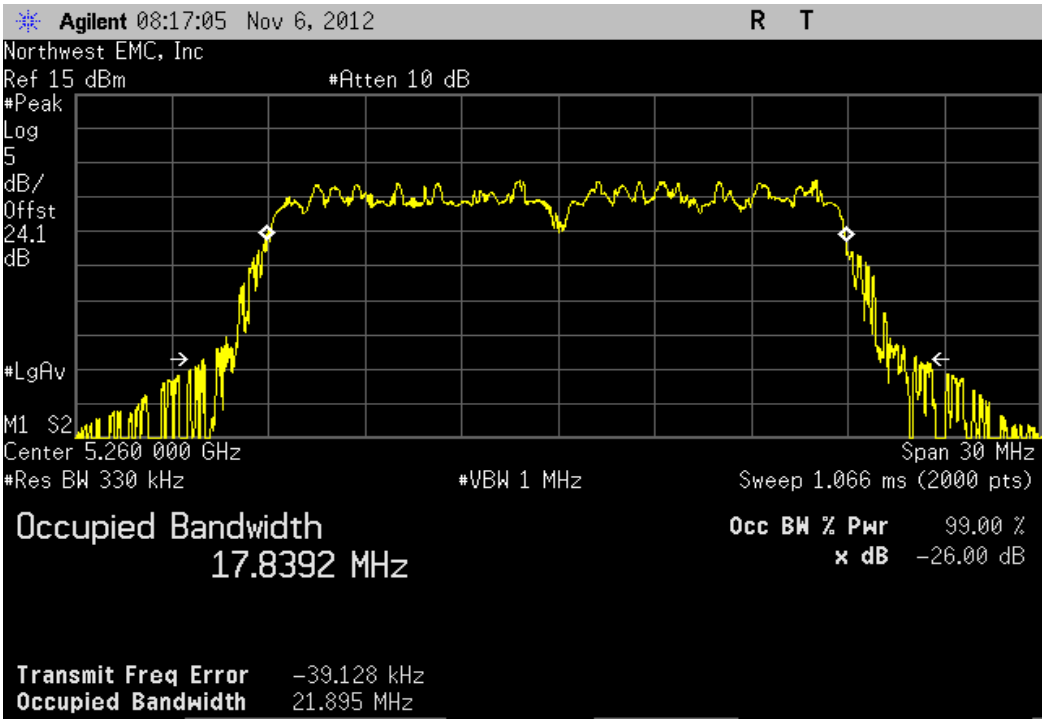
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.614 MHz	> 500 kHz	Pass



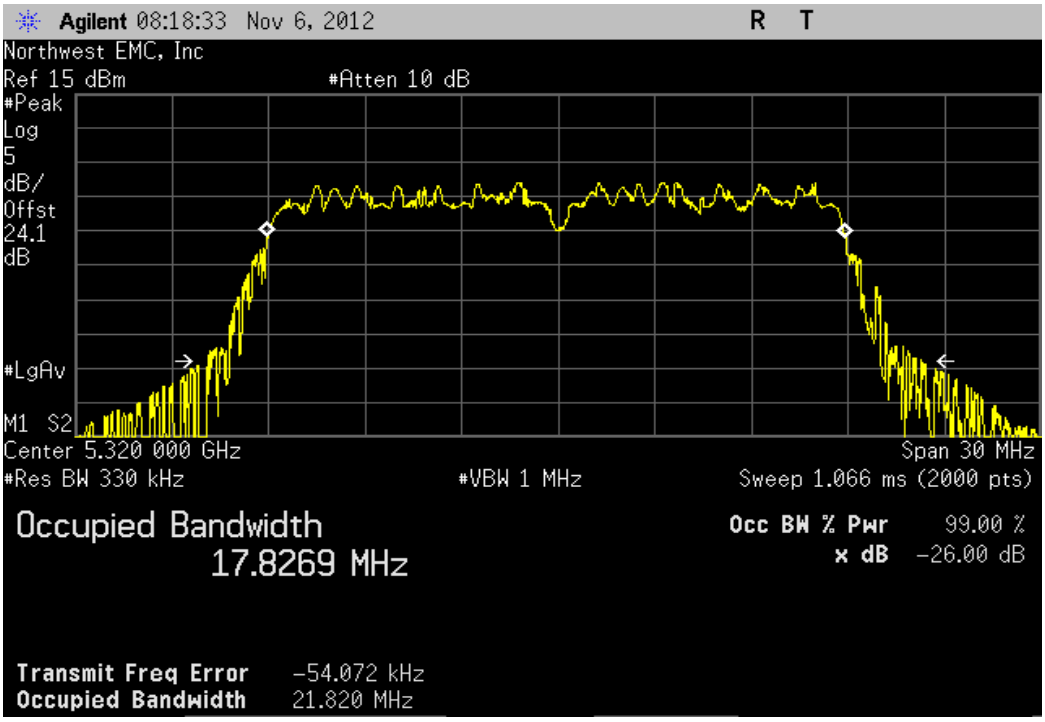
20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.895 MHz	> 500 kHz	Pass



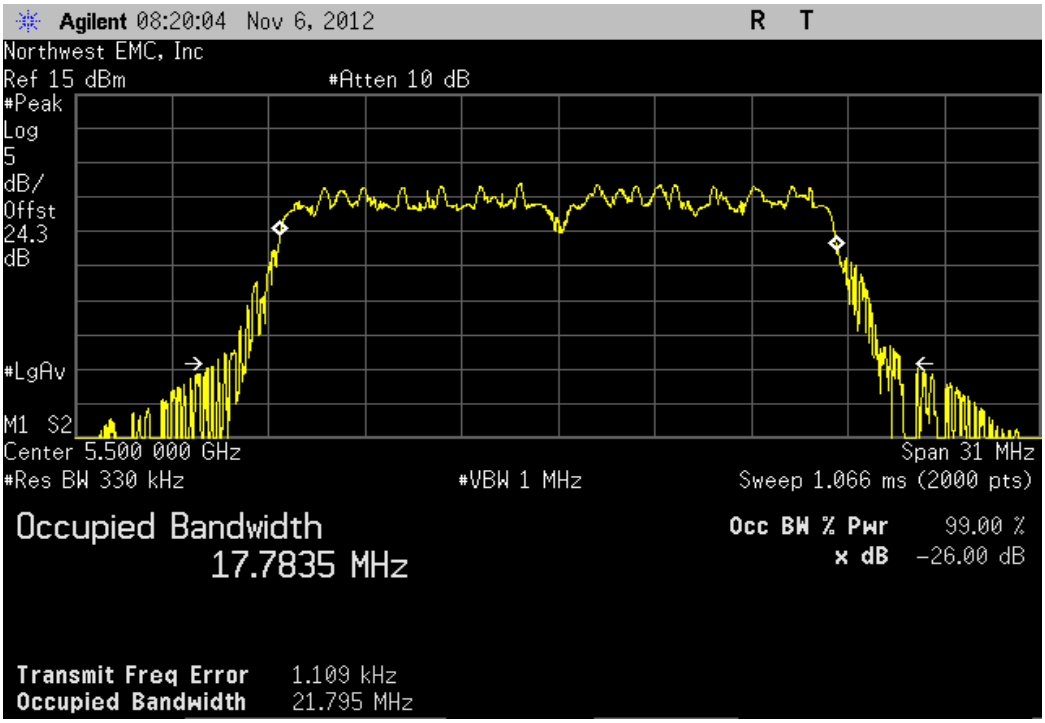
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				21.82 MHz	> 500 kHz	Pass



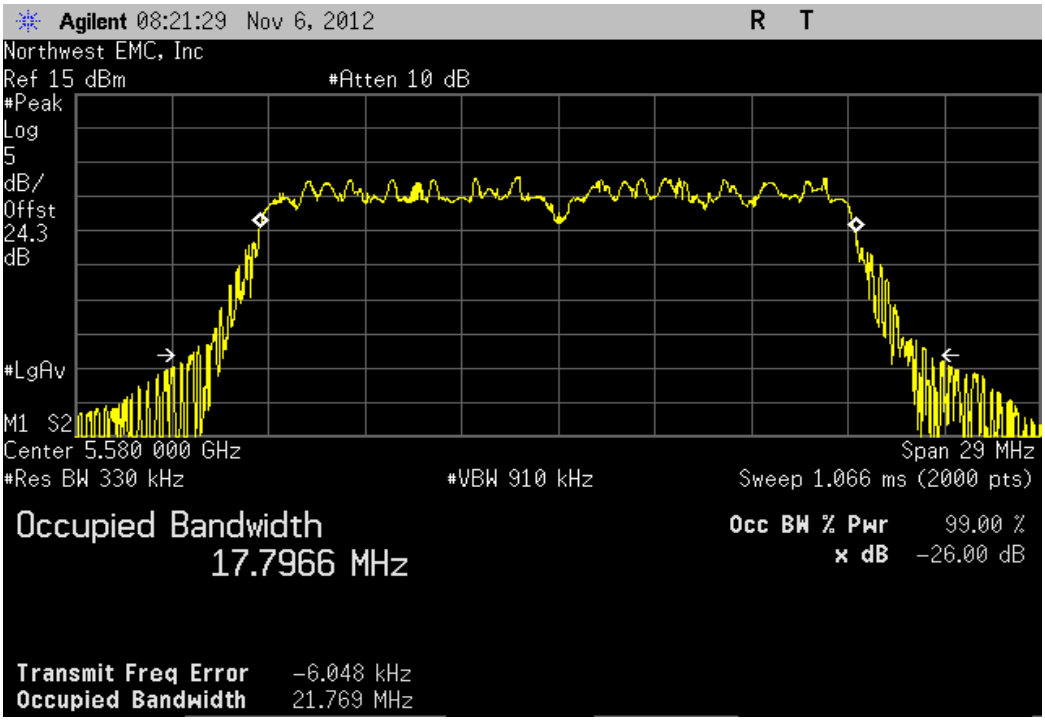
20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.795 MHz	> 500 kHz	Pass



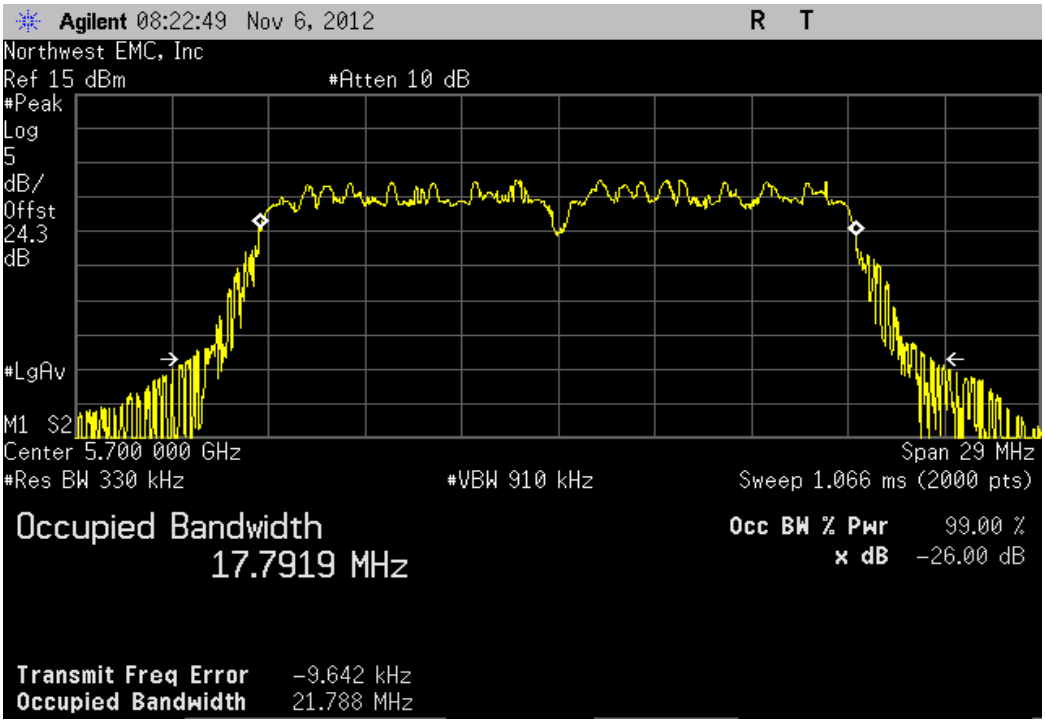
20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.769 MHz	> 500 kHz	Pass



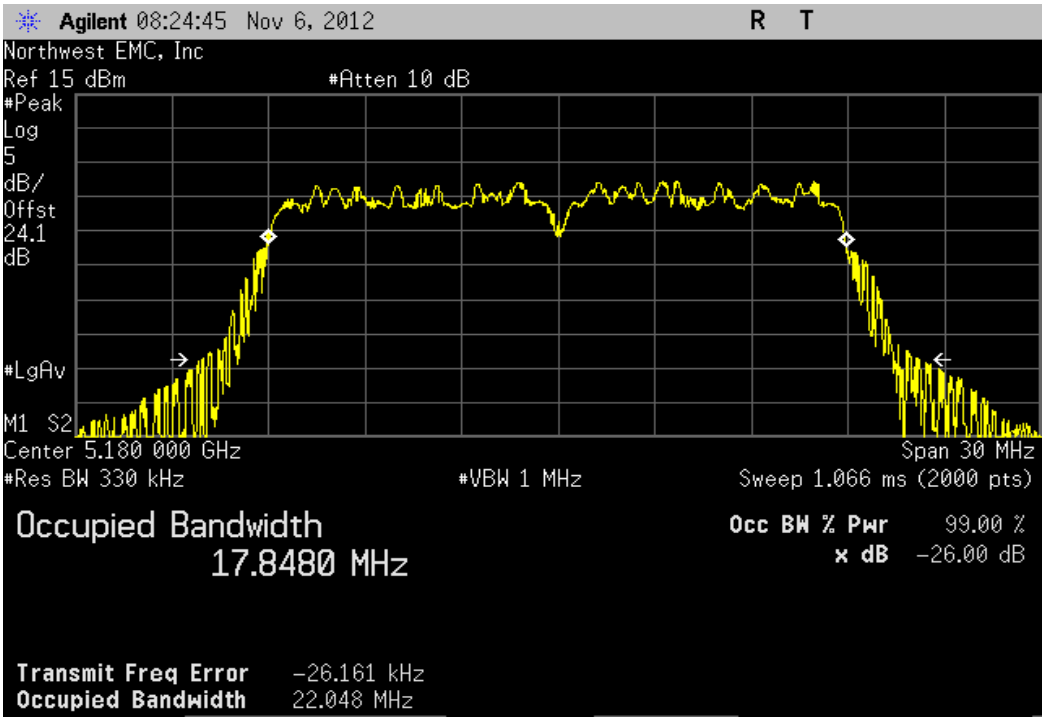
20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.788 MHz	> 500 kHz	Pass



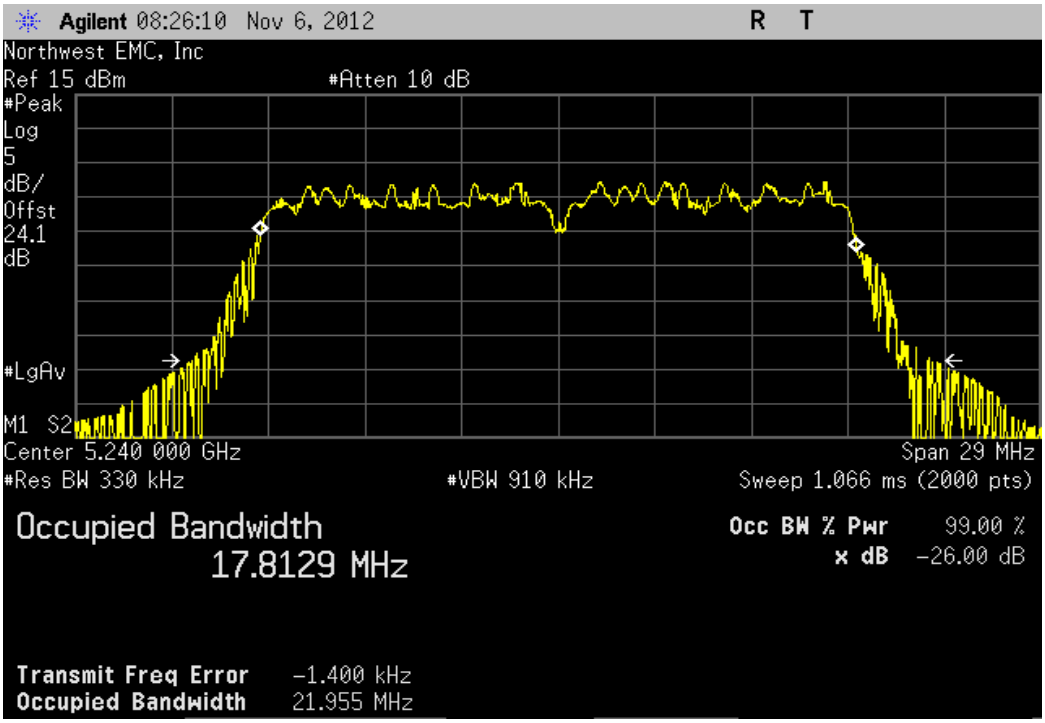
20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				22.048 MHz	> 500 kHz	Pass



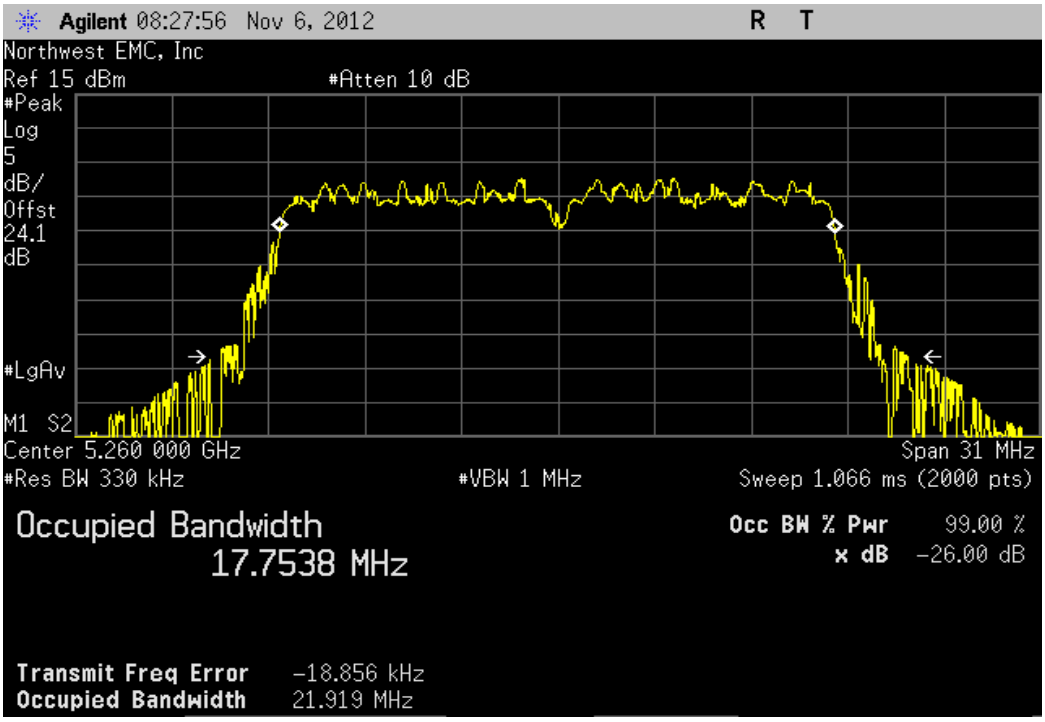
20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.955 MHz	> 500 kHz	Pass



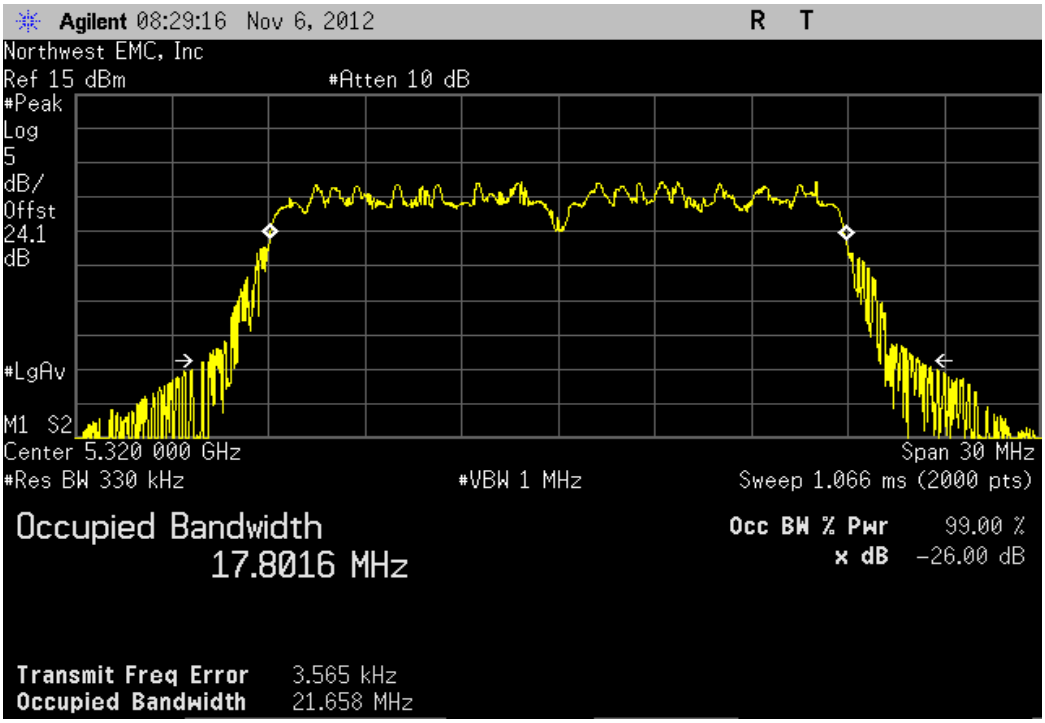
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.919 MHz	> 500 kHz	Pass



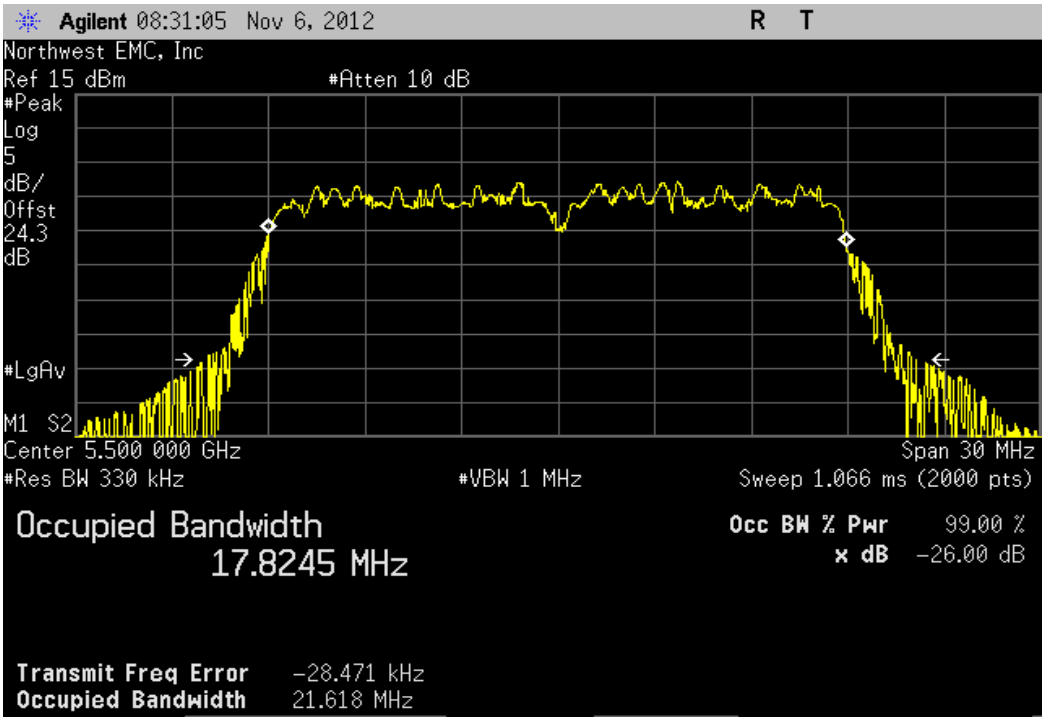
20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				21.658 MHz	> 500 kHz	Pass



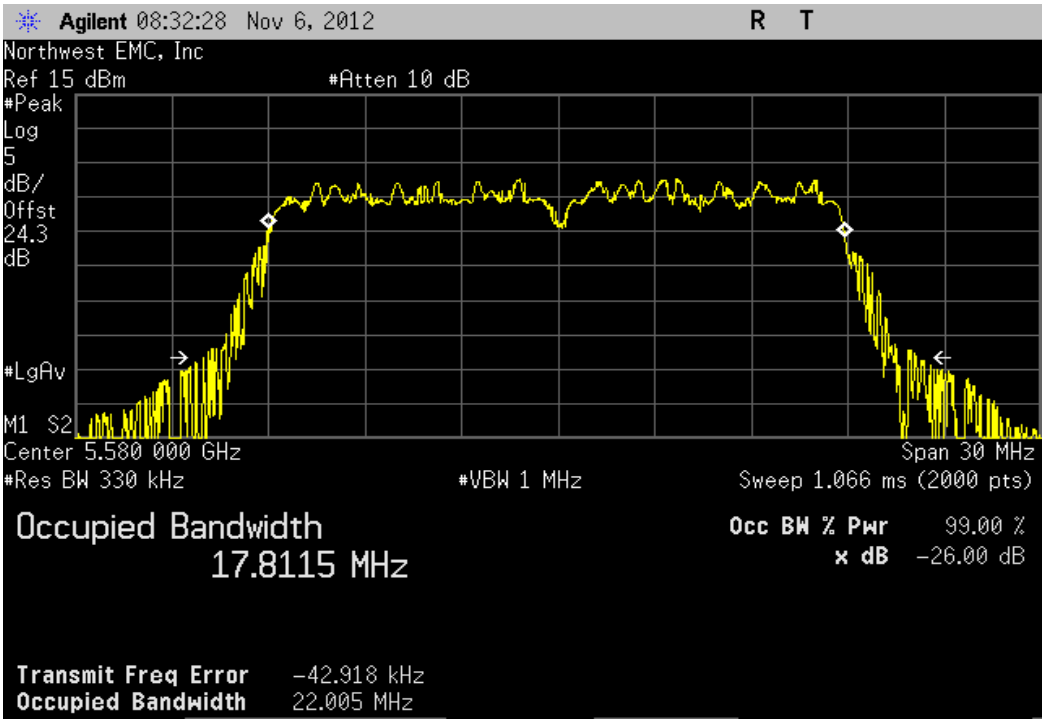
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.618 MHz	> 500 kHz	Pass



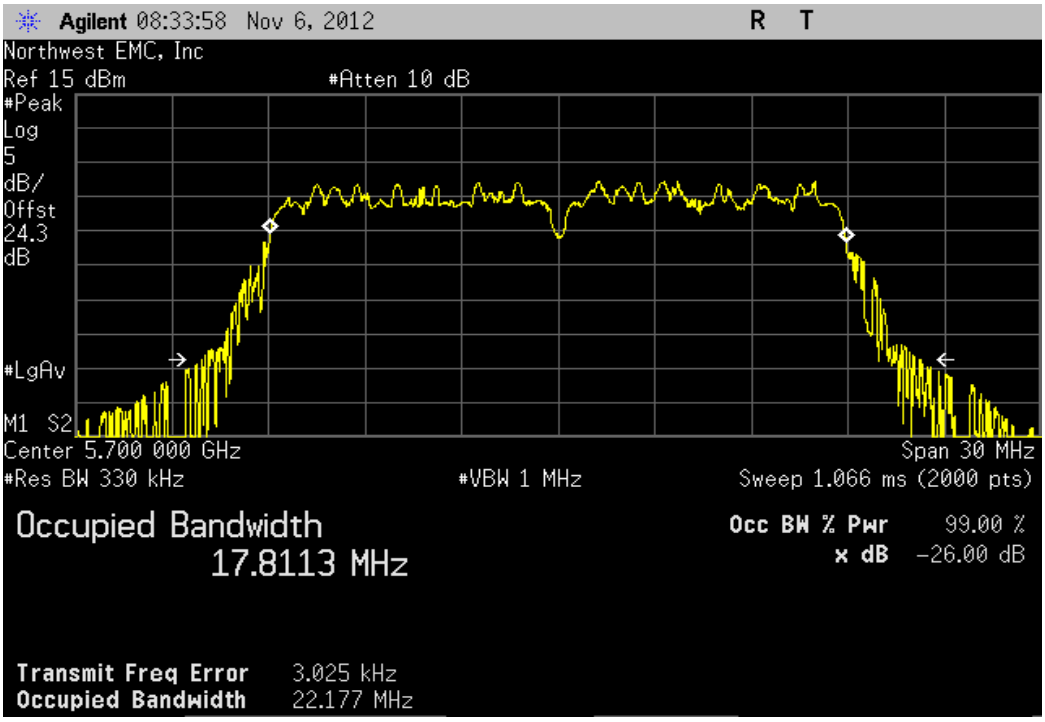
20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				22.005 MHz	> 500 kHz	Pass



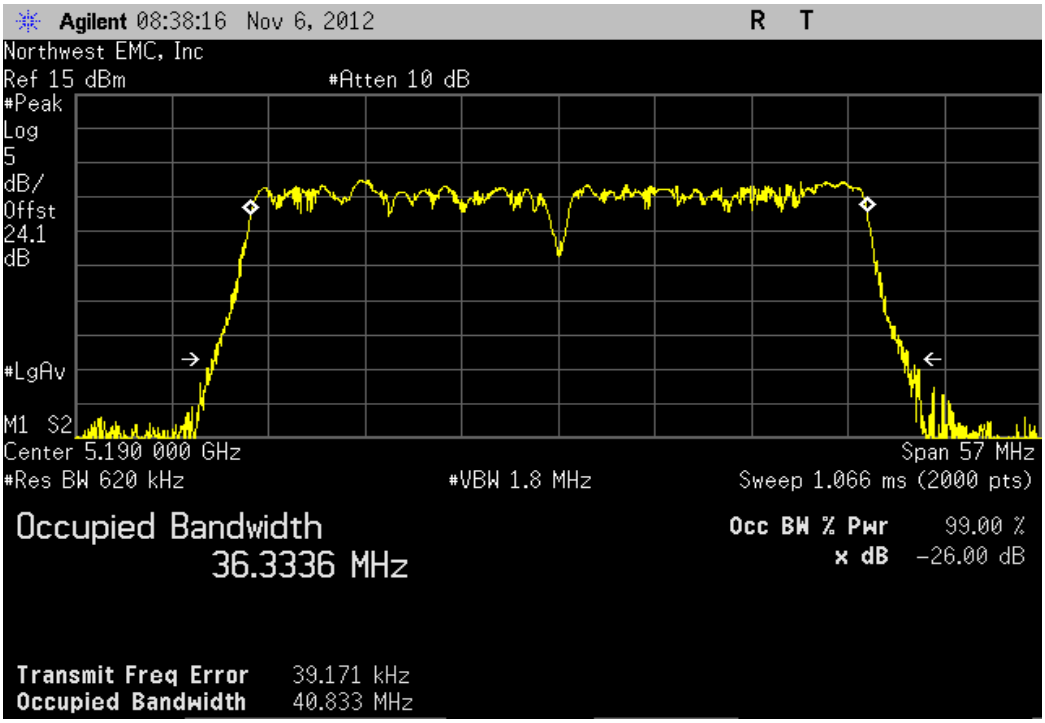
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				22.177 MHz	> 500 kHz	Pass



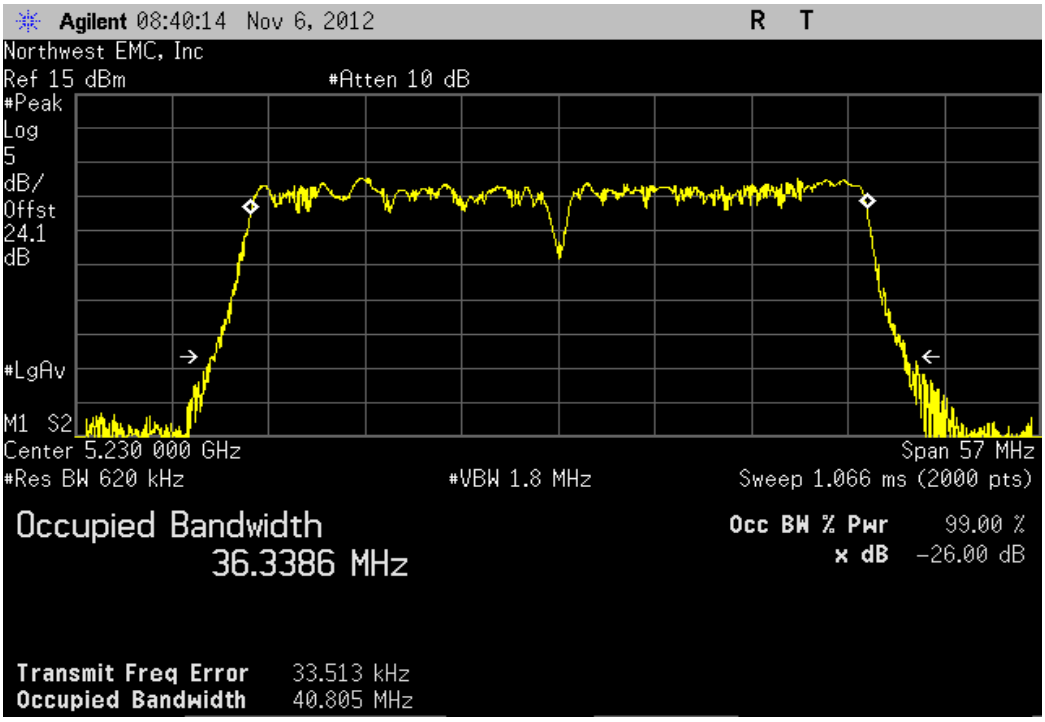
40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				40.833 MHz	> 500 kHz	Pass



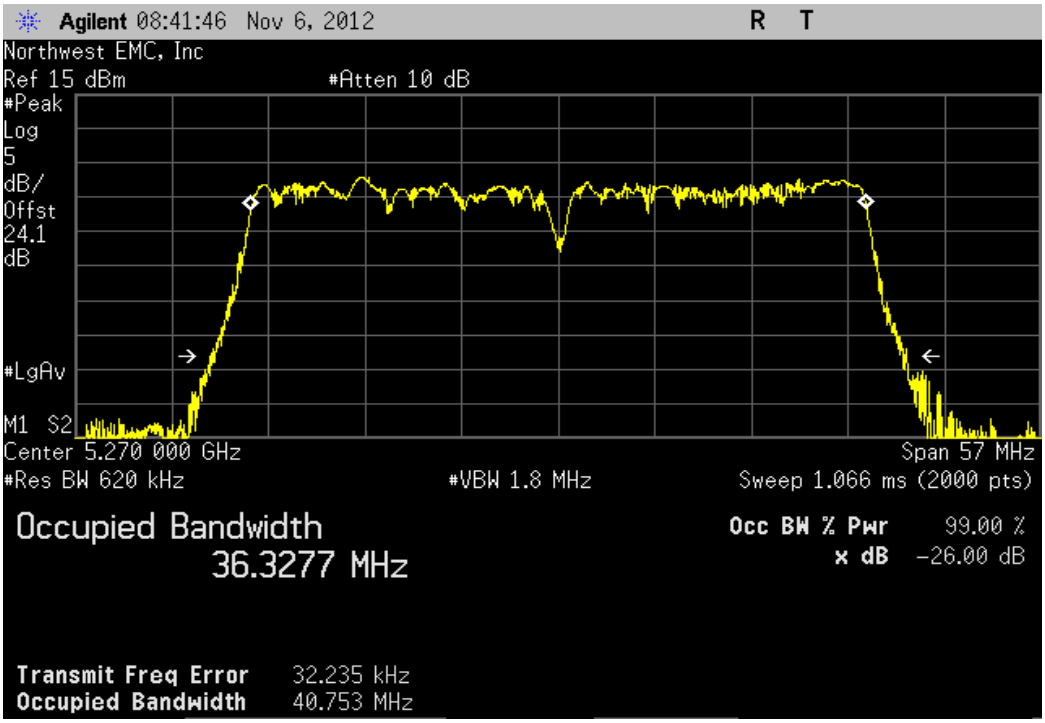
40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				40.805 MHz	> 500 kHz	Pass



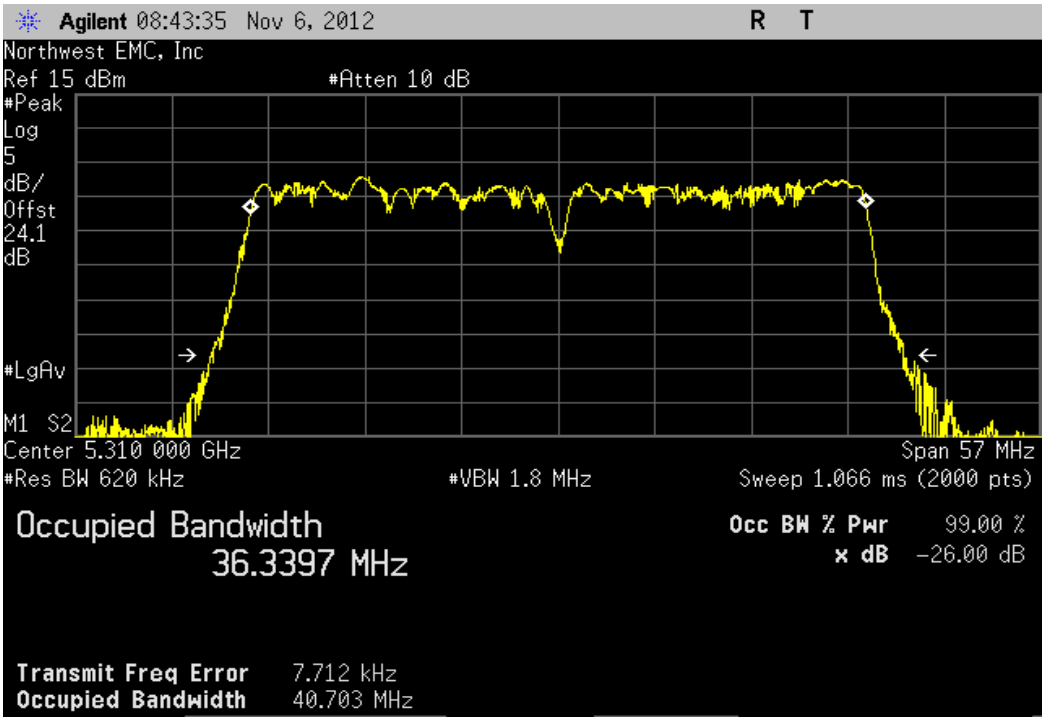
40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				40.753 MHz	> 500 kHz	Pass



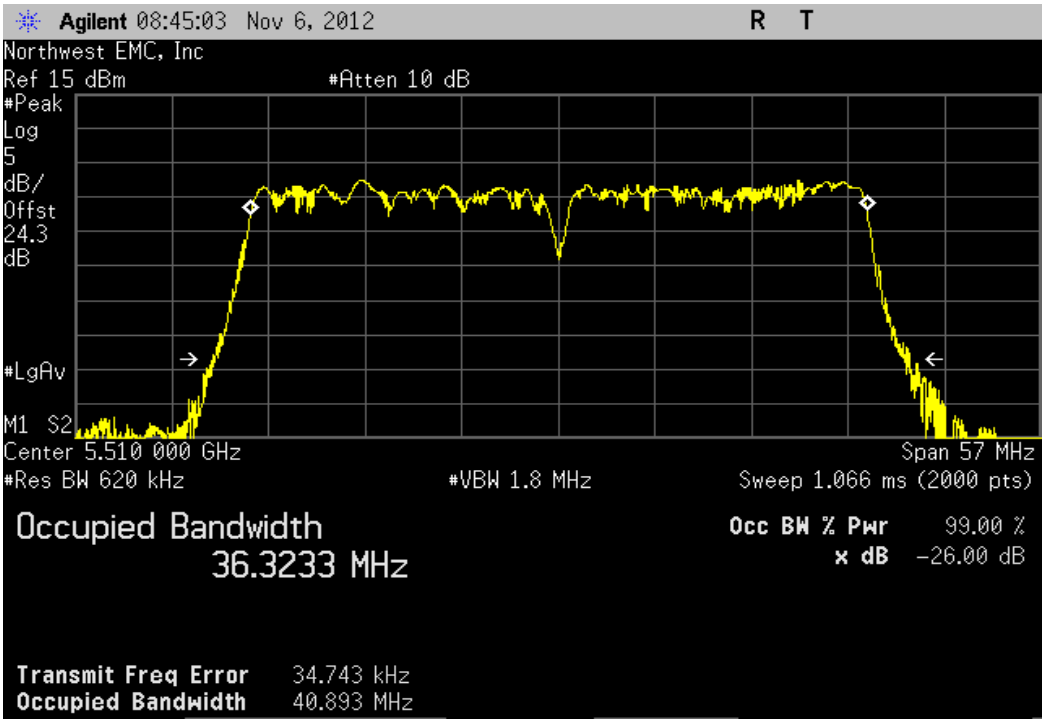
40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				40.703 MHz	> 500 kHz	Pass



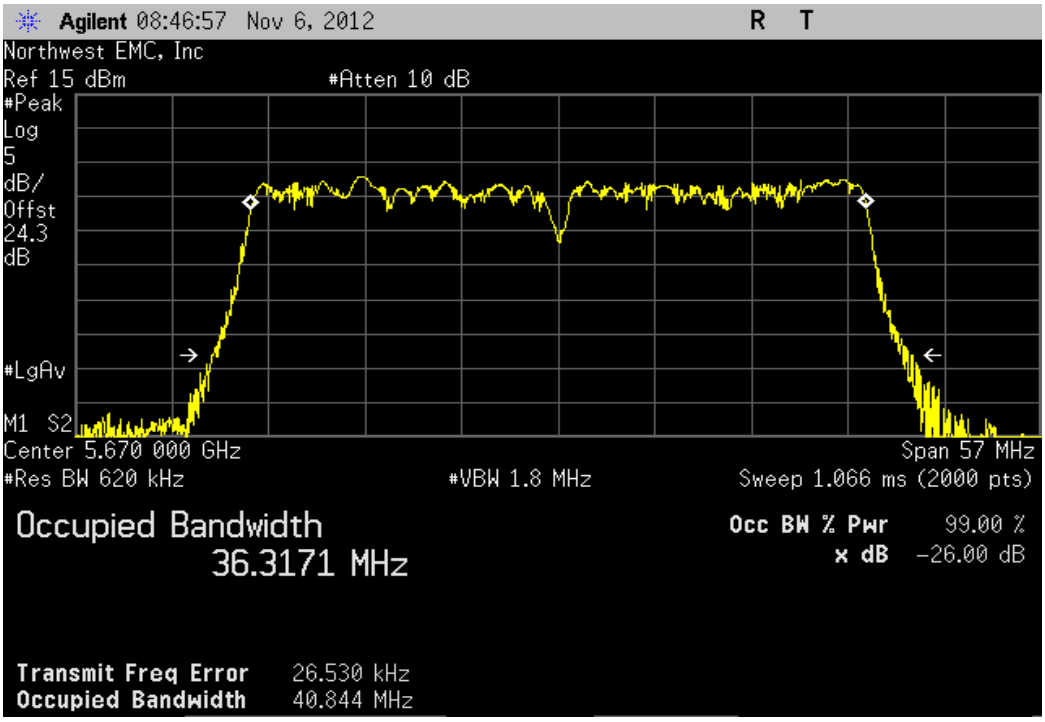
40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				40.893 MHz	> 500 kHz	Pass



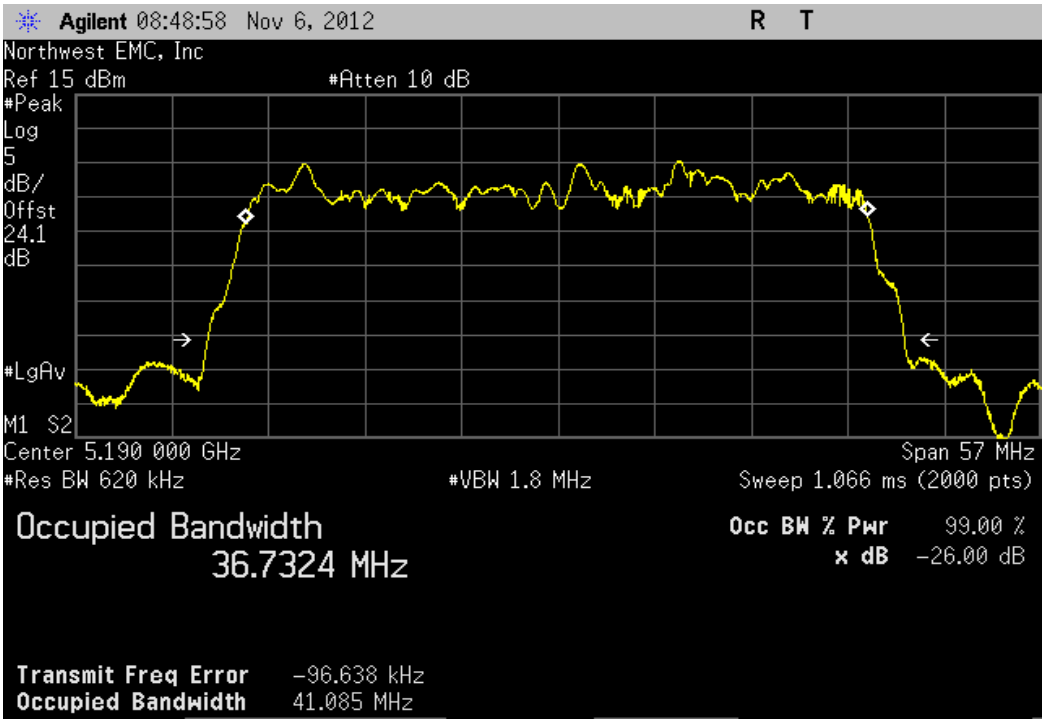
40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				40.844 MHz	> 500 kHz	Pass



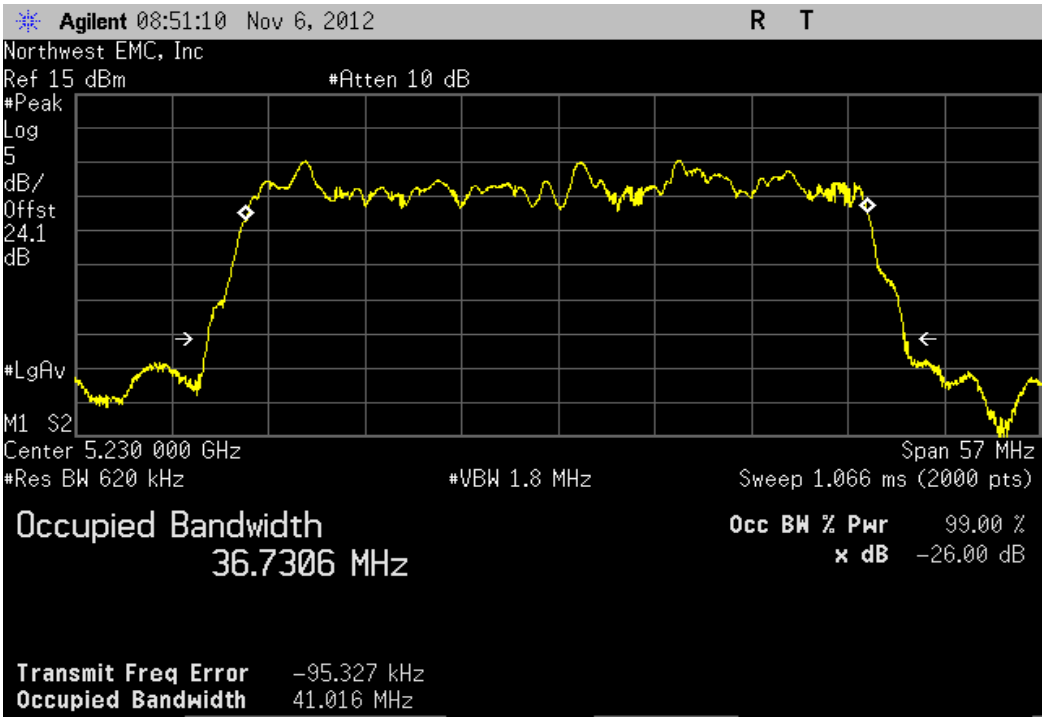
40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.085 MHz	> 500 kHz	Pass



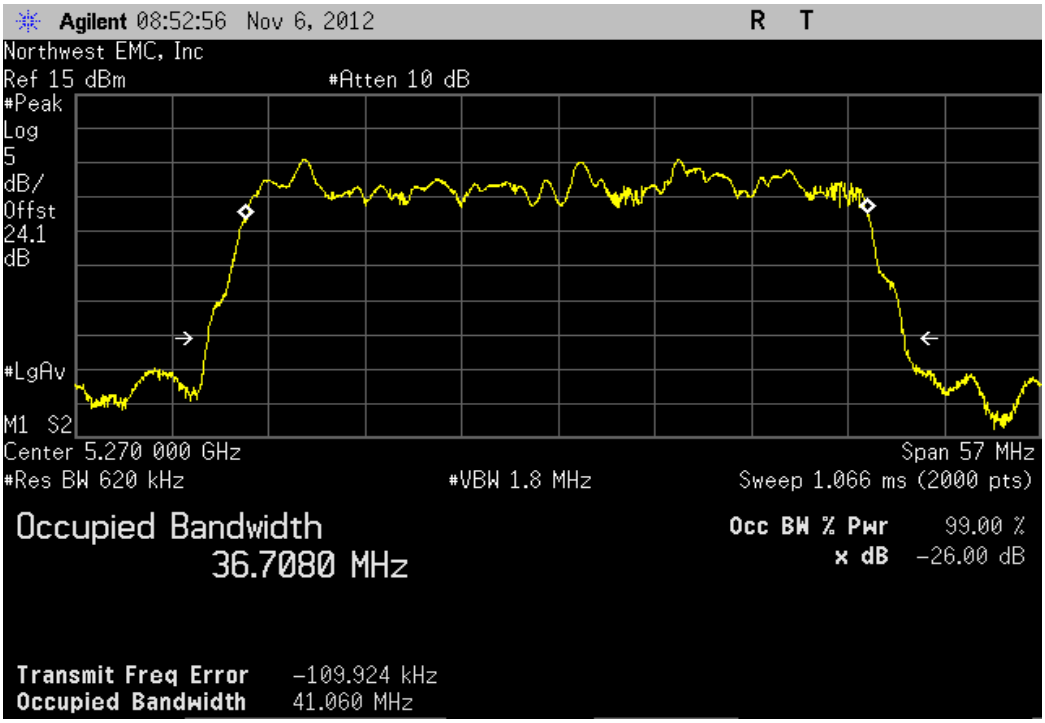
40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				41.016 MHz	> 500 kHz	Pass



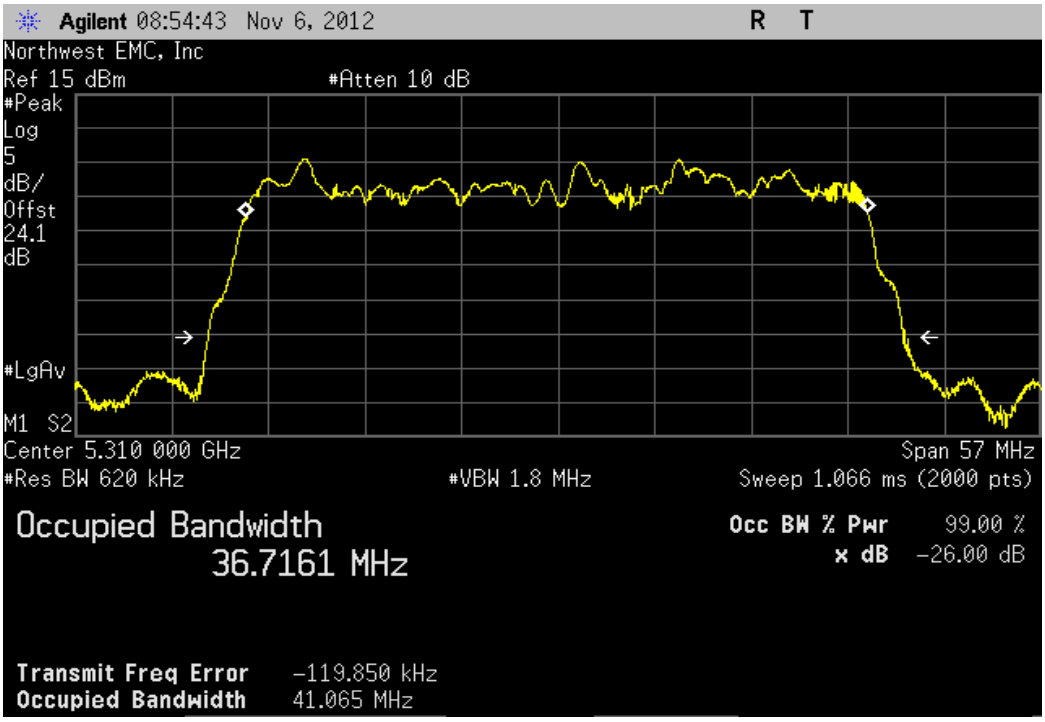
40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				41.06 MHz	> 500 kHz	Pass



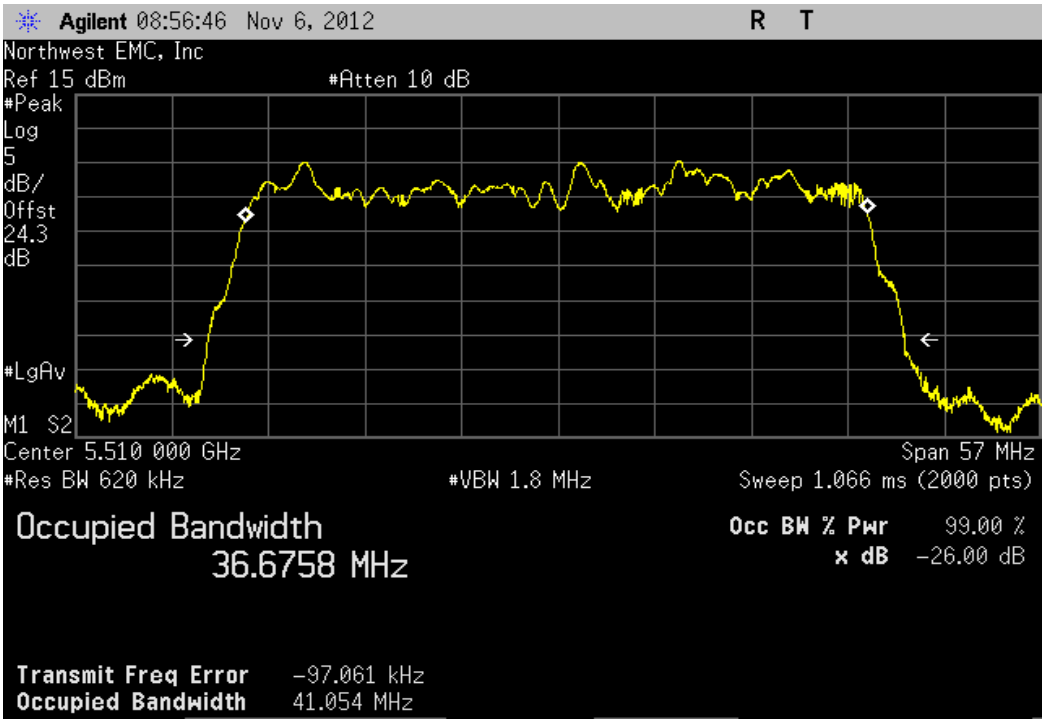
40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				41.065 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz

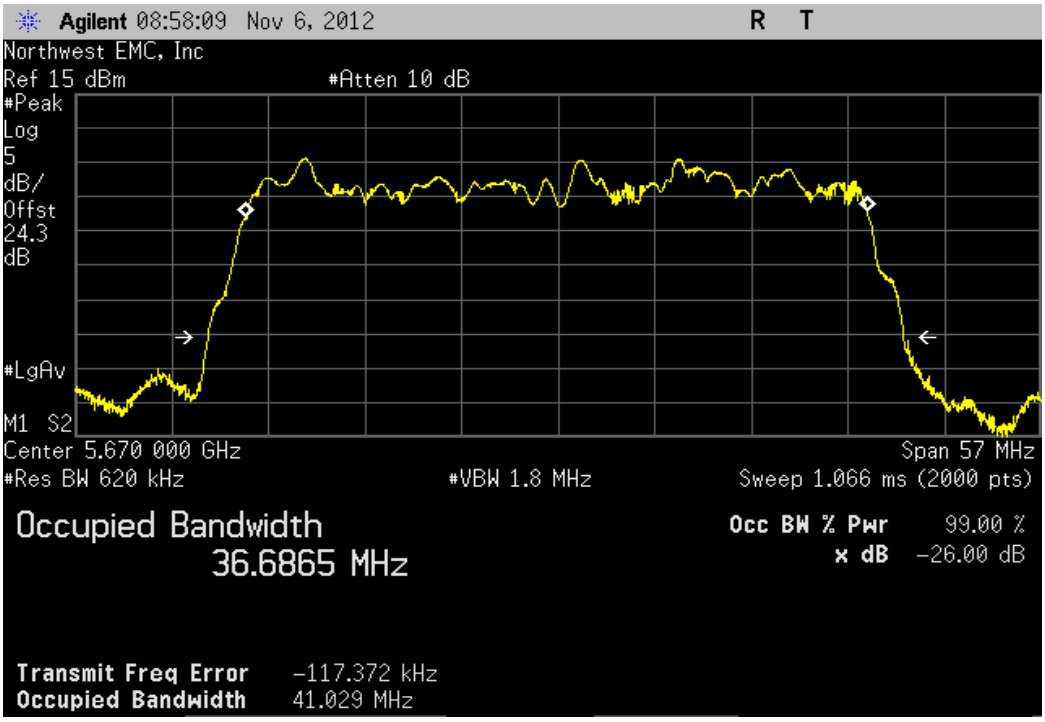
				Value	Limit	Result
				41.054 MHz	> 500 kHz	Pass



Emission Bandwidth

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.029 MHz	> 500 kHz	Pass



Duty Cycle

TEST DESCRIPTION

The transmission pulse duration (T) and Duty Cycle (x) were measured for each of the EUT operating modes per the FCC KDB 789033 D01 General UNII Test Procedures.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, a duty cycle correction factor in dB can be calculated to add to power measurements if required in the method guidance.

10 * LOG (1/x) = dB

The EUT was operating at 100% duty cycle

Power Table

This power table represents the power level settings used in the customer provided radio control test software during testing.

FCC 15.407		Test Description						
		Radiated Spurious	Peak Transmit Power	Peak Power Spectral Density	Emission Bandwidth	Peak Excursion	Band Edge Compliance	AC Powerline Conducted
Frequency Band	**Channel**	**Power (dBm)**	**Power (dBm)**	**Power (dBm)**	**Power (dBm)**	**Power (dBm)**	**Power (dBm)**	**Power (dBm)**
5.15 to 5.25 GHz	Ch 36	12	12	12	13	13	13	13
	Ch 48	12	12	12	13	13	13	13
	Ch 36/40 - 40 MHz	9	9	9	13	13	13	13
	Ch 44/48-40 MHz	12	12	12	13	13	13	13
5.25 to 5.35 GHz	Ch 52	12	12	12	13	13	13	13
	Ch 64	12	12	12	13	13	13	13
	Ch 52/56-40 MHz	12	11	11	13	13	13	13
	Ch 60/64-40 MHz	12	11	11	13	13	13	13
5.47 to 5.725 GHz	Ch 100	12	12	12	13	13	13	13
	Ch 116	12	12	12	13	13	13	13
	Ch 120	***Prohibited***	***Prohibited***	***Prohibited***	***Prohibited***	***Prohibited***	***Prohibited***	***Prohibited***
	Ch 124							
	Ch 128							
	Ch 140	12	12	12	13	13	13	13
	Ch 100/104-40MHz	10	10	10	13	13	13	13
	Ch 124/128-40 MHz	12	12	12	13	13	13	13

Emission Bandwidth

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section D was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:
- Span = approximately 1.5 to 2 times the emission bandwidth, centered on the transmit channel.
- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- A peak detector was used.

The spectrum analyzer Occupied Bandwidth measurement function was then used to measure 26 dB emission bandwidth.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.
The EUT is operating on antenna port A and B.

Emission Bandwidth

EUT:	1514	Work Order:	MCSO1638
Serial Number:	000109423753	Date:	11/06/12
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1018
Tested by:	Brandon Hobbs Rod Peloquin	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for n modes.

DEVIATIONS FROM TEST STANDARD

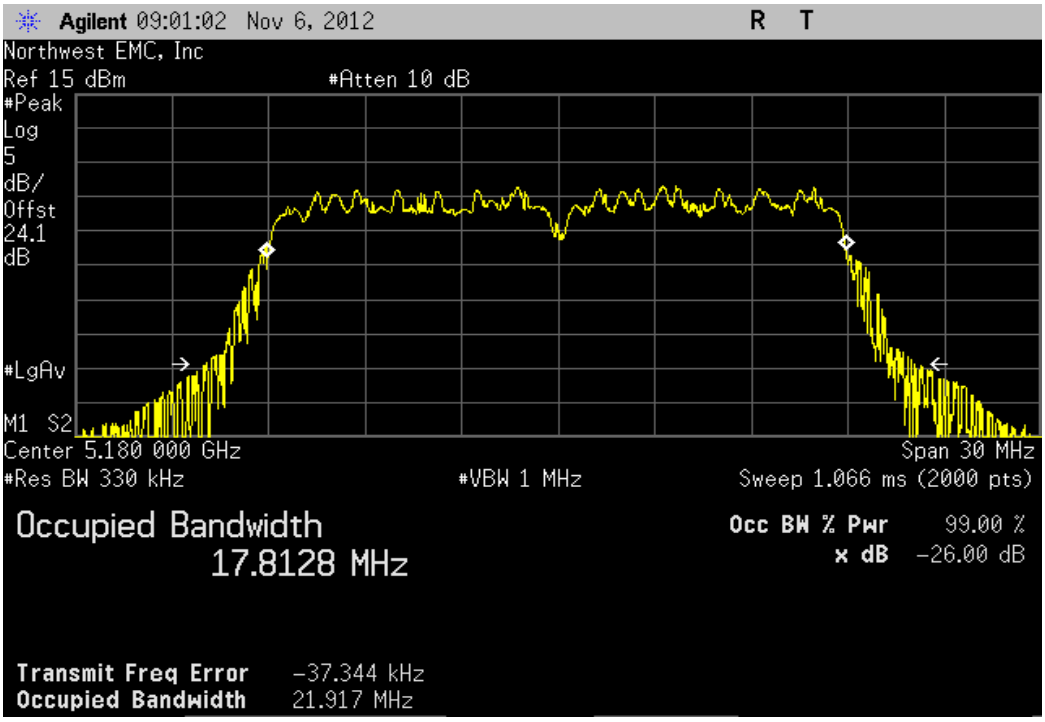
None

Configuration #	1	Signature

	Value	Limit	Result
Chain A			
20 MHz			
802.11(n) MCS8			
Ch 36, Low Channel 5180 MHz	21.917 MHz	> 500 kHz	Pass
Ch 48, High Channel 5240 MHz	21.771 MHz	> 500 kHz	Pass
Ch 52, Low Channel 5260 MHz	21.492 MHz	> 500 kHz	Pass
Ch 64, High Channel 5320 MHz	21.145 MHz	> 500 kHz	Pass
Ch 100, Low Channel 5500 MHz	21.886 MHz	> 500 kHz	Pass
Ch 116, Mid Channel 5580 MHz	21.677 MHz	> 500 kHz	Pass
Ch 140, High Channel 5700 MHz	21.168 MHz	> 500 kHz	Pass
802.11(n) MCS15			
Ch 36, Low Channel 5180 MHz	21.867 MHz	> 500 kHz	Pass
Ch 48, High Channel 5240 MHz	21.329 MHz	> 500 kHz	Pass
Ch 52, Low Channel 5260 MHz	21.732 MHz	> 500 kHz	Pass
Ch 64, High Channel 5320 MHz	22.032 MHz	> 500 kHz	Pass
Ch 100, Low Channel 5500 MHz	21.844 MHz	> 500 kHz	Pass
Ch 116, Mid Channel 5580 MHz	21.524 MHz	> 500 kHz	Pass
Ch 140, High Channel 5700 MHz	21.814 MHz	> 500 kHz	Pass
40 MHz			
802.11(n) MCS8			
Ch 36/40, Low Channel 5190 MHz	41.173 MHz	> 500 kHz	Pass
Ch 44/48, High Channel 5230 MHz	41.285 MHz	> 500 kHz	Pass
Ch 52/56, Low Channel 5270 MHz	41.272 MHz	> 500 kHz	Pass
Ch 60/64, High Channel 5310 MHz	41.14 MHz	> 500 kHz	Pass
Ch 100/104, Low Channel 5510 MHz	41.159 MHz	> 500 kHz	Pass
Ch 132/136, High Channel 5670 MHz	41.271 MHz	> 500 kHz	Pass
802.11(n) MCS15			
Ch 36/40, Low Channel 5190 MHz	42.024 MHz	> 500 kHz	Pass
Ch 44/48, High Channel 5230 MHz	41.741 MHz	> 500 kHz	Pass
Ch 52/56, Low Channel 5270 MHz	41.665 MHz	> 500 kHz	Pass
Ch 60/64, High Channel 5310 MHz	41.705 MHz	> 500 kHz	Pass
Ch 100/104, Low Channel 5510 MHz	41.725 MHz	> 500 kHz	Pass
Ch 132/136, High Channel 5670 MHz	41.356 MHz	> 500 kHz	Pass
Chain B			
20 MHz			
802.11(n) MCS8			
Ch 36, Low Channel 5180 MHz	20.986 MHz	> 500 kHz	Pass
Ch 48, High Channel 5240 MHz	21.359 MHz	> 500 kHz	Pass
Ch 52, Low Channel 5260 MHz	21.156 MHz	> 500 kHz	Pass
Ch 64, High Channel 5320 MHz	20.979 MHz	> 500 kHz	Pass
Ch 100, Low Channel 5500 MHz	21.403 MHz	> 500 kHz	Pass
Ch 116, Mid Channel 5580 MHz	20.801 MHz	> 500 kHz	Pass
Ch 140, High Channel 5700 MHz	21.378 MHz	> 500 kHz	Pass
802.11(n) MCS15			
Ch 36, Low Channel 5180 MHz	21.292 MHz	> 500 kHz	Pass
Ch 48, High Channel 5240 MHz	20.931 MHz	> 500 kHz	Pass
Ch 52, Low Channel 5260 MHz	21.459 MHz	> 500 kHz	Pass
Ch 64, High Channel 5320 MHz	21.113 MHz	> 500 kHz	Pass
Ch 100, Low Channel 5500 MHz	21.333 MHz	> 500 kHz	Pass
Ch 116, Mid Channel 5580 MHz	20.606 MHz	> 500 kHz	Pass
Ch 140, High Channel 5700 MHz	21.332 MHz	> 500 kHz	Pass
40 MHz			
802.11(n) MCS8			
Ch 36/40, Low Channel 5190 MHz	41.306 MHz	> 500 kHz	Pass
Ch 44/48, High Channel 5230 MHz	41.905 MHz	> 500 kHz	Pass
Ch 52/56, Low Channel 5270 MHz	41.528 MHz	> 500 kHz	Pass
Ch 60/64, High Channel 5310 MHz	42.564 MHz	> 500 kHz	Pass
Ch 100/104, Low Channel 5510 MHz	41.709 MHz	> 500 kHz	Pass
Ch 132/136, High Channel 5670 MHz	41.907 MHz	> 500 kHz	Pass
802.11(n) MCS15			
Ch 36/40, Low Channel 5190 MHz	41.726 MHz	> 500 kHz	Pass
Ch 44/48, High Channel 5230 MHz	41.007 MHz	> 500 kHz	Pass
Ch 52/56, Low Channel 5270 MHz	41.077 MHz	> 500 kHz	Pass
Ch 60/64, High Channel 5310 MHz	41.162 MHz	> 500 kHz	Pass
Ch 100/104, Low Channel 5510 MHz	40.943 MHz	> 500 kHz	Pass
Ch 132/136, High Channel 5670 MHz	41.195 MHz	> 500 kHz	Pass

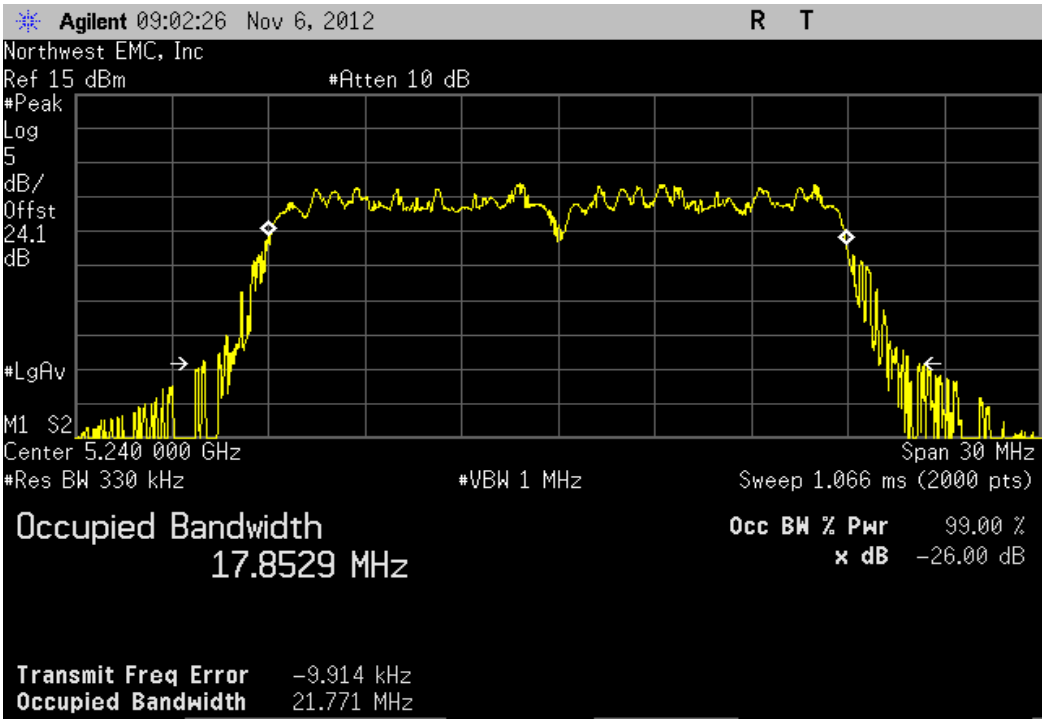
Chain A, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.917 MHz	> 500 kHz	Pass



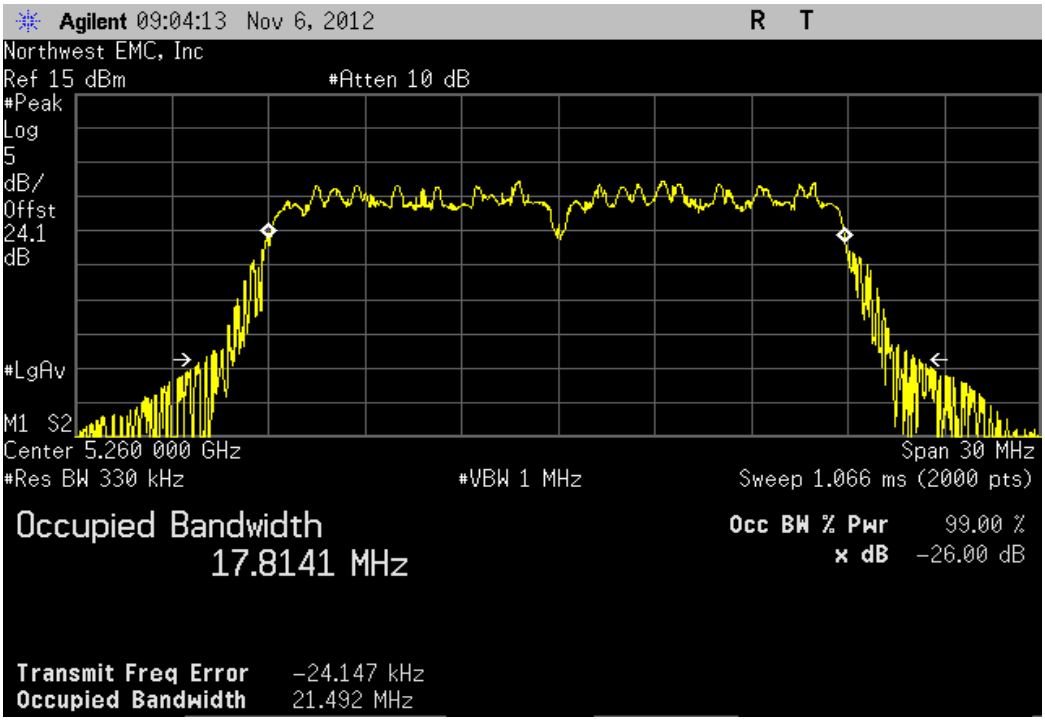
Chain A, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.771 MHz	> 500 kHz	Pass



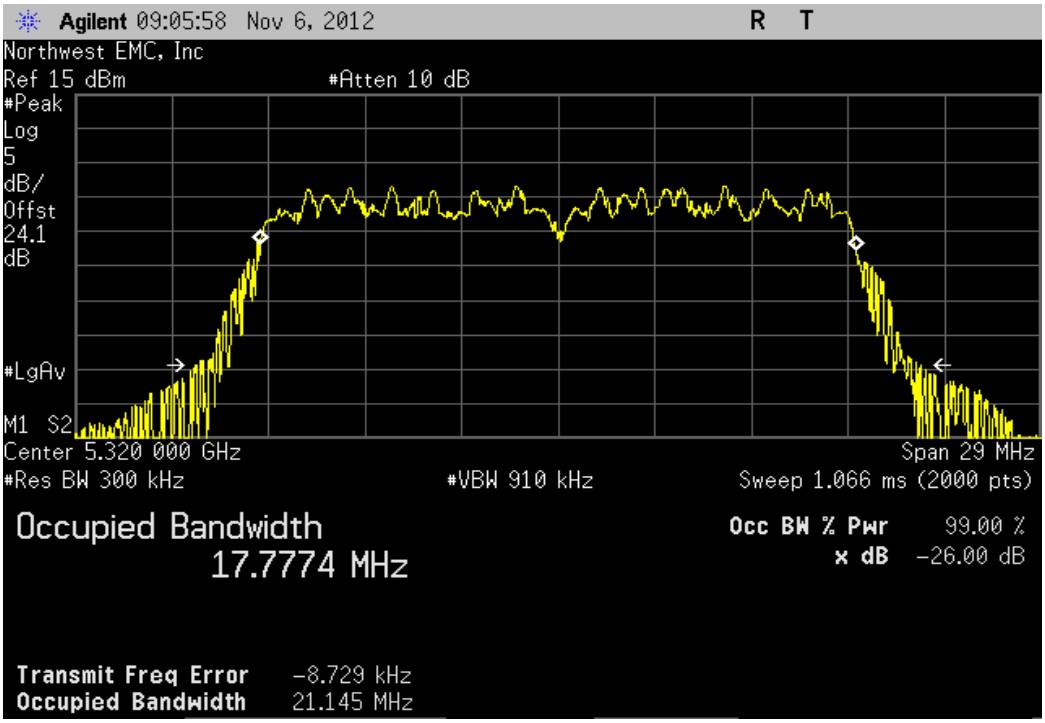
Chain A, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.492 MHz	> 500 kHz	Pass



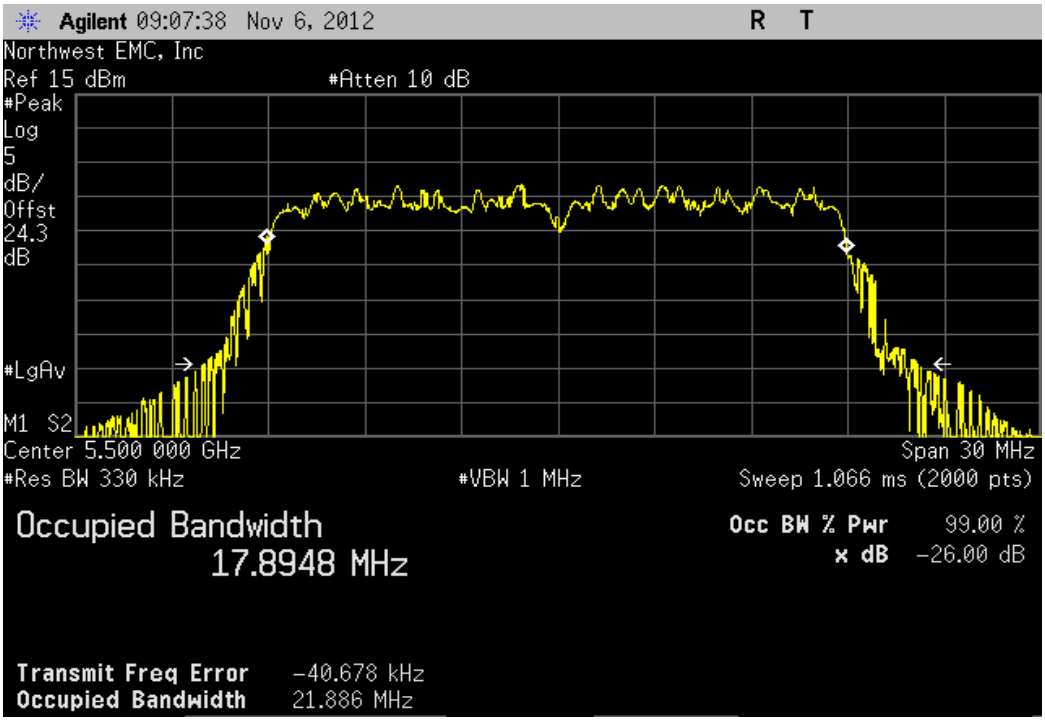
Chain A, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				21.145 MHz	> 500 kHz	Pass



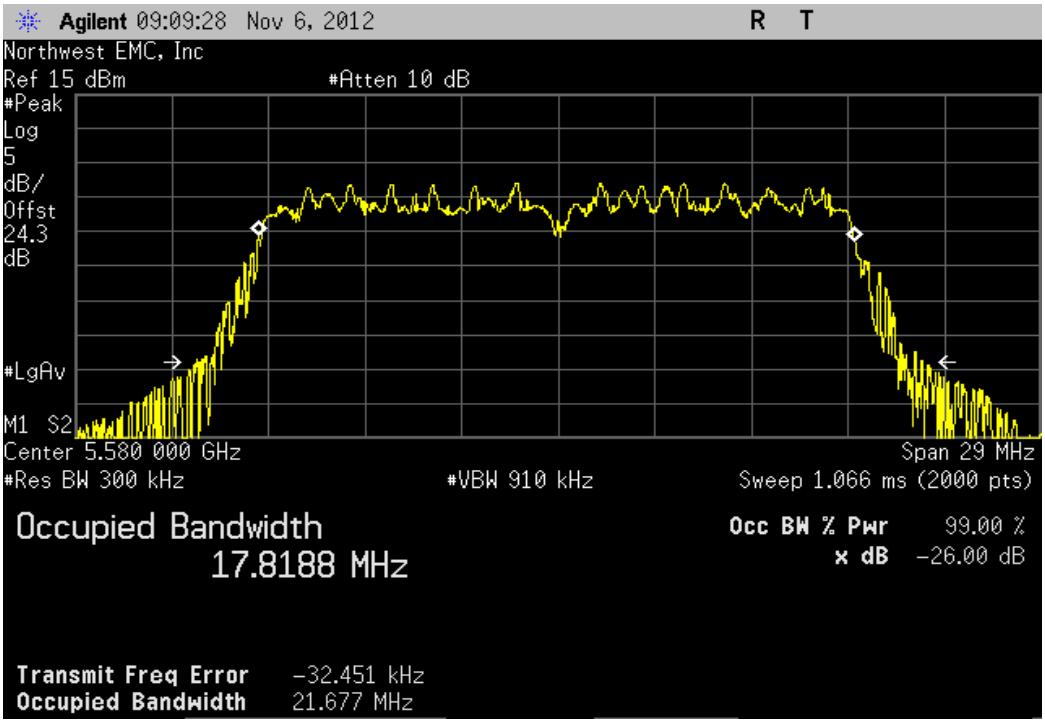
Chain A, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.886 MHz	> 500 kHz	Pass



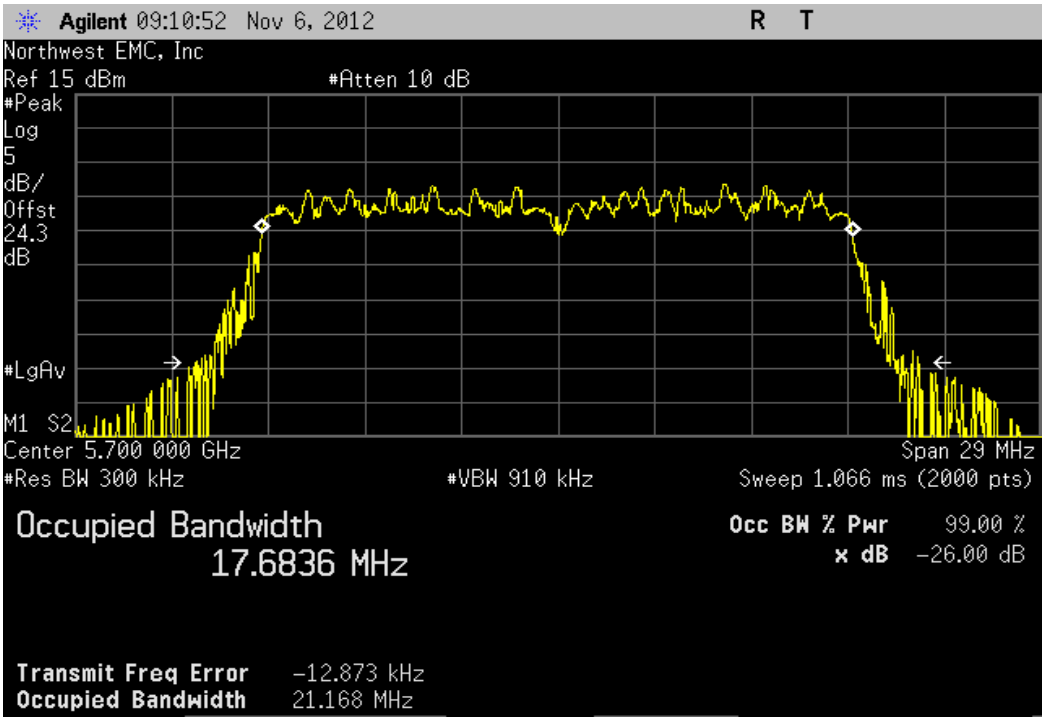
Chain A, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.677 MHz	> 500 kHz	Pass



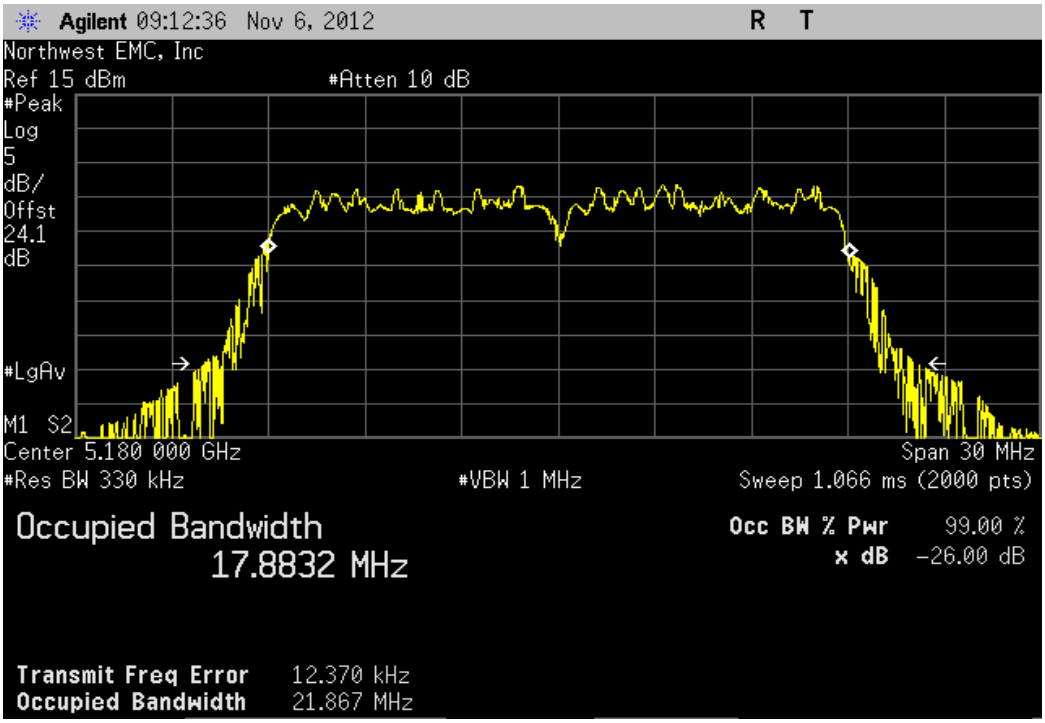
Chain A, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.168 MHz	> 500 kHz	Pass



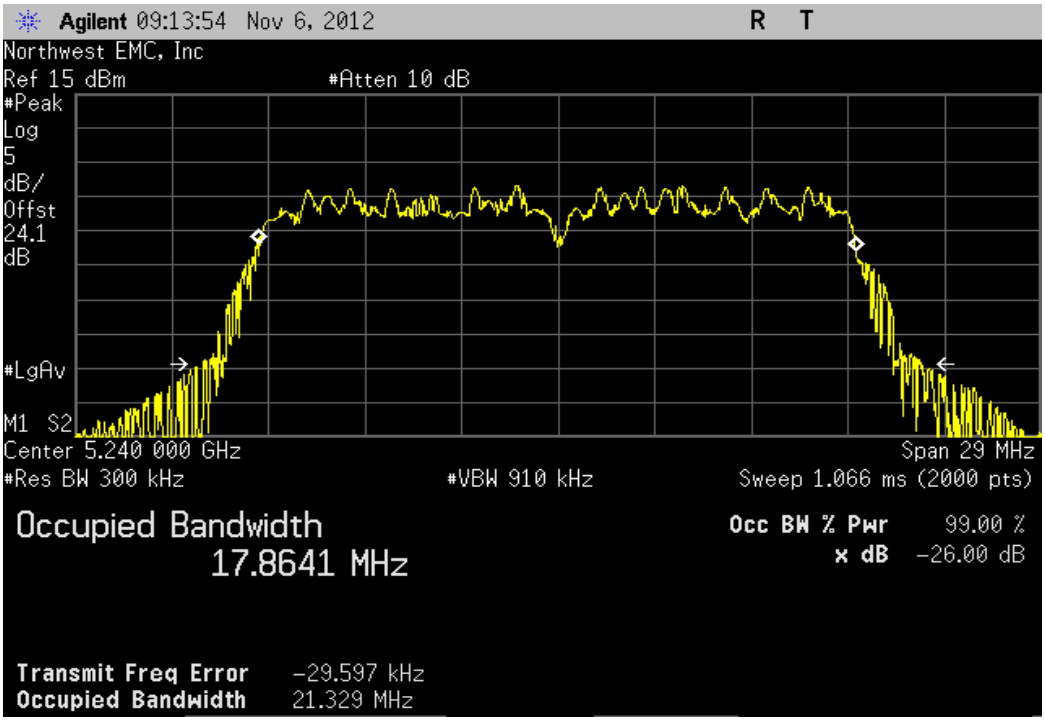
Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.867 MHz	> 500 kHz	Pass



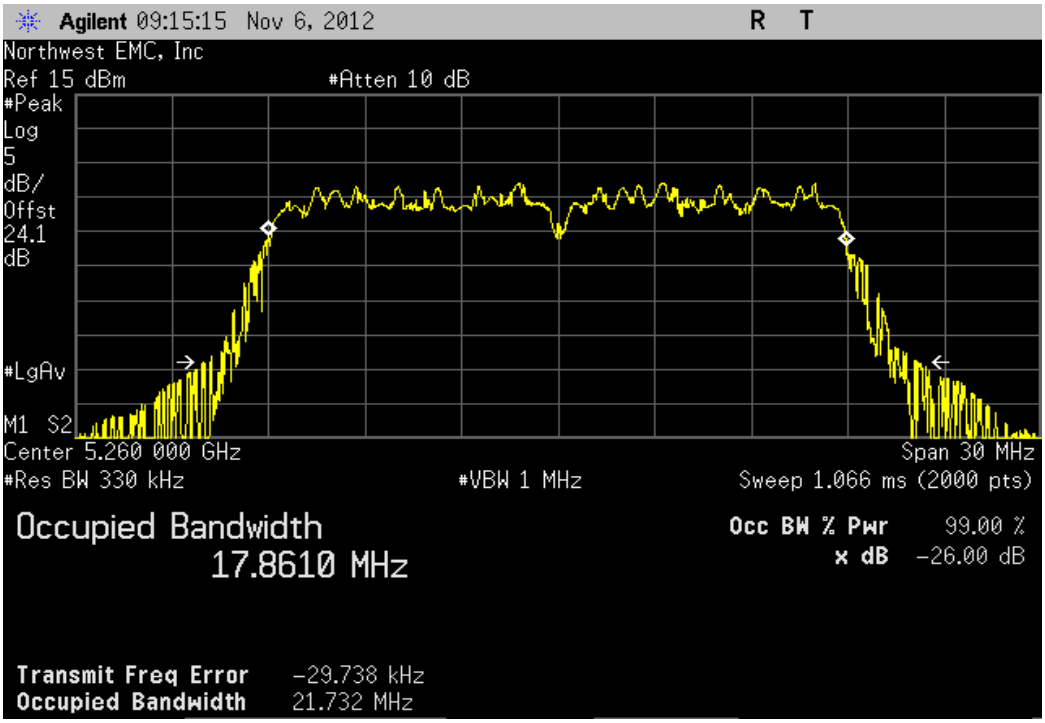
Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.329 MHz	> 500 kHz	Pass

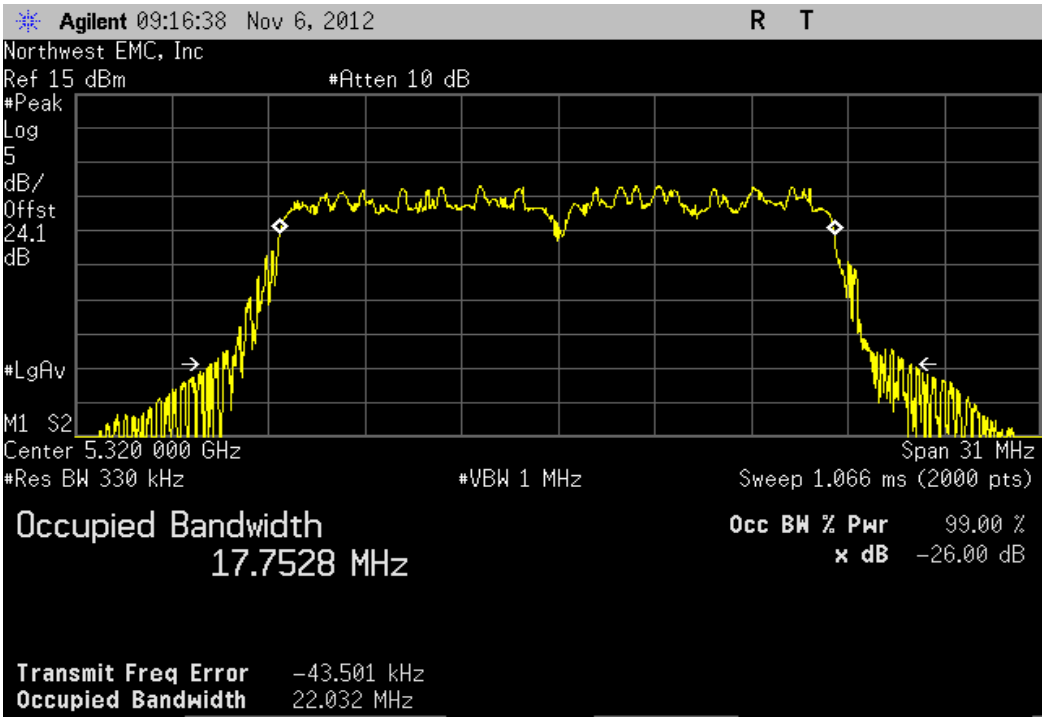


Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

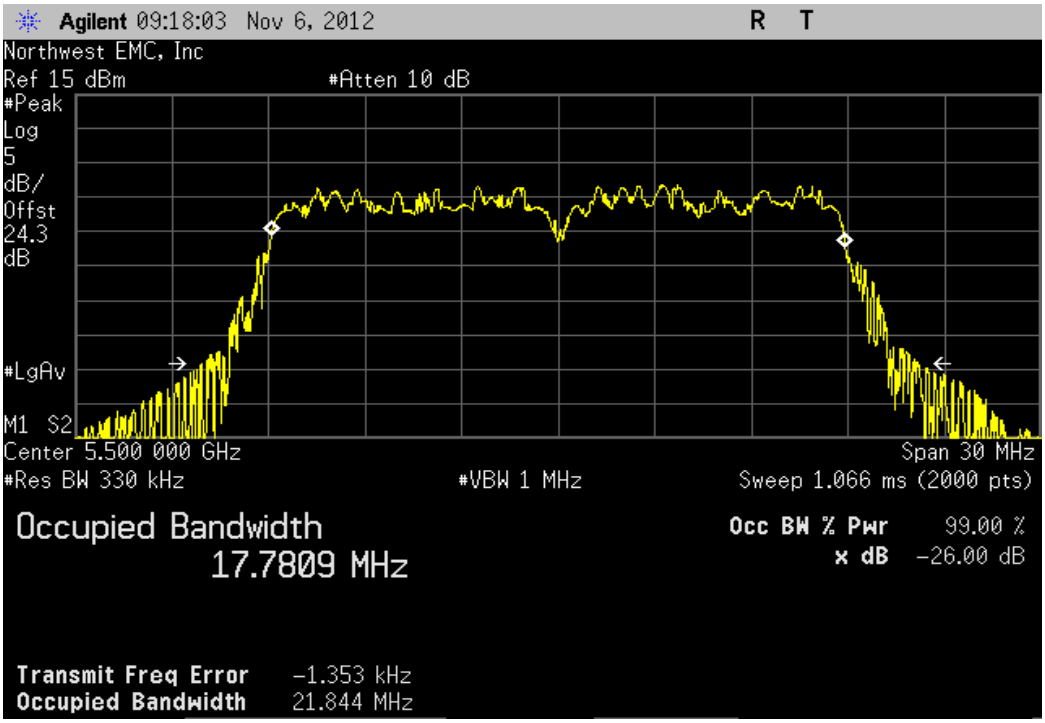
				Value	Limit	Result
				21.732 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				22.032 MHz	> 500 kHz	Pass

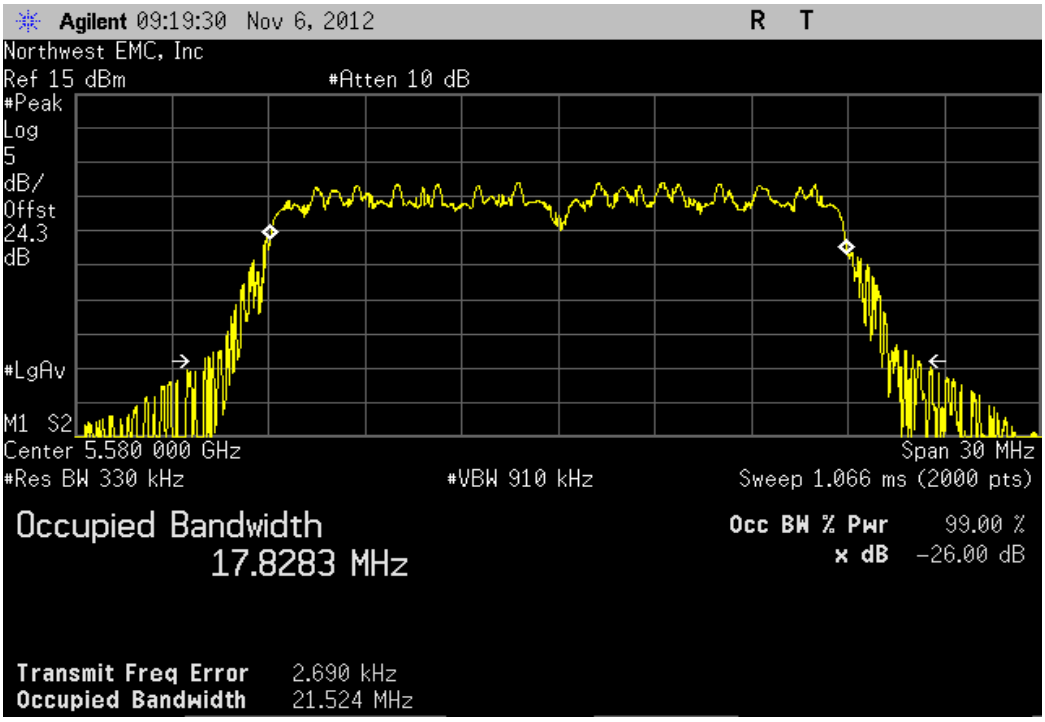


Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				21.844 MHz	> 500 kHz	Pass



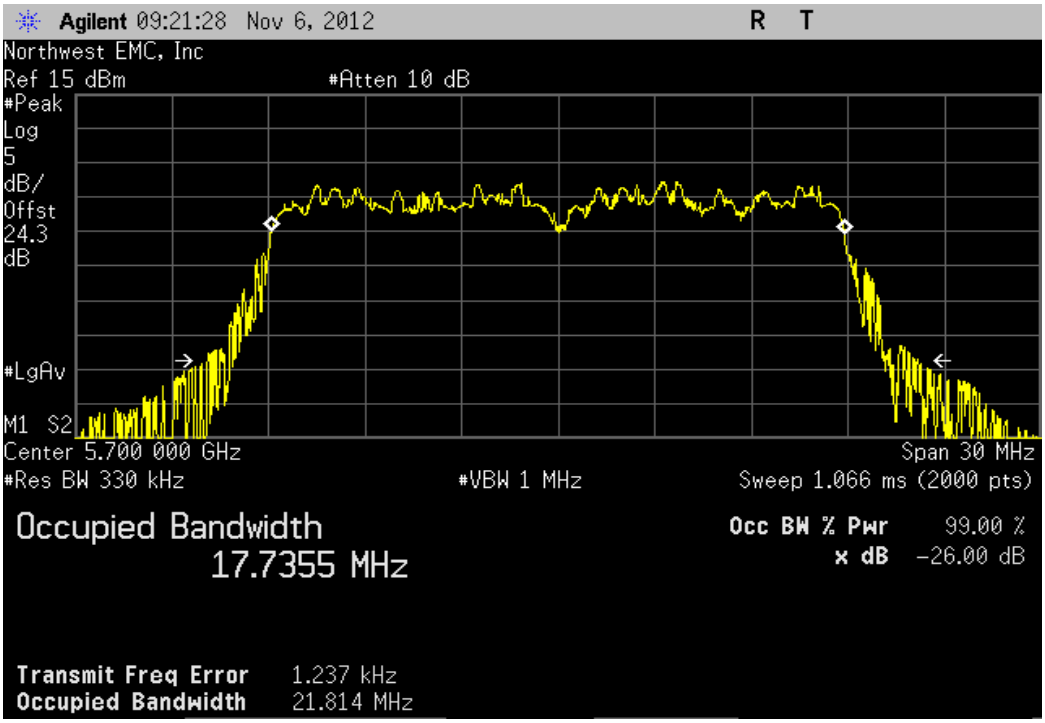
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.524 MHz	> 500 kHz	Pass



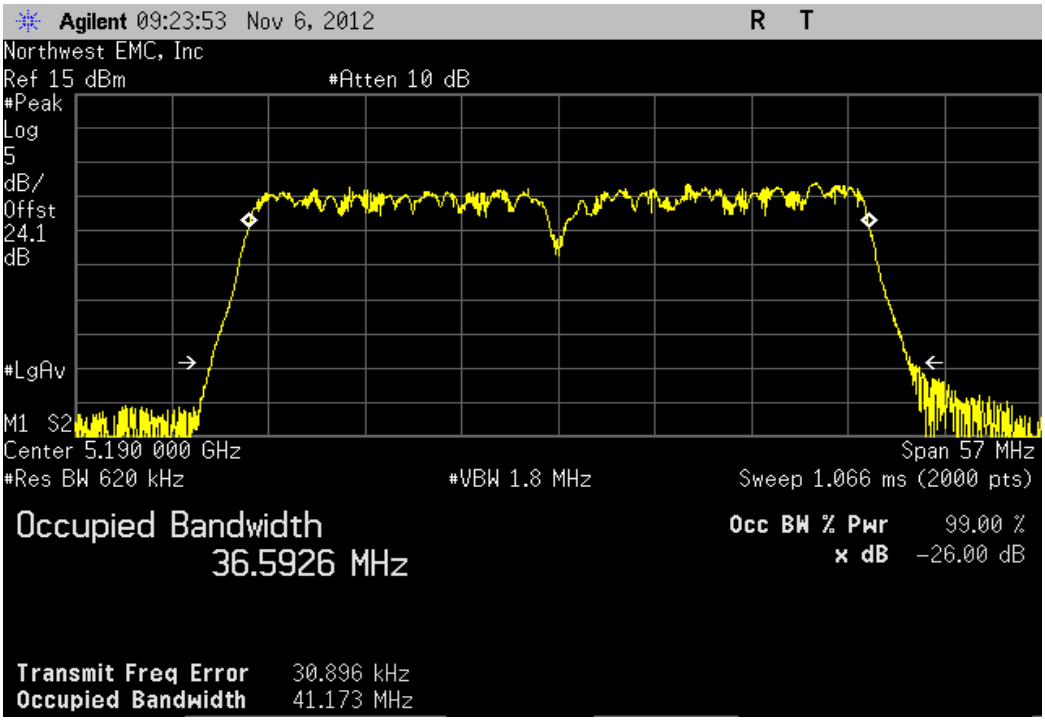
Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.814 MHz	> 500 kHz	Pass



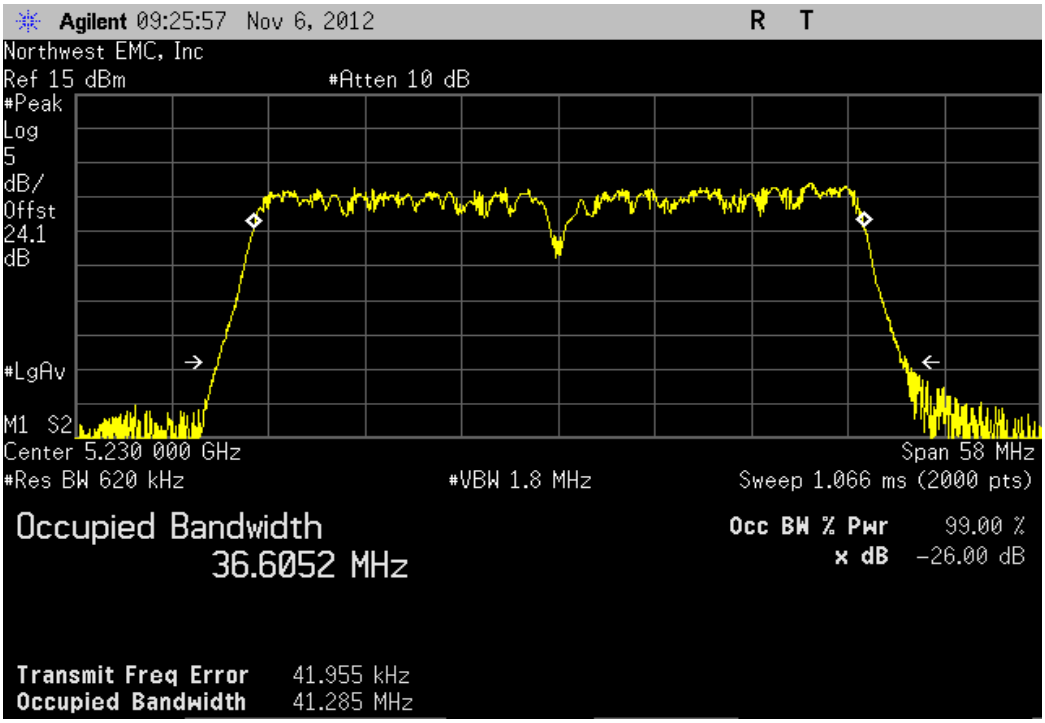
Chain A, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.173 MHz	> 500 kHz	Pass



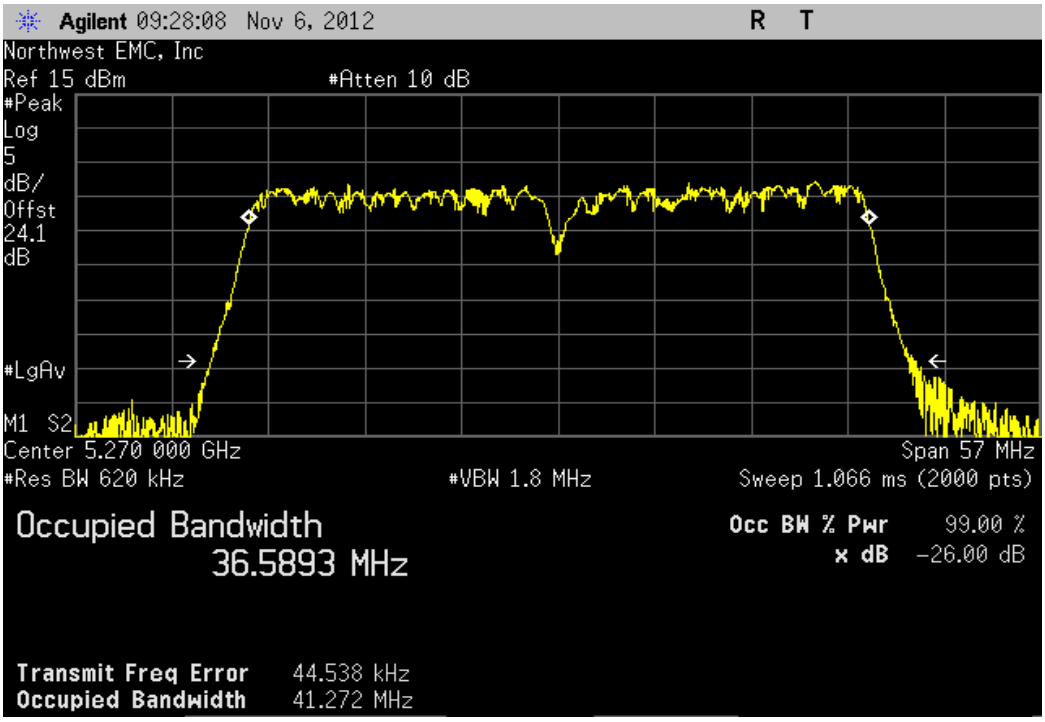
Chain A, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				41.285 MHz	> 500 kHz	Pass



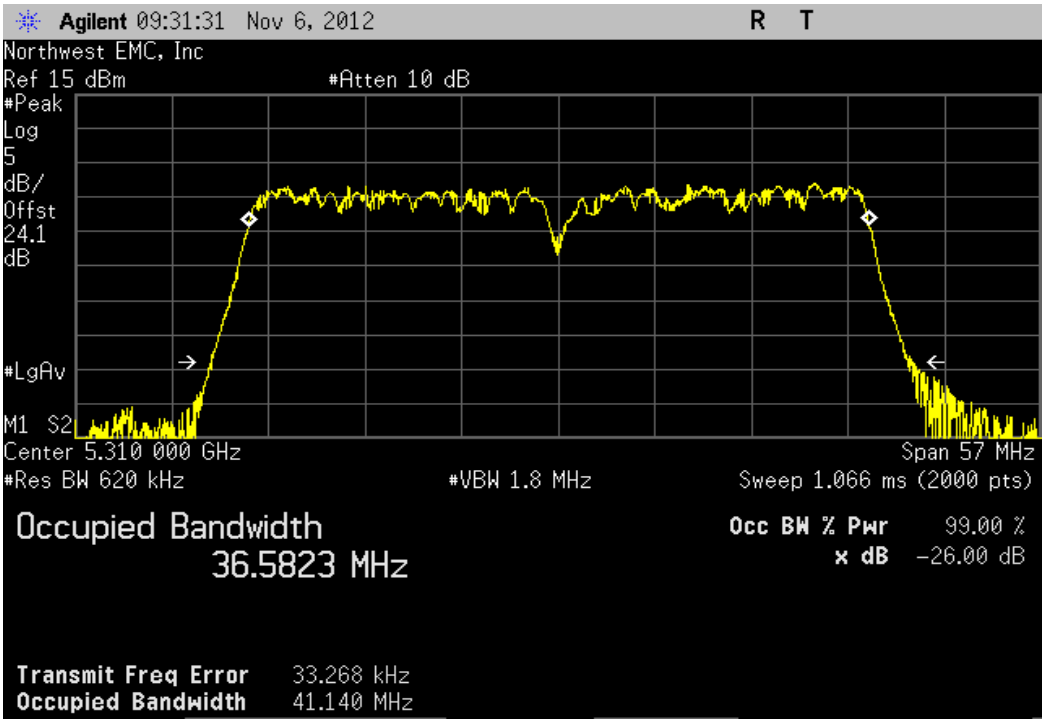
Chain A, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				41.272 MHz	> 500 kHz	Pass



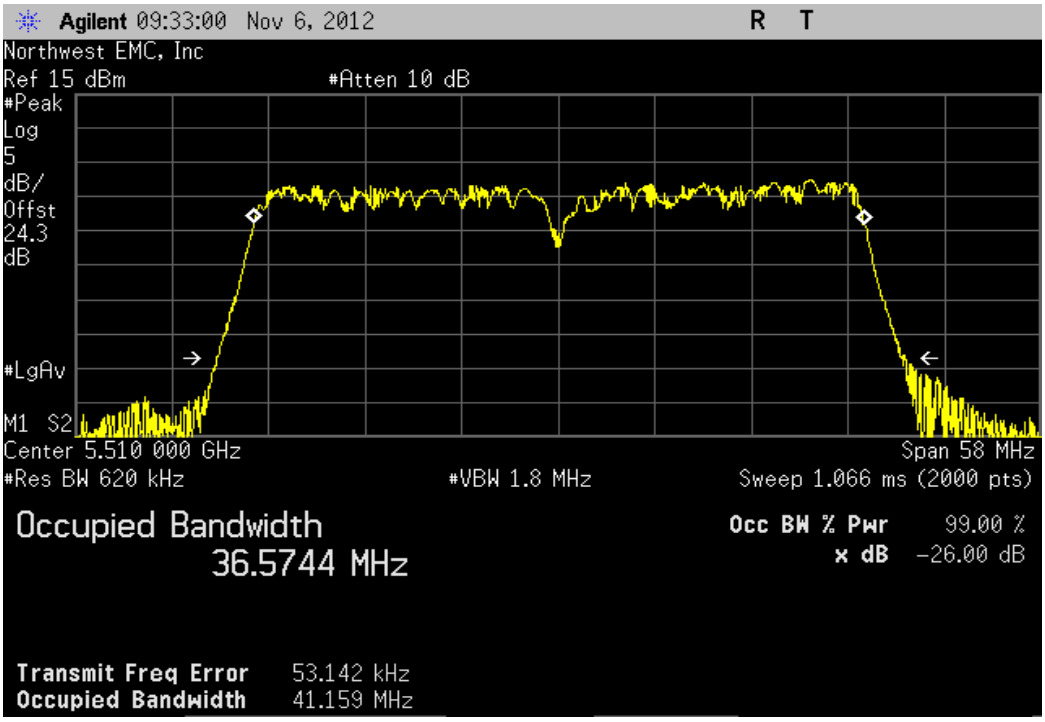
Chain A, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				41.14 MHz	> 500 kHz	Pass



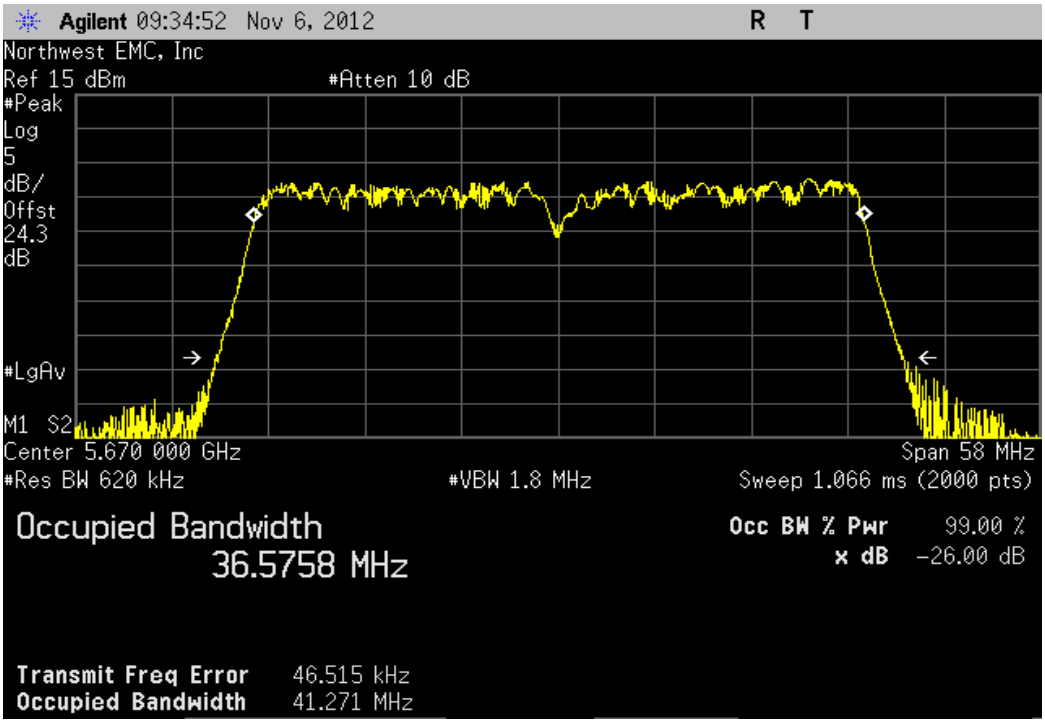
Chain A, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				41.159 MHz	> 500 kHz	Pass



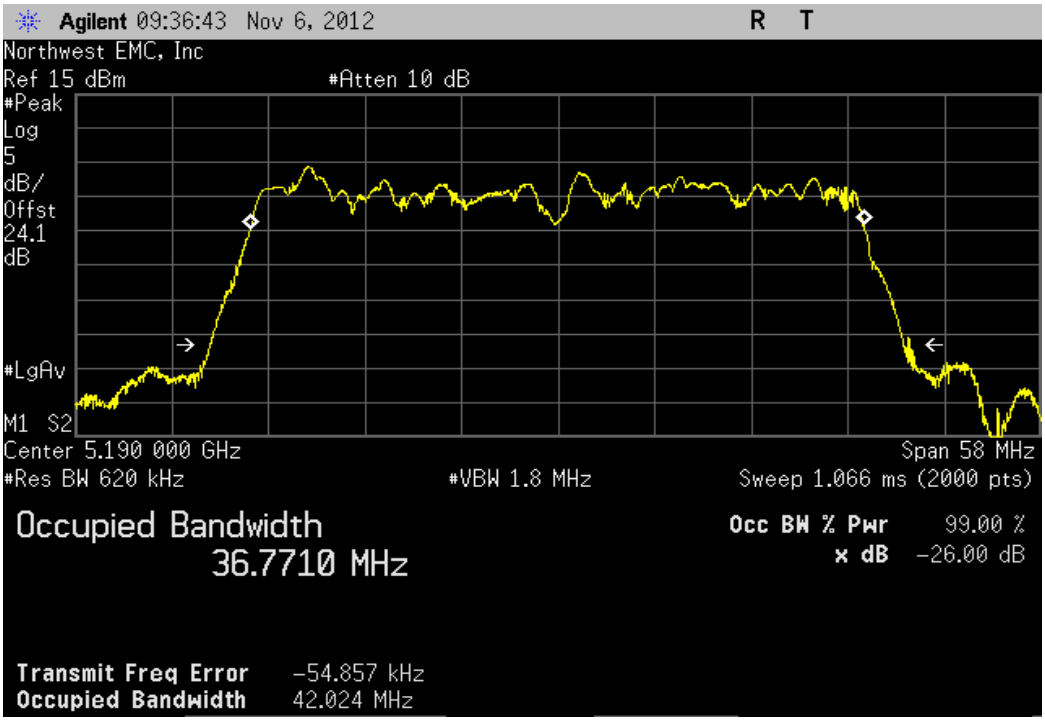
Chain A, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.271 MHz	> 500 kHz	Pass



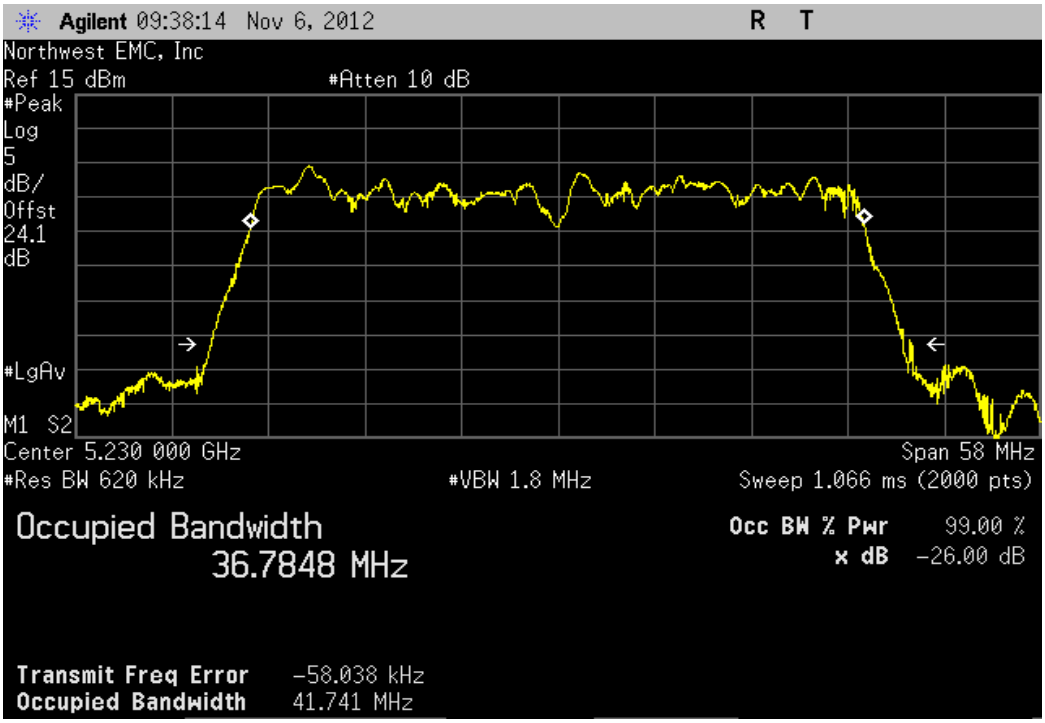
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				42.024 MHz	> 500 kHz	Pass

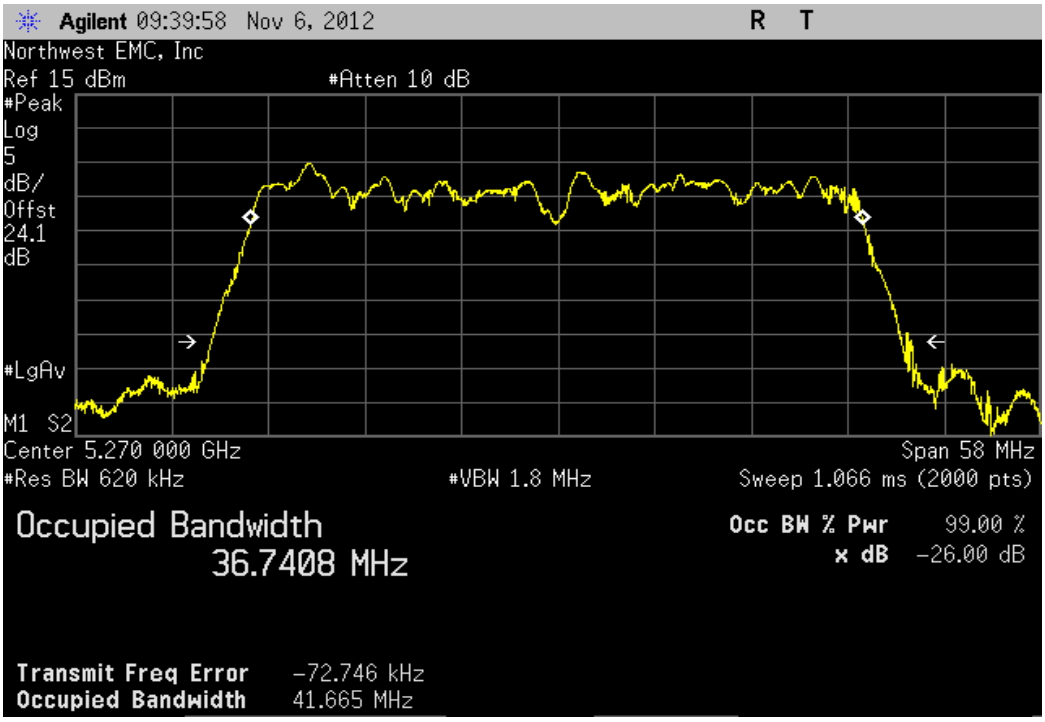


Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

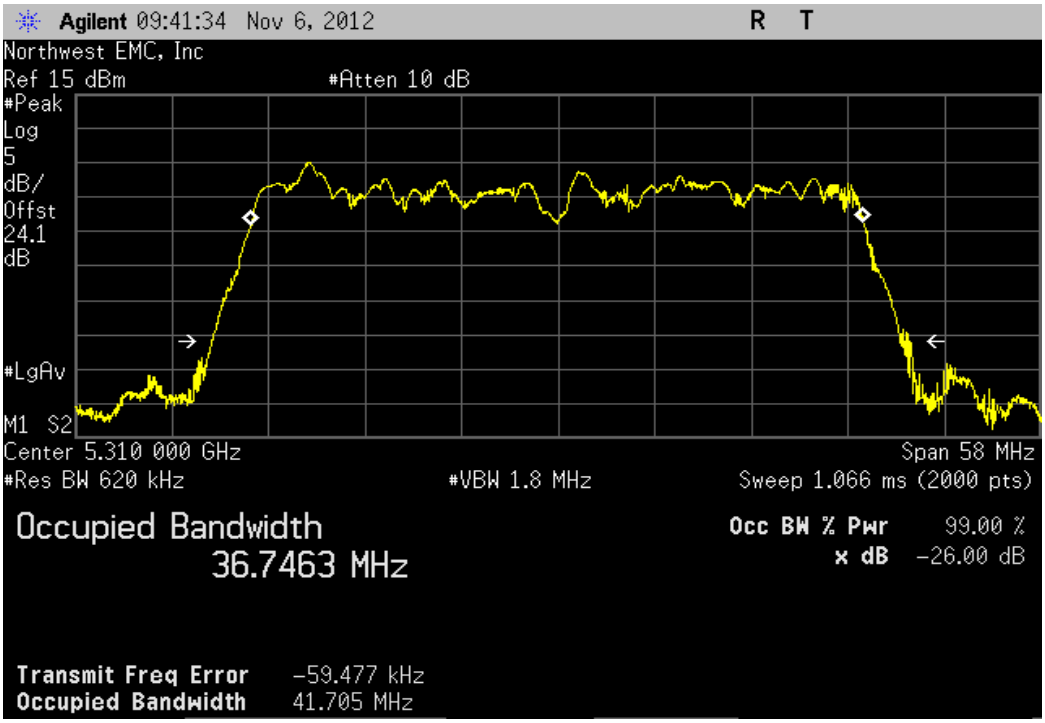
				Value	Limit	Result
				41.741 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz							
					Value	Limit	Result
					41.665 MHz	> 500 kHz	Pass

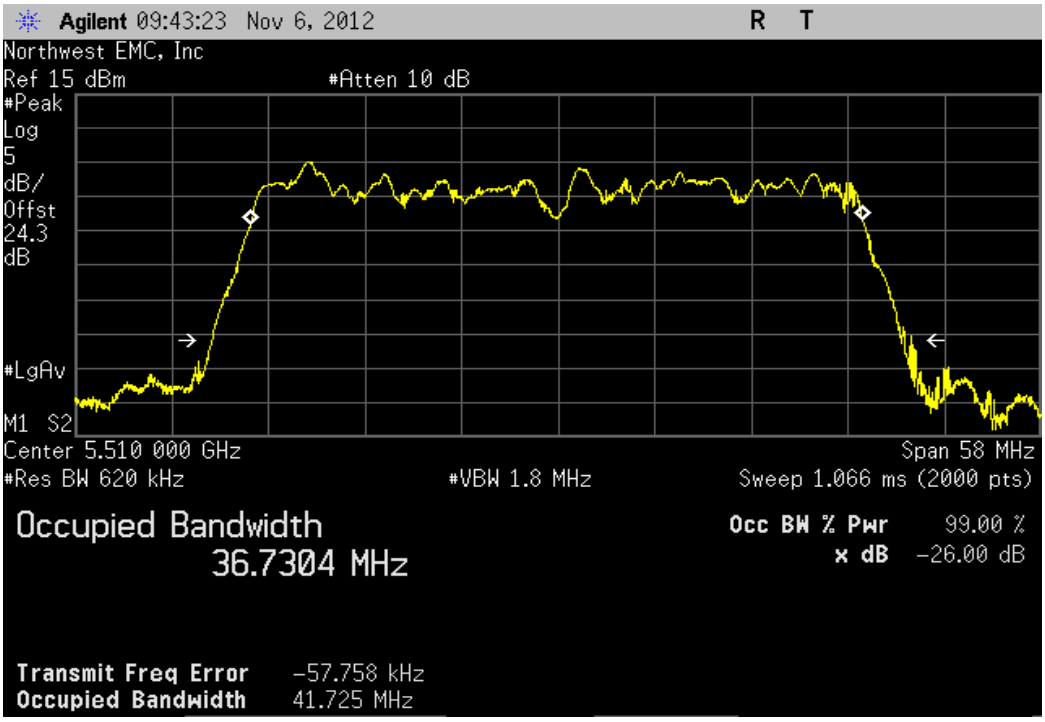


Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz							
					Value	Limit	Result
					41.705 MHz	> 500 kHz	Pass



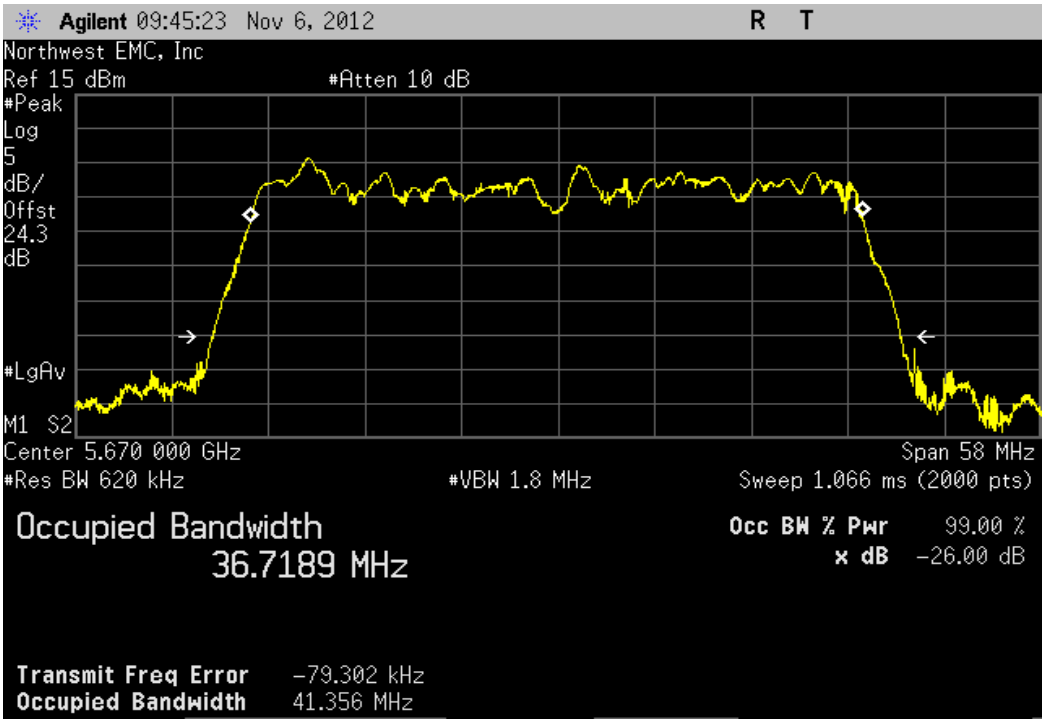
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				41.725 MHz	> 500 kHz	Pass



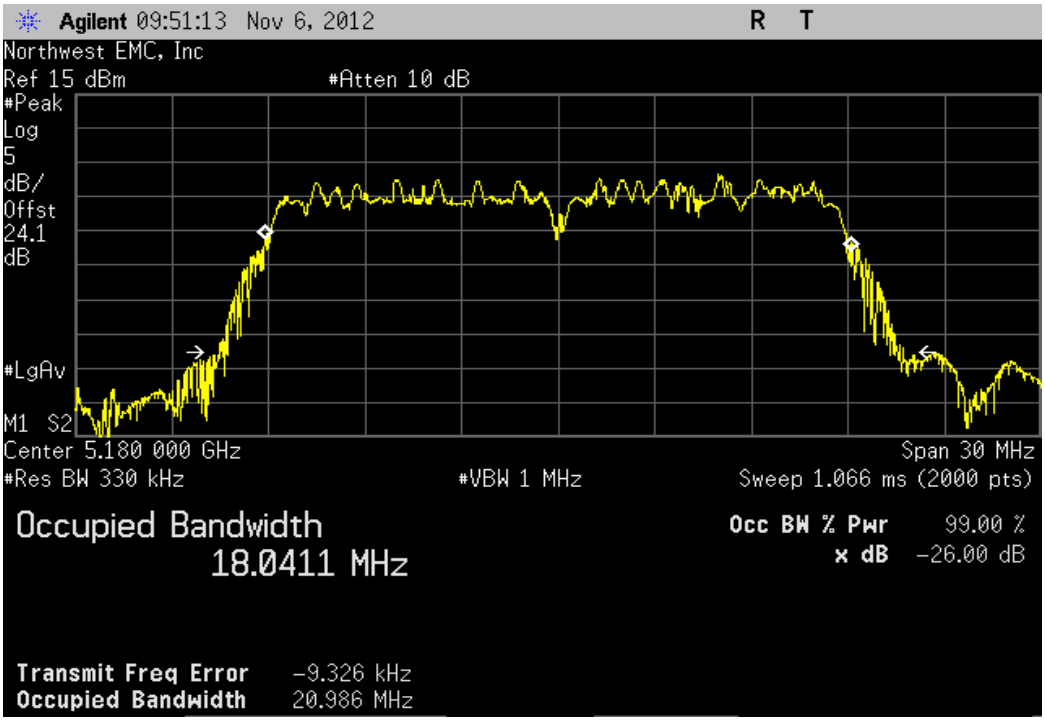
Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.356 MHz	> 500 kHz	Pass



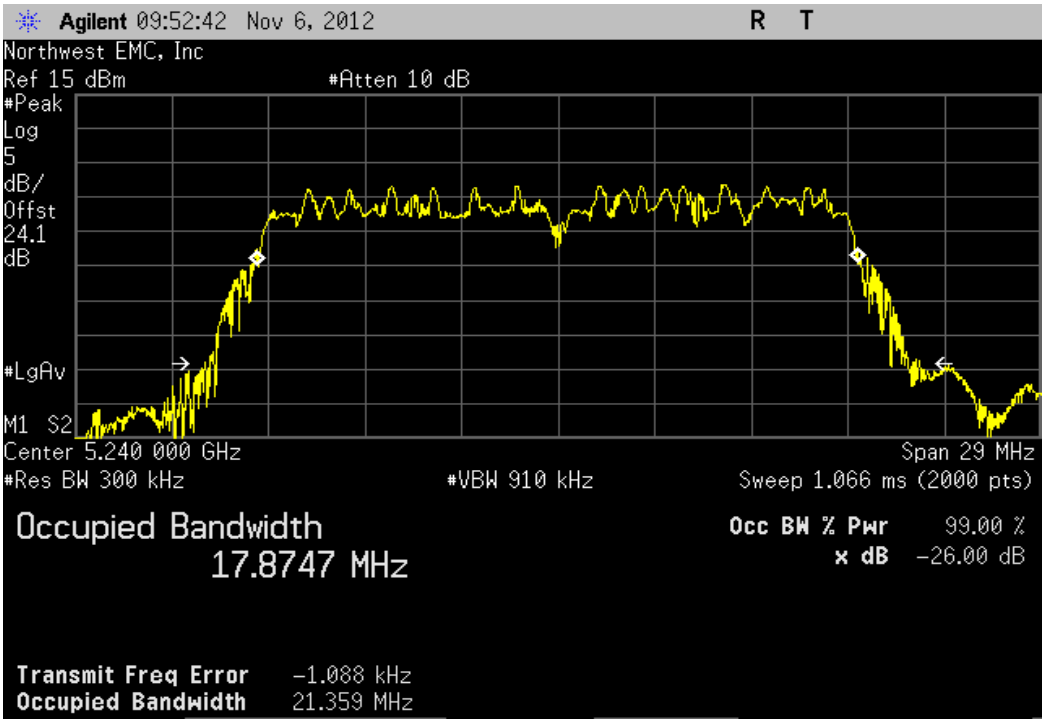
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				20.986 MHz	> 500 kHz	Pass



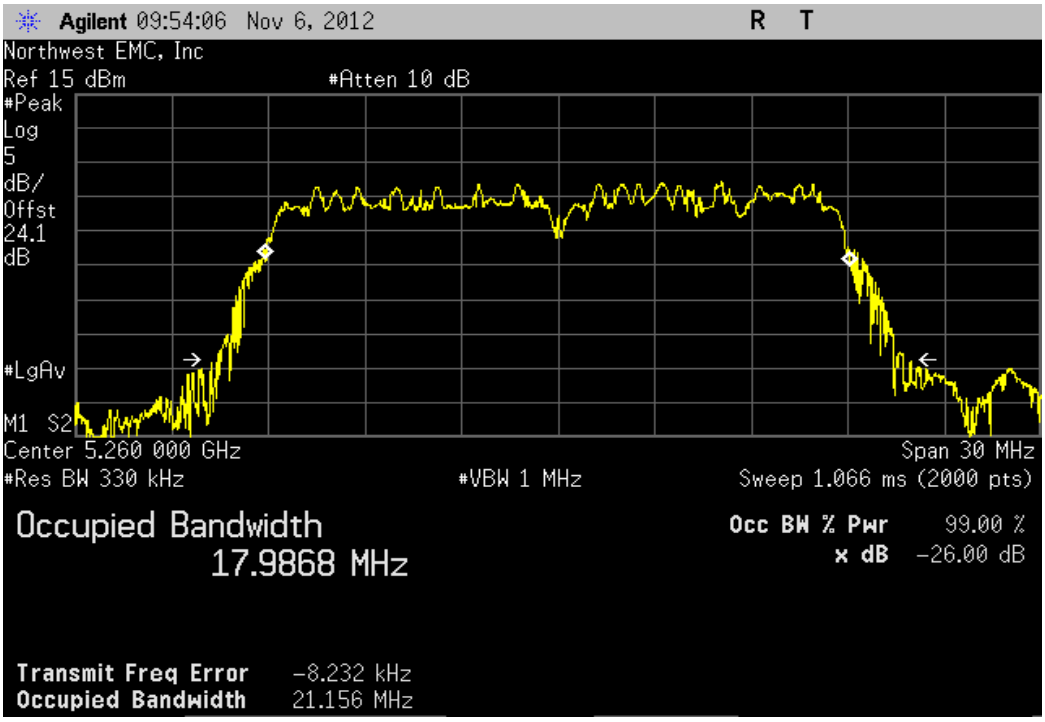
Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.359 MHz	> 500 kHz	Pass



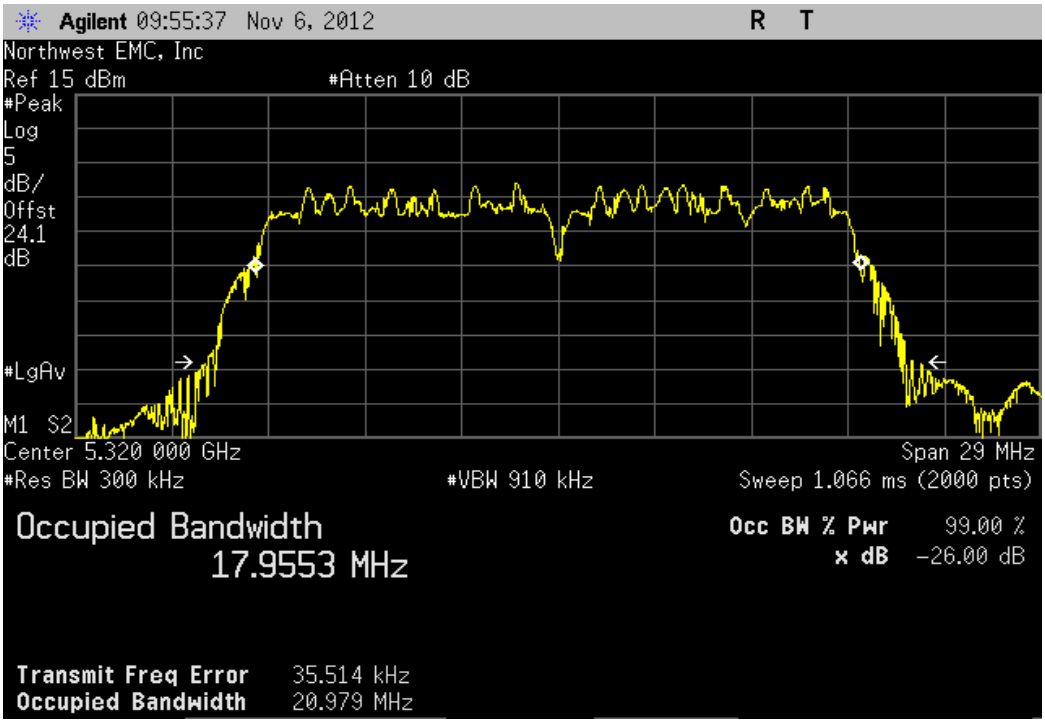
Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.156 MHz	> 500 kHz	Pass

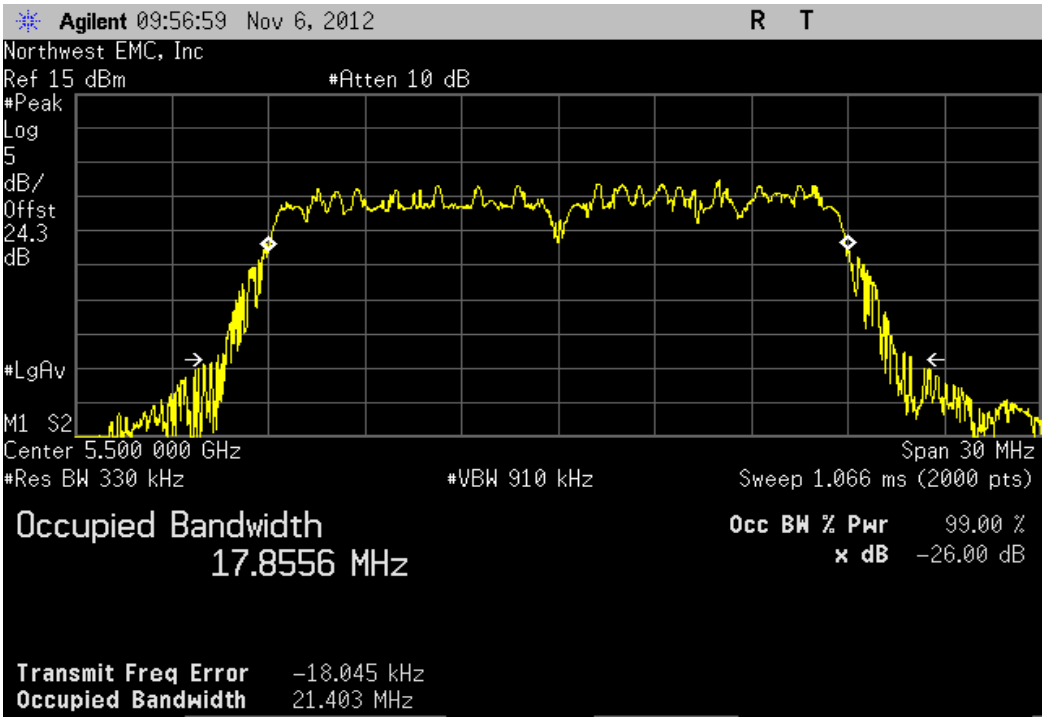


Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

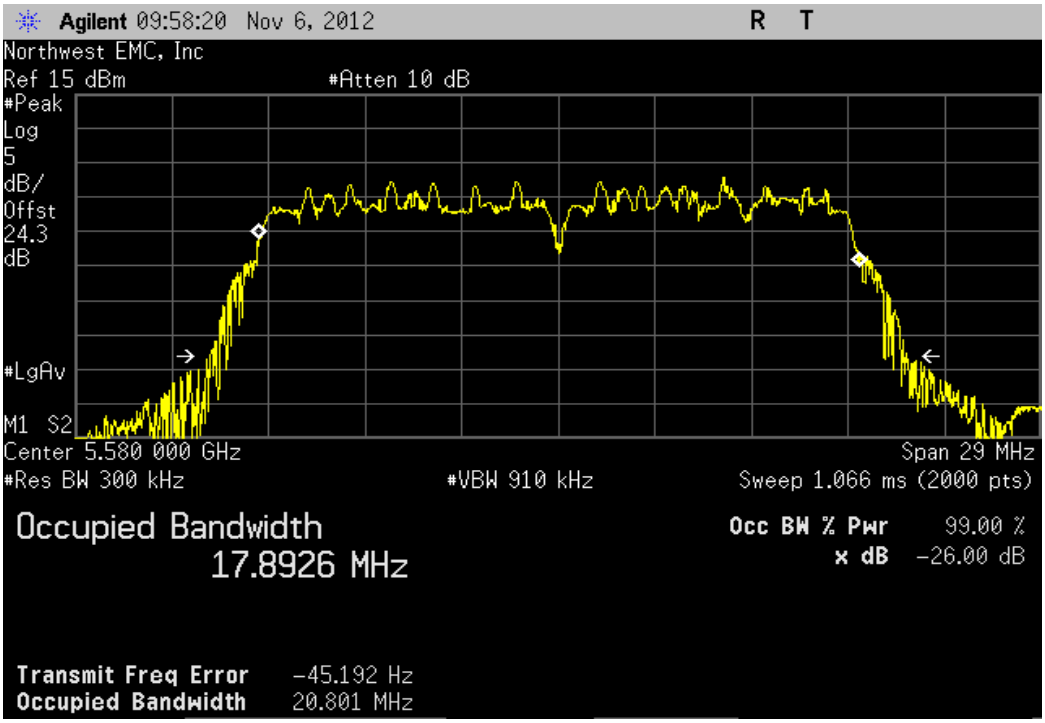
				Value	Limit	Result
				20.979 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz							
					Value	Limit	Result
					21.403 MHz	> 500 kHz	Pass

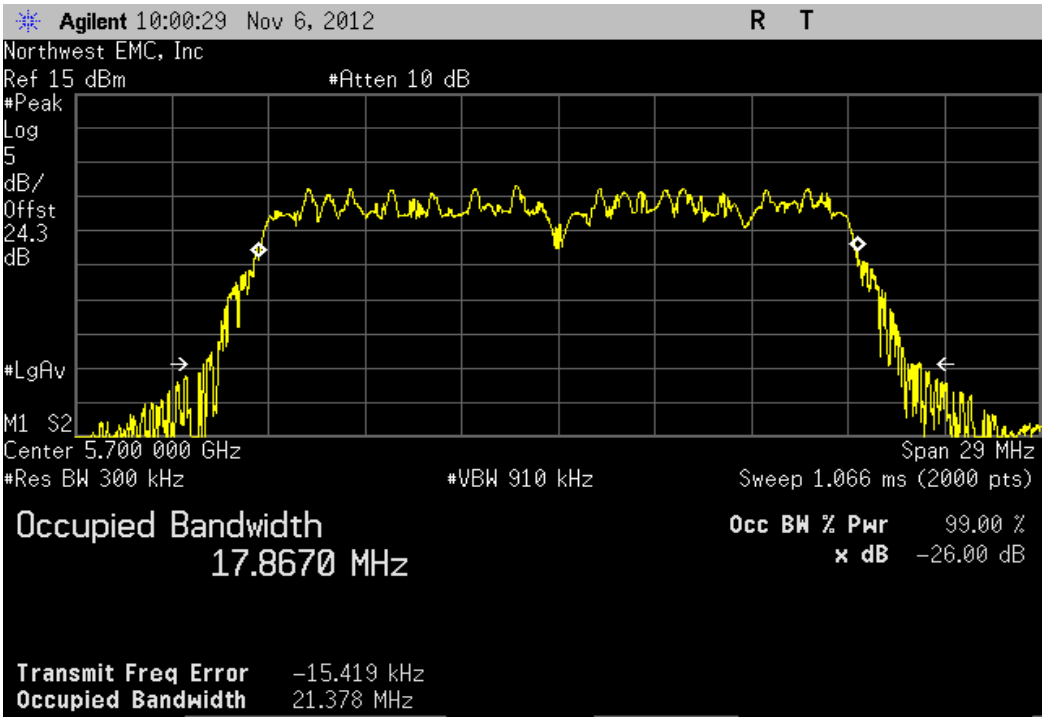


Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz							
					Value	Limit	Result
					20.801 MHz	> 500 kHz	Pass



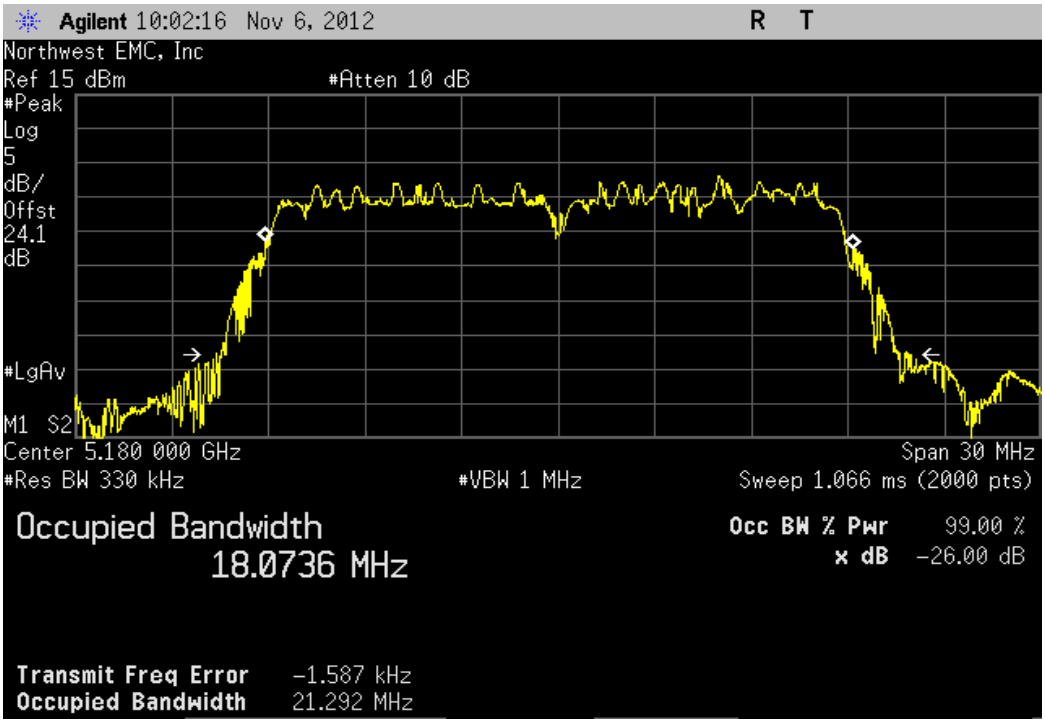
Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.378 MHz	> 500 kHz	Pass



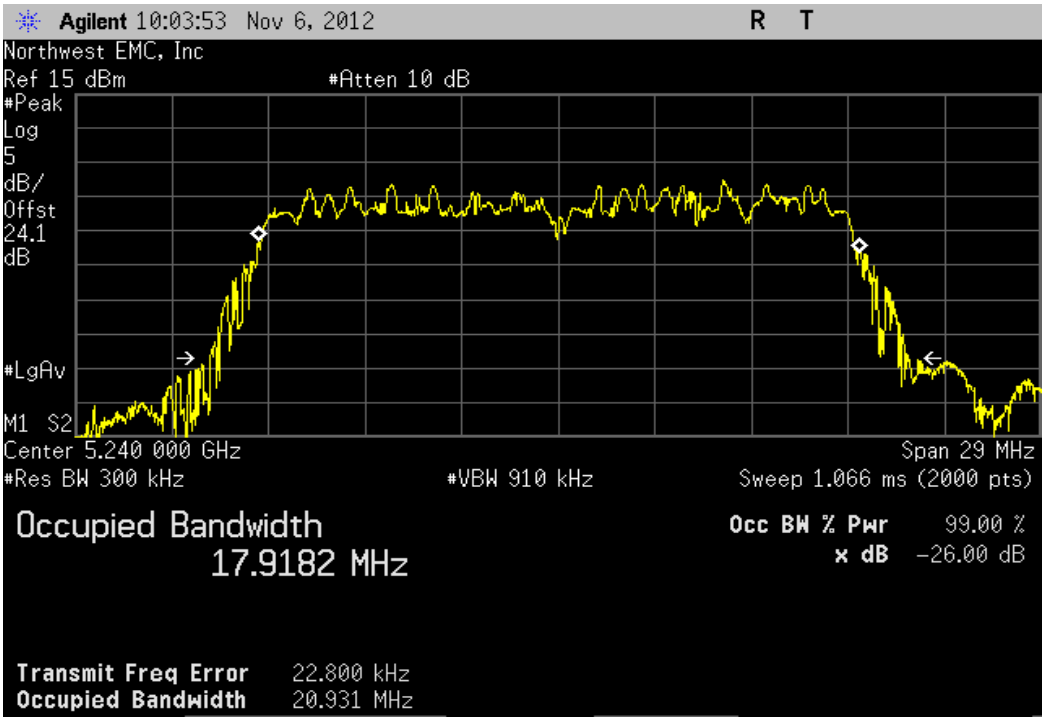
Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.292 MHz	> 500 kHz	Pass



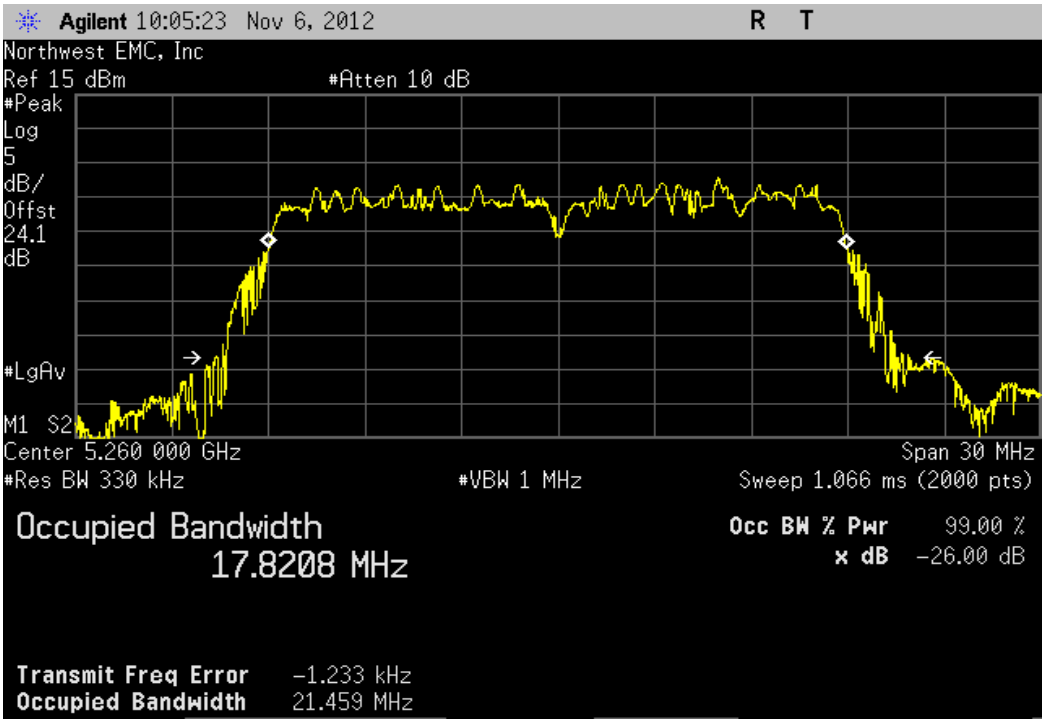
Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				20.931 MHz	> 500 kHz	Pass

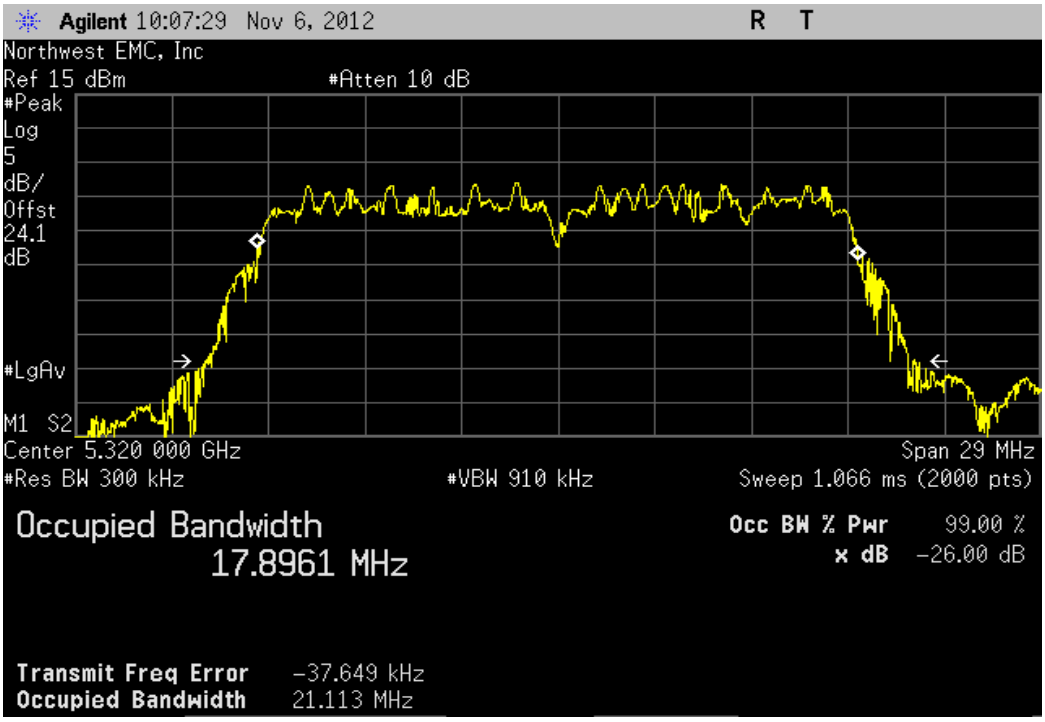


Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

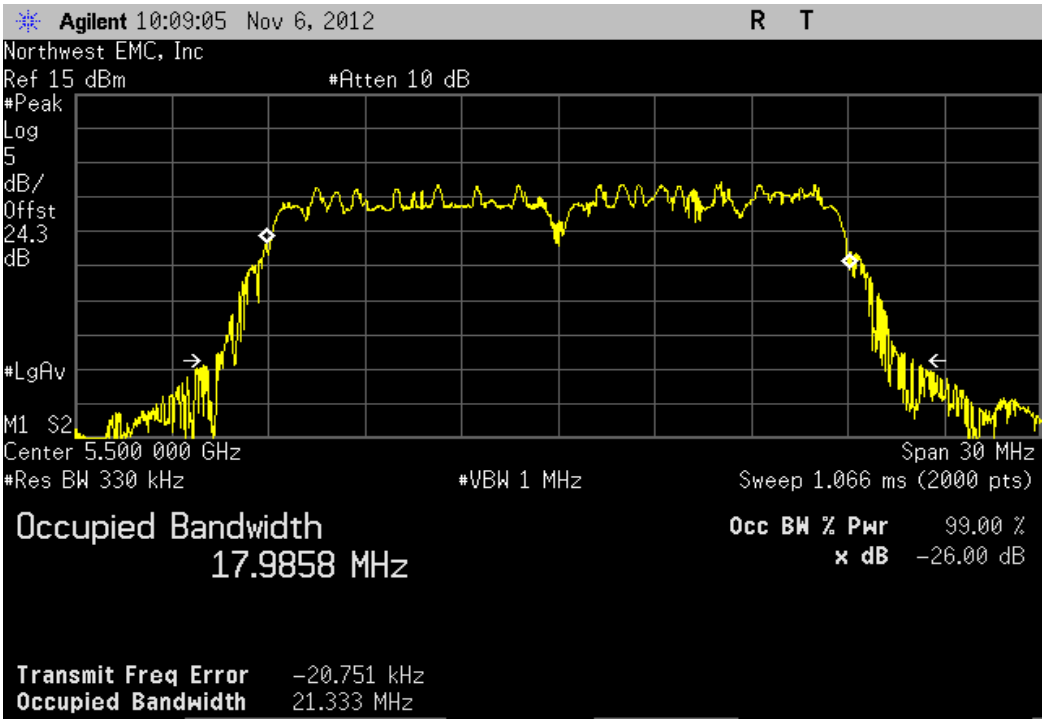
				Value	Limit	Result
				21.459 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				21.113 MHz	> 500 kHz	Pass

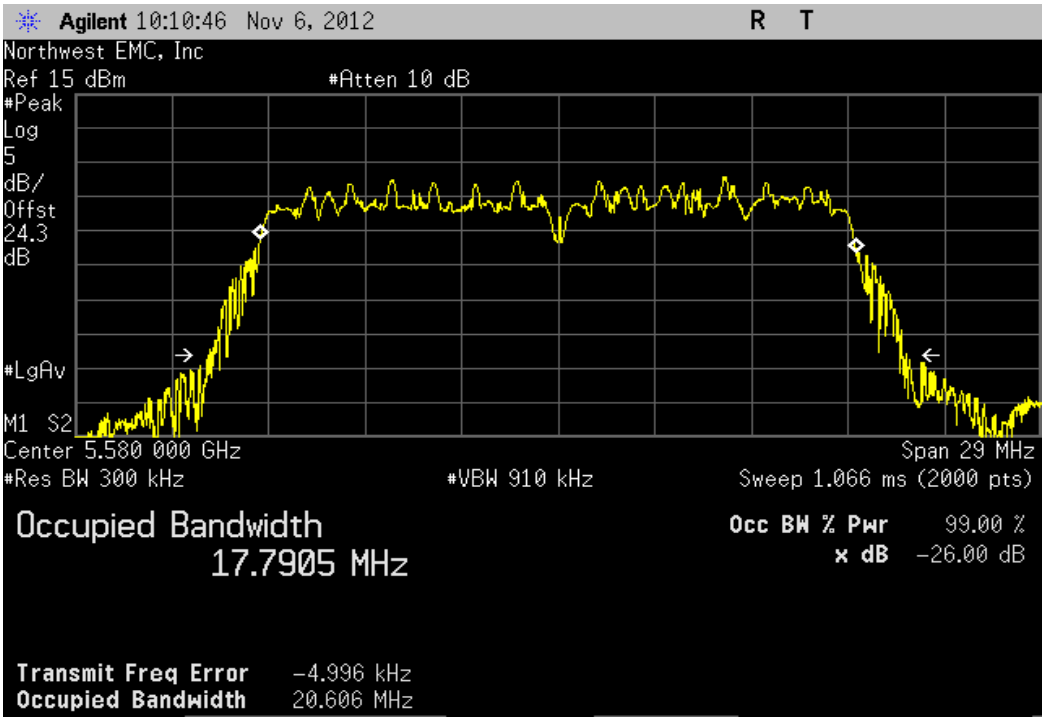


Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				21.333 MHz	> 500 kHz	Pass



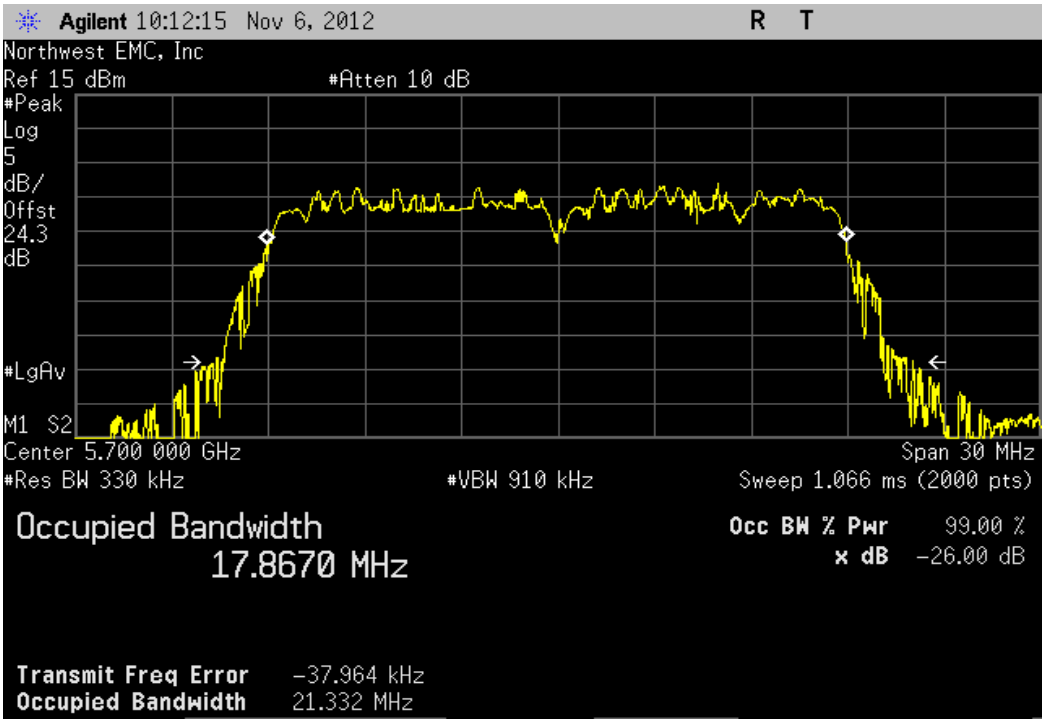
Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				20.606 MHz	> 500 kHz	Pass



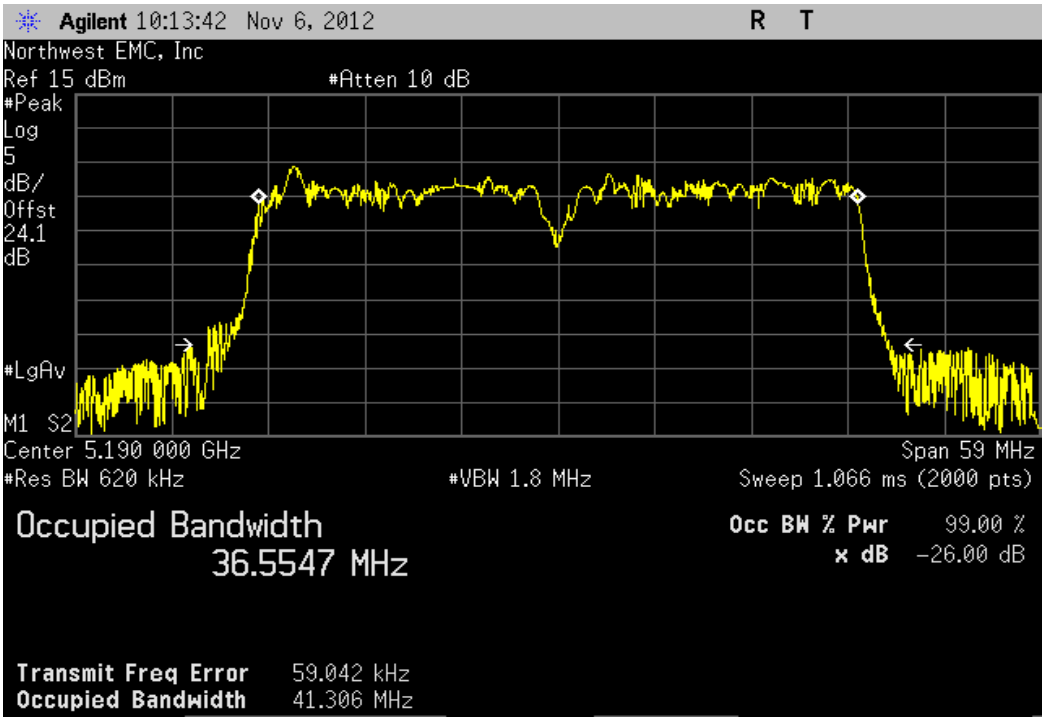
Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.332 MHz	> 500 kHz	Pass



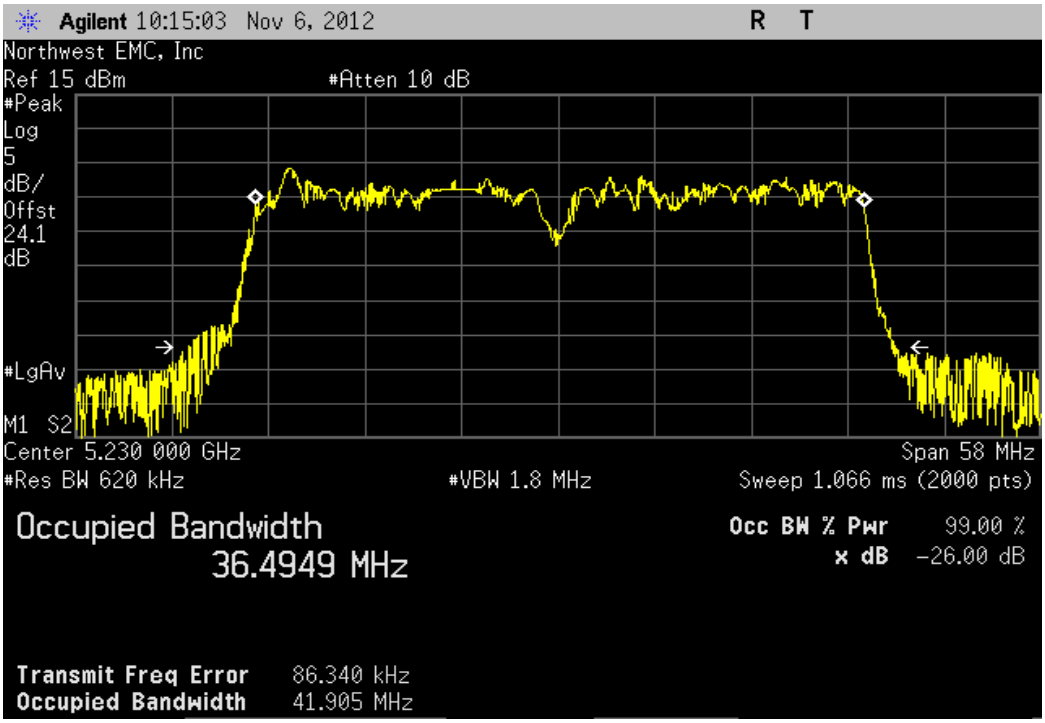
Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.306 MHz	> 500 kHz	Pass

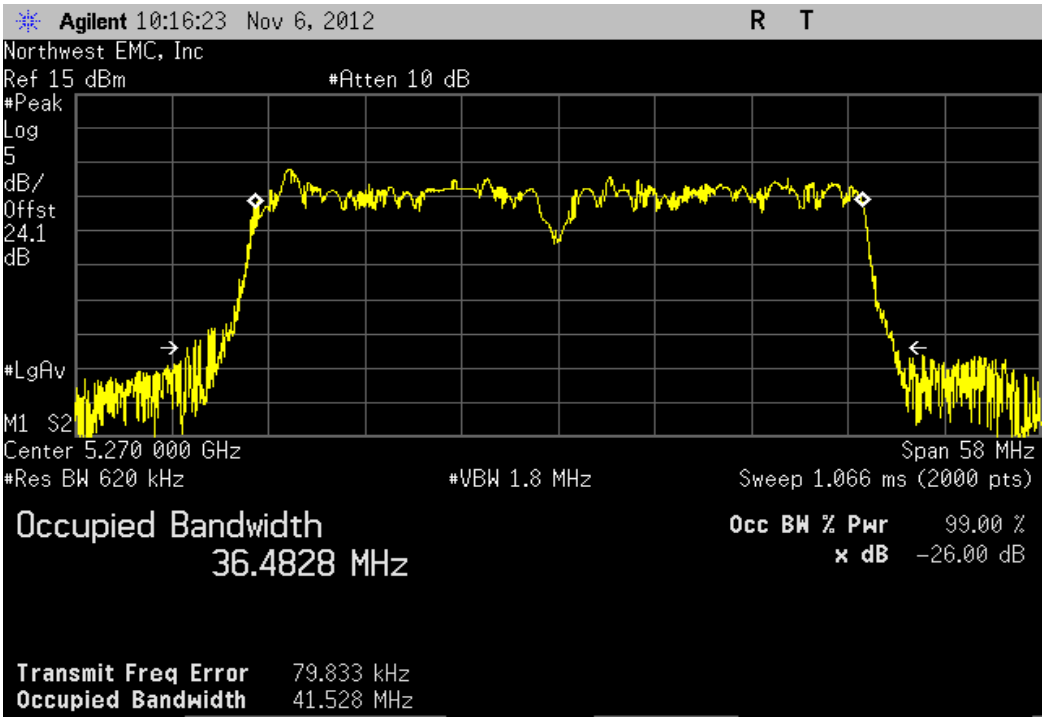


Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

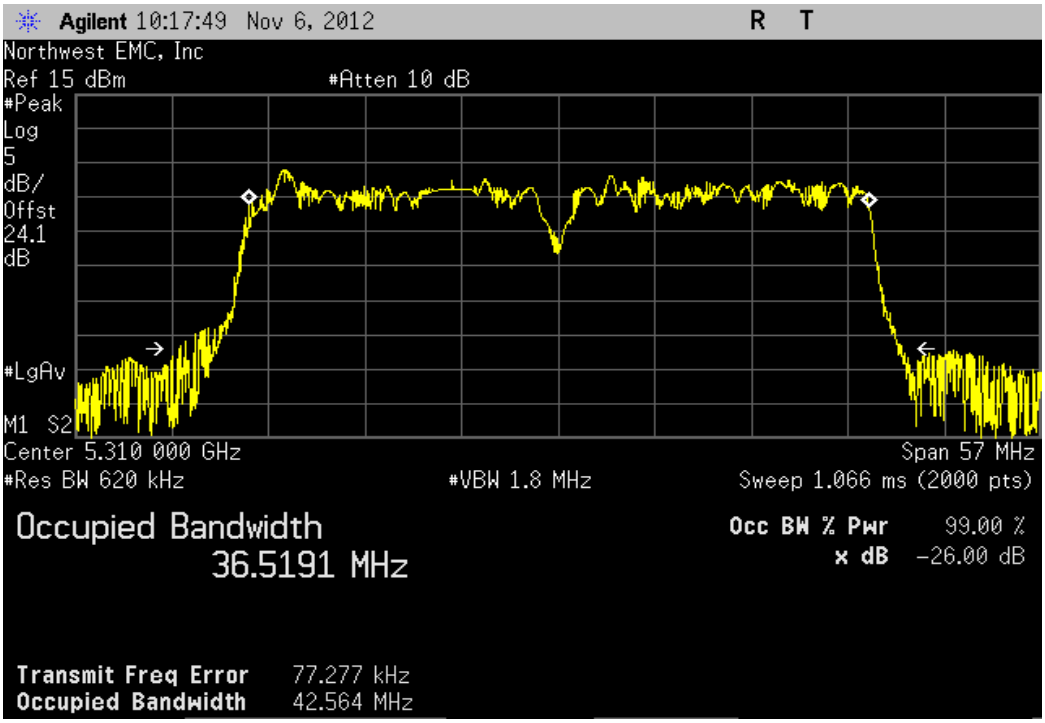
				Value	Limit	Result
				41.905 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz							
					Value	Limit	Result
					41.528 MHz	> 500 kHz	Pass

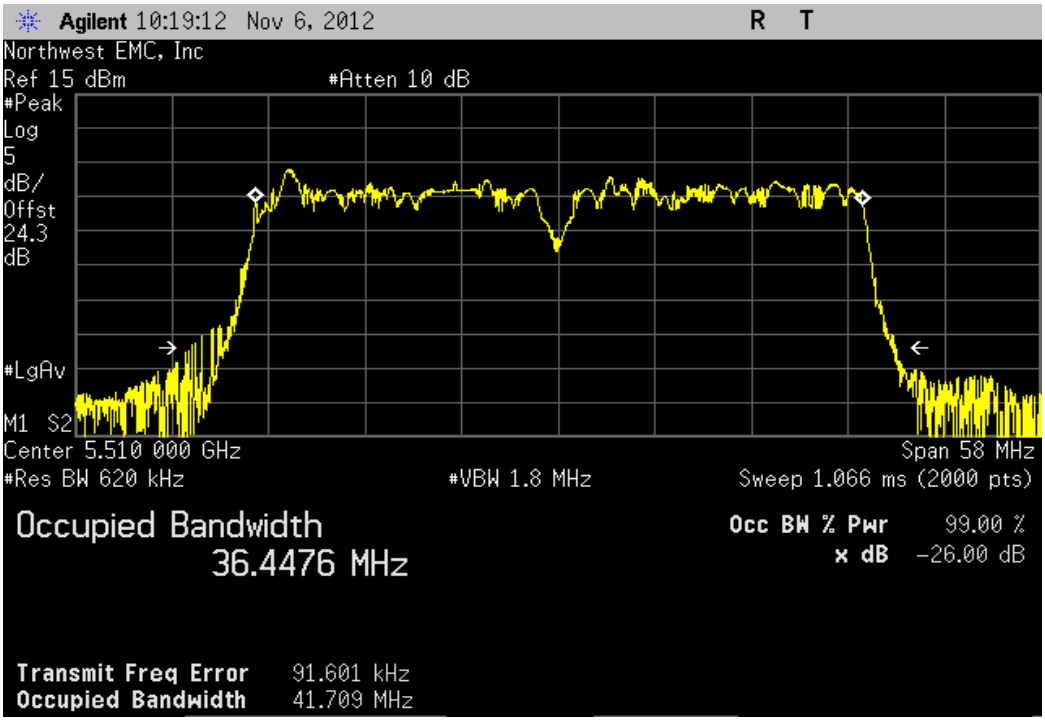


Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz							
					Value	Limit	Result
					42.564 MHz	> 500 kHz	Pass



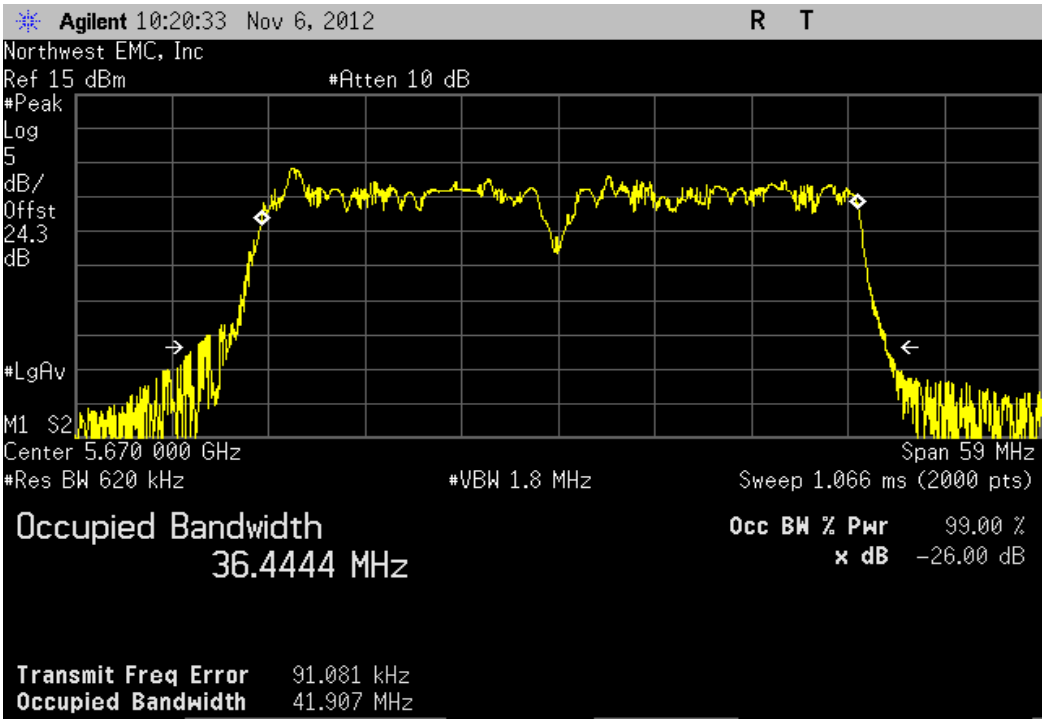
Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				41.709 MHz	> 500 kHz	Pass

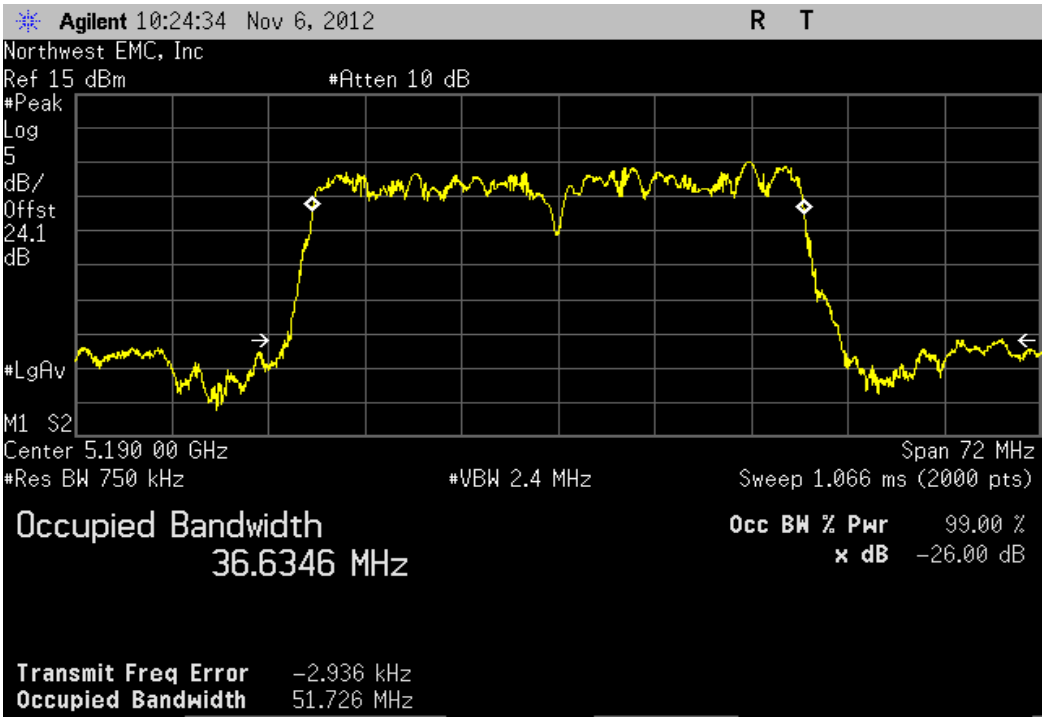


Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

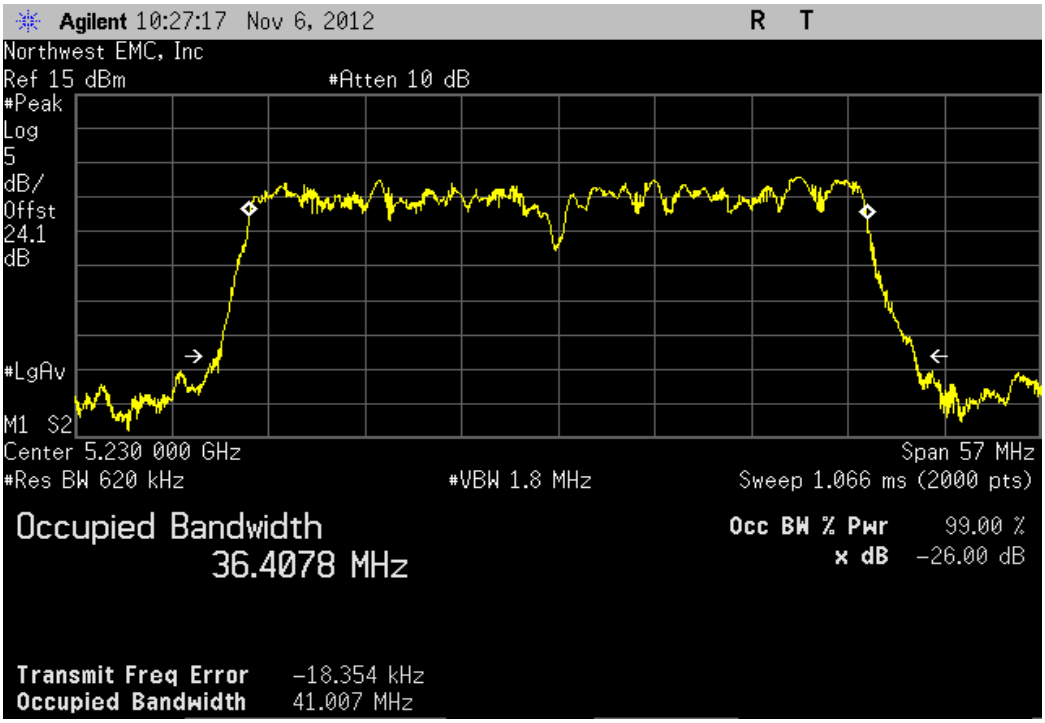
				Value	Limit	Result
				41.907 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz						
				Value	Limit	Result
				41.726 MHz	> 500 kHz	Pass

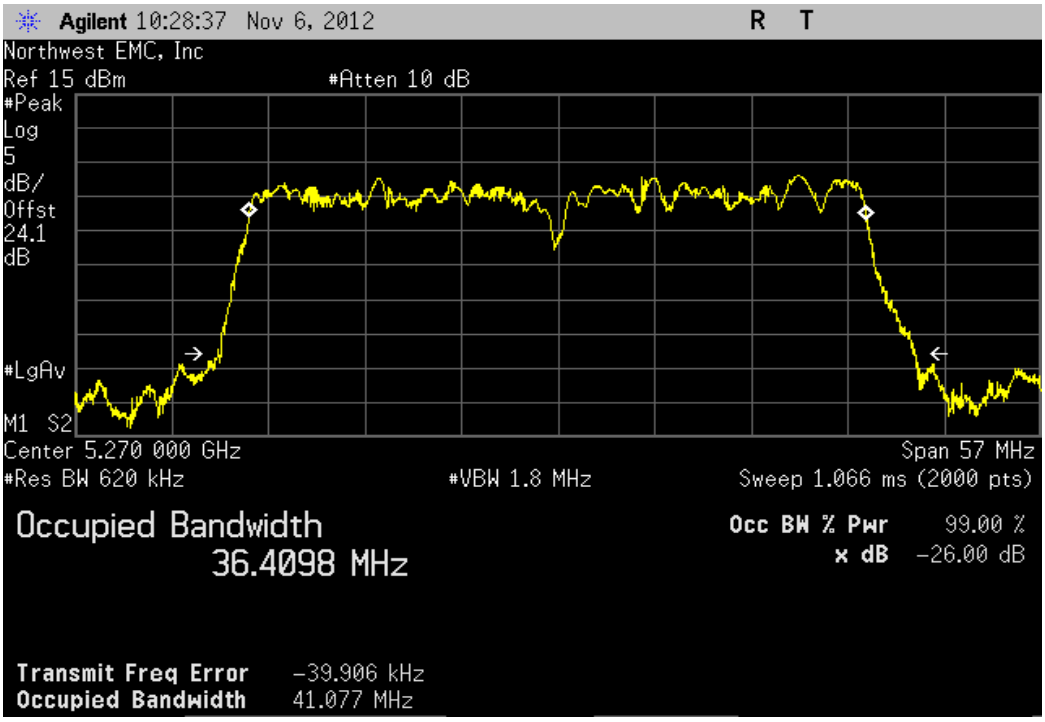


Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz						
				Value	Limit	Result
				41.007 MHz	> 500 kHz	Pass



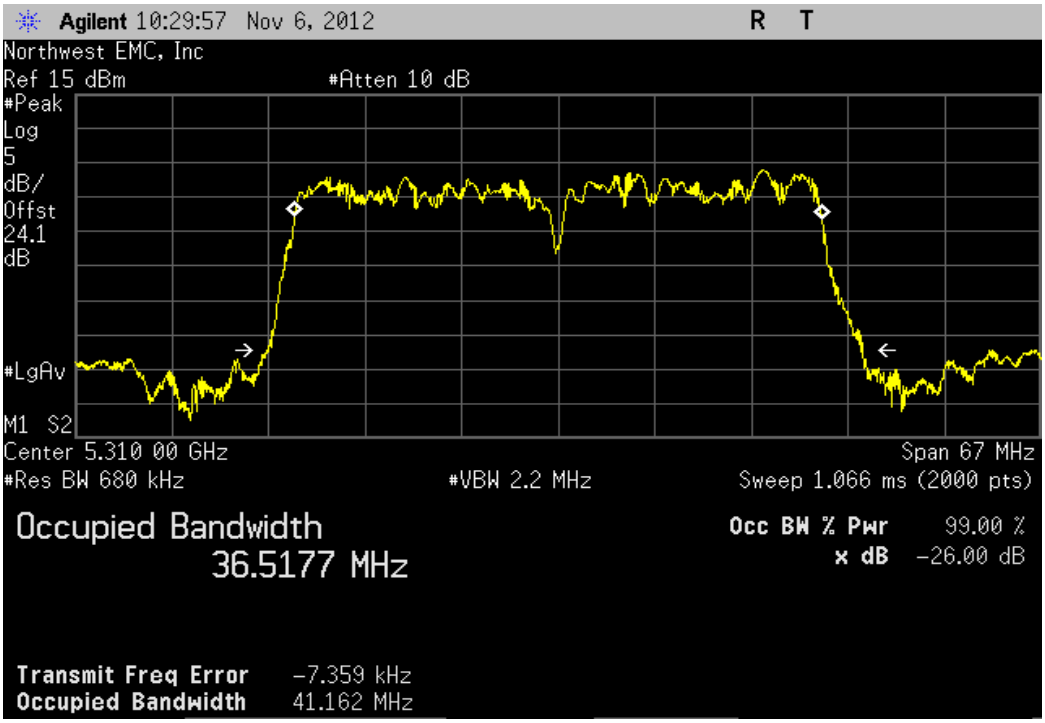
Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				41.077 MHz	> 500 kHz	Pass



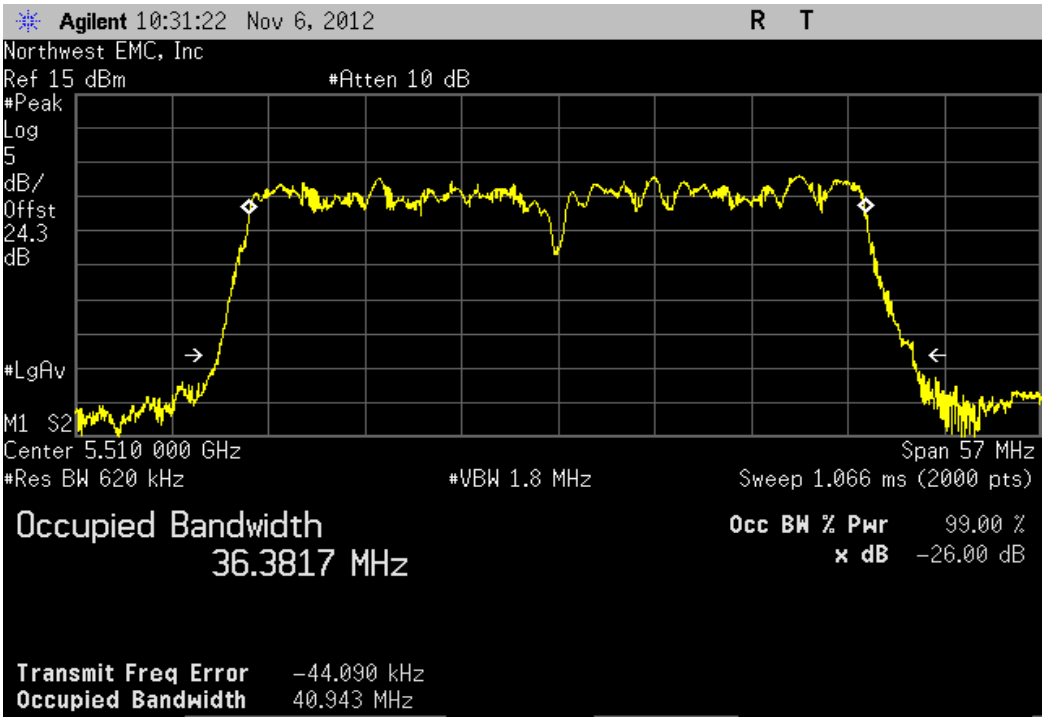
Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				41.162 MHz	> 500 kHz	Pass



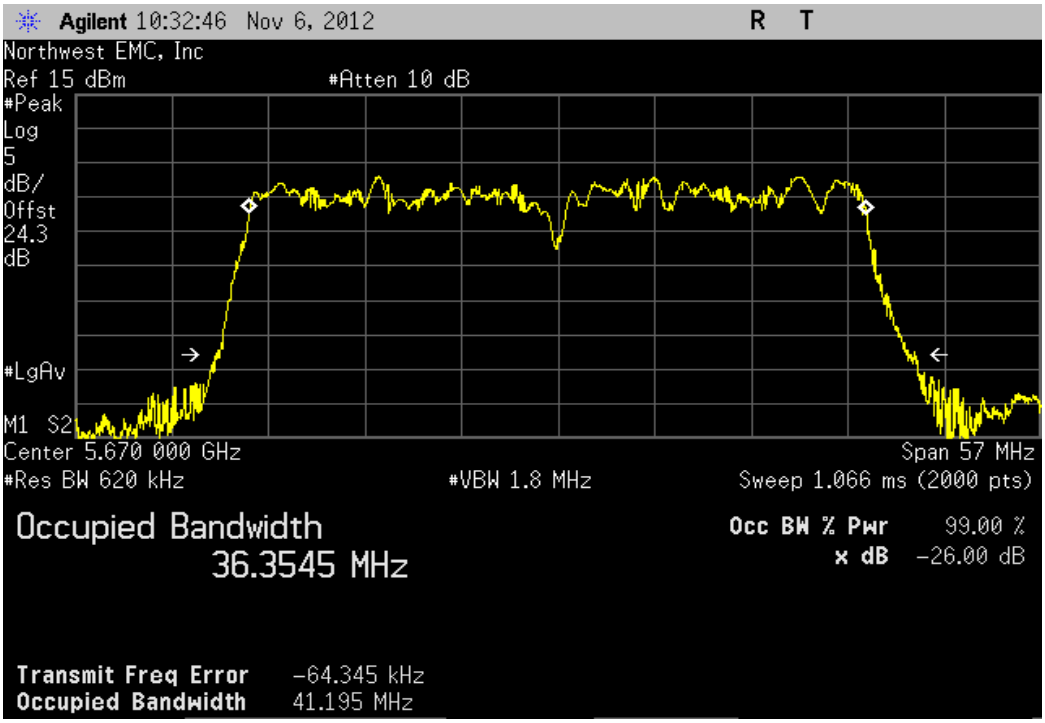
Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				40.943 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.195 MHz	> 500 kHz	Pass



Peak Transmit Power

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.
The EUT is operating on antenna port A only

Peak Transmit Power

EUT:	1514	Work Order:	MCSO1638
Serial Number:	000070724253	Date:	12/12/12
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	35%
Project:	None	Barometric Pres.:	1011
Tested by:	Brandon Hobbs Rod Peloquin	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD

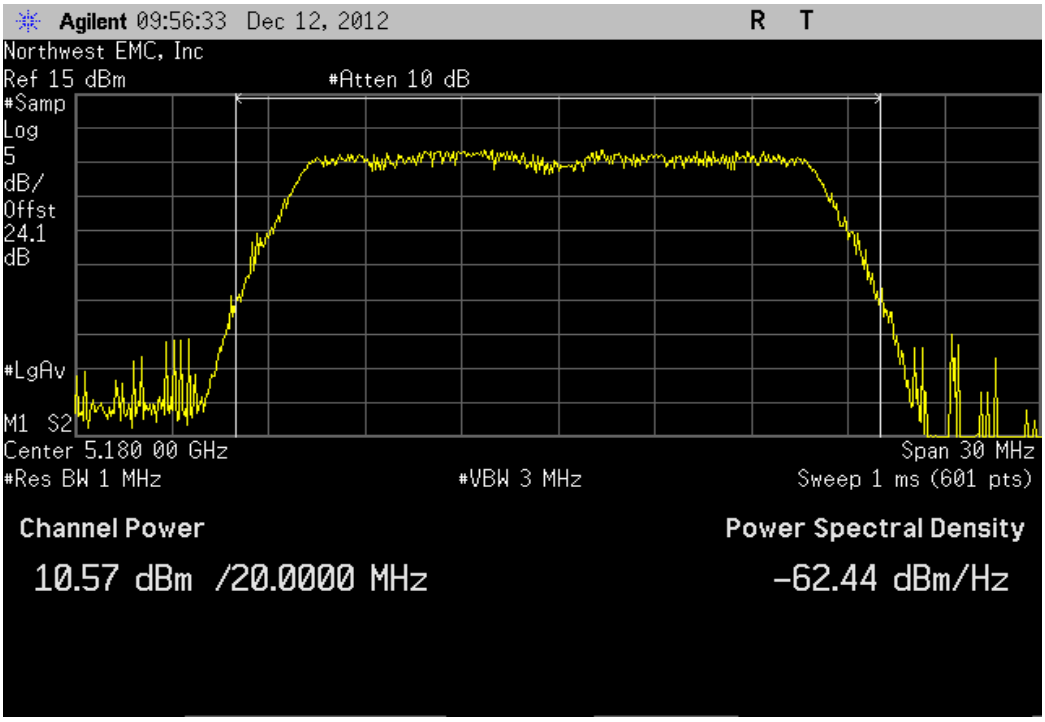
None

Configuration #	4	Signature

		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	10.574 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	10.432 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	11.395 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	10.629 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	10.566 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.996 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	11.333 dBm	< 24 dBm	Pass
	802.11(a) 36 Mbps			
	Ch 36, Low Channel 5180 MHz	10.858 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	10.895 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	11.208 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	11.025 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	10.494 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	11.459 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	11.241 dBm	< 24 dBm	Pass
	802.11(a) 54 Mbps			
	Ch 36, Low Channel 5180 MHz	10.835 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	10.777 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	11.133 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	10.942 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	10.361 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	11.292 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	11.125 dBm	< 24 dBm	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	10.802 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	10.753 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	11.121 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	10.905 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	10.353 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	11.341 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	11.1 dBm	< 24 dBm	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	10.797 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	10.741 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	11.128 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	10.944 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	10.37 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.868 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	11.145 dBm	< 24 dBm	Pass
40 MHz				
	802.11(n) MCS0			
	Ch 36/40, Low Channel 5190 MHz	8.846 dBm	< 17 dBm	Pass
	Ch 44/48, High Channel 5230 MHz	11.389 dBm	< 17 dBm	Pass
	Ch 52/56, Low Channel 5270 MHz	11.01 dBm	< 24 dBm	Pass
	Ch 60/64, High Channel 5310 MHz	11.159 dBm	< 24 dBm	Pass
	Ch 100/104, Low Channel 5510 MHz	8.759 dBm	< 24 dBm	Pass
	Ch 132/136, High Channel 5670 MHz	11.727 dBm	< 24 dBm	Pass
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	9.538 dBm	< 17 dBm	Pass
	Ch 44/48, High Channel 5230 MHz	12.086 dBm	< 17 dBm	Pass
	Ch 52/56, Low Channel 5270 MHz	11.796 dBm	< 24 dBm	Pass
	Ch 60/64, High Channel 5310 MHz	11.881 dBm	< 24 dBm	Pass
	Ch 100/104, Low Channel 5510 MHz	9.483 dBm	< 24 dBm	Pass
	Ch 132/136, High Channel 5670 MHz	12.492 dBm	< 24 dBm	Pass

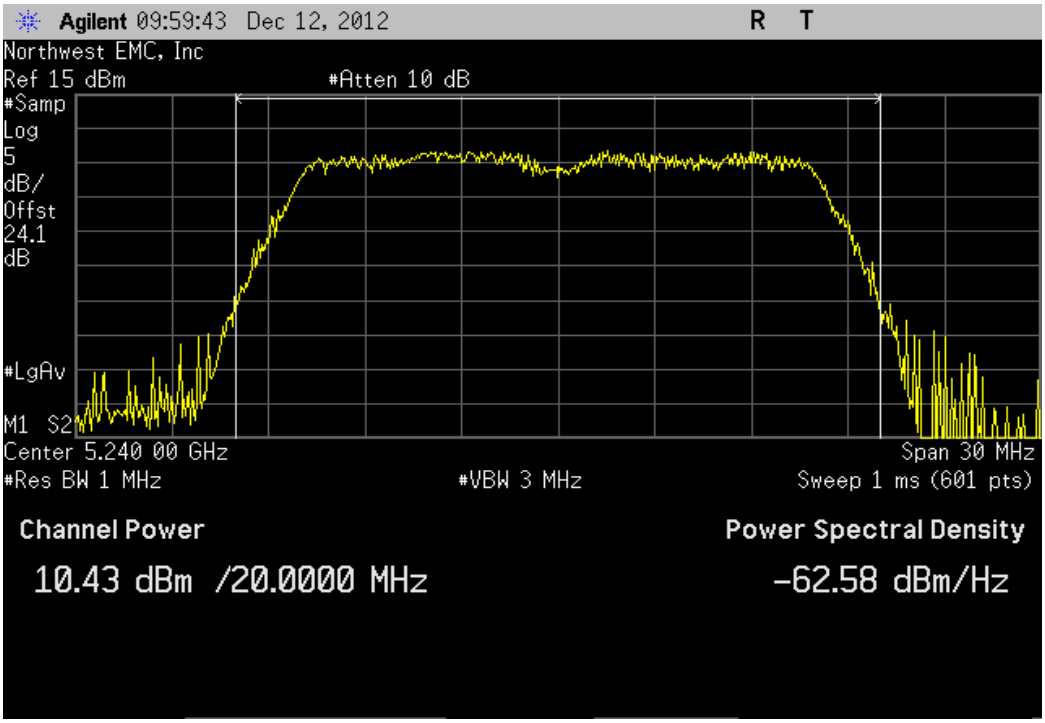
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				10.574 dBm	< 17 dBm	Pass



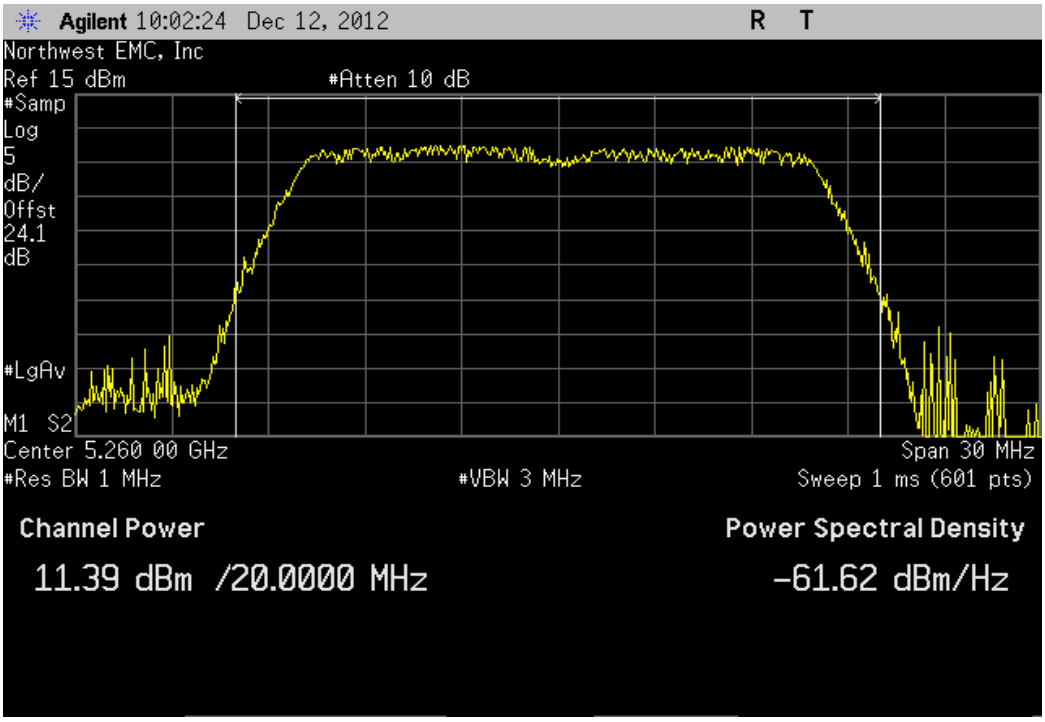
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				10.432 dBm	< 17 dBm	Pass



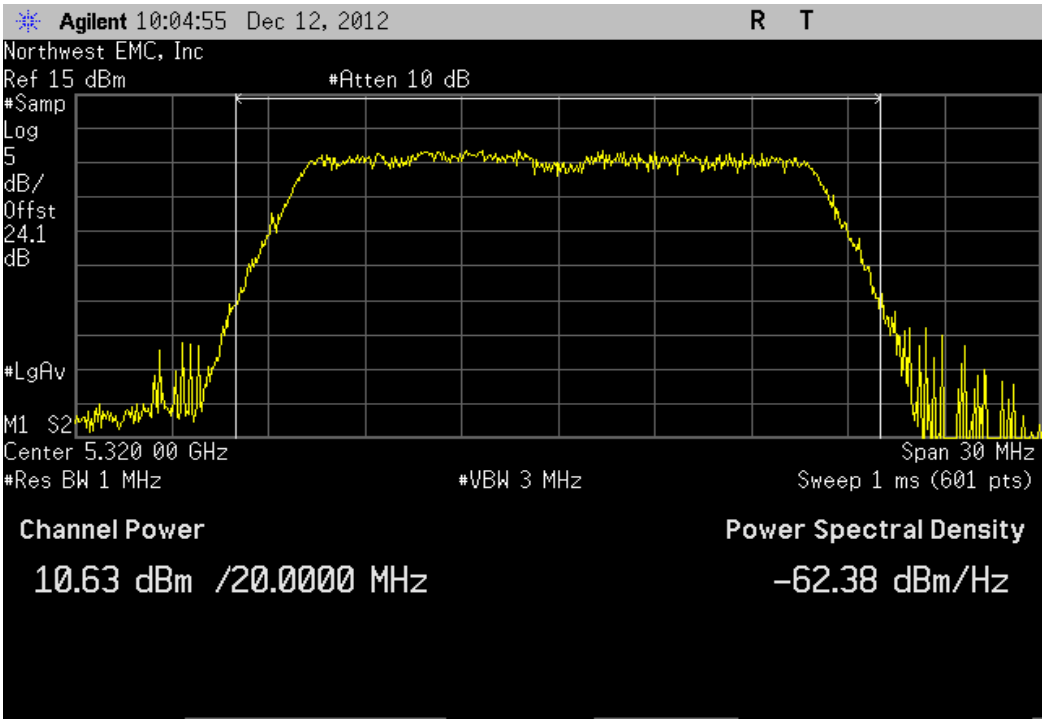
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				11.395 dBm	< 24 dBm	Pass



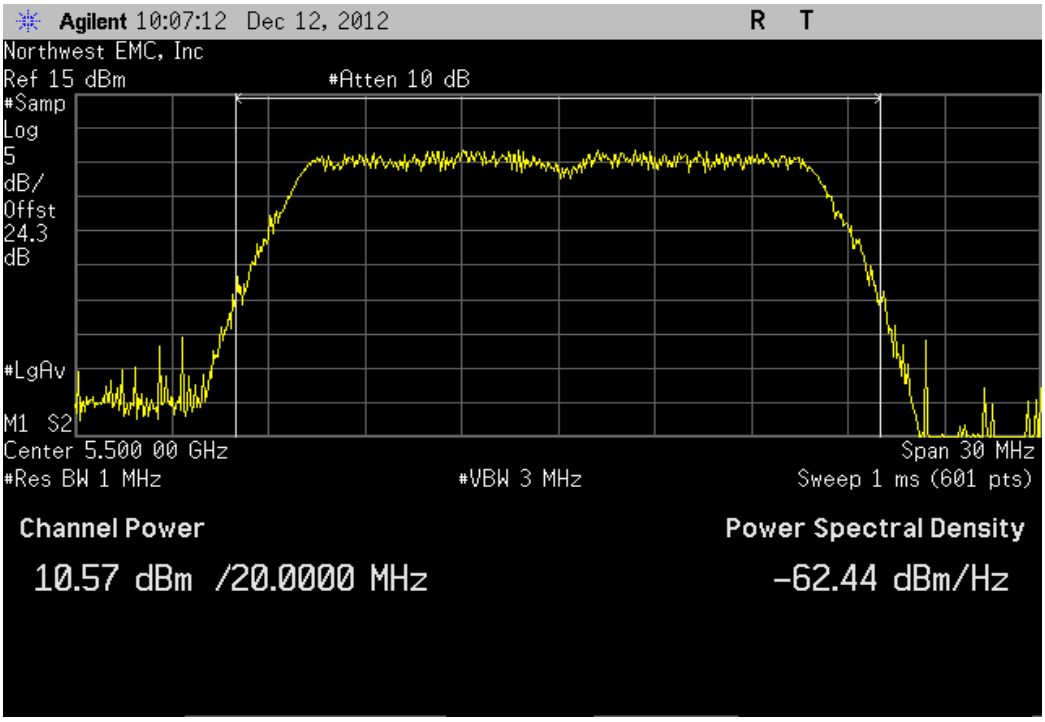
20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				10.629 dBm	< 24 dBm	Pass



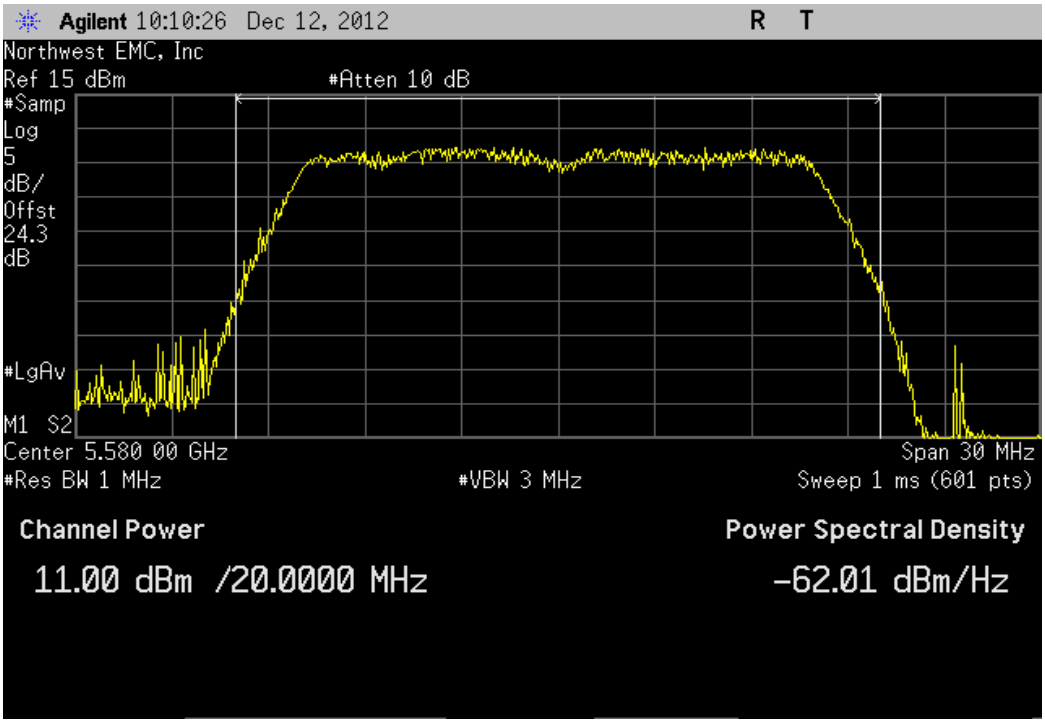
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				10.566 dBm	< 24 dBm	Pass



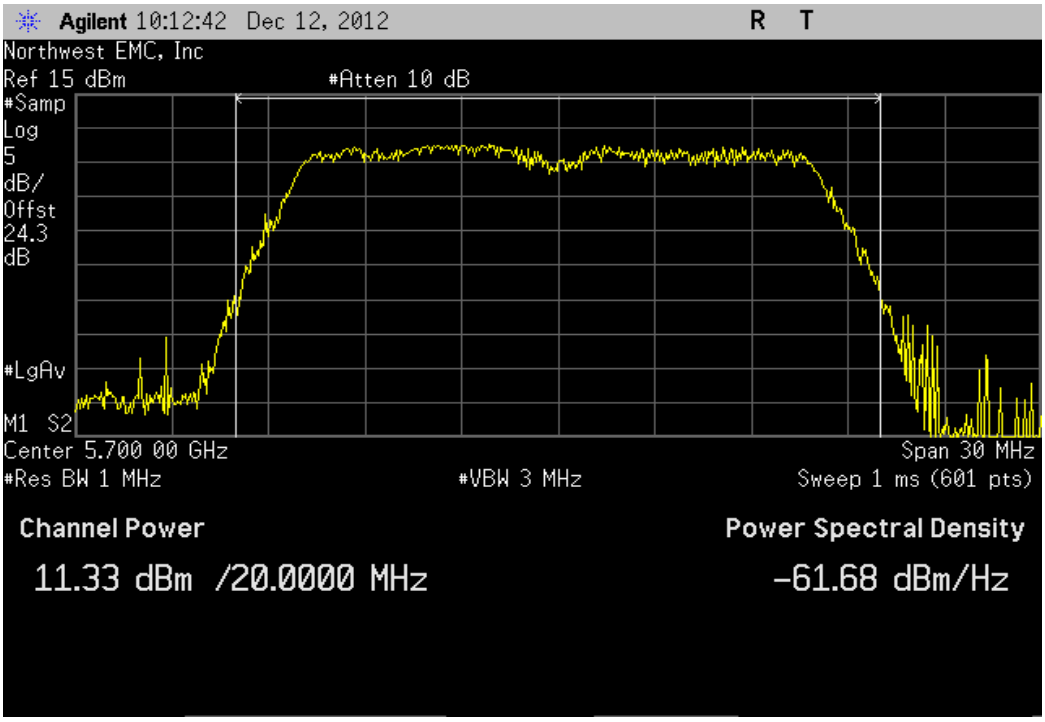
20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				10.996 dBm	< 24 dBm	Pass



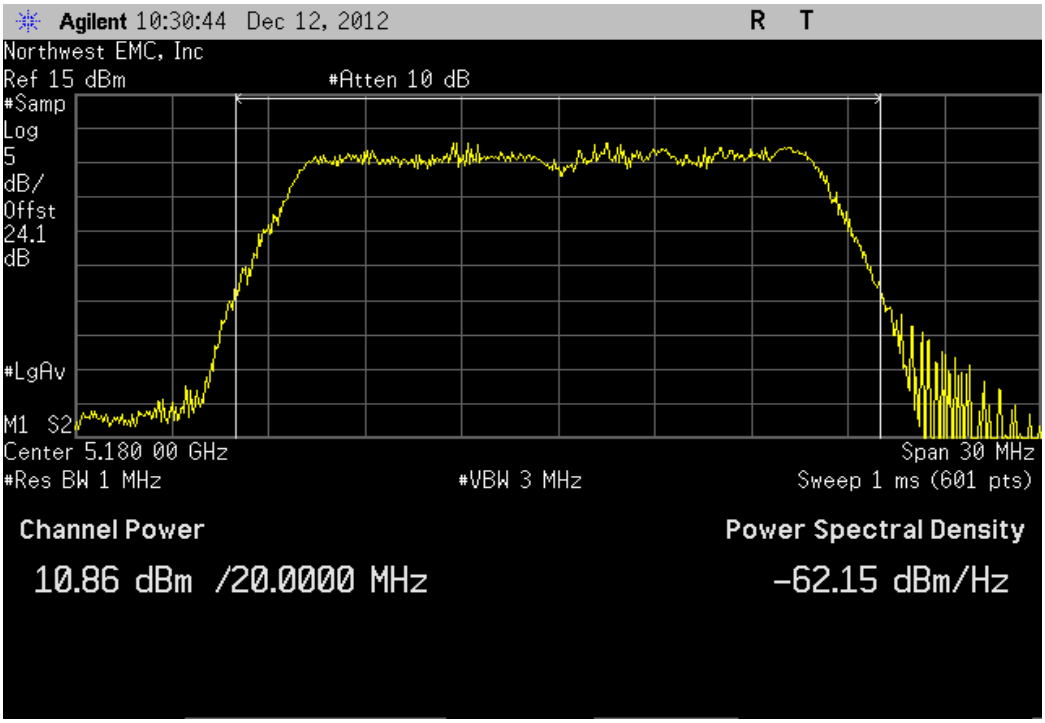
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.333 dBm	< 24 dBm	Pass



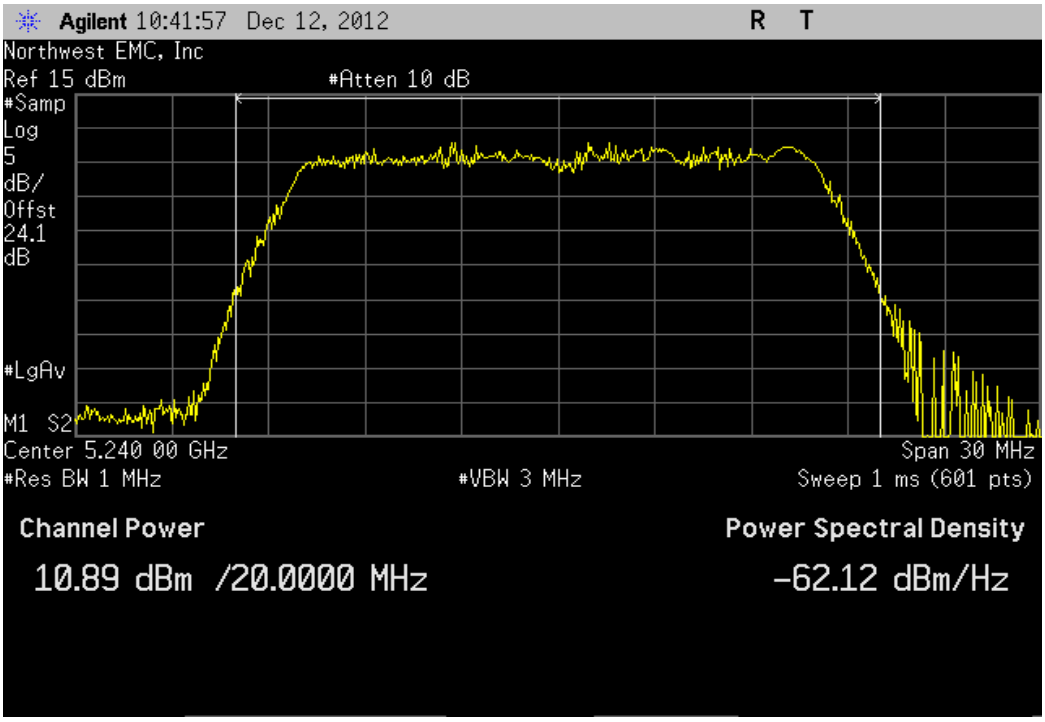
20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				10.858 dBm	< 17 dBm	Pass



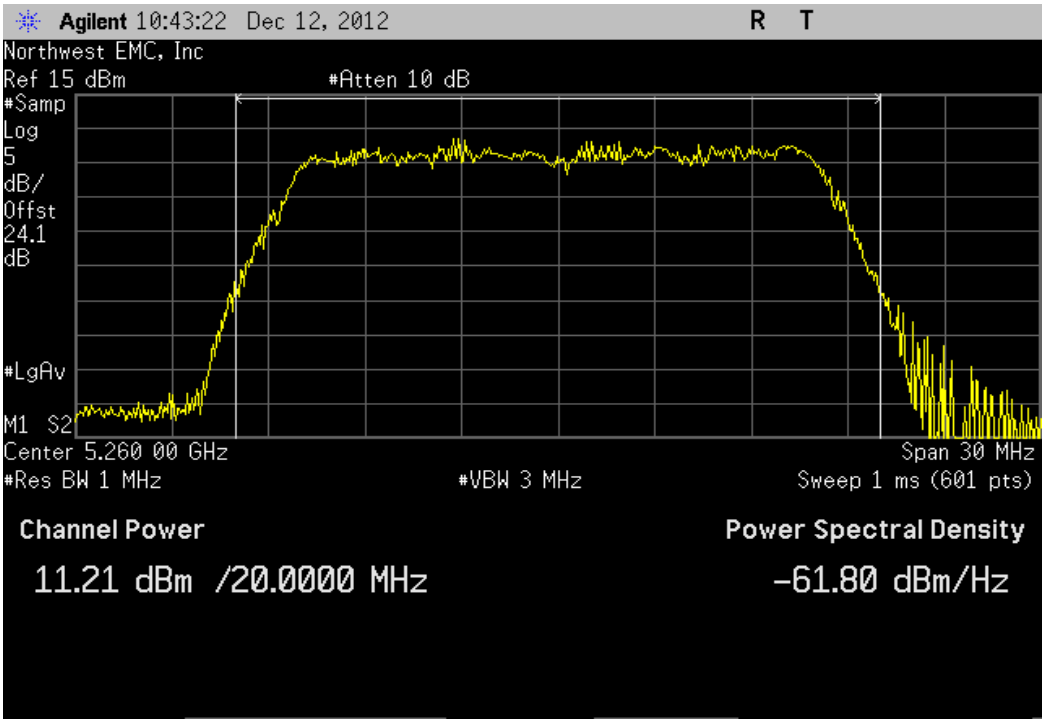
20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				10.895 dBm	< 17 dBm	Pass



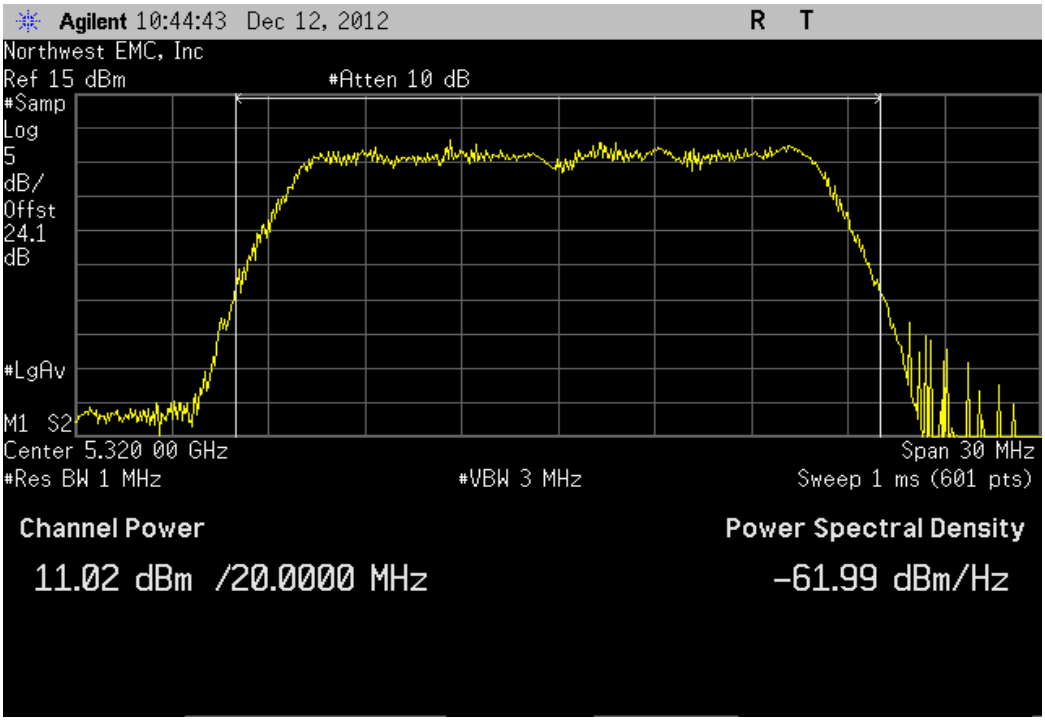
20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				11.208 dBm	< 24 dBm	Pass



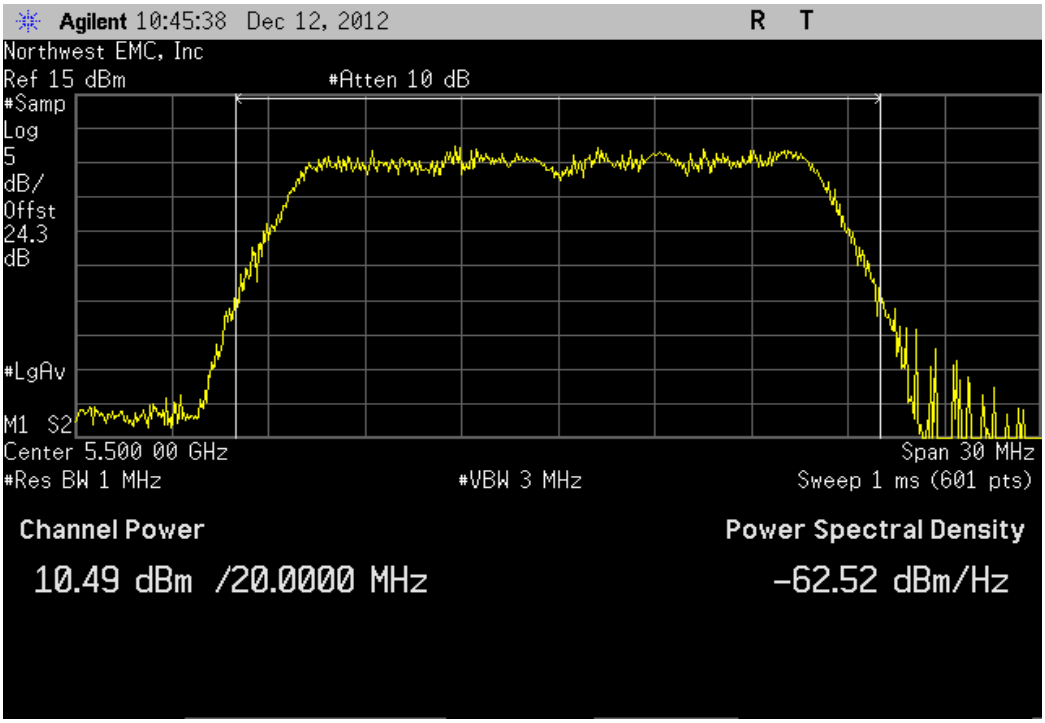
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				11.025 dBm	< 24 dBm	Pass



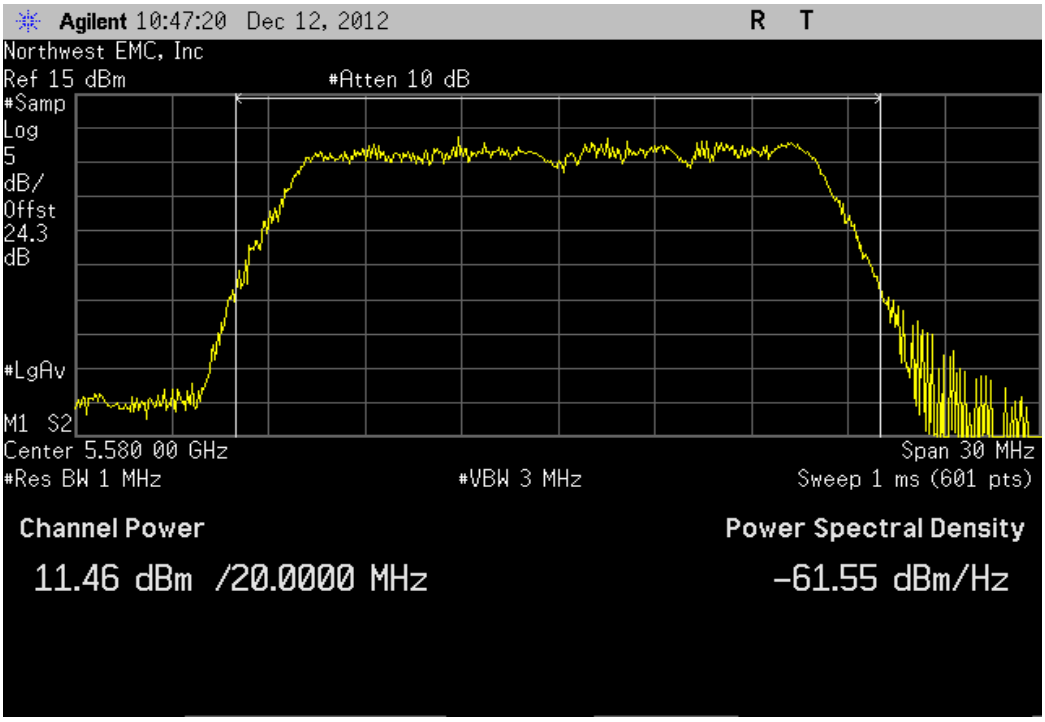
20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				10.494 dBm	< 24 dBm	Pass



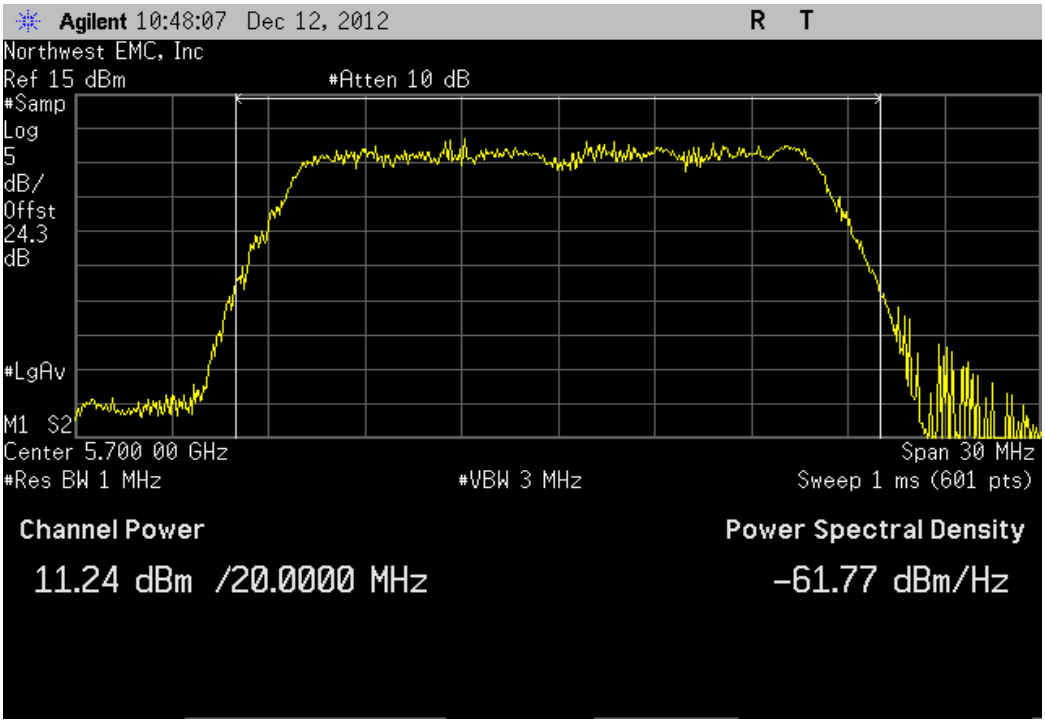
20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				11.459 dBm	< 24 dBm	Pass



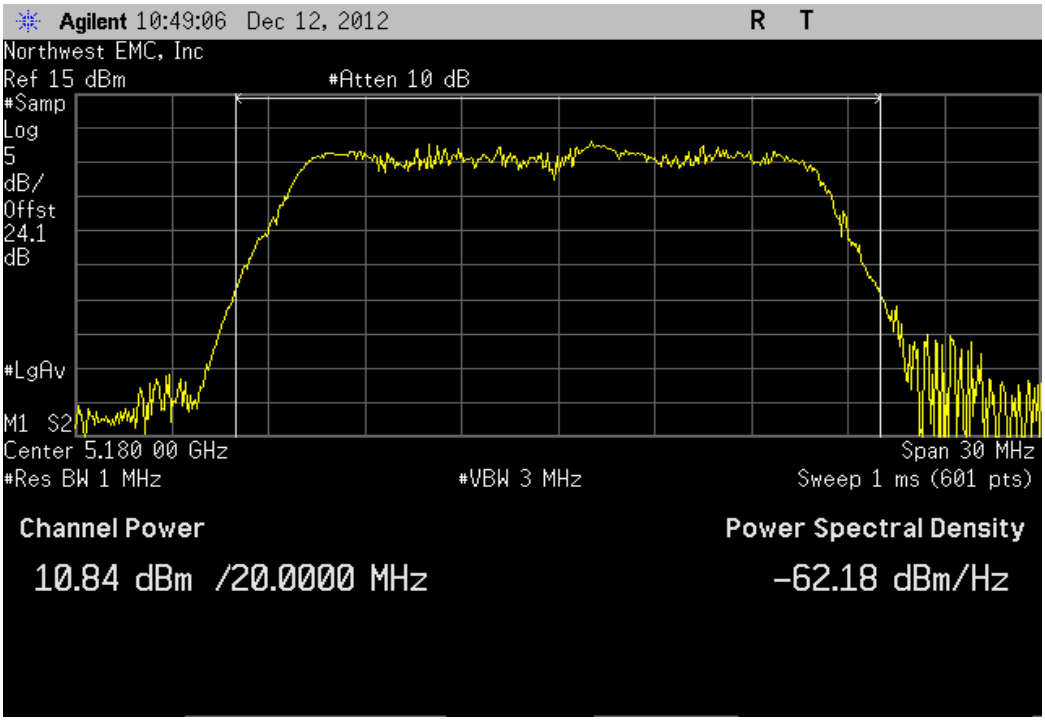
20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.241 dBm	< 24 dBm	Pass



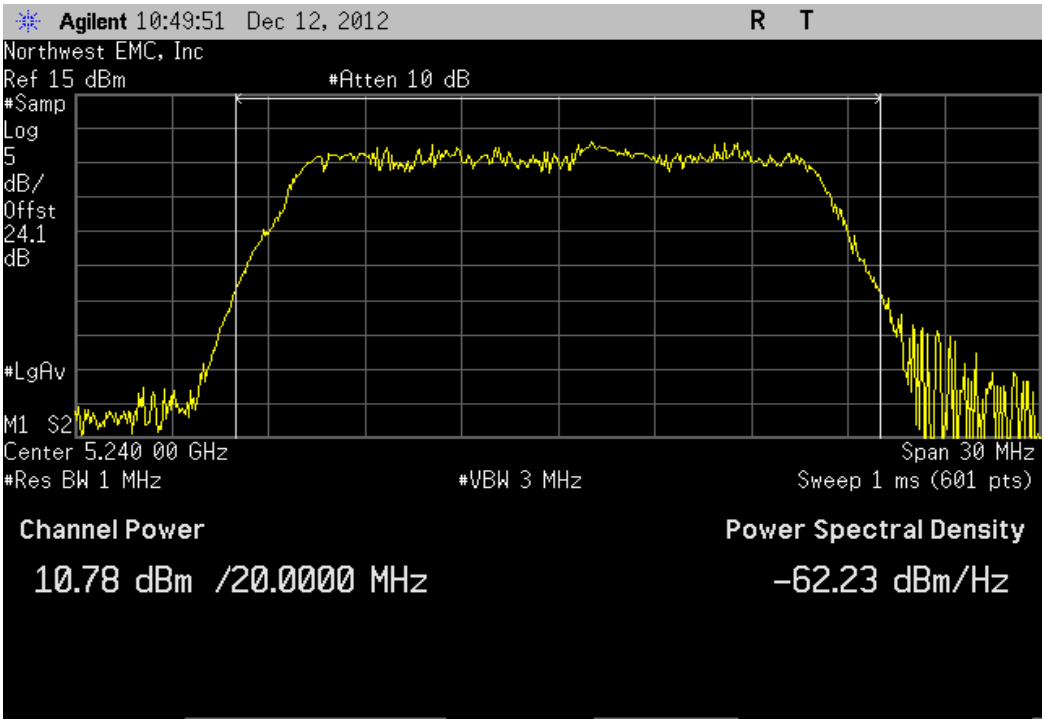
20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				10.835 dBm	< 17 dBm	Pass

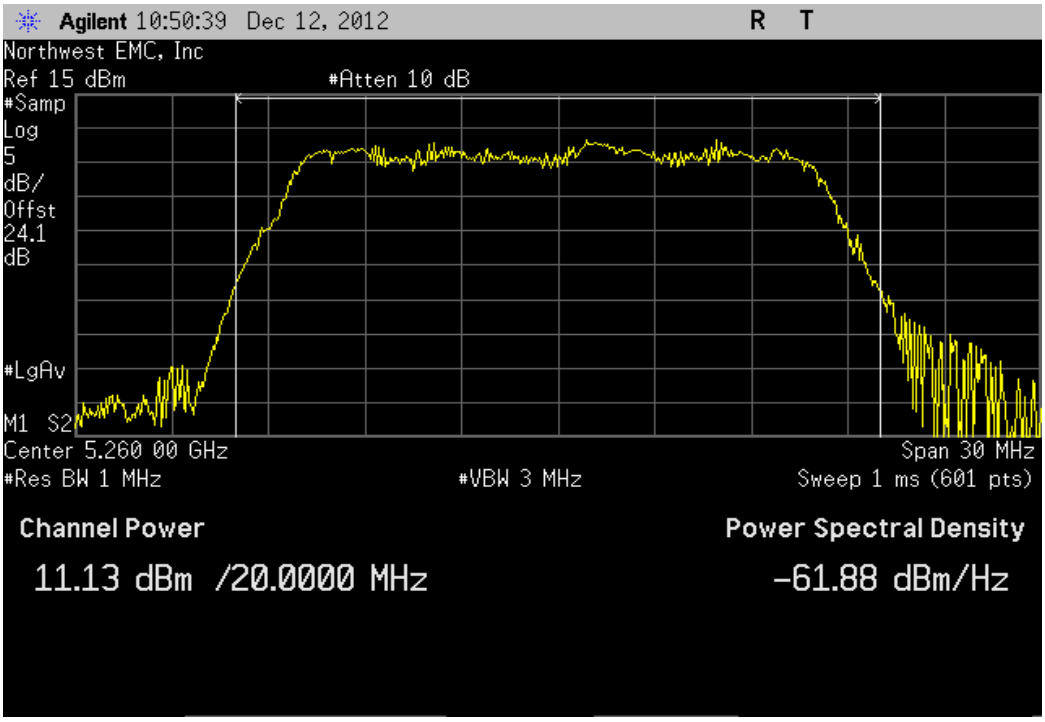


20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz

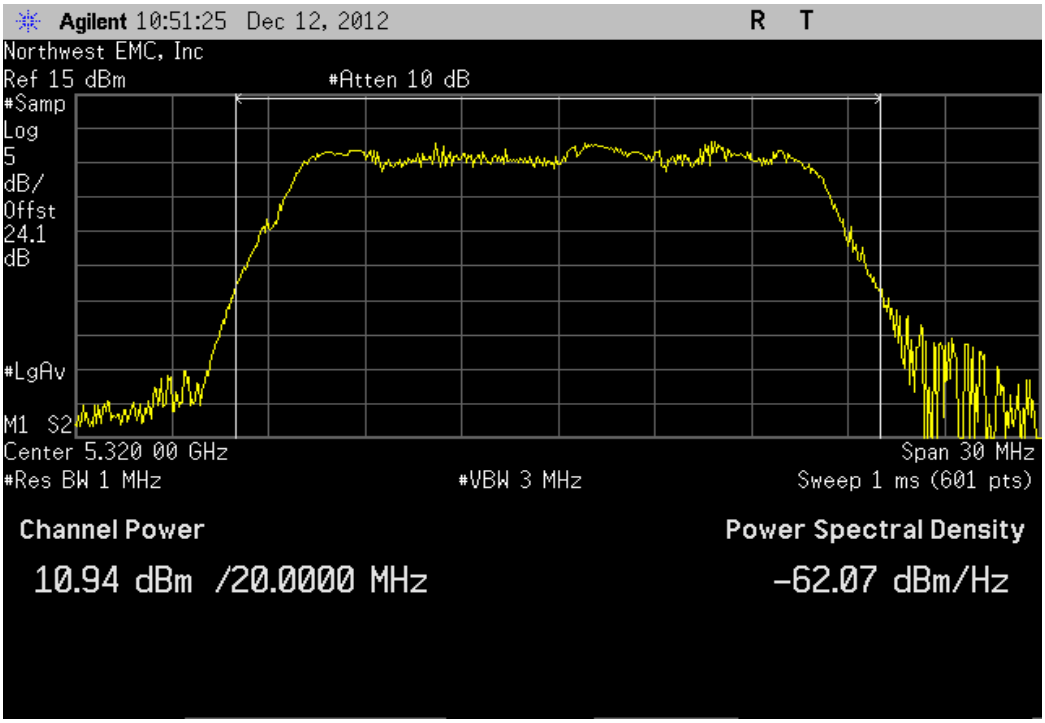
				Value	Limit	Result
				10.777 dBm	< 17 dBm	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz							
					Value	Limit	Result
					11.133 dBm	< 24 dBm	Pass

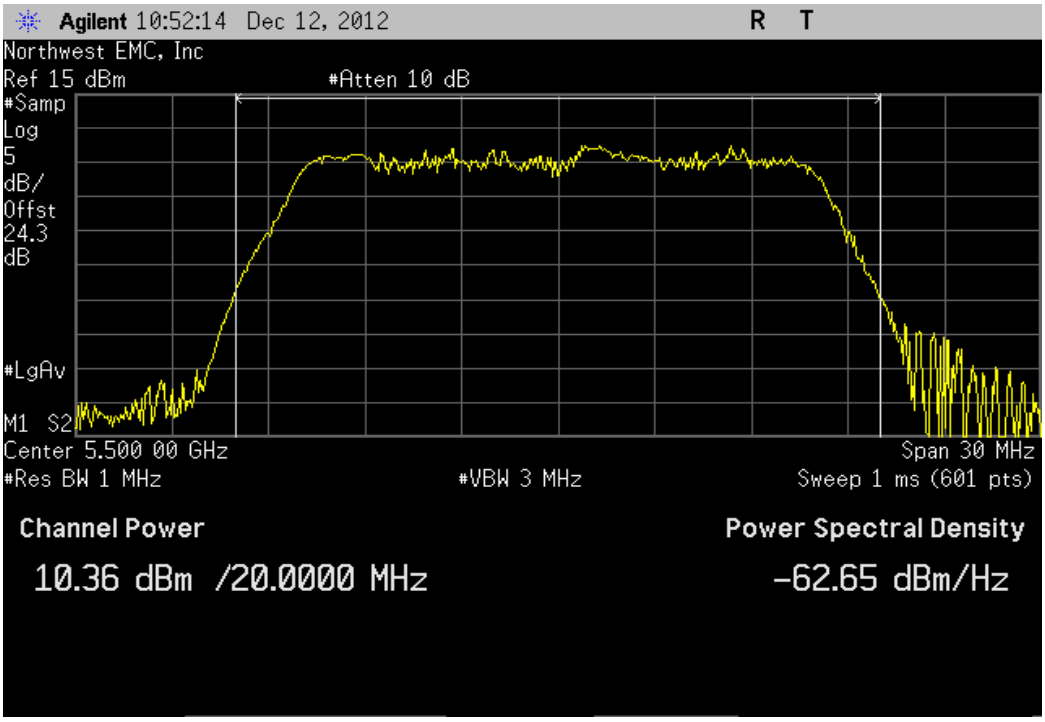


20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz							
					Value	Limit	Result
					10.942 dBm	< 24 dBm	Pass



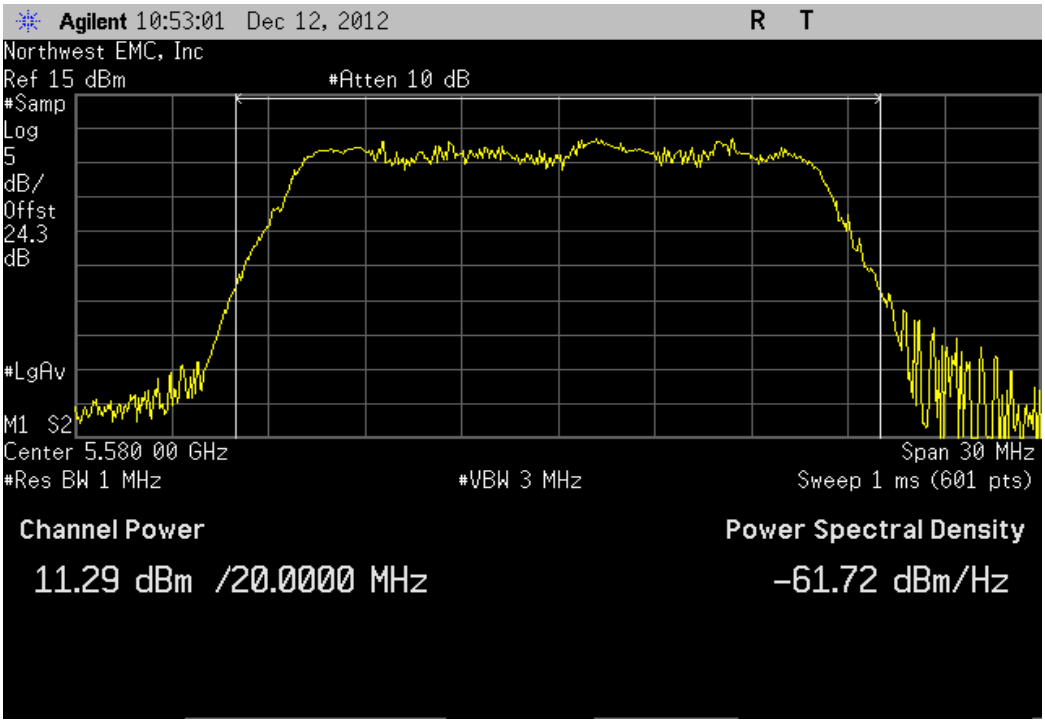
20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				10.361 dBm	< 24 dBm	Pass



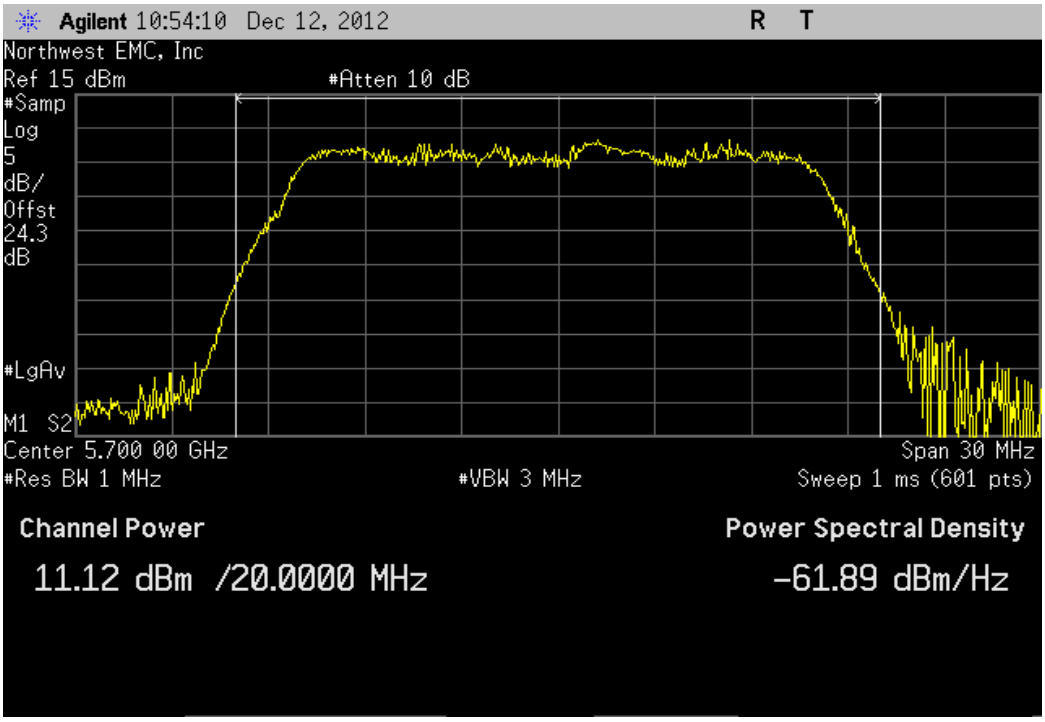
20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				11.292 dBm	< 24 dBm	Pass



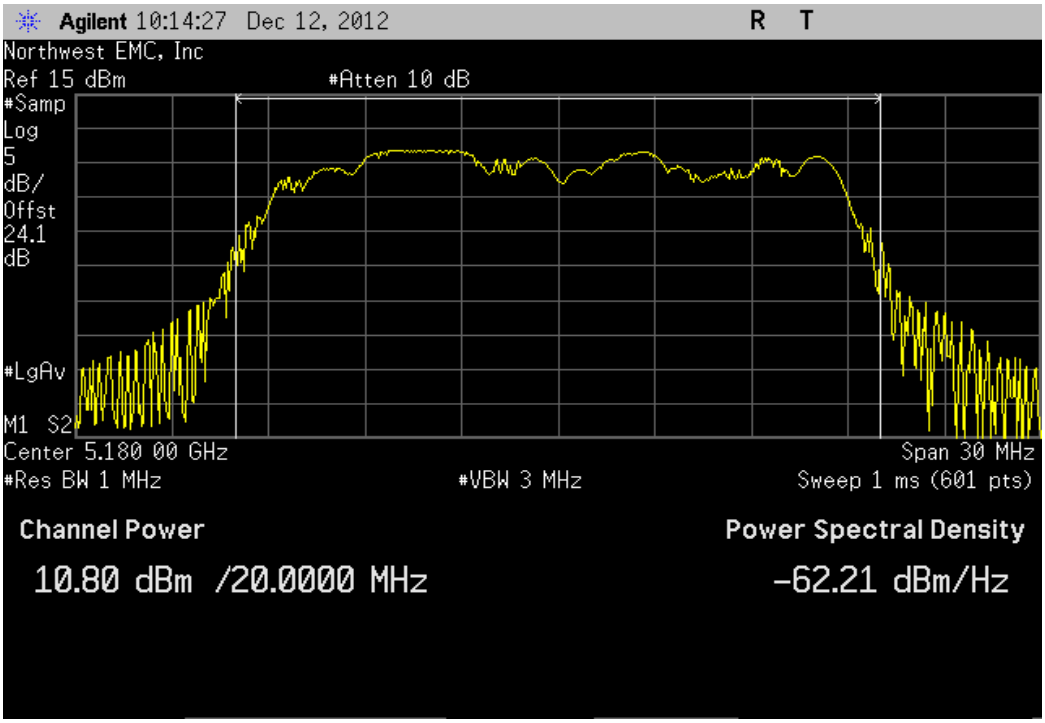
20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.125 dBm	< 24 dBm	Pass



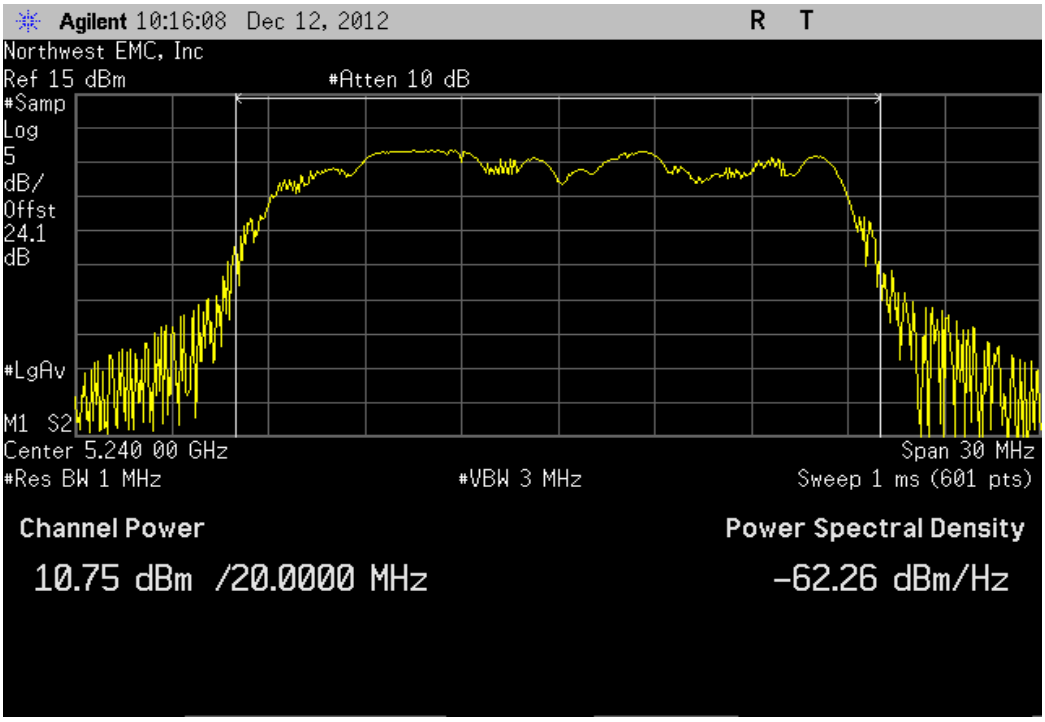
20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				10.802 dBm	< 17 dBm	Pass



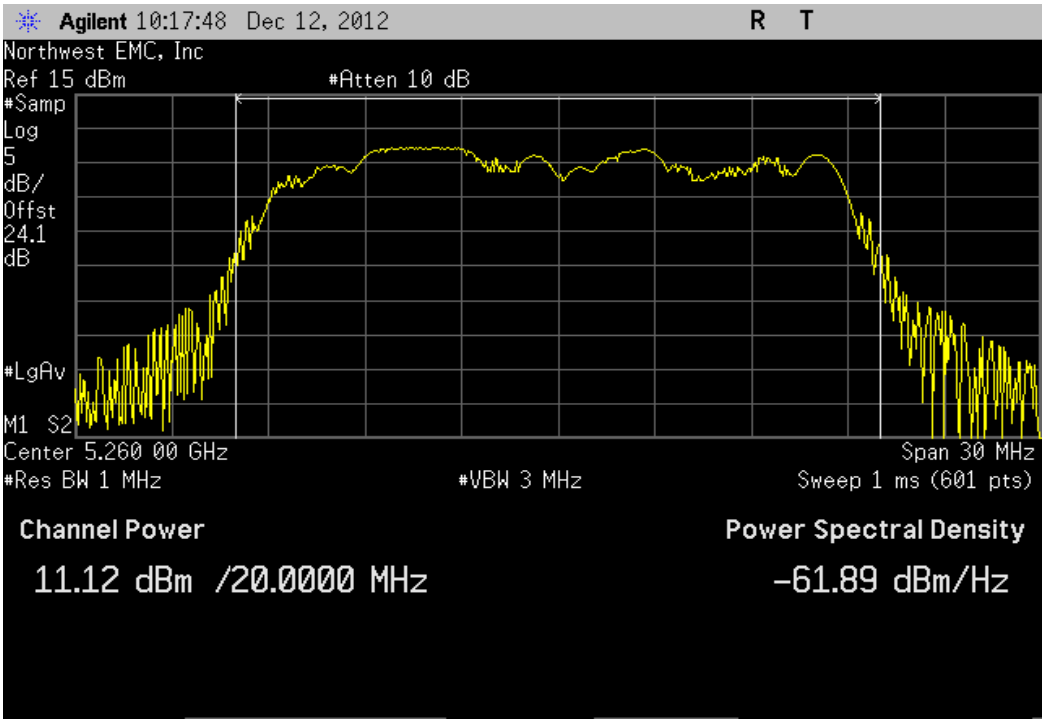
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				10.753 dBm	< 17 dBm	Pass



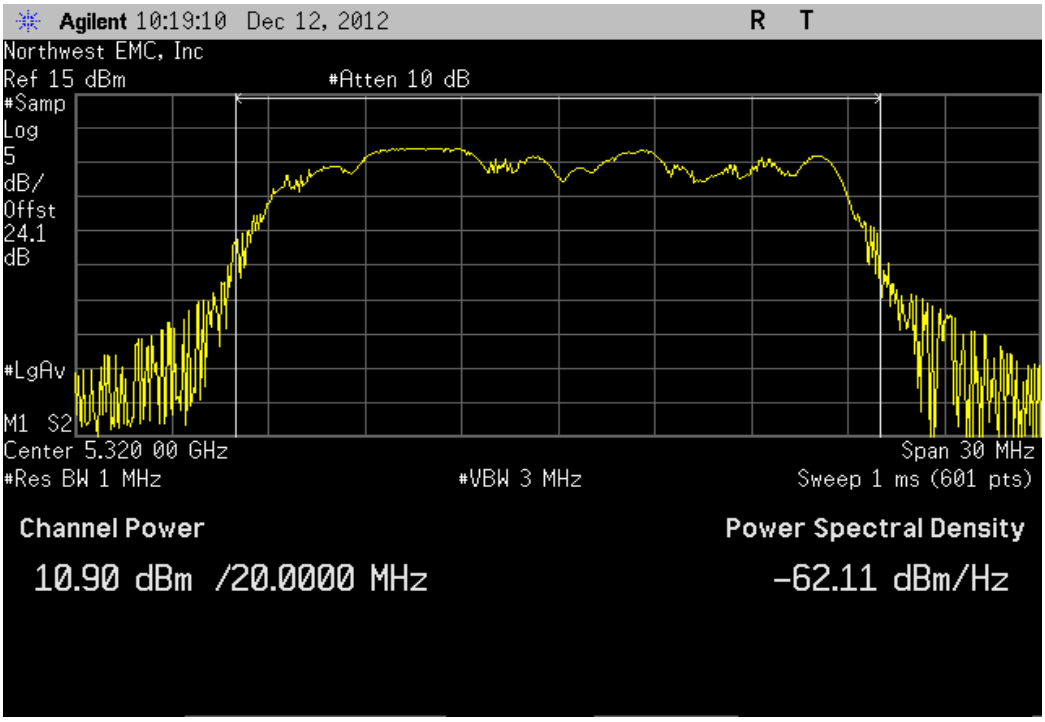
20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				11.121 dBm	< 24 dBm	Pass



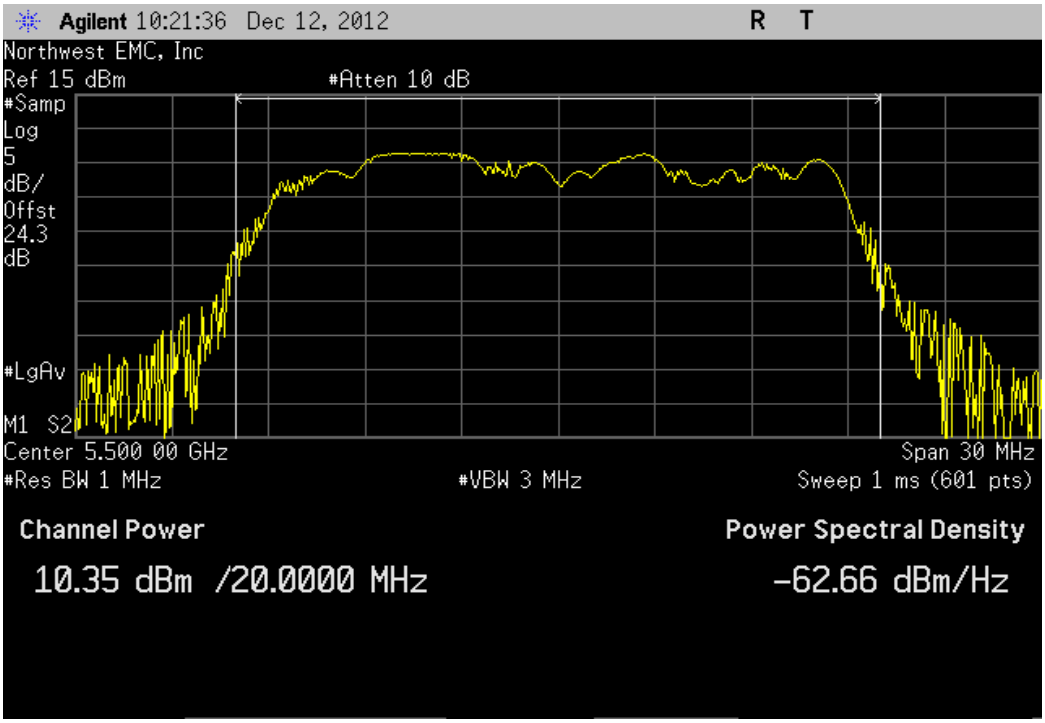
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				10.905 dBm	< 24 dBm	Pass

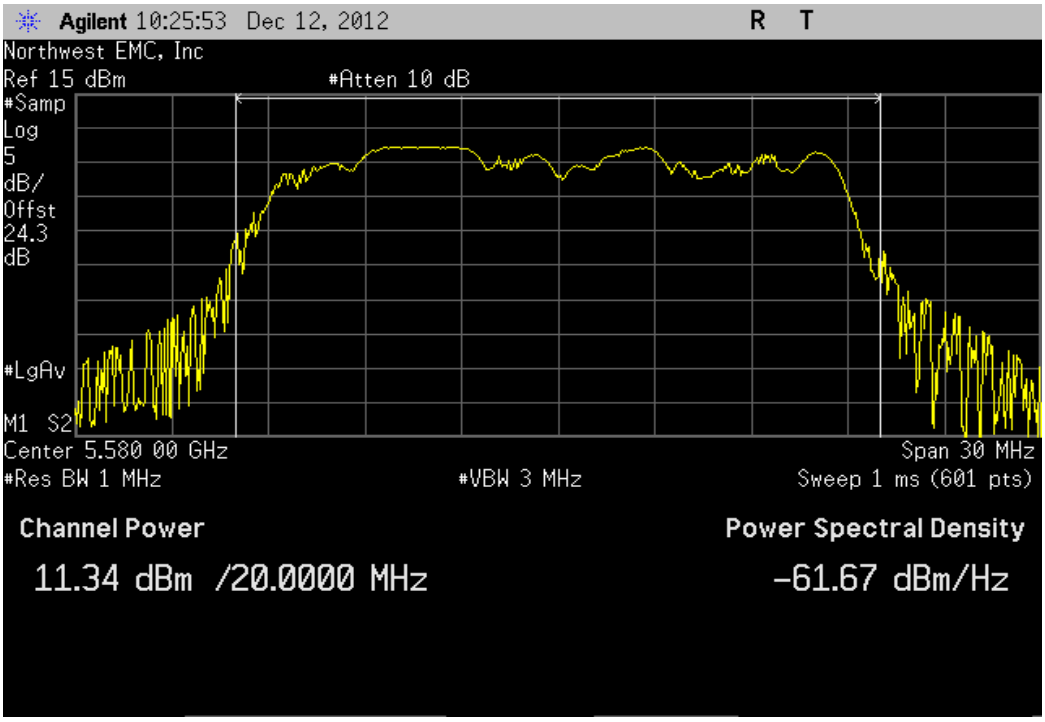


20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

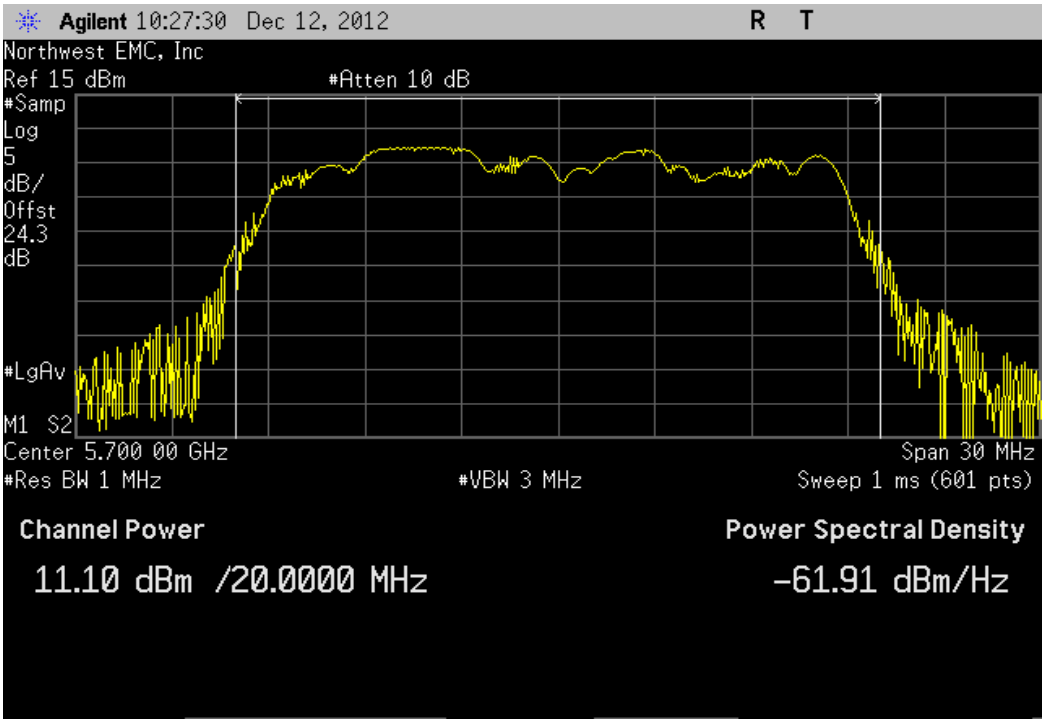
				Value	Limit	Result
				10.353 dBm	< 24 dBm	Pass



20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz							
					Value	Limit	Result
					11.341 dBm	< 24 dBm	Pass

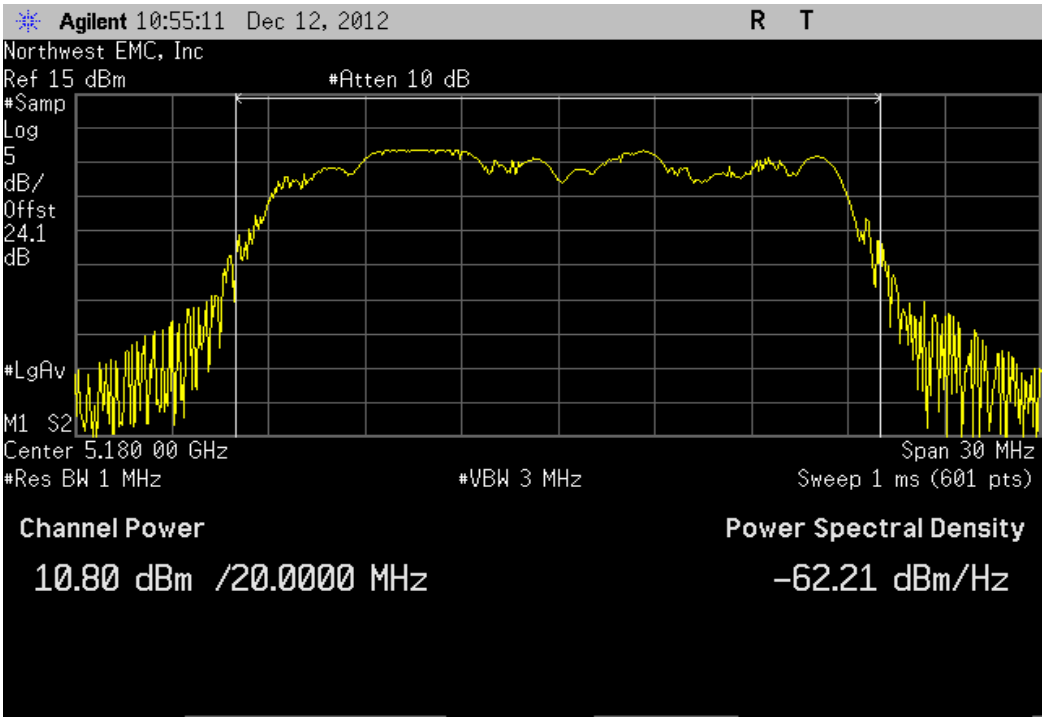


20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz							
					Value	Limit	Result
					11.1 dBm	< 24 dBm	Pass



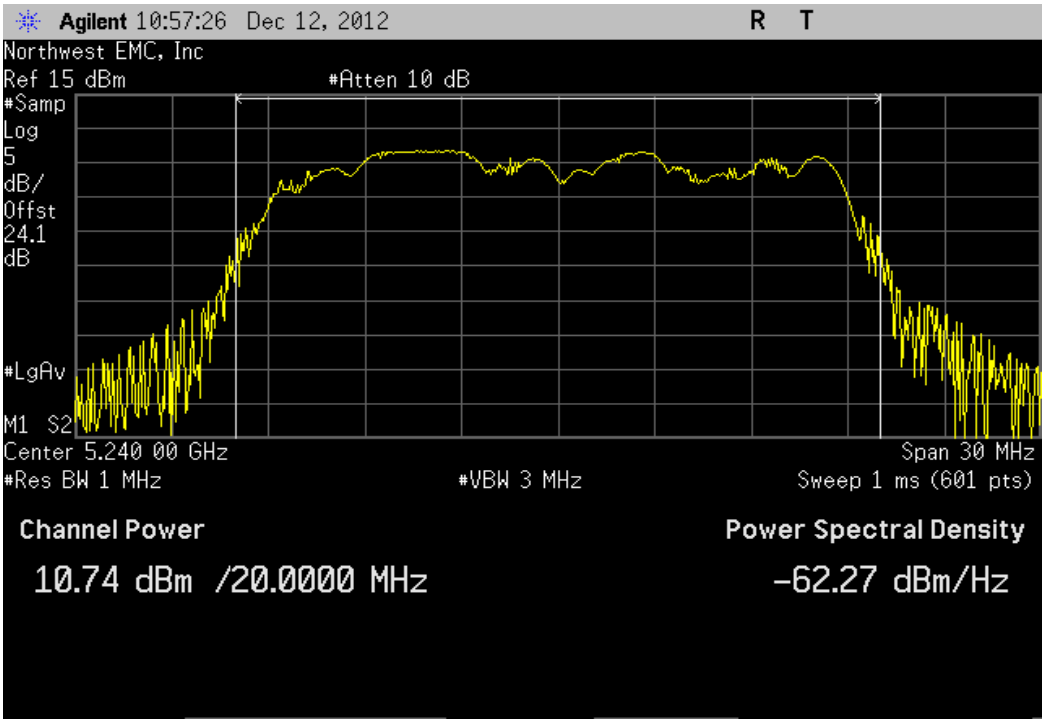
20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				10.797 dBm	< 17 dBm	Pass



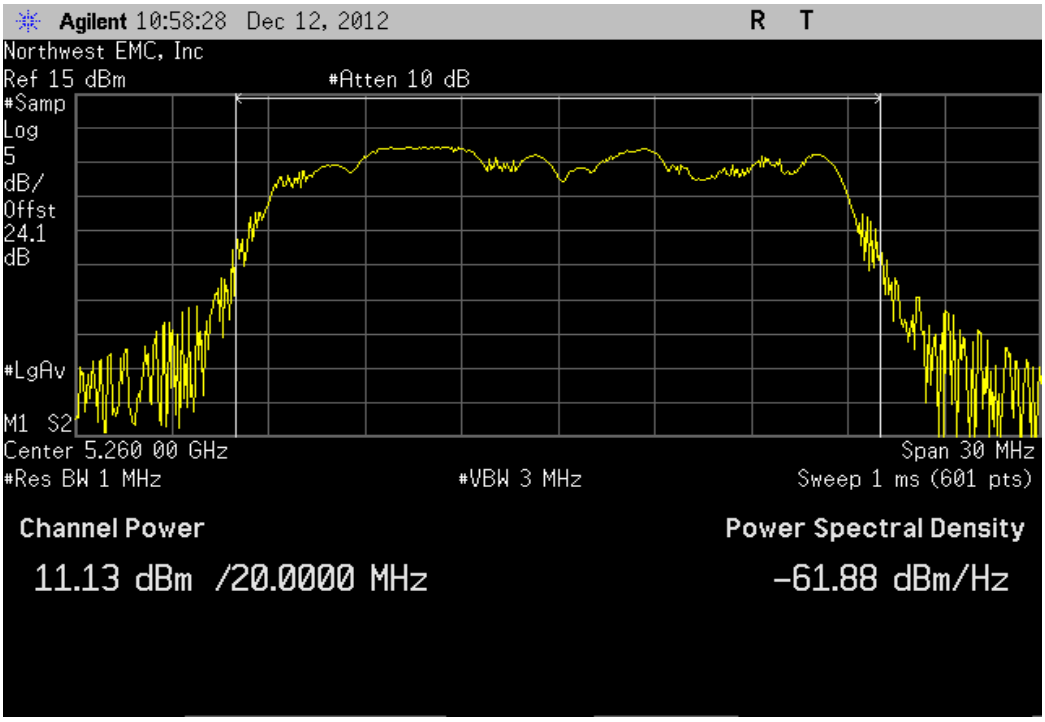
20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				10.741 dBm	< 17 dBm	Pass



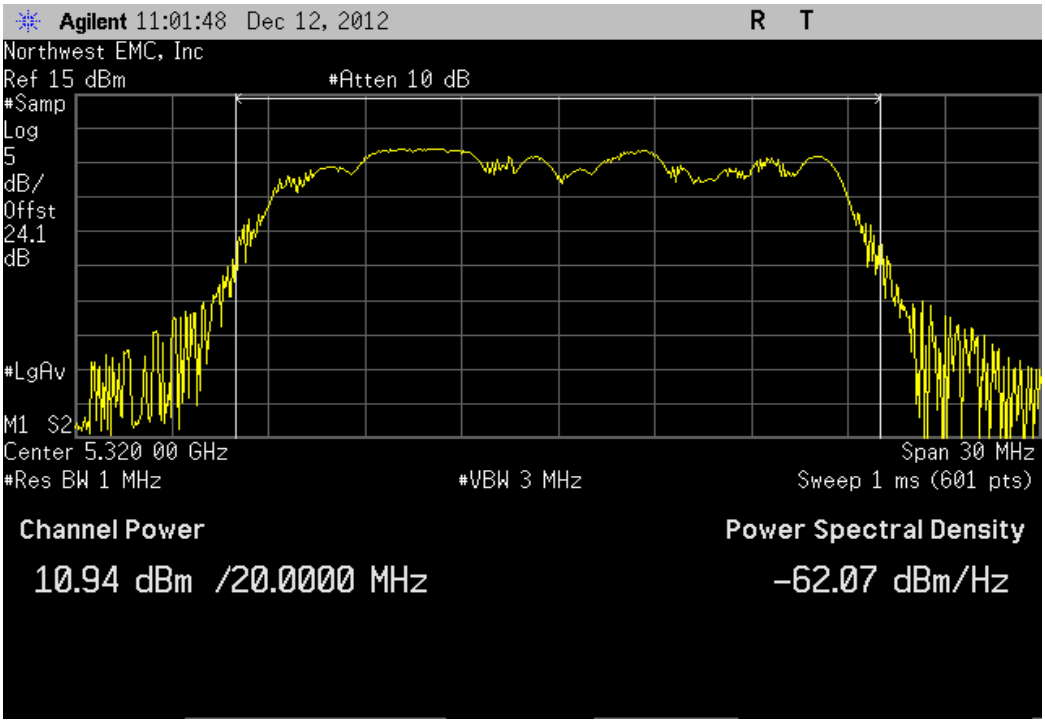
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				11.128 dBm	< 24 dBm	Pass



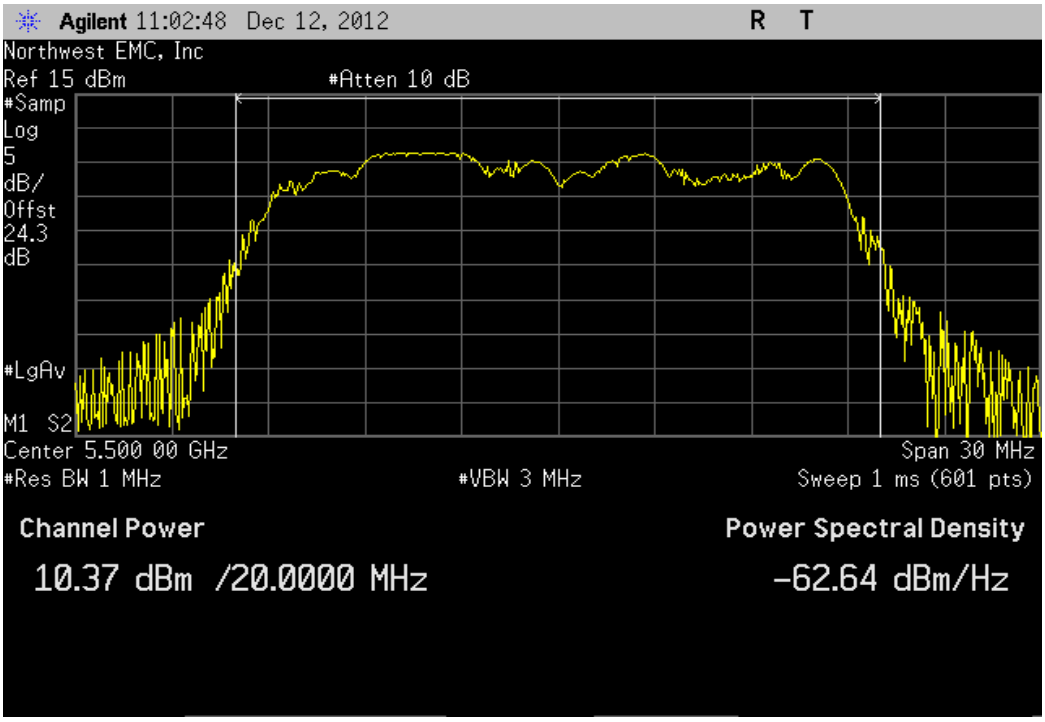
20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				10.944 dBm	< 24 dBm	Pass



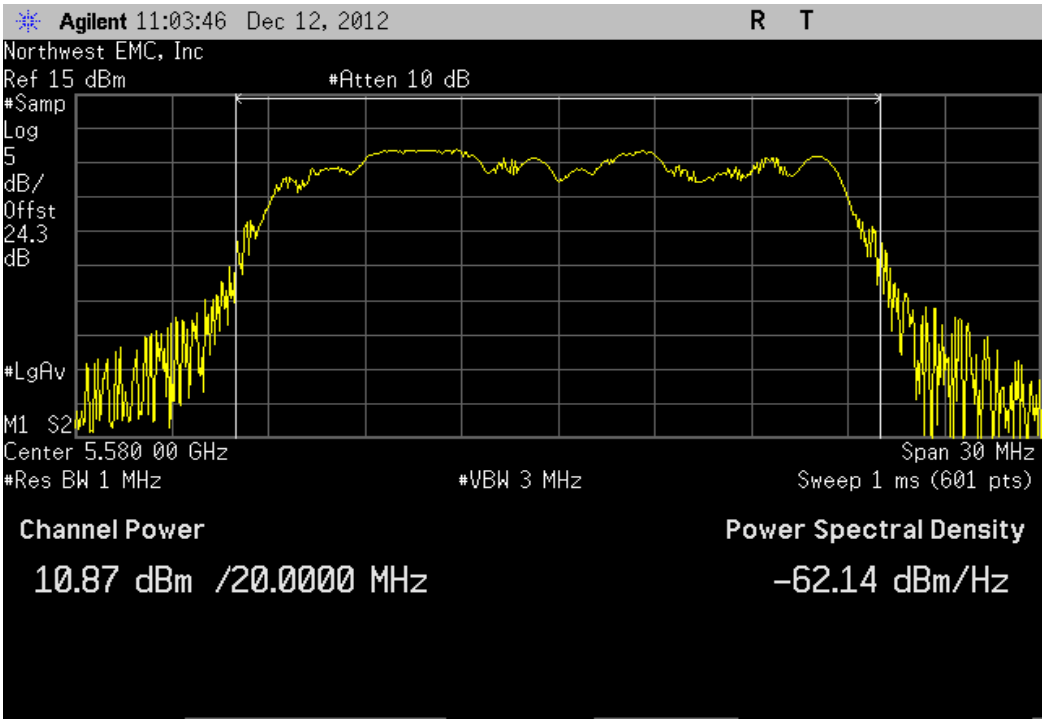
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				10.37 dBm	< 24 dBm	Pass



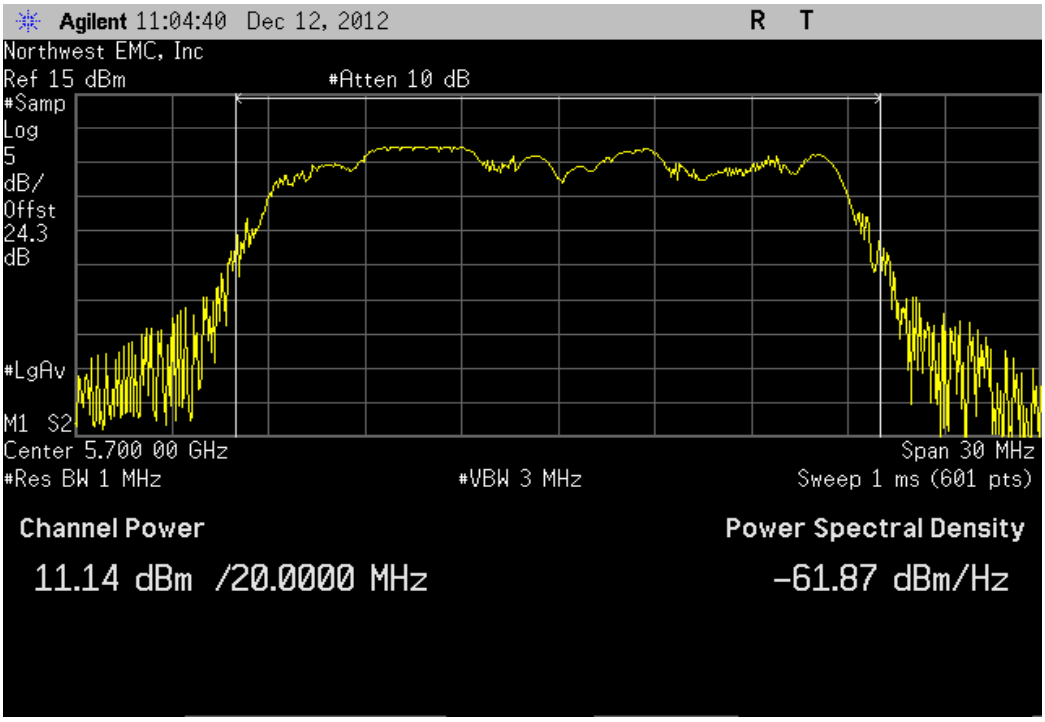
20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				10.868 dBm	< 24 dBm	Pass



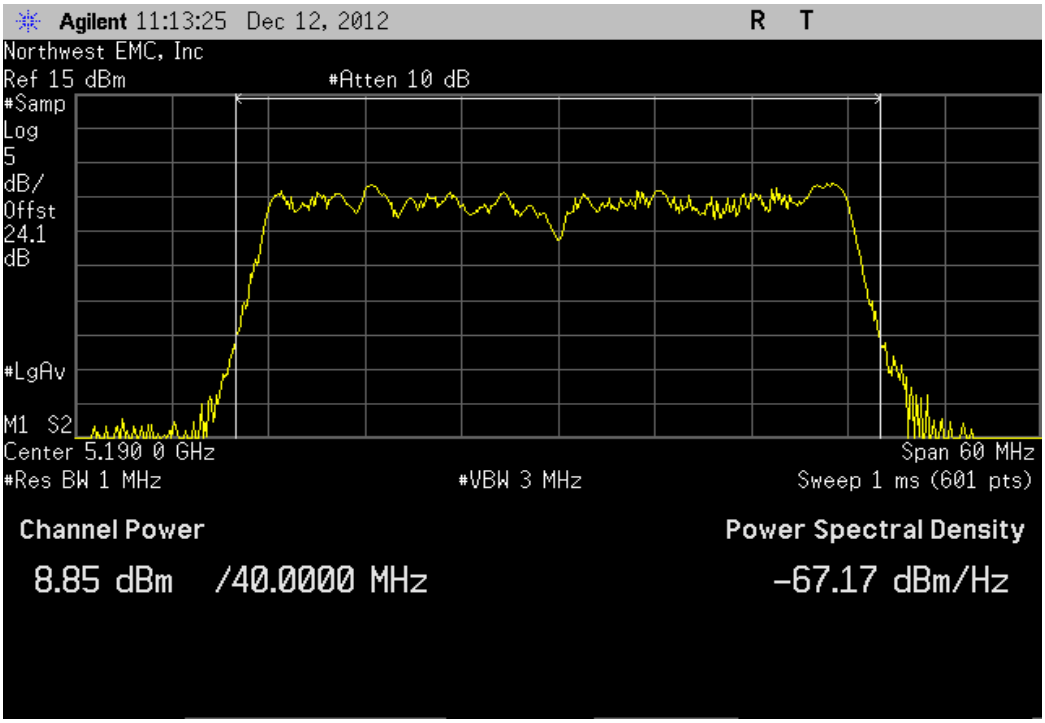
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.145 dBm	< 24 dBm	Pass



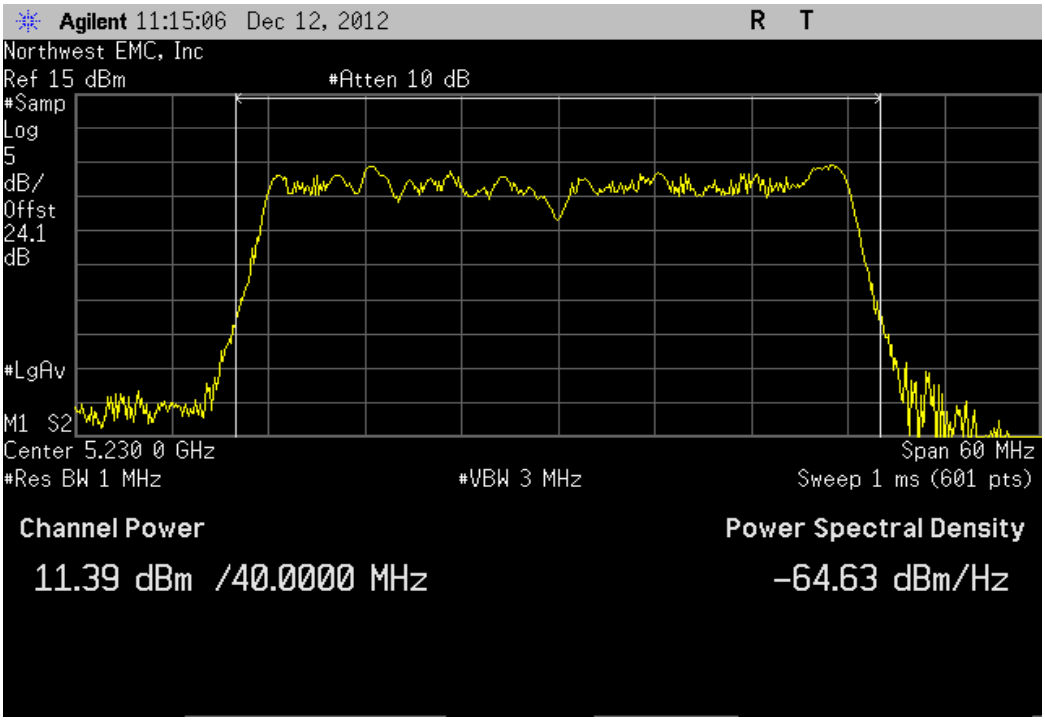
40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				8.846 dBm	< 17 dBm	Pass



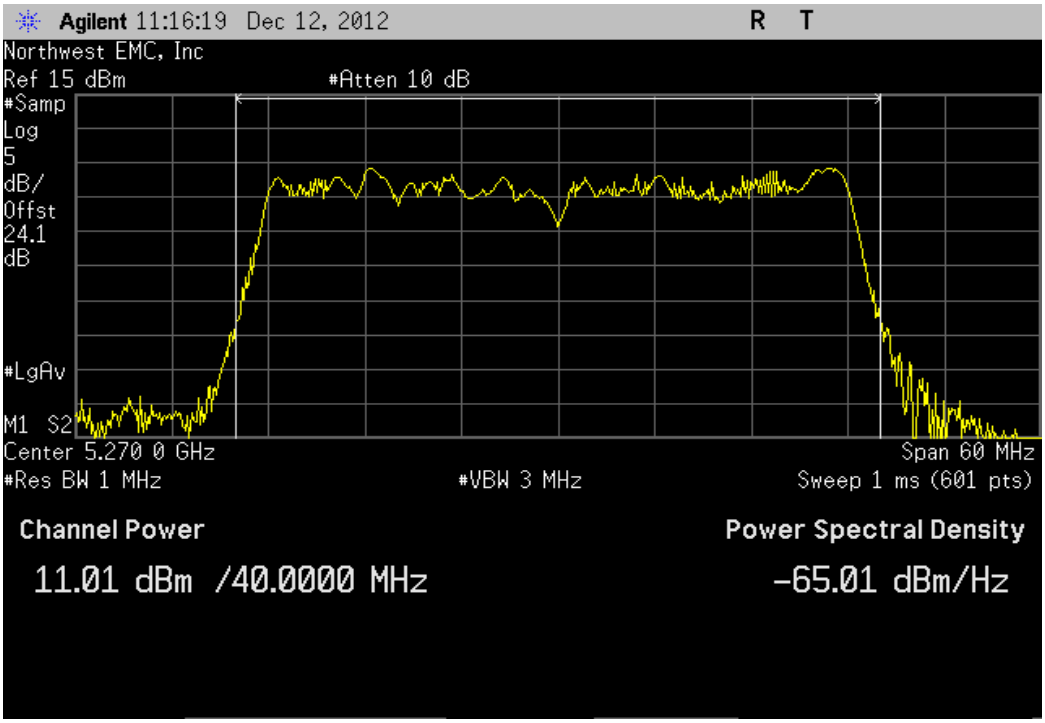
40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				11.389 dBm	< 17 dBm	Pass



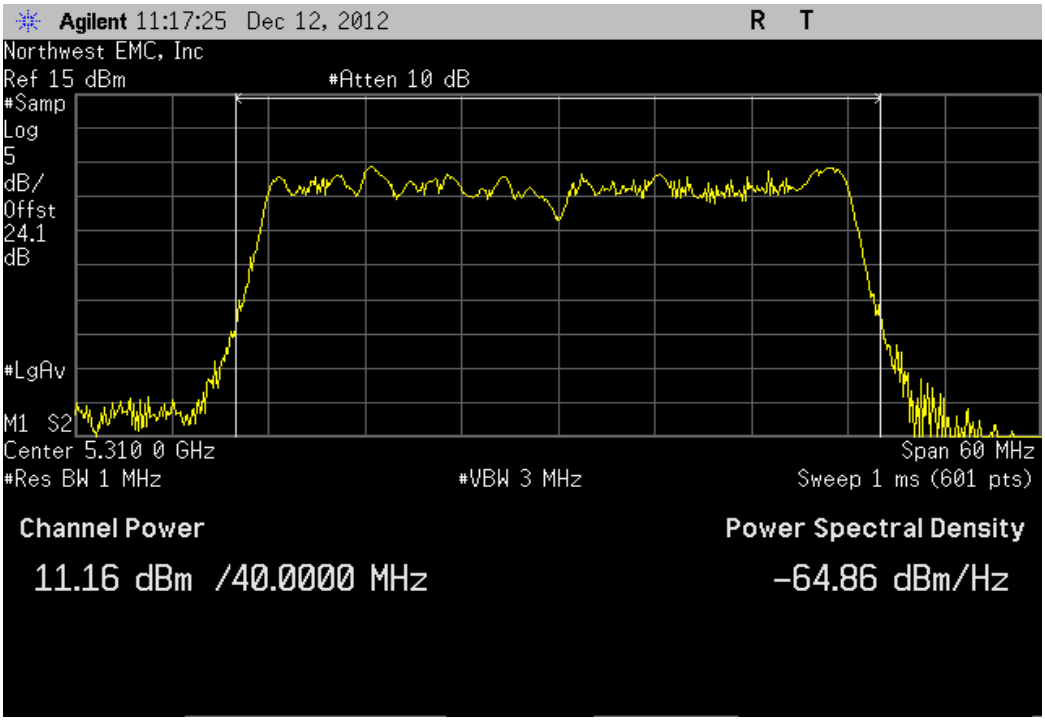
40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				11.01 dBm	< 24 dBm	Pass



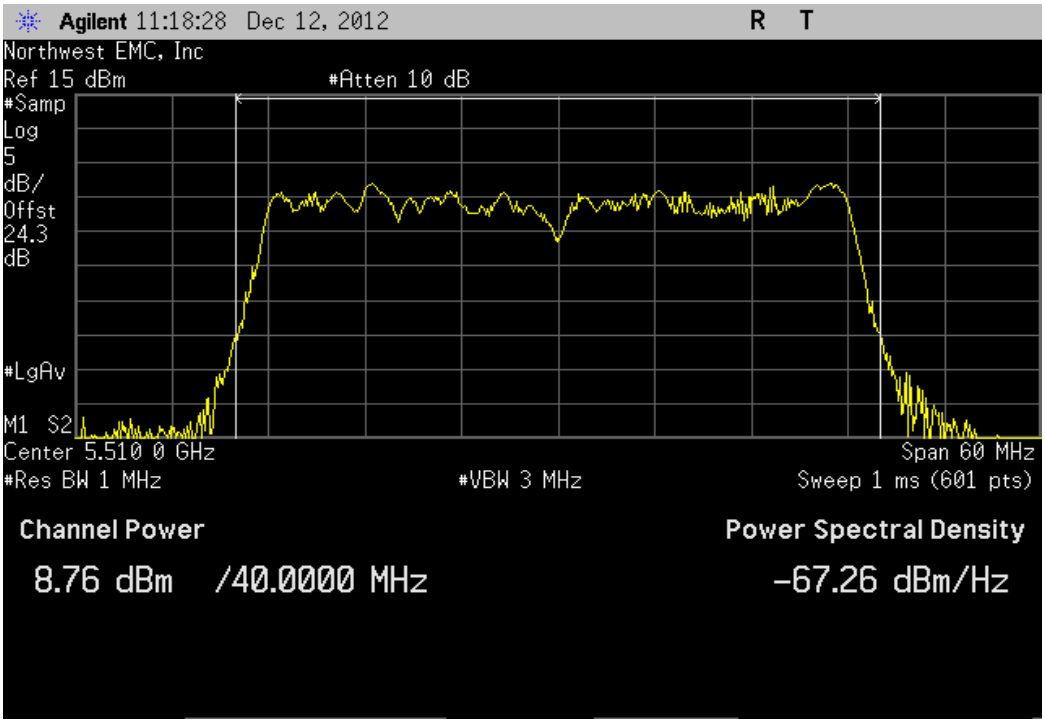
40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				11.159 dBm	< 24 dBm	Pass



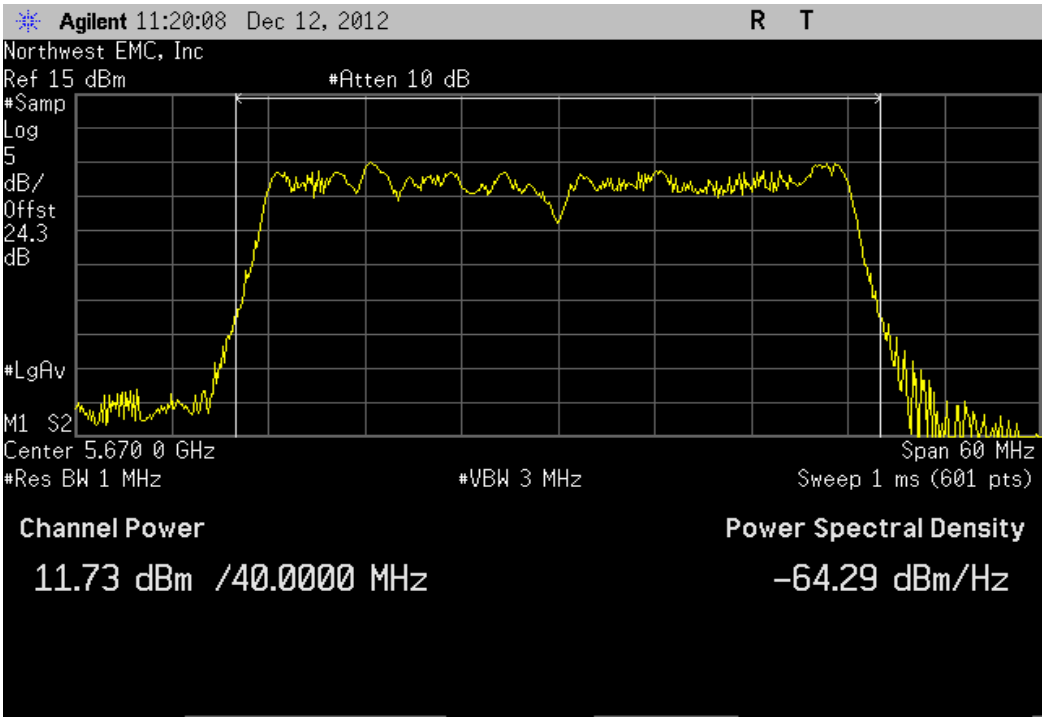
40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				8.759 dBm	< 24 dBm	Pass



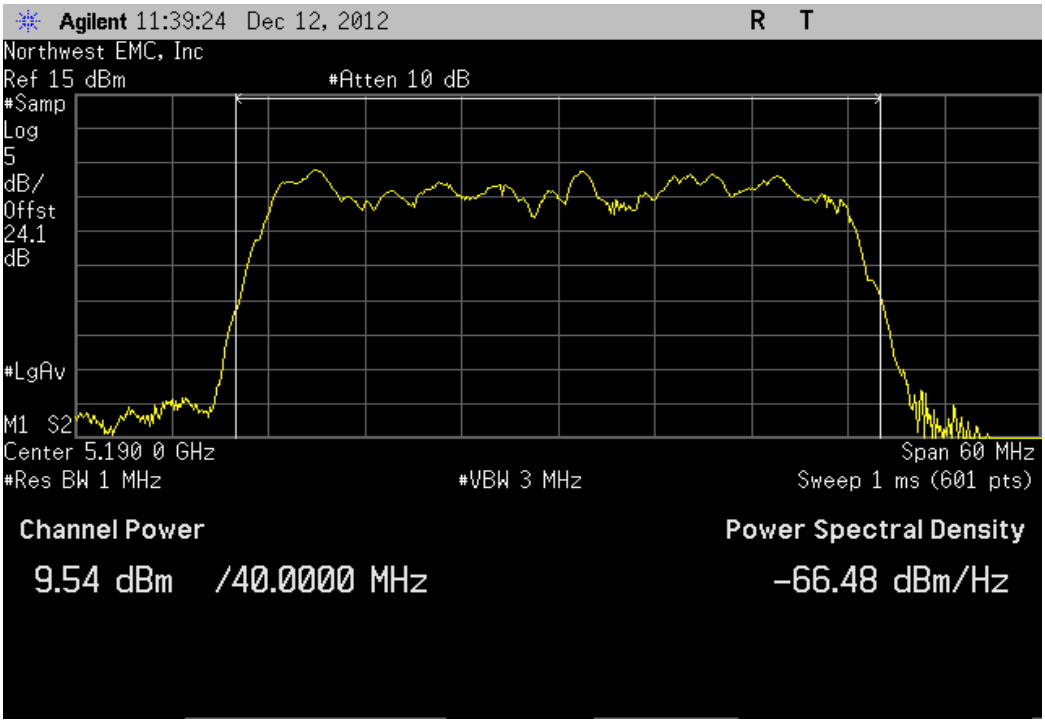
40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				11.727 dBm	< 24 dBm	Pass

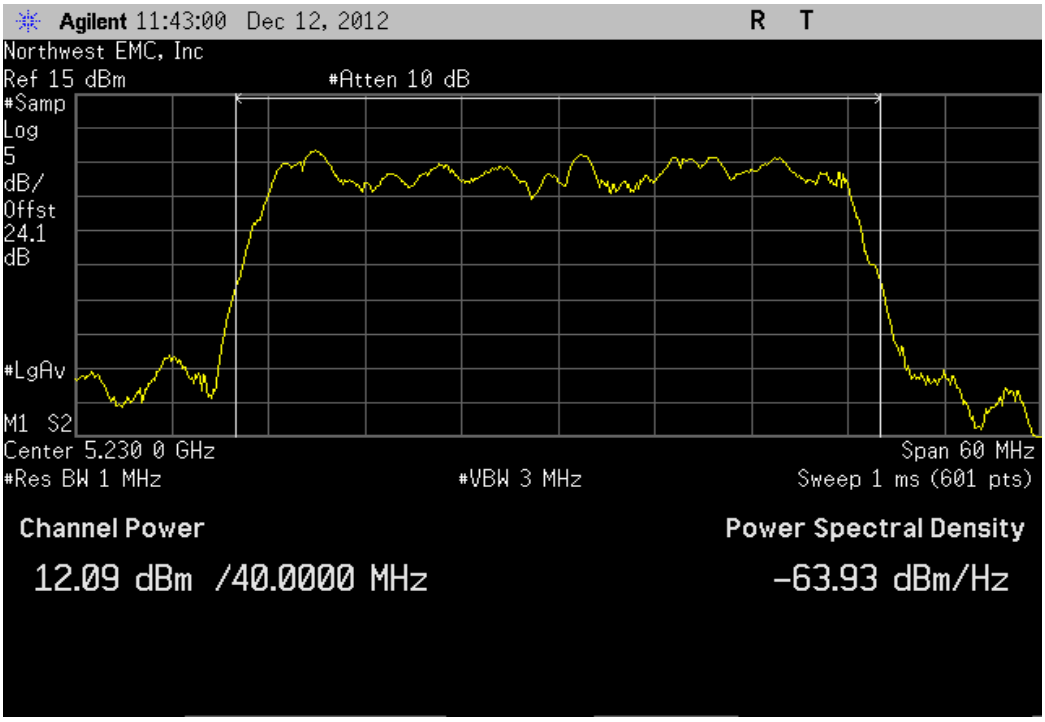


40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

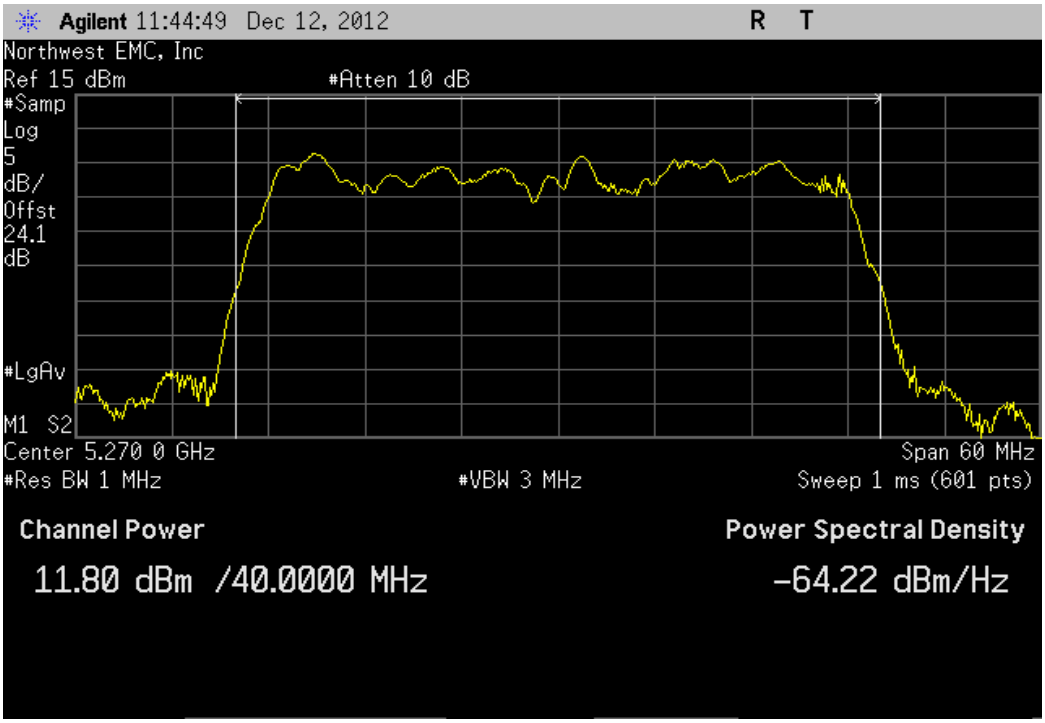
				Value	Limit	Result
				9.538 dBm	< 17 dBm	Pass



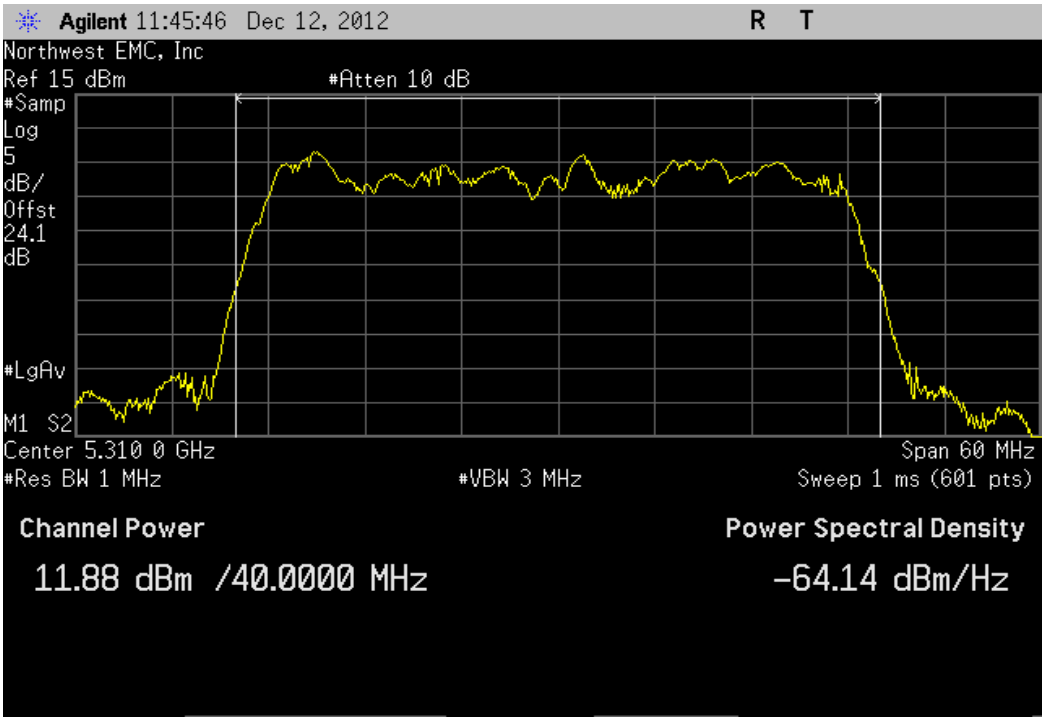
40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz							
					Value	Limit	Result
					12.086 dBm	< 17 dBm	Pass



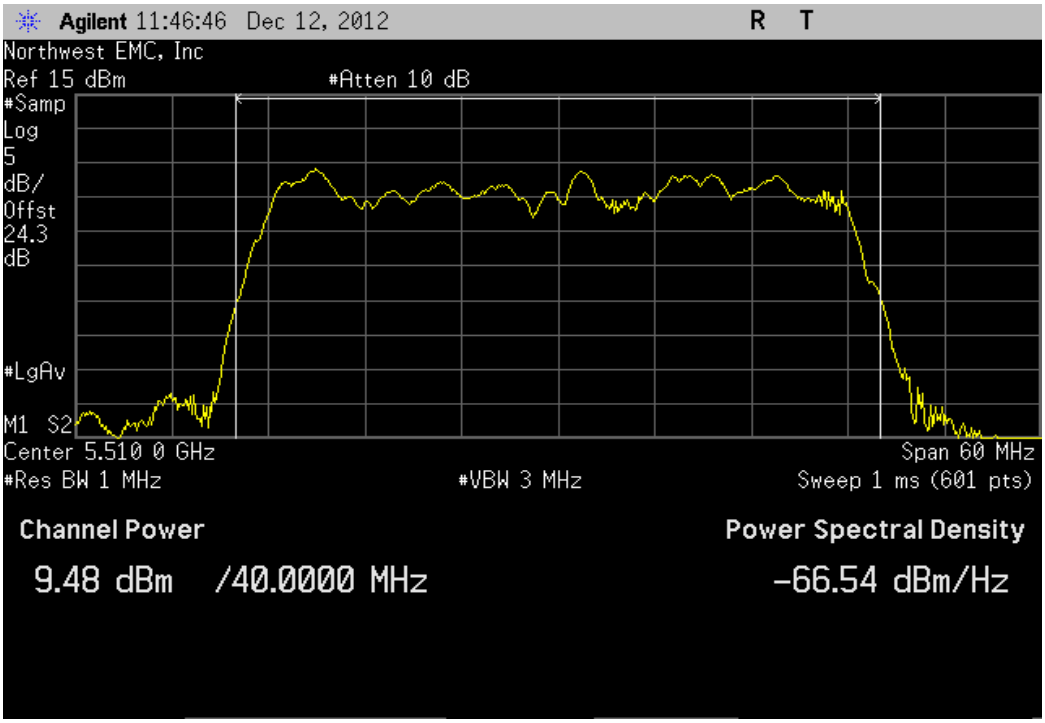
40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz							
					Value	Limit	Result
					11.796 dBm	< 24 dBm	Pass



40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz							
					Value	Limit	Result
					11.881 dBm	< 24 dBm	Pass



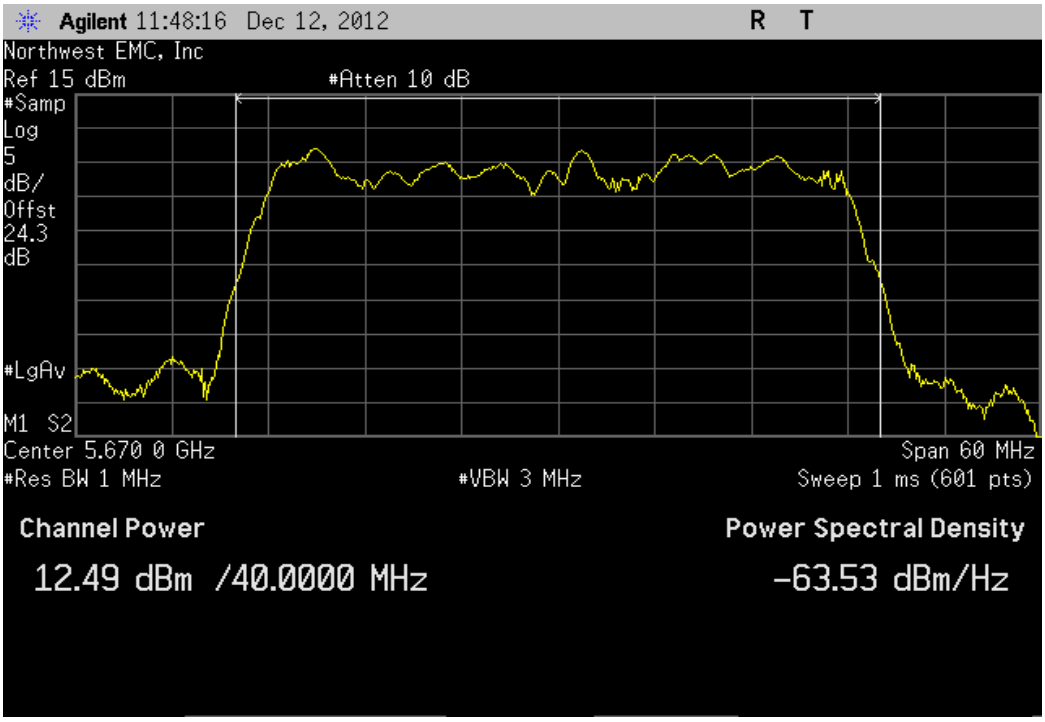
40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz							
					Value	Limit	Result
					9.483 dBm	< 24 dBm	Pass



Peak Transmit Power

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				12.492 dBm	< 24 dBm	Pass



Peak Transmit Power

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT is operating on antenna port A and B.

Peak Transmit Power

EUT:	1514	Work Order:	MCSO1638
Serial Number:	000109423753	Date:	12/14/12
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	35%
Project:	None	Barometric Pres.:	1012
Tested by:	Brandon Hobbs Rod Peloquin	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD

None

Configuration #	4	Signature

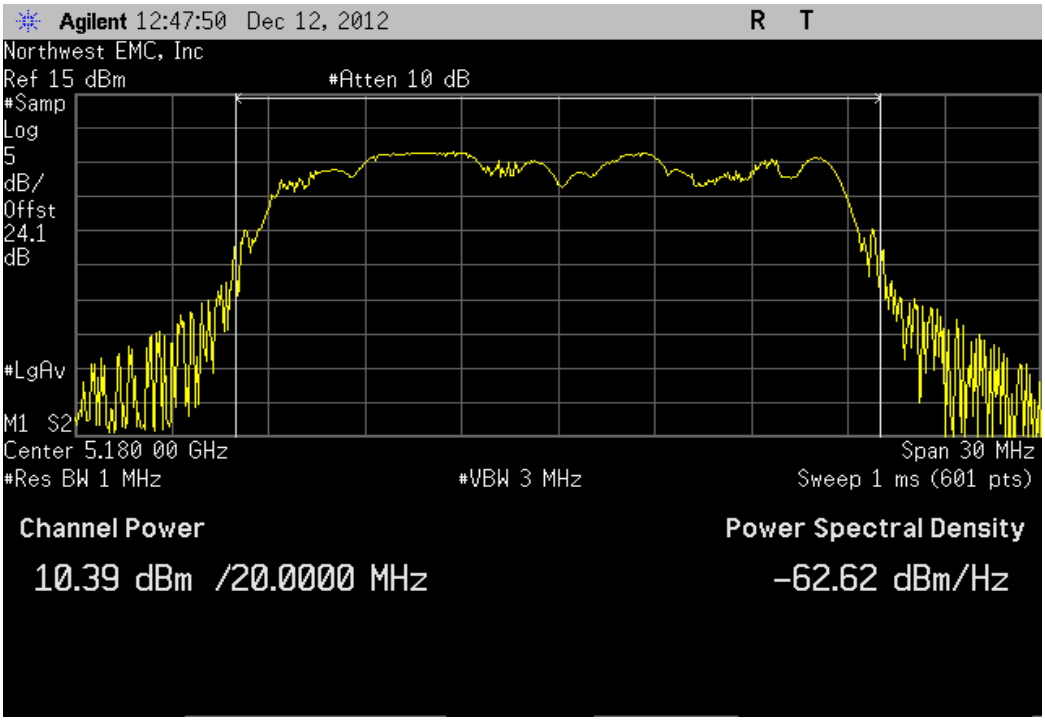
	Value	Limit	Result
Chain A			
20 MHz			
802.11(n) MCS8			
Ch 36, Low Channel 5180 MHz	10.394 dBm	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	10.208 dBm	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	11.03 dBm	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	10.76 dBm	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	10.142 dBm	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	11.184 dBm	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	10.83 dBm	< 24 dBm	Pass
802.11(n) MCS15			
Ch 36, Low Channel 5180 MHz	10.495 dBm	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	10.325 dBm	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	10.781 dBm	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	10.553 dBm	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	9.957 dBm	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	10.872 dBm	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	11.157 dBm	< 24 dBm	Pass
40 MHz			
802.11(n) MCS8			
Ch 36/40, Low Channel 5190 MHz	8.557 dBm	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	11.056 dBm	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	10.781 dBm	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	10.958 dBm	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	8.611 dBm	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	11.443 dBm	< 24 dBm	Pass
802.11(n) MCS15			
Ch 36/40, Low Channel 5190 MHz	9.2 dBm	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	11.65 dBm	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	11.397 dBm	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	11.529 dBm	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	9.191 dBm	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	12.029 dBm	< 24 dBm	Pass
Chain B			
20 MHz			
802.11(n) MCS8			
Ch 36, Low Channel 5180 MHz	11.137 dBm	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	10.936 dBm	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	11.062 dBm	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	10.23 dBm	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	10.54 dBm	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	10.98 dBm	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	10.459 dBm	< 24 dBm	Pass
802.11(n) MCS15			
Ch 36, Low Channel 5180 MHz	10.919 dBm	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	10.643 dBm	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	10.692 dBm	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	10.308 dBm	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	10.313 dBm	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	11.195 dBm	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	10.634 dBm	< 24 dBm	Pass
40 MHz			
802.11(n) MCS8			
Ch 36/40, Low Channel 5190 MHz	8.234 dBm	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	11.076 dBm	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	10.464 dBm	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	10.21 dBm	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	9.479 dBm	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	11.272 dBm	< 24 dBm	Pass
802.11(n) MCS15			
Ch 36/40, Low Channel 5190 MHz	8.373 dBm	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	11.132 dBm	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	10.069 dBm	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	9.889 dBm	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	9.254 dBm	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	10.913 dBm	< 24 dBm	Pass

Chain AB

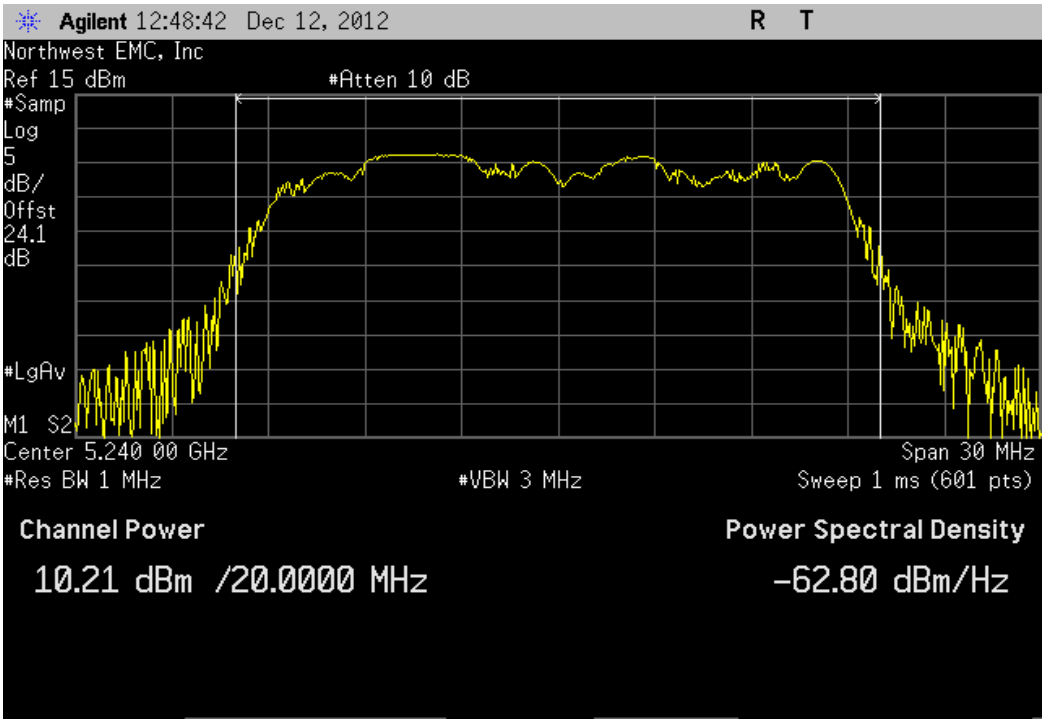
20 MHz	Chain A		Chain B		Summed Power	
802.11(n) MCS8	(dBm)	(mw)	(dBm)	(mw)	(dBm)	
Ch 36, Low Channel 5180 MHz	10.39	10.940	11.13	12.972	13.786	Pass
Ch 48, High Channel 5240 MHz	10.2	10.471	10.93	12.388	13.591	Pass
Ch 52, Low Channel 5260 MHz	11	12.589	11.06	12.764	14.040	Pass
Ch 64, High Channel 5320 MHz	10.7	11.749	10.2	10.471	13.467	Pass
Ch 100, Low Channel 5500 MHz	10.14	10.328	10.5	11.220	13.334	Pass
Ch 116, Mid Channel 5580 MHz	11.18	13.122	10.9	12.303	14.053	Pass
Ch 140, High Channel 5700 MHz	10.8	12.023	10.45	11.092	13.639	Pass
802.11(n) MCS15						
Ch 36, Low Channel 5180 MHz	10.49	11.194	10.91	12.331	13.715	Pass
Ch 48, High Channel 5240 MHz	10.32	10.765	10.64	11.588	13.493	Pass

	Ch 52, Low Channel 5260 MHz	10.78	11.967	10.69	11.722	13.746	Pass
	Ch 64, High Channel 5320 MHz	10.55	11.350	10.3	10.715	13.437	Pass
	Ch 100, Low Channel 5500 MHz	9.95	9.886	10.31	10.740	13.144	Pass
	Ch 116, Mid Channel 5580 MHz	10.87	12.218	11.19	13.152	14.043	Pass
	Ch 140, High Channel 5700 MHz	11.15	13.032	10.63	11.561	13.908	Pass
Chain AB							
40 MHz		Chain A		Chain B		Summed Power	
	802.11(n) MCS8	(dBm)	(mw)	(dBm)	(mw)	(dBm)	
	Ch 36/40, Low Channel 5190 MHz	8.55	7.161	8.23	6.653	11.403	Pass
	Ch 44/48, High Channel 5230 MHz	11.05	12.735	11.07	12.794	14.070	Pass
	Ch 52/56, Low Channel 5270 MHz	10.78	11.967	10.46	11.117	13.633	Pass
	Ch 60/64, High Channel 5310 MHz	10.95	12.445	10.2	10.471	13.601	Pass
	Ch 100/104, Low Channel 5510 MHz	8.61	7.261	9.47	8.851	12.072	Pass
	Ch 132/136, High Channel 5670 MHz	11.44	13.932	11.27	13.397	14.366	Pass
	802.11(n) MCS15						
	Ch 36/40, Low Channel 5190 MHz	9	7.943	8.37	6.871	11.707	Pass
	Ch 44/48, High Channel 5230 MHz	11.6	14.454	11.13	12.972	14.382	Pass
	Ch 52/56, Low Channel 5270 MHz	11.39	13.772	10.06	10.139	13.786	Pass
	Ch 60/64, High Channel 5310 MHz	11.52	14.191	9.88	9.727	13.787	Pass
	Ch 100/104, Low Channel 5510 MHz	9.19	8.299	9.25	8.414	12.230	Pass
	Ch 132/136, High Channel 5670 MHz	12.02	15.922	10.91	12.331	14.511	Pass

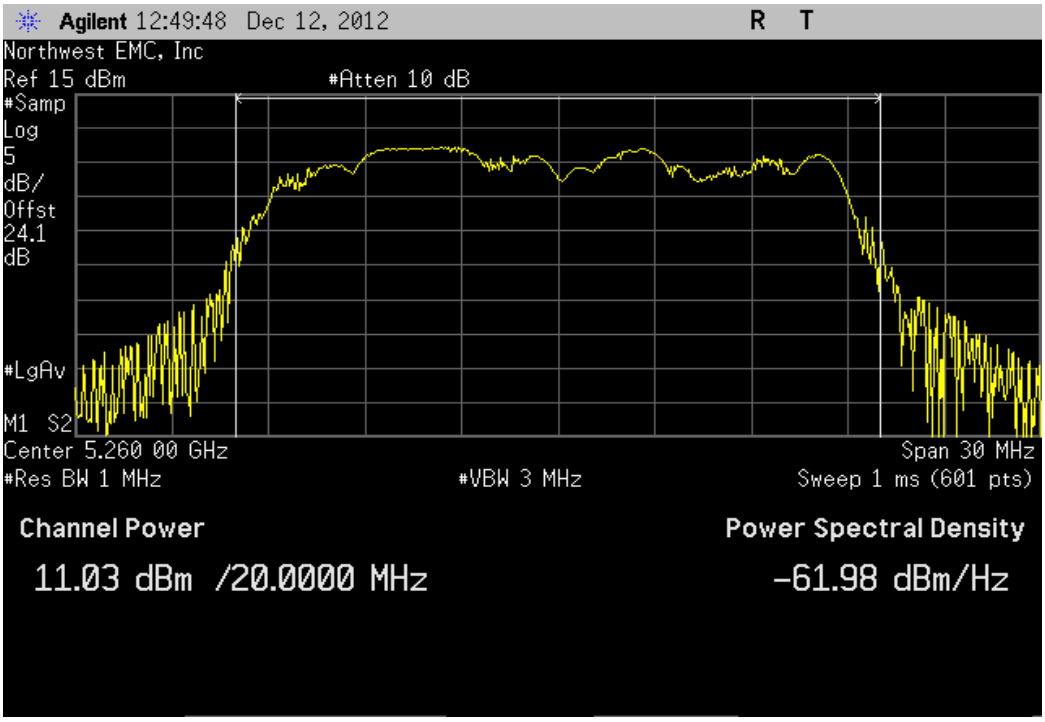
Chain A, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz							
					Value	Limit	Result
					10.394 dBm	< 17 dBm	Pass



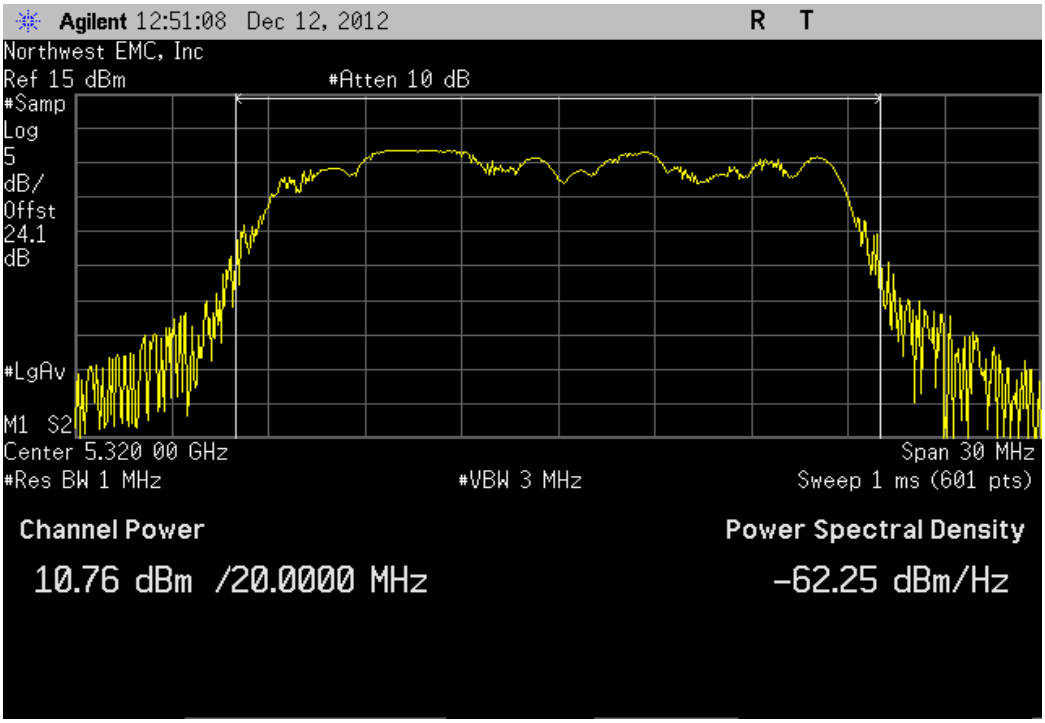
Chain A, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz							
					Value	Limit	Result
					10.208 dBm	< 17 dBm	Pass



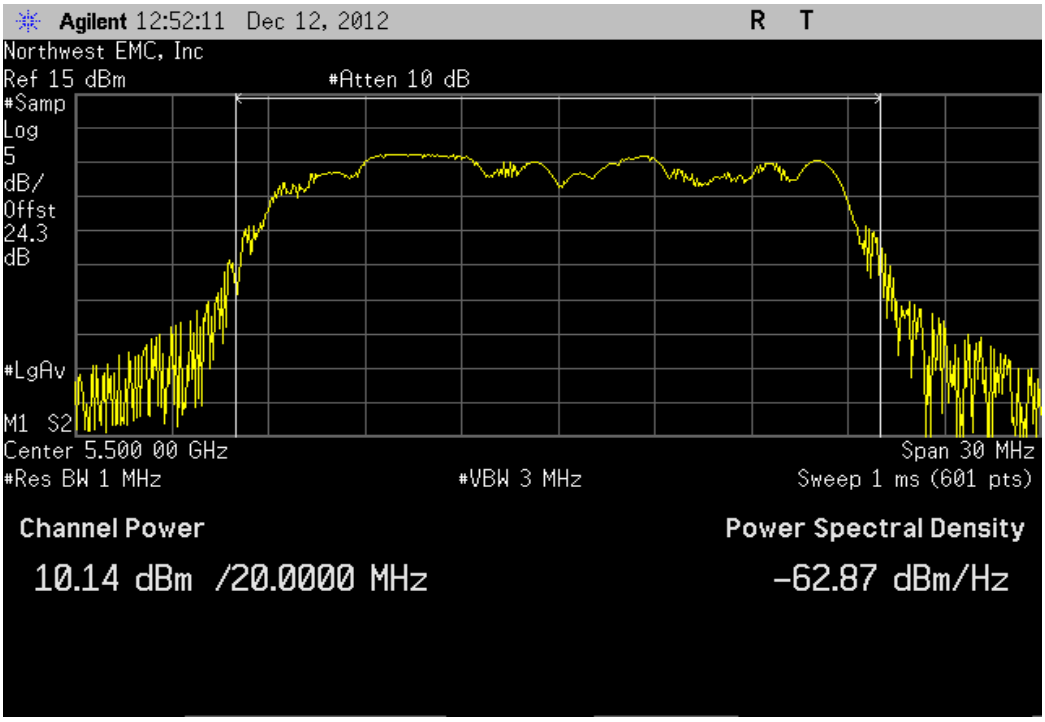
Chain A, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz							
					Value	Limit	Result
					11.03 dBm	< 24 dBm	Pass



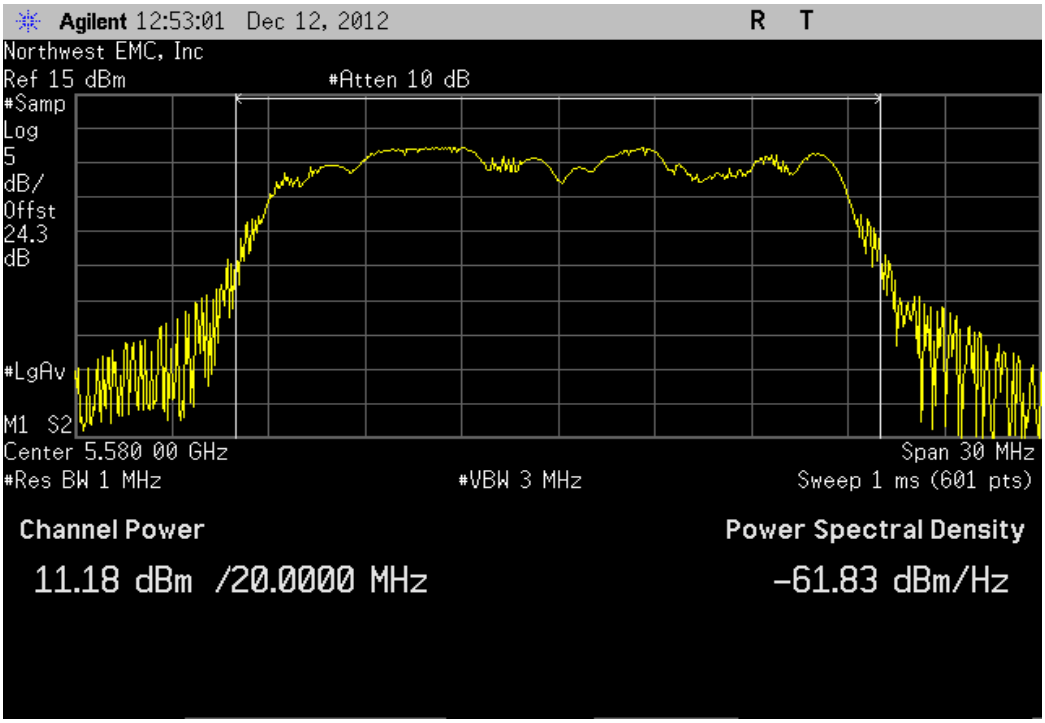
Chain A, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz							
					Value	Limit	Result
					10.76 dBm	< 24 dBm	Pass



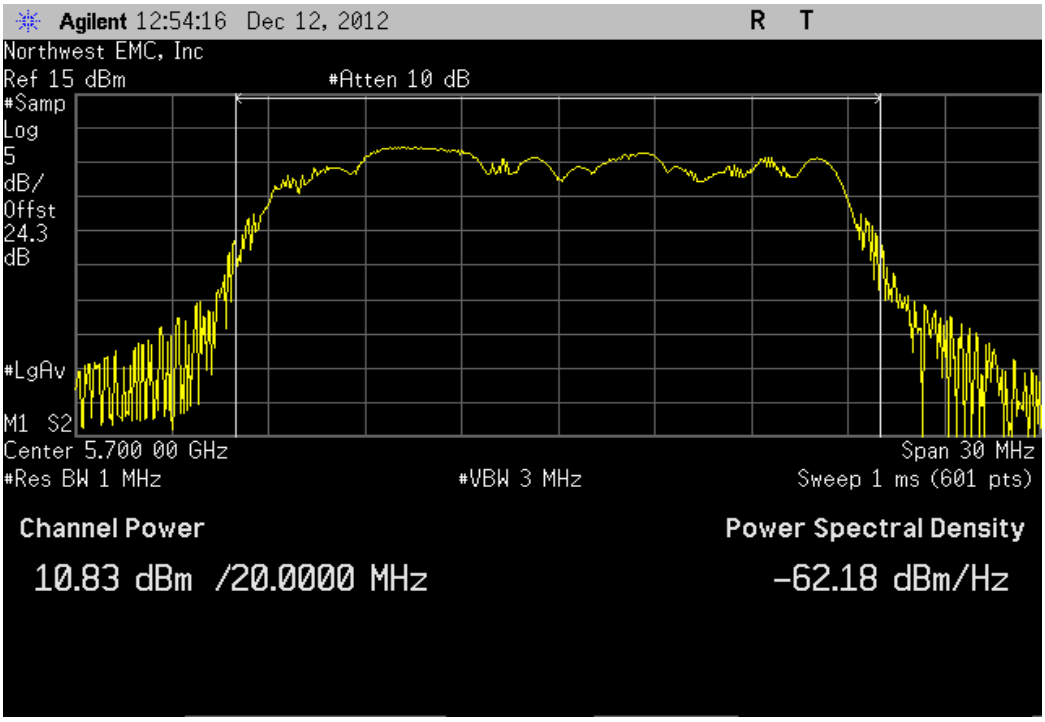
Chain A, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz							
					Value	Limit	Result
					10.142 dBm	< 24 dBm	Pass



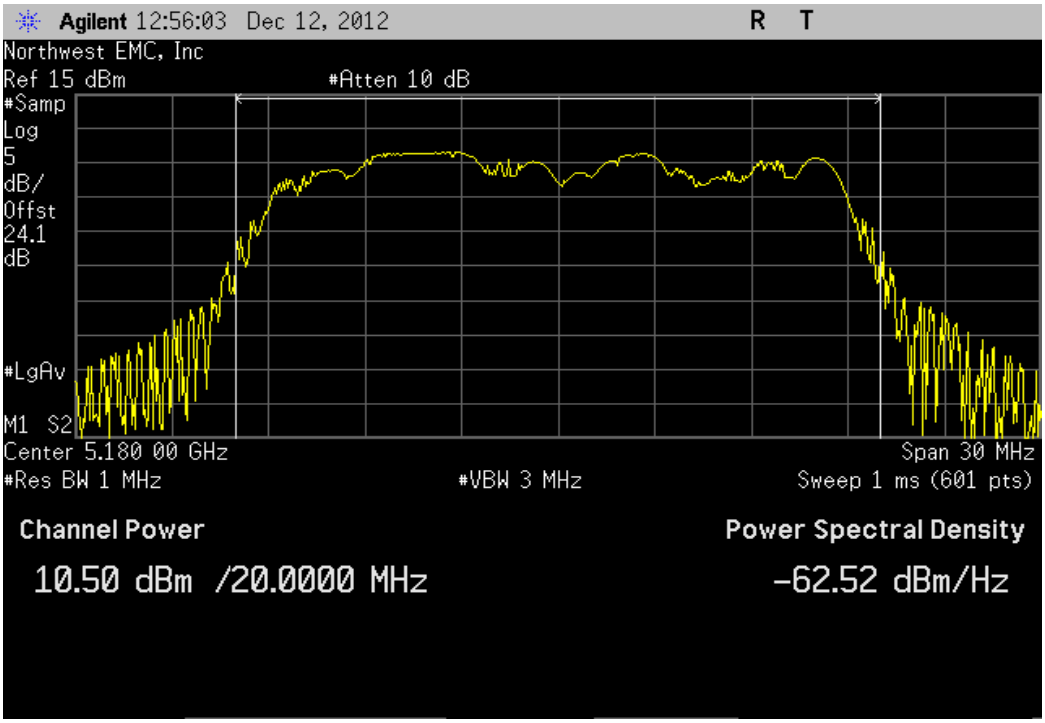
Chain A, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz							
					Value	Limit	Result
					11.184 dBm	< 24 dBm	Pass



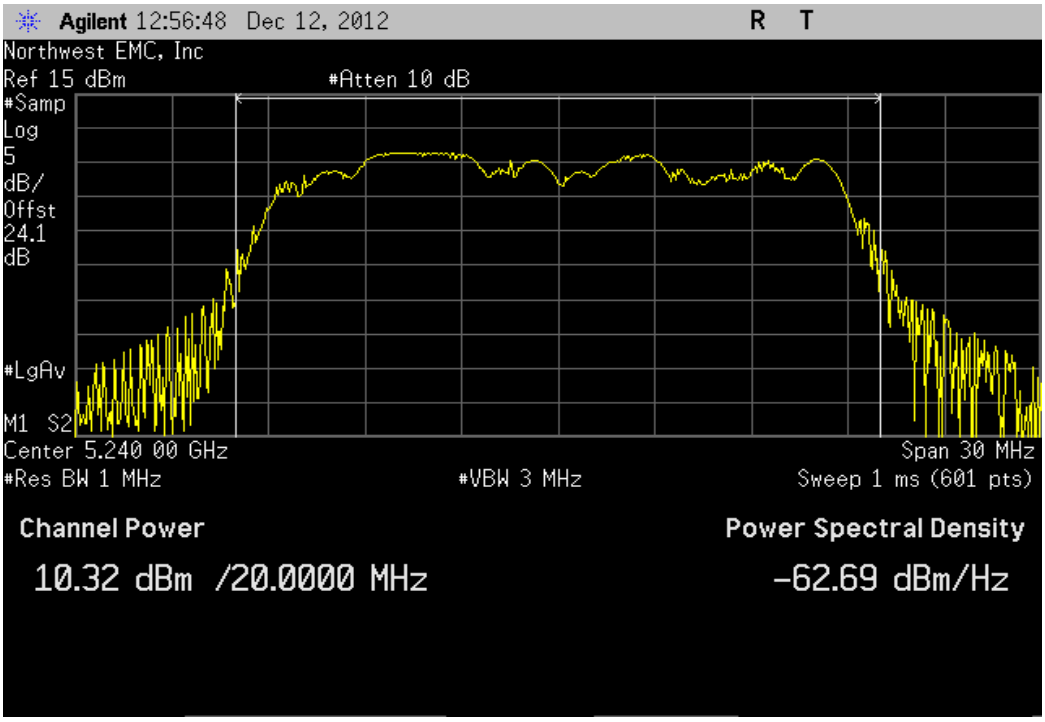
Chain A, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz							
					Value	Limit	Result
					10.83 dBm	< 24 dBm	Pass



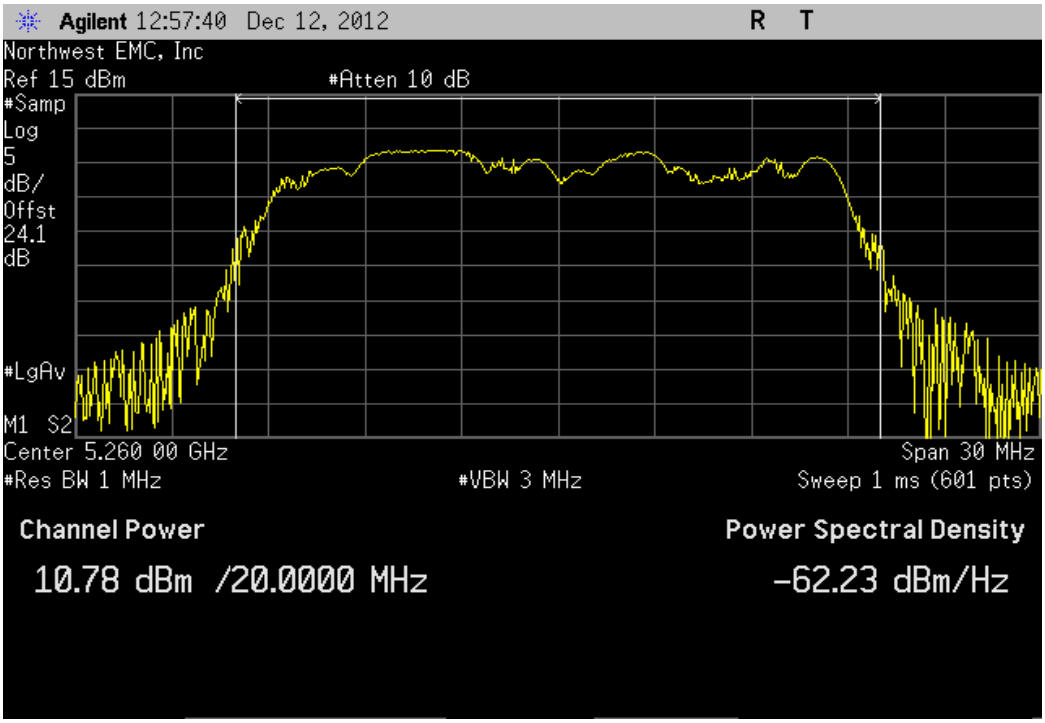
Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz							
					Value	Limit	Result
					10.495 dBm	< 17 dBm	Pass



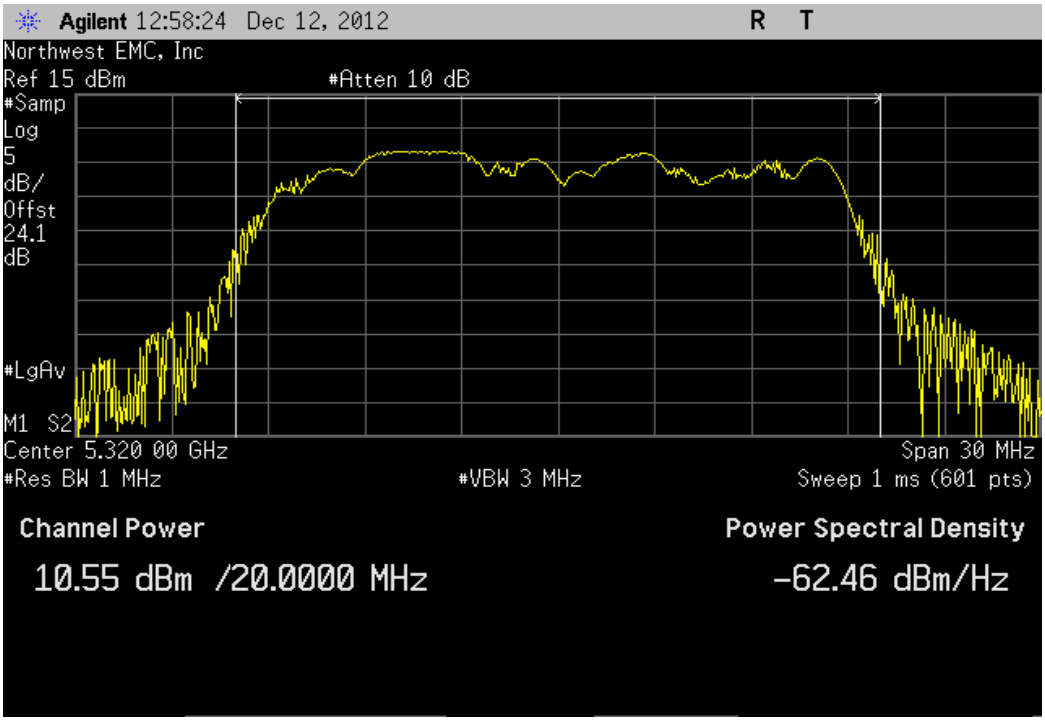
Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz							
					Value	Limit	Result
					10.325 dBm	< 17 dBm	Pass



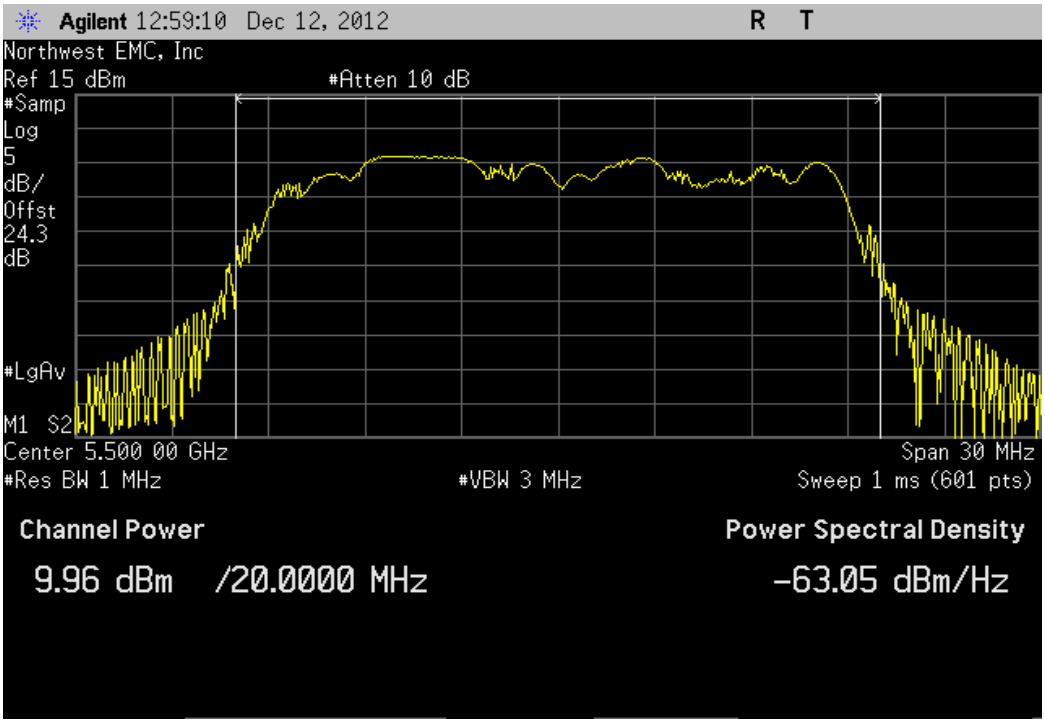
Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz							
					Value	Limit	Result
					10.781 dBm	< 24 dBm	Pass



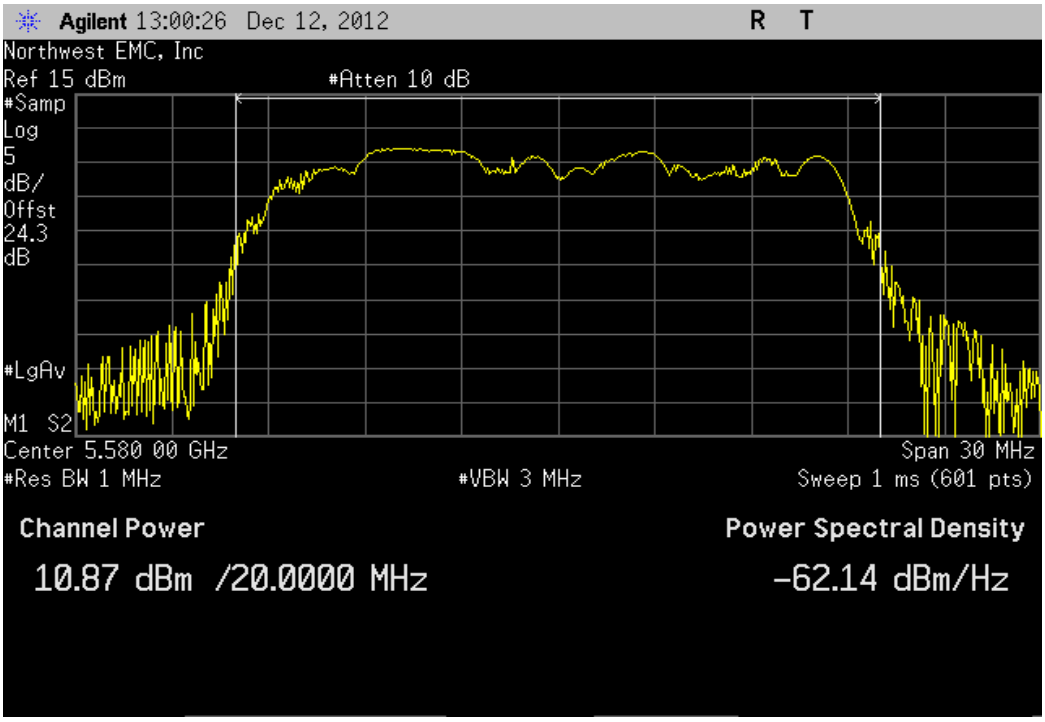
Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				10.553 dBm	< 24 dBm	Pass



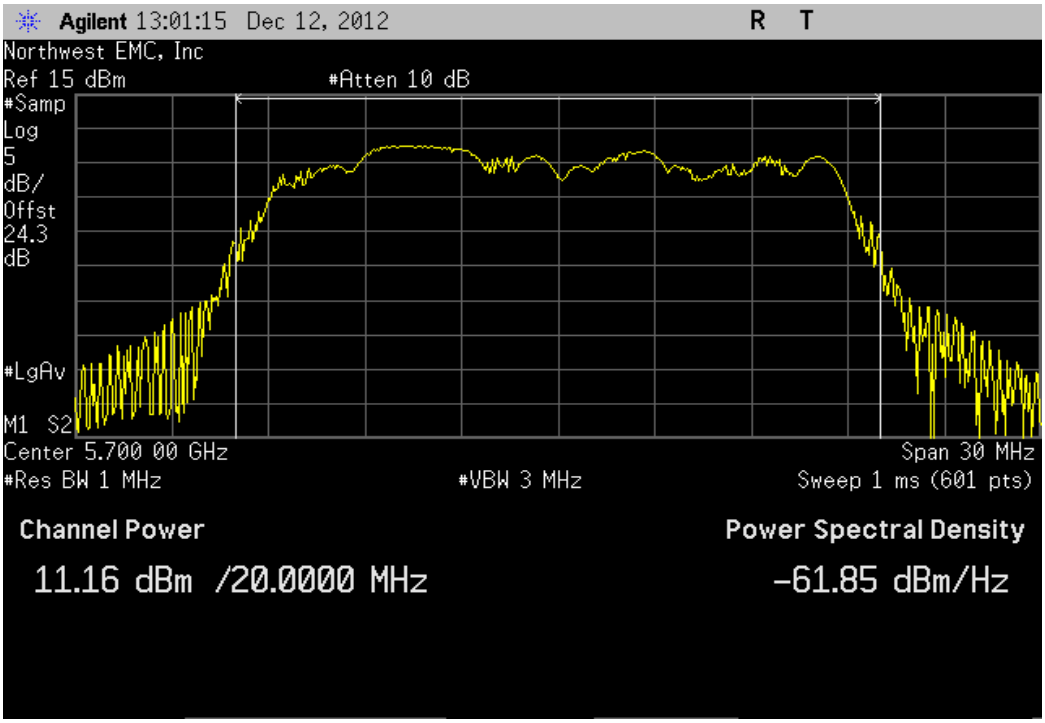
Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				9.957 dBm	< 24 dBm	Pass



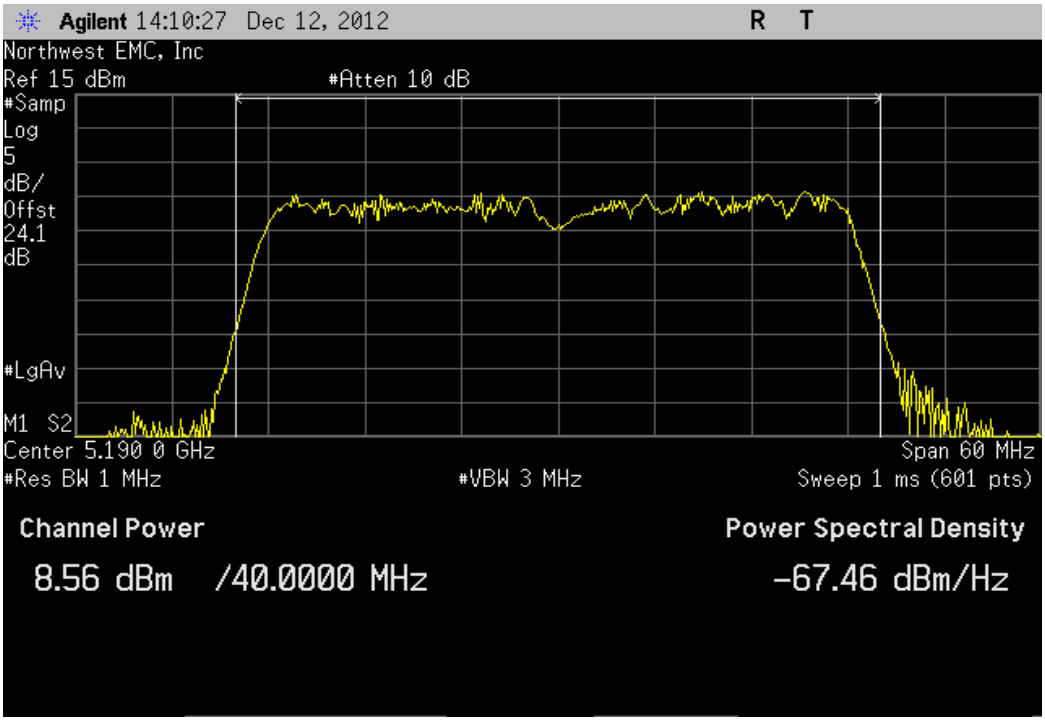
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				10.872 dBm	< 24 dBm	Pass



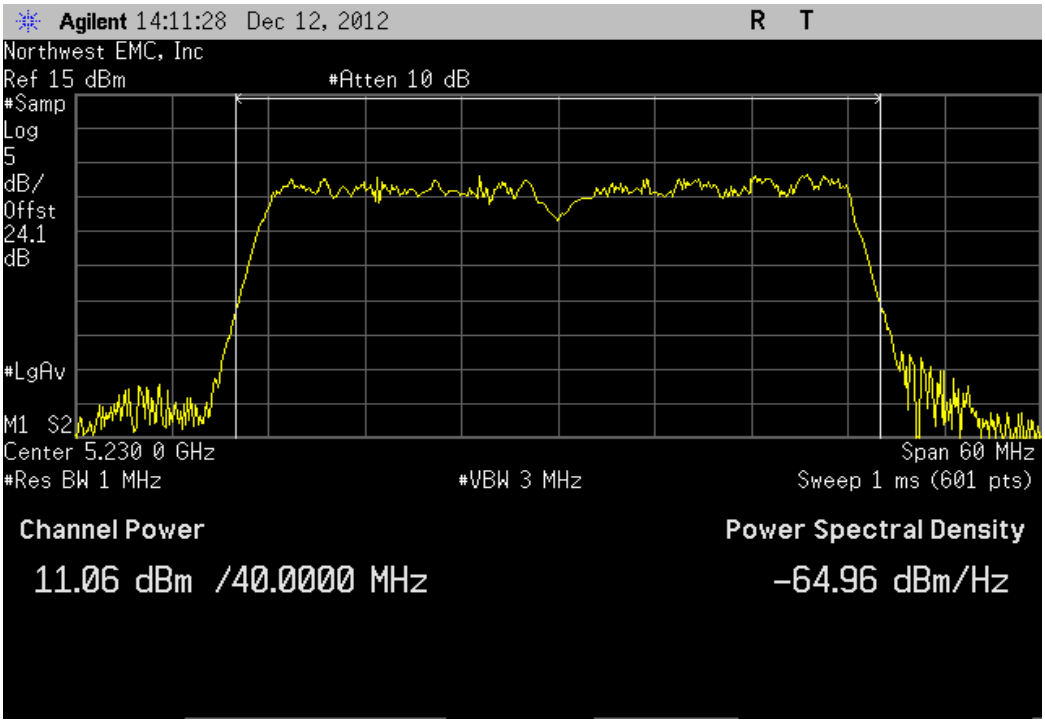
Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				11.157 dBm	< 24 dBm	Pass



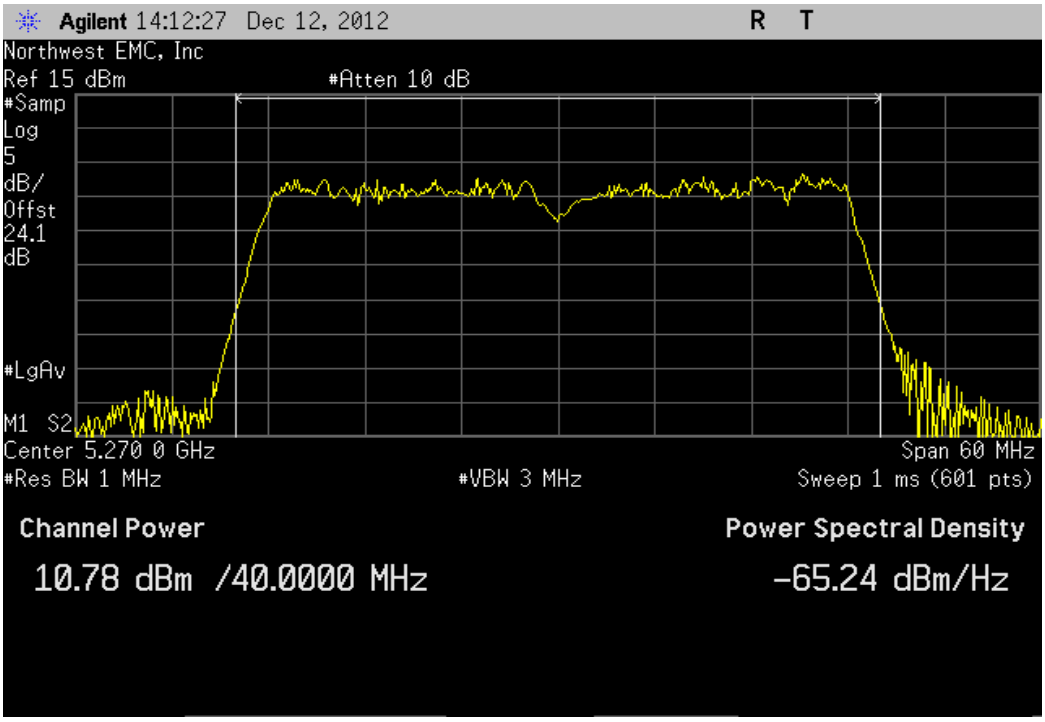
Chain A, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz							
					Value	Limit	Result
					8.557 dBm	< 17 dBm	Pass



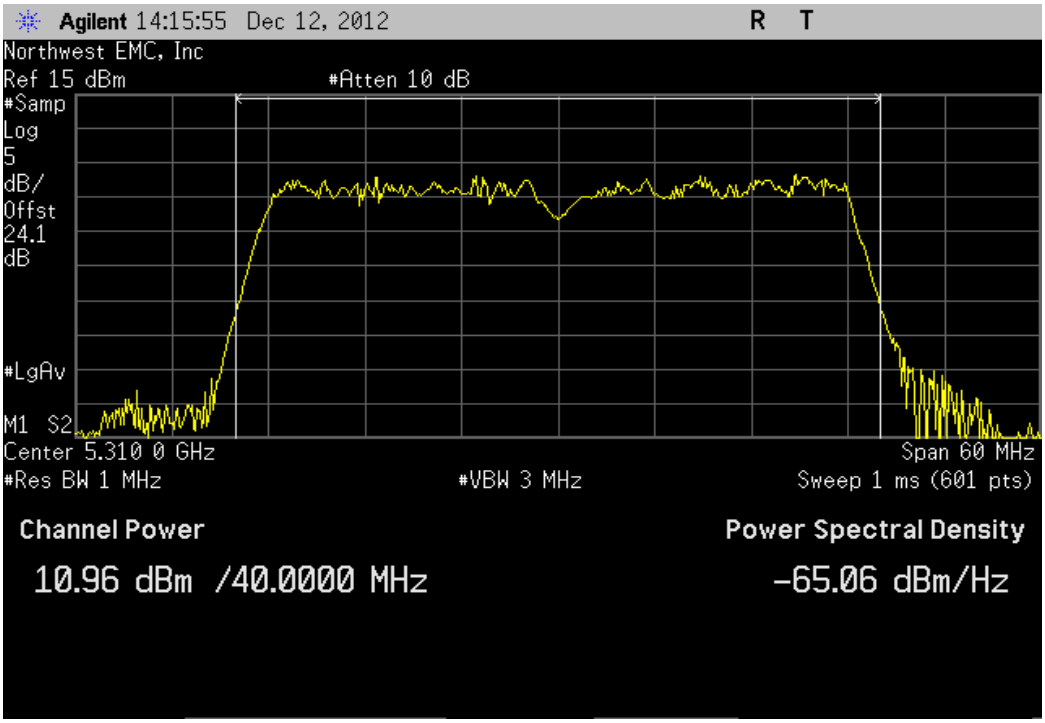
Chain A, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz							
					Value	Limit	Result
					11.056 dBm	< 17 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz							
					Value	Limit	Result
					10.781 dBm	< 24 dBm	Pass

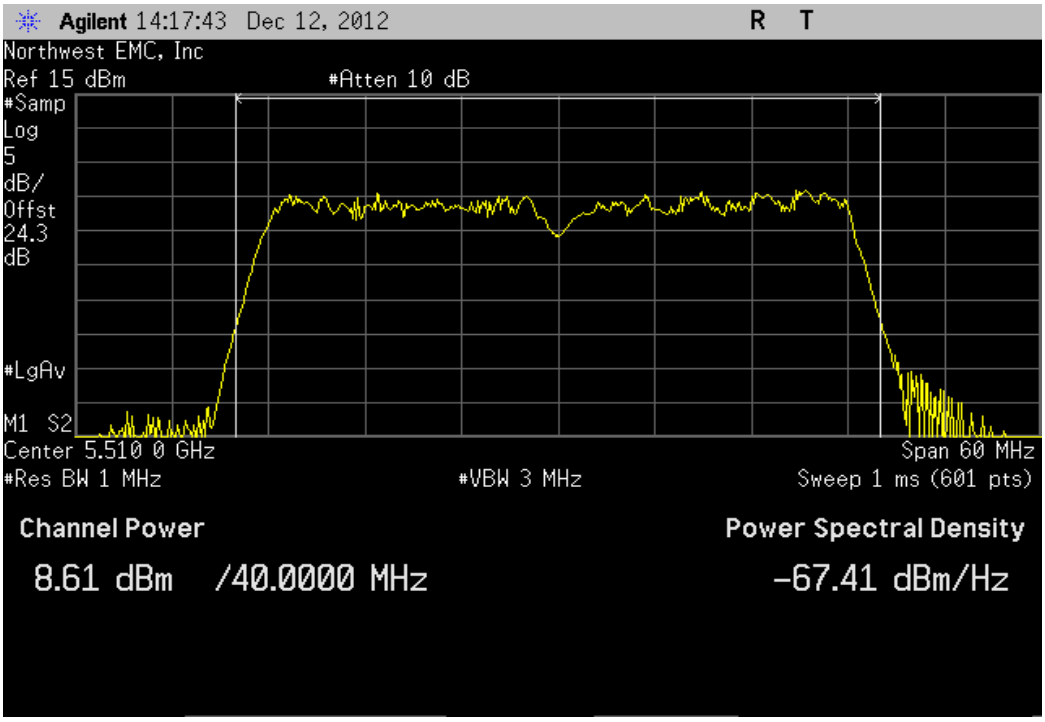


Chain A, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz							
					Value	Limit	Result
					10.958 dBm	< 24 dBm	Pass



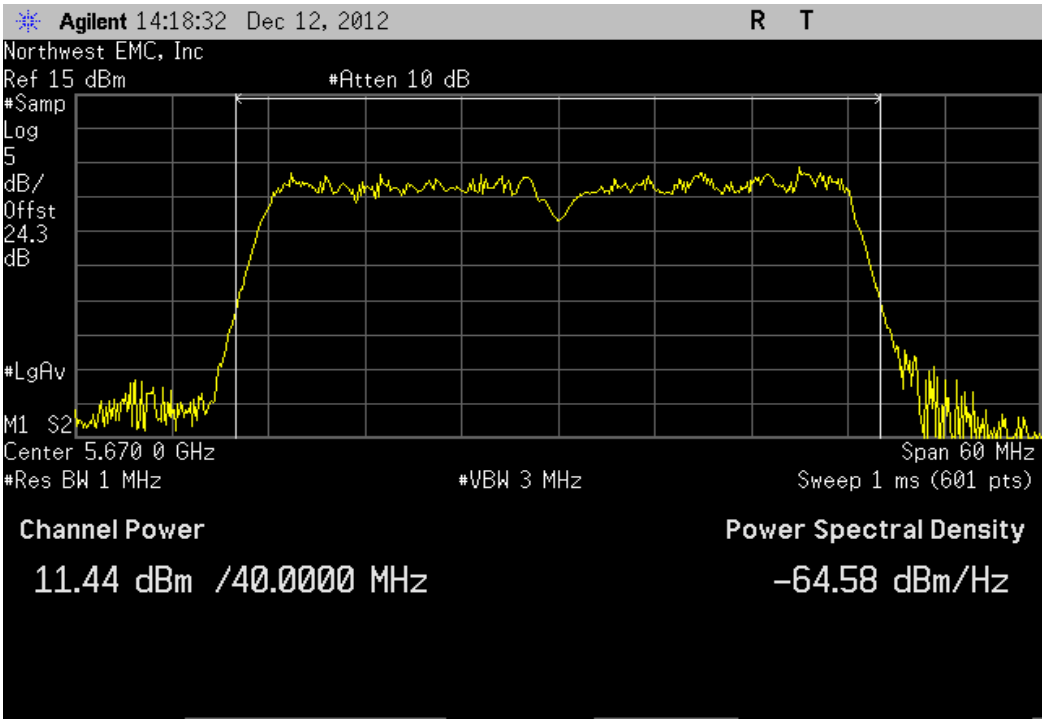
Chain A, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				8.611 dBm	< 24 dBm	Pass

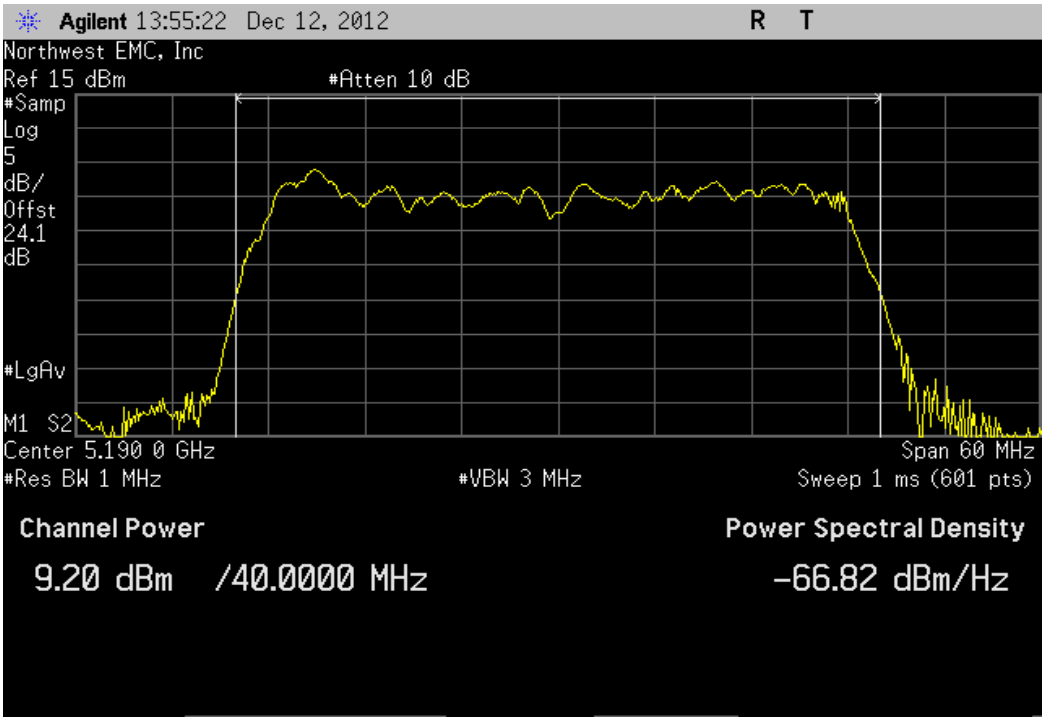


Chain A, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

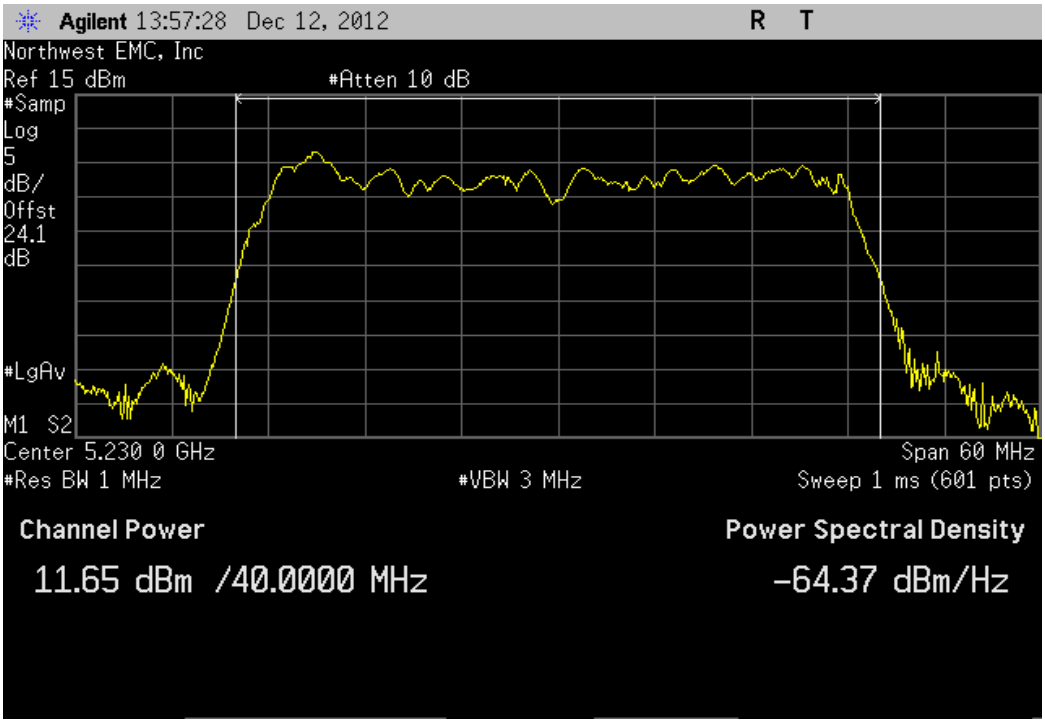
				Value	Limit	Result
				11.443 dBm	< 24 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz							
					Value	Limit	Result
					9.2 dBm	< 17 dBm	Pass

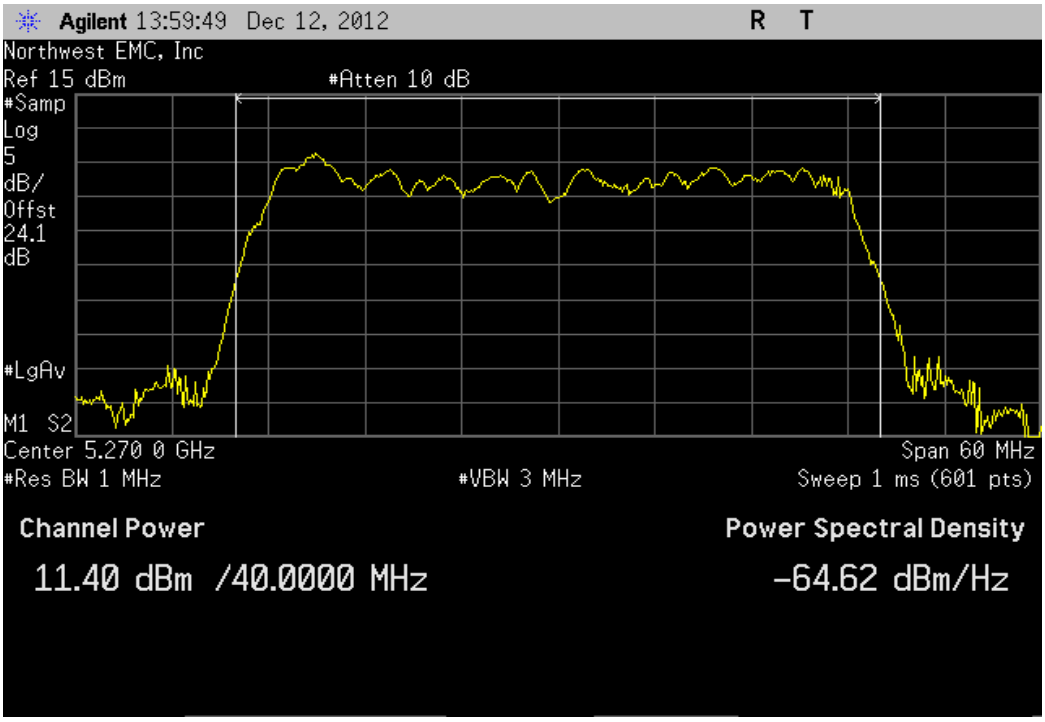


Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz							
					Value	Limit	Result
					11.65 dBm	< 17 dBm	Pass



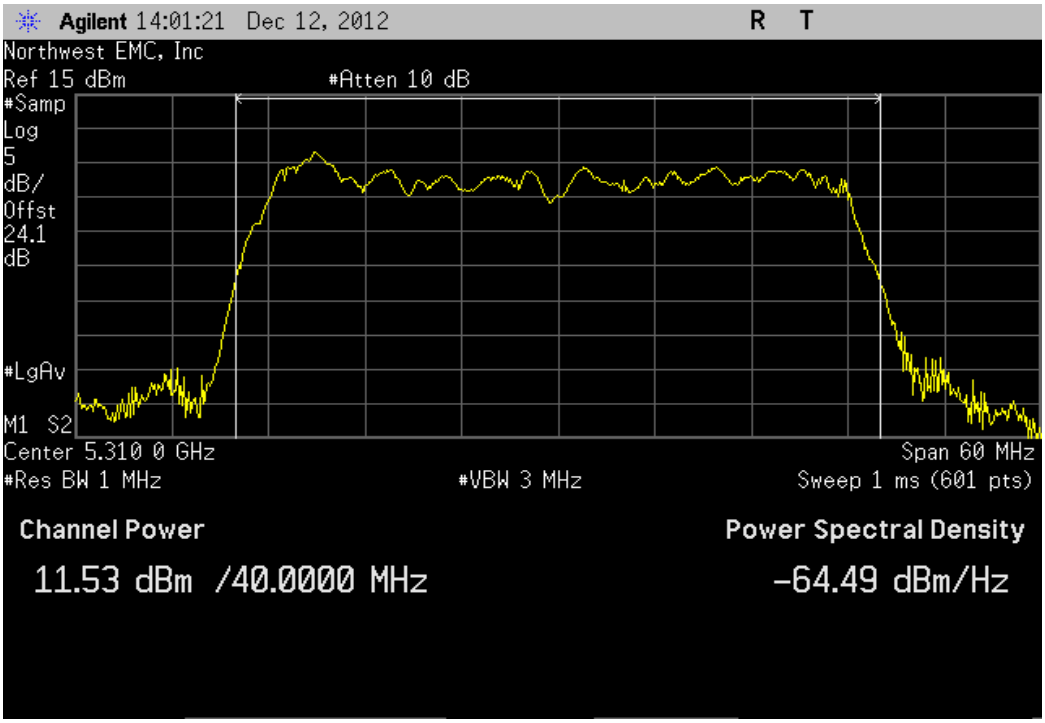
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				11.397 dBm	< 24 dBm	Pass

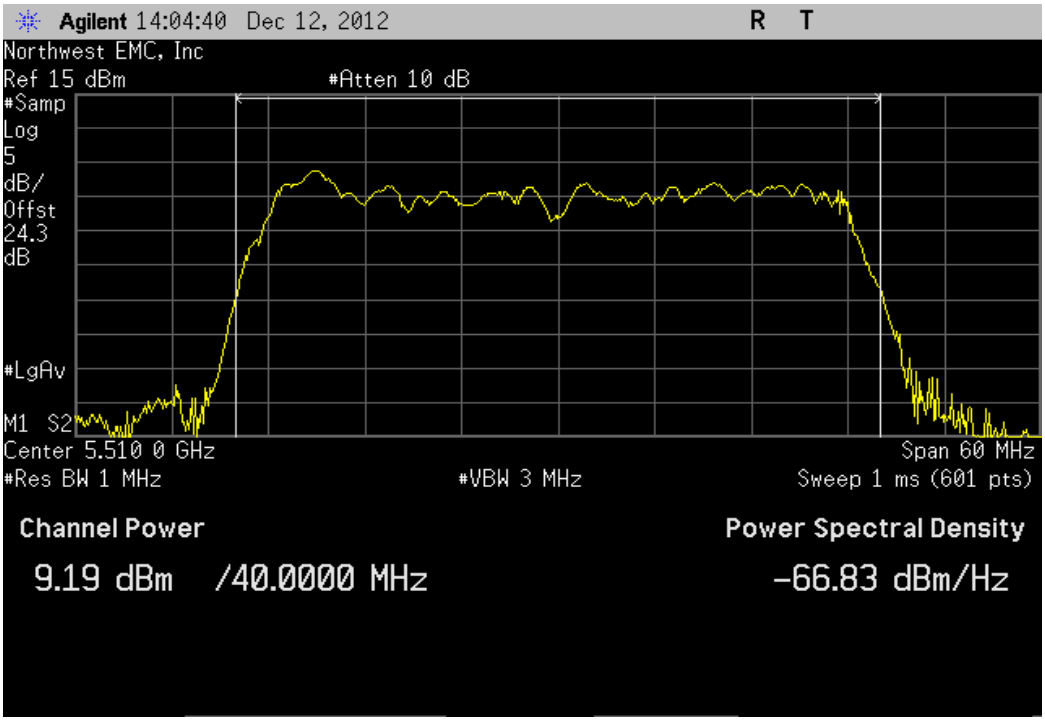


Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

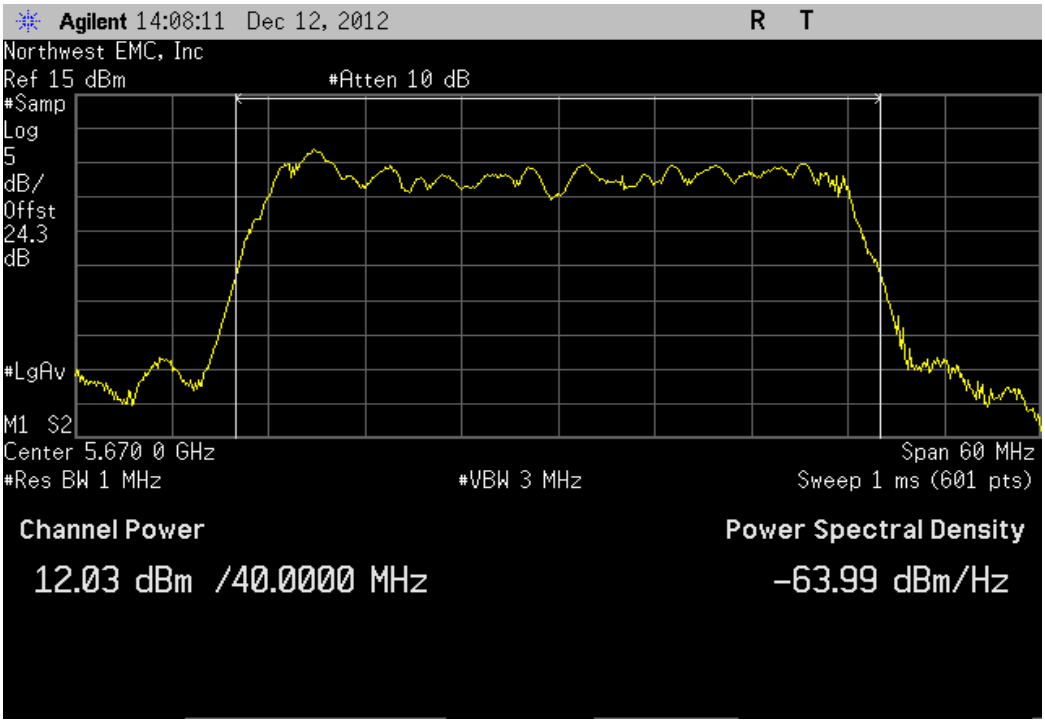
				Value	Limit	Result
				11.529 dBm	< 24 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz							
					Value	Limit	Result
					9.191 dBm	< 24 dBm	Pass

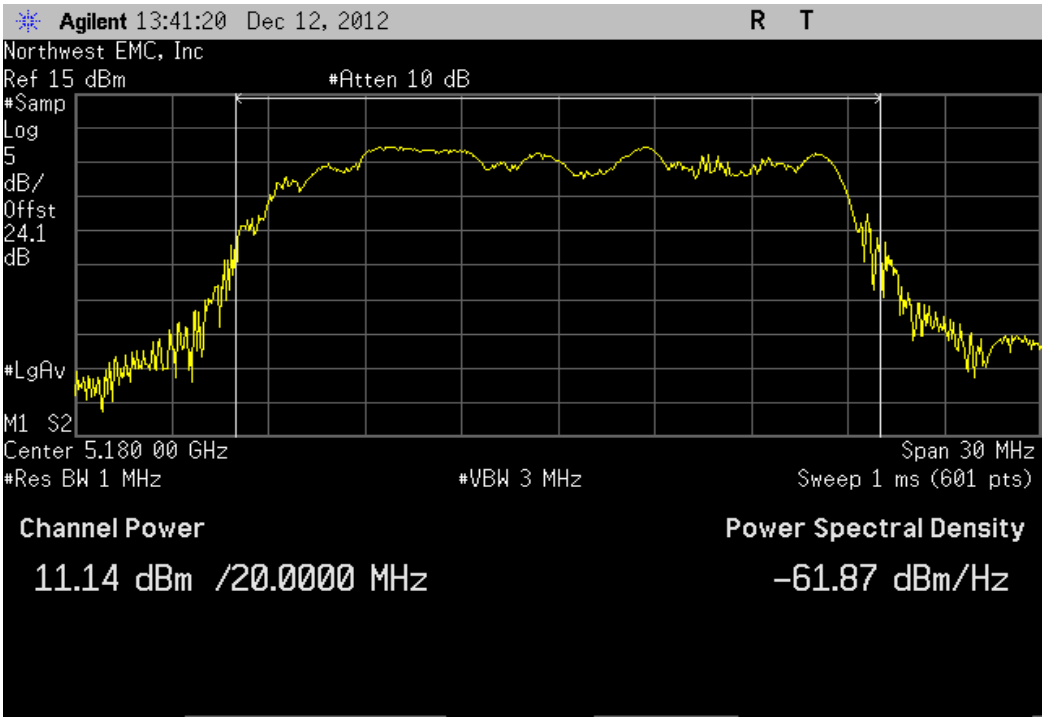


Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz							
					Value	Limit	Result
					12.029 dBm	< 24 dBm	Pass



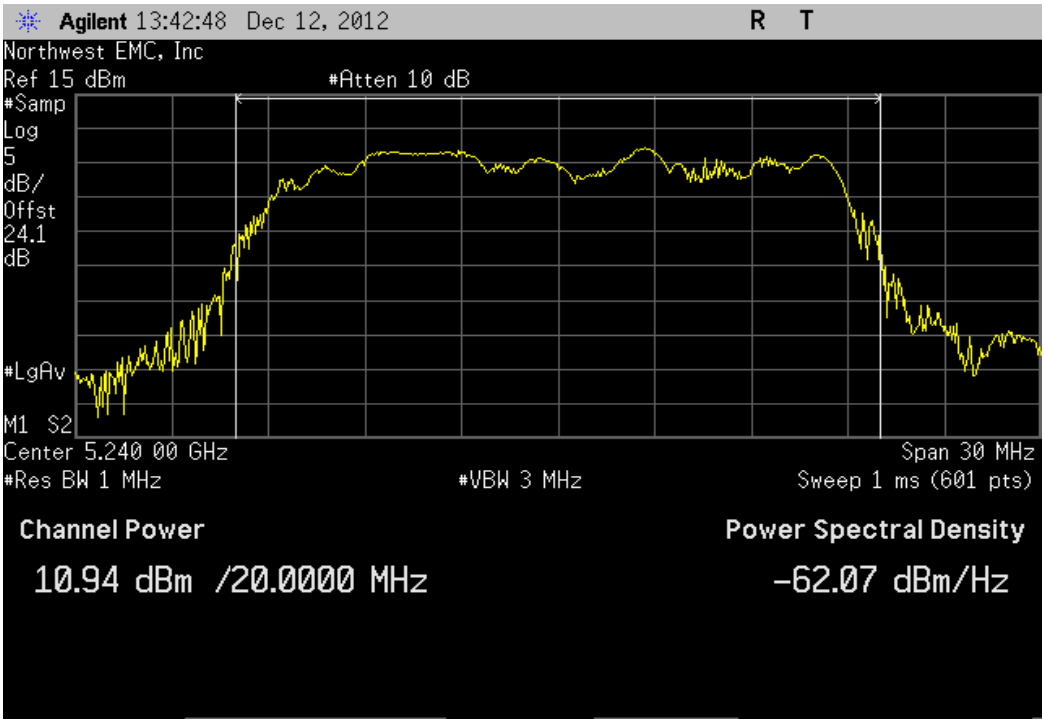
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				11.137 dBm	< 17 dBm	Pass



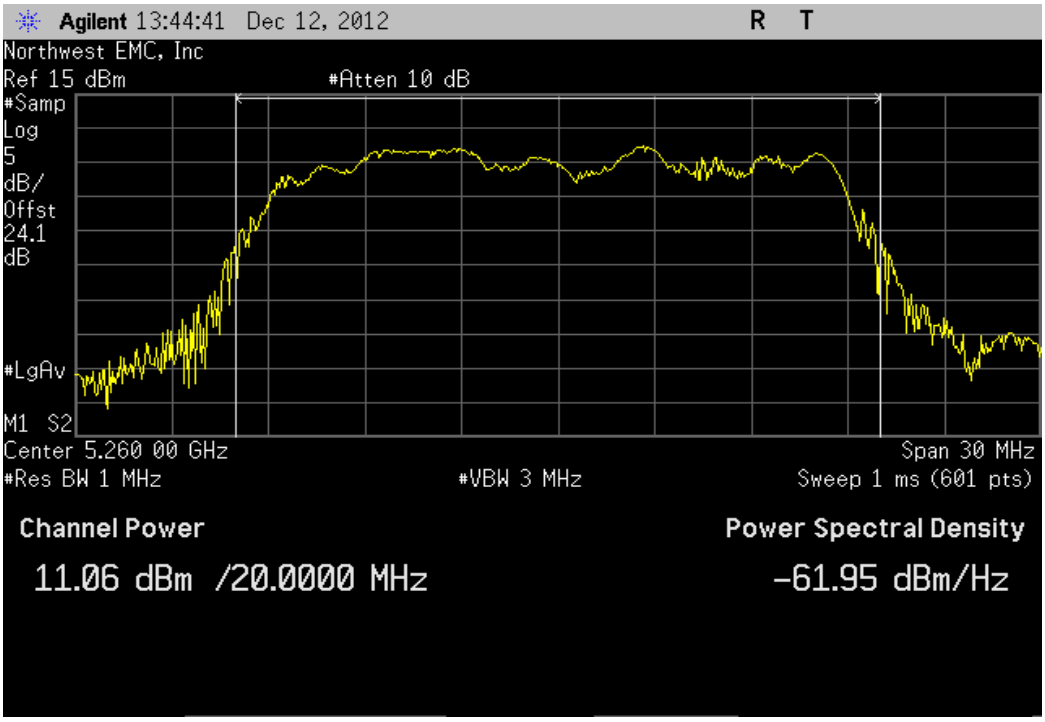
Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				10.936 dBm	< 17 dBm	Pass



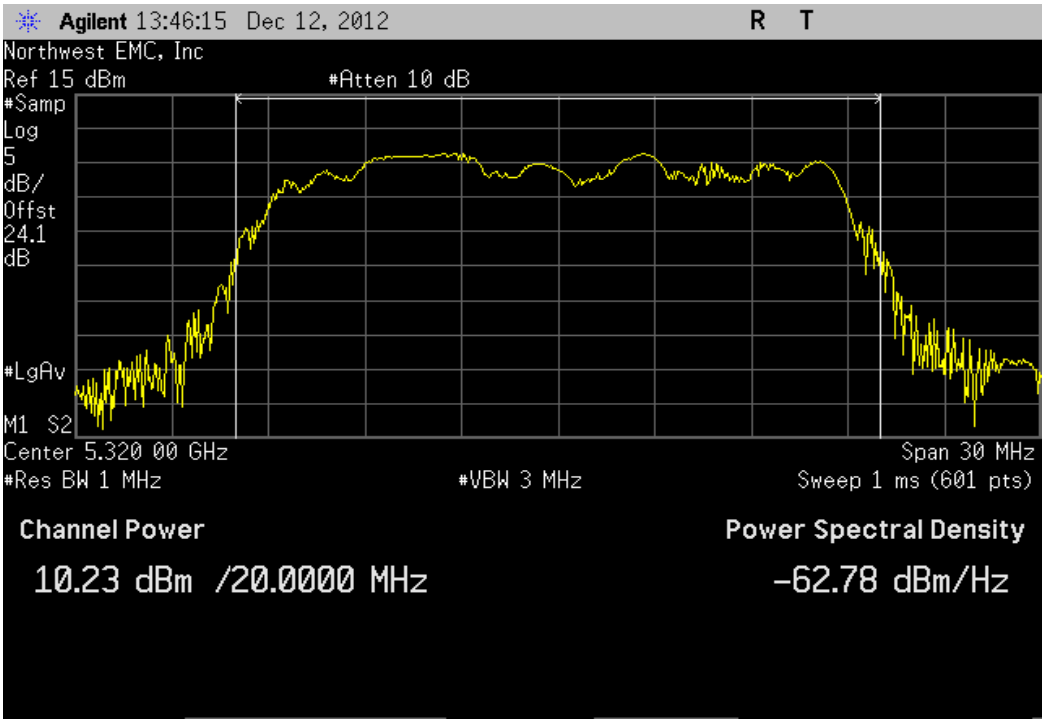
Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				11.062 dBm	< 24 dBm	Pass

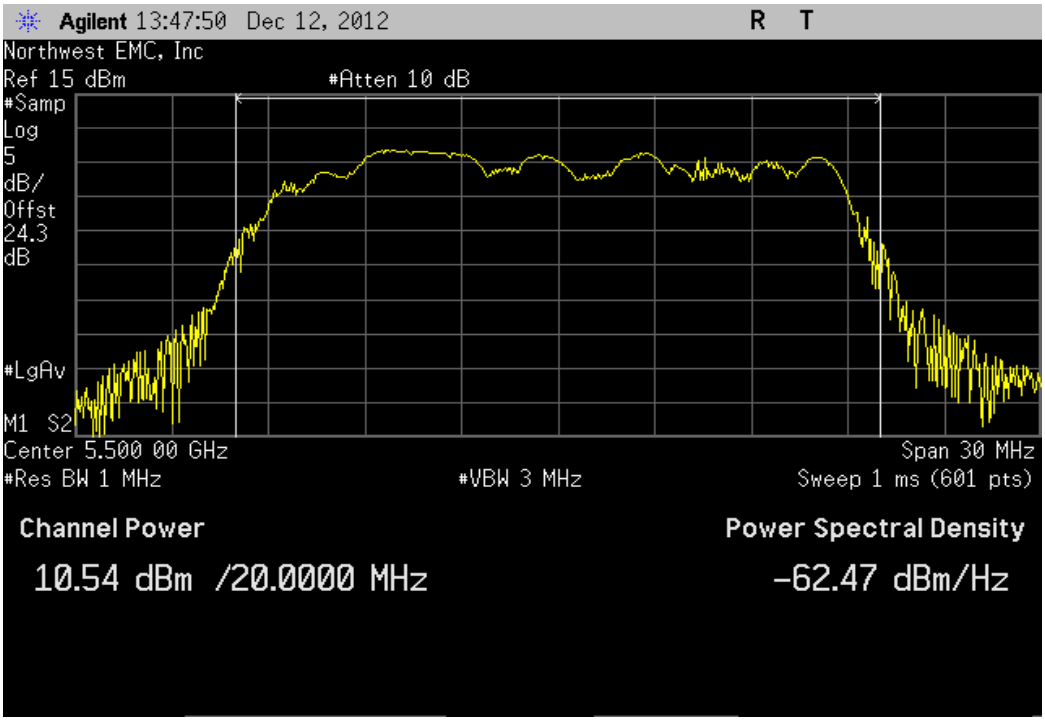


Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

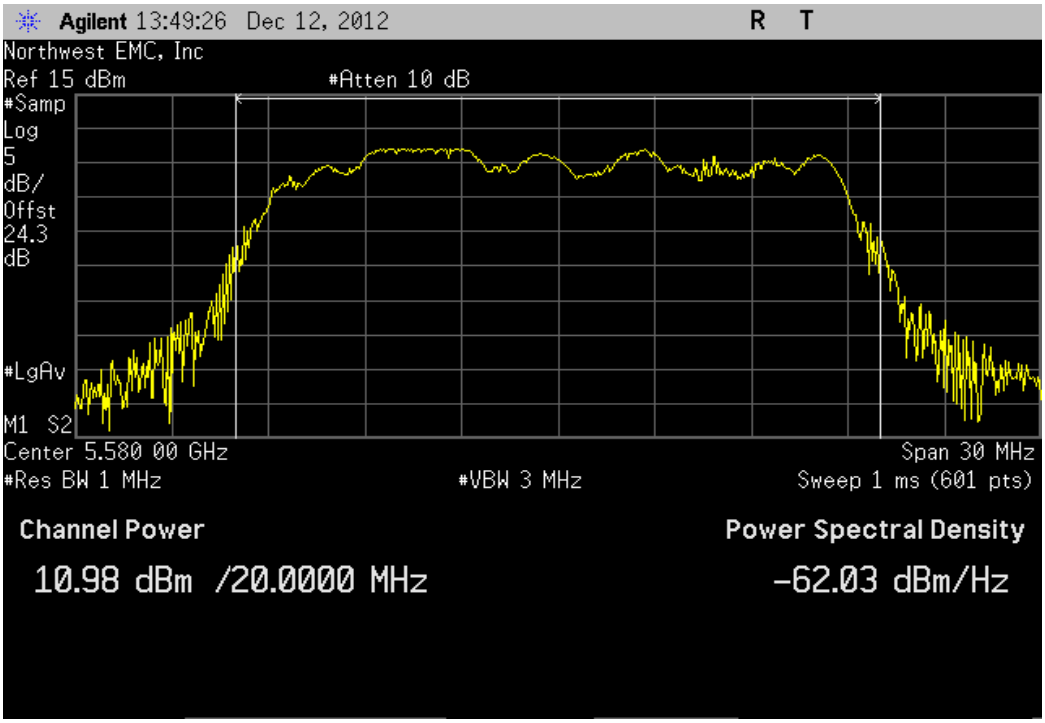
				Value	Limit	Result
				10.23 dBm	< 24 dBm	Pass



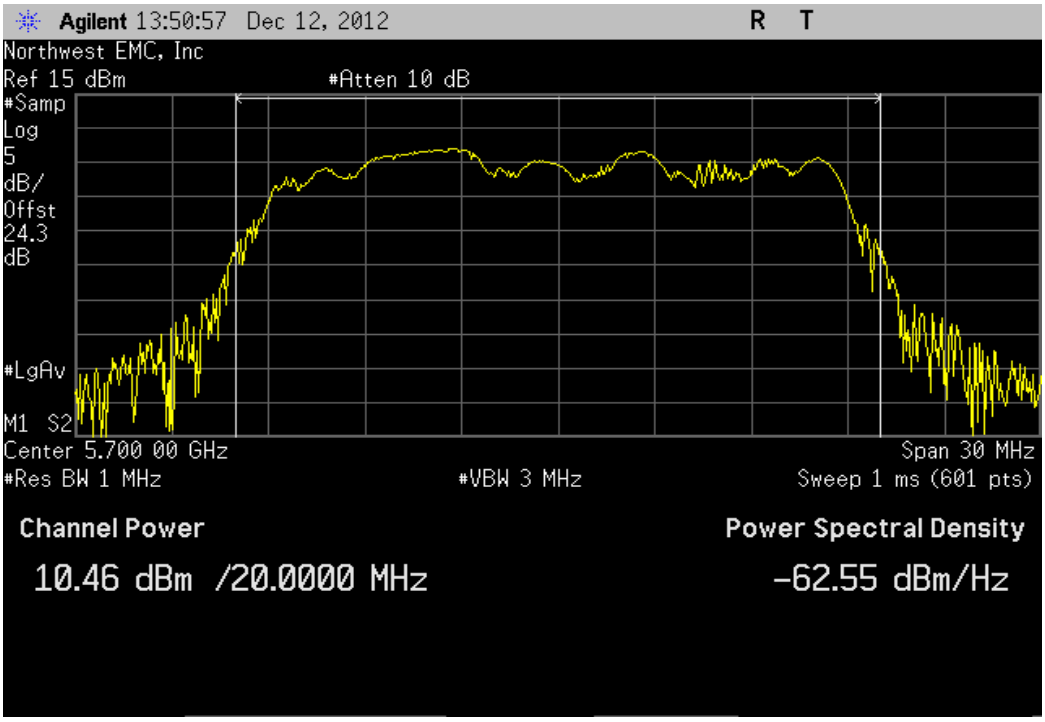
Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				10.54 dBm	< 24 dBm	Pass



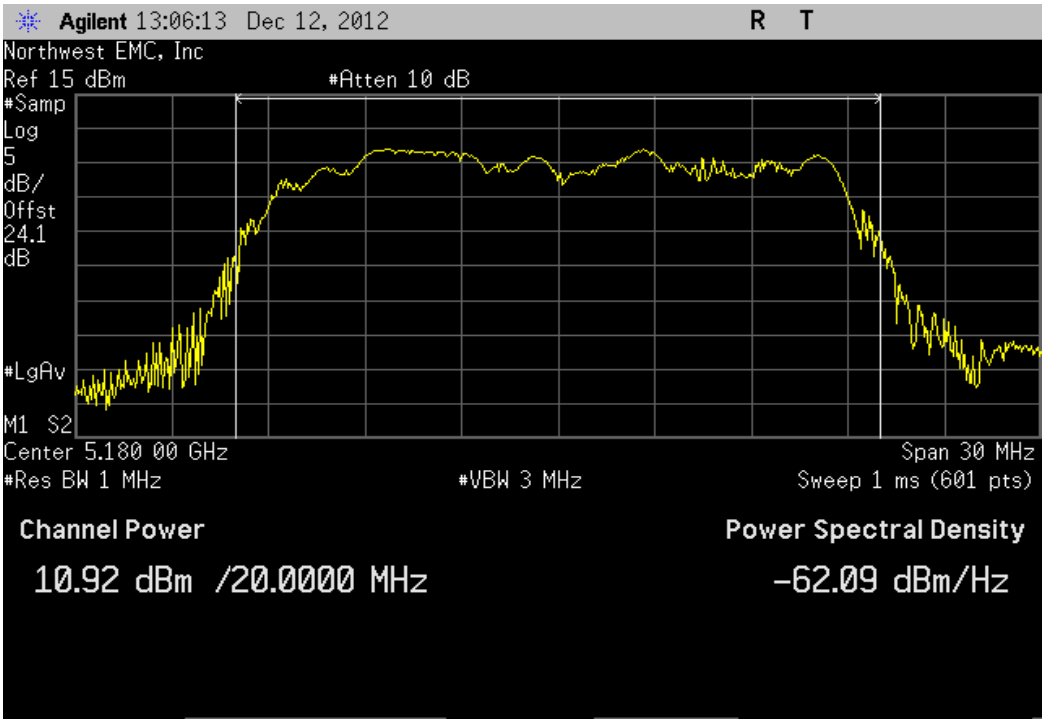
Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				10.98 dBm	< 24 dBm	Pass



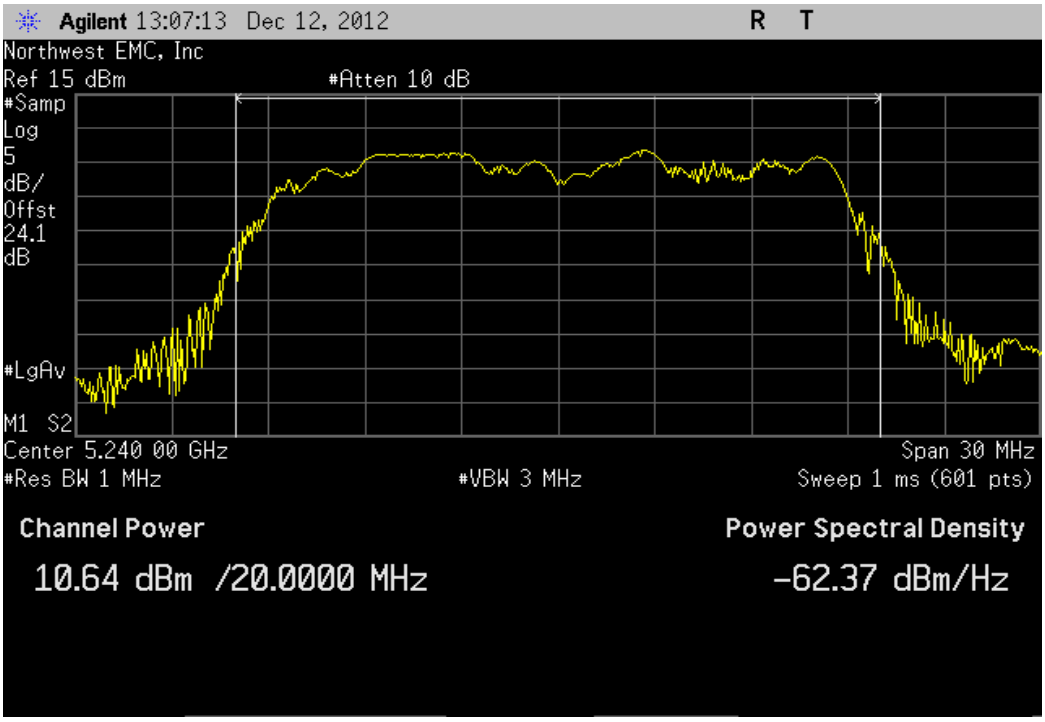
Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				10.459 dBm	< 24 dBm	Pass



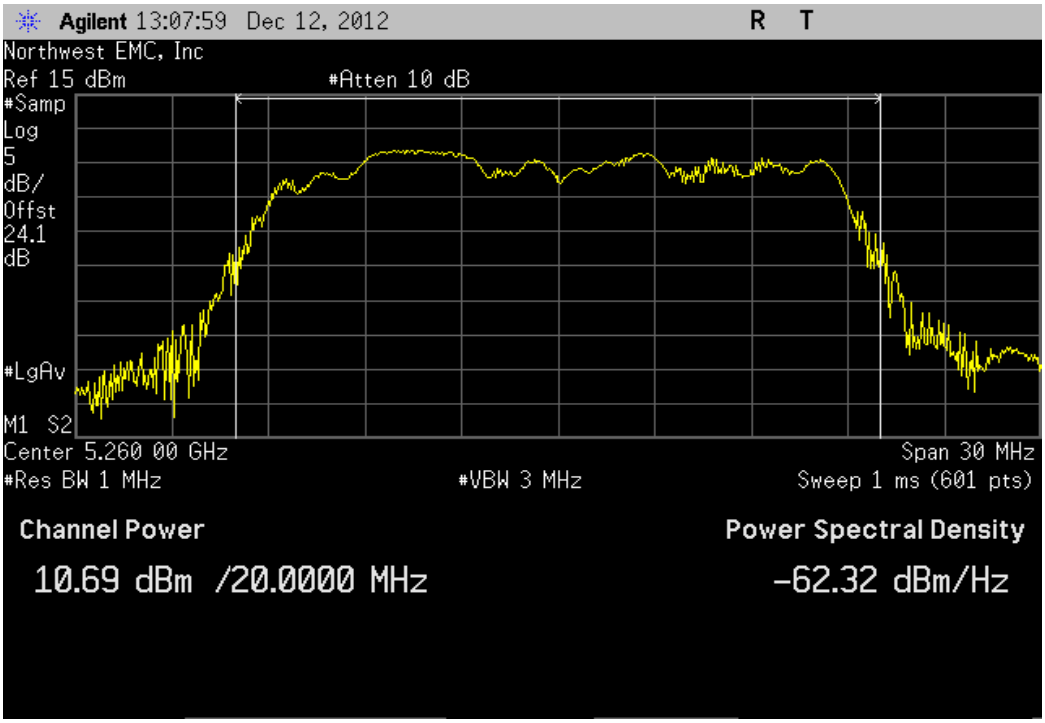
Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				10.919 dBm	< 17 dBm	Pass



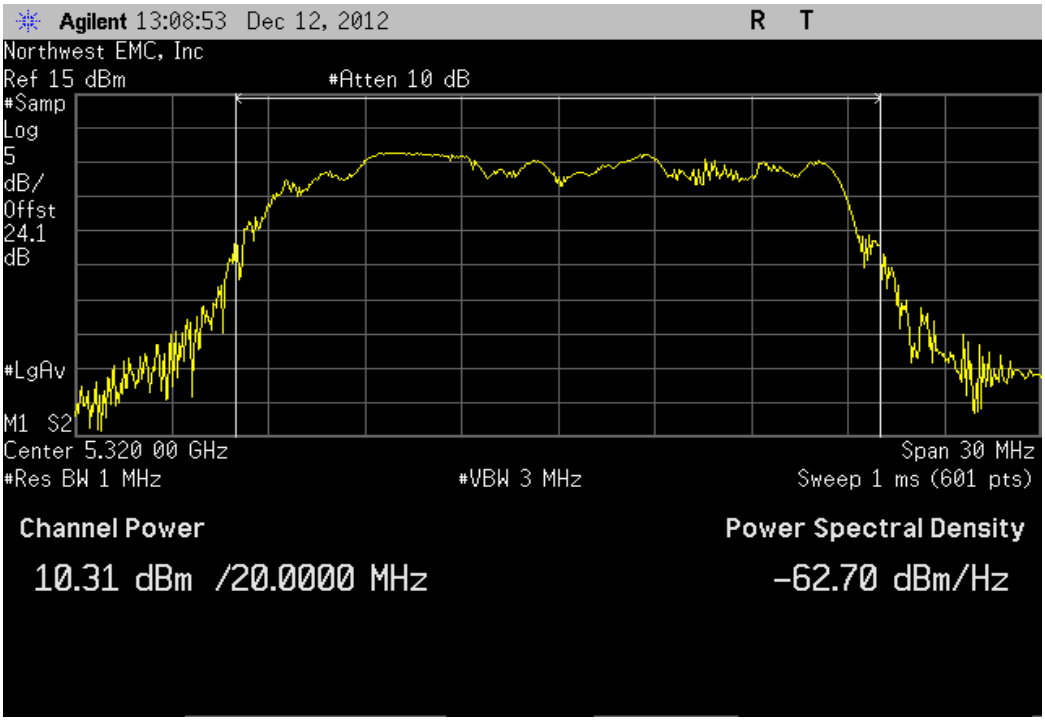
Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz							
					Value	Limit	Result
					10.643 dBm	< 17 dBm	Pass



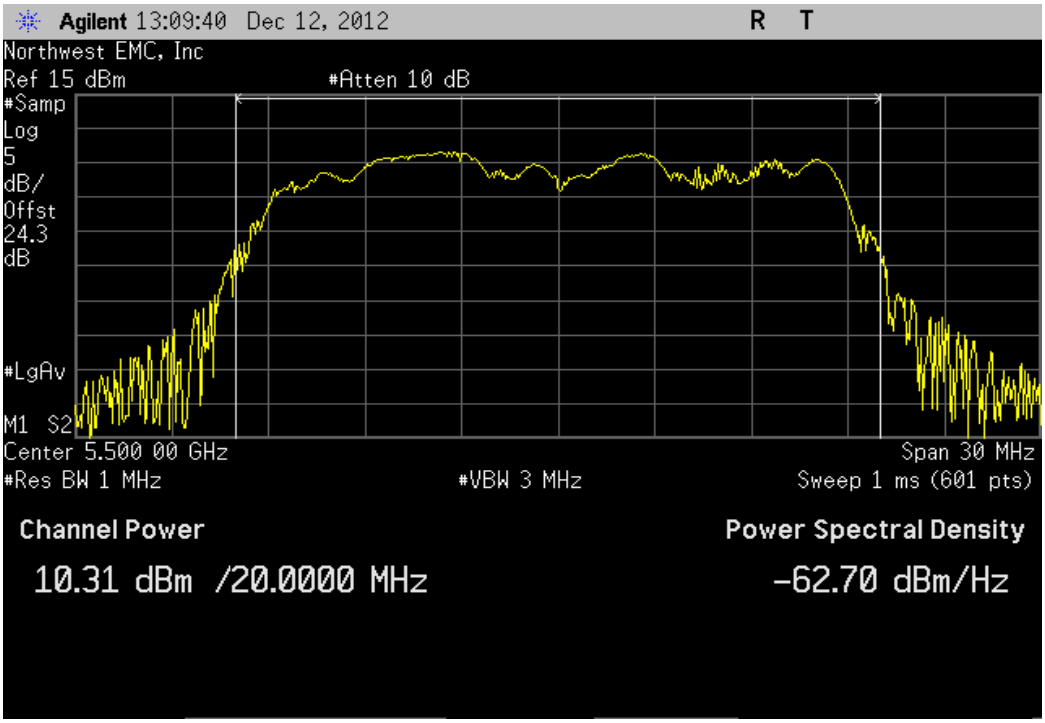
Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz							
					Value	Limit	Result
					10.692 dBm	< 24 dBm	Pass



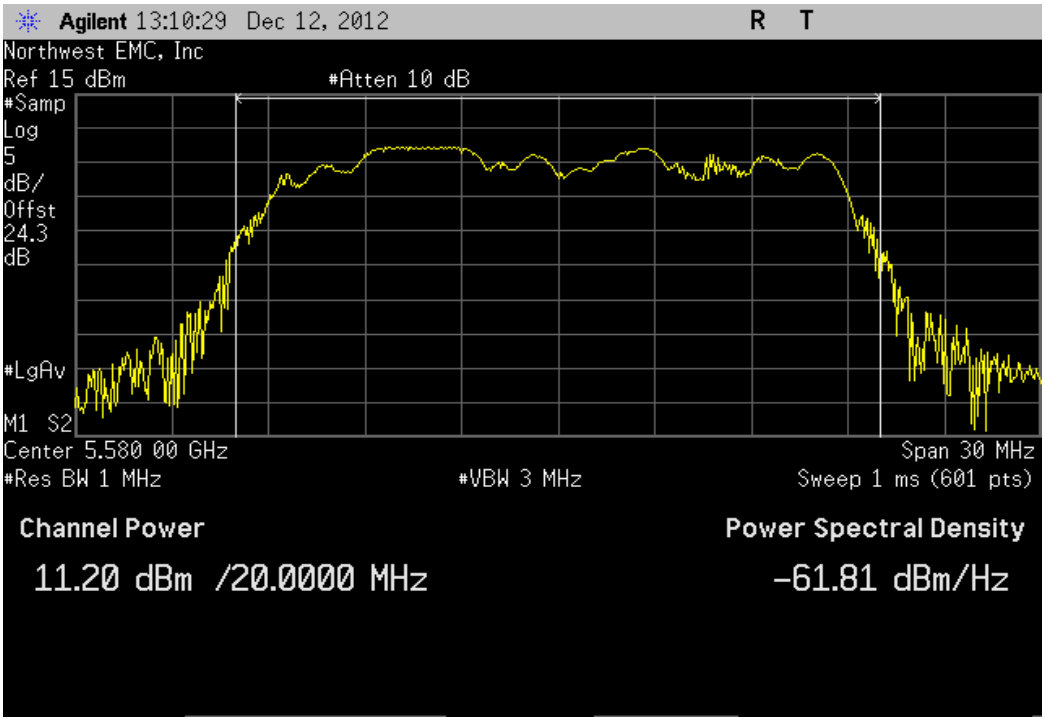
Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				10.308 dBm	< 24 dBm	Pass



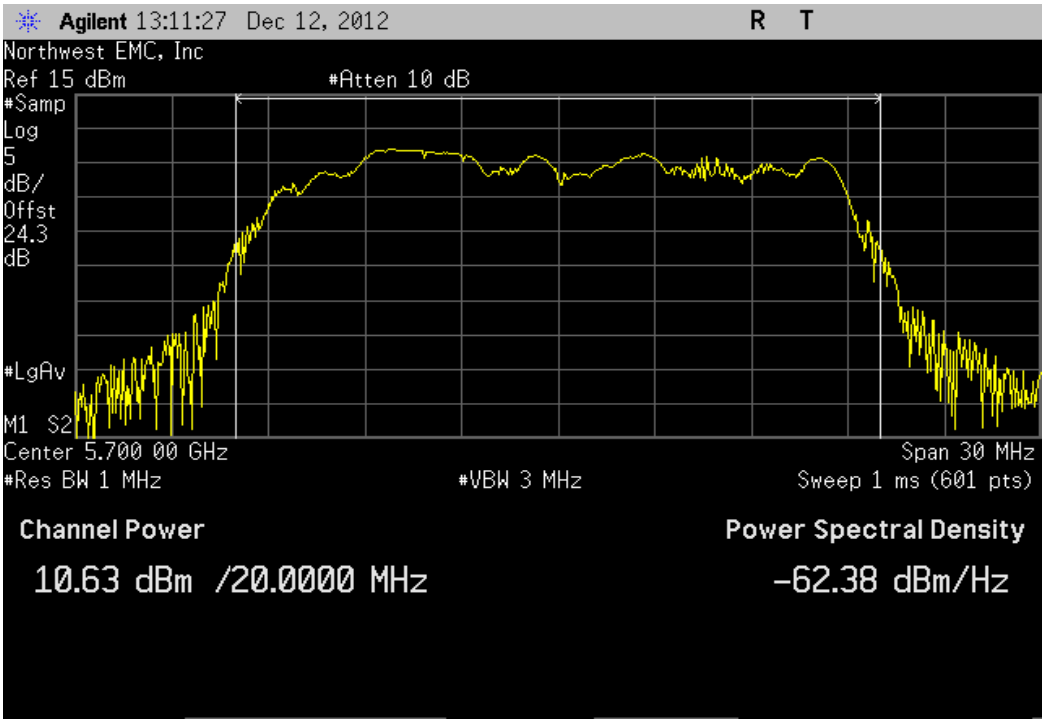
Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				10.313 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				11.195 dBm	< 24 dBm	Pass

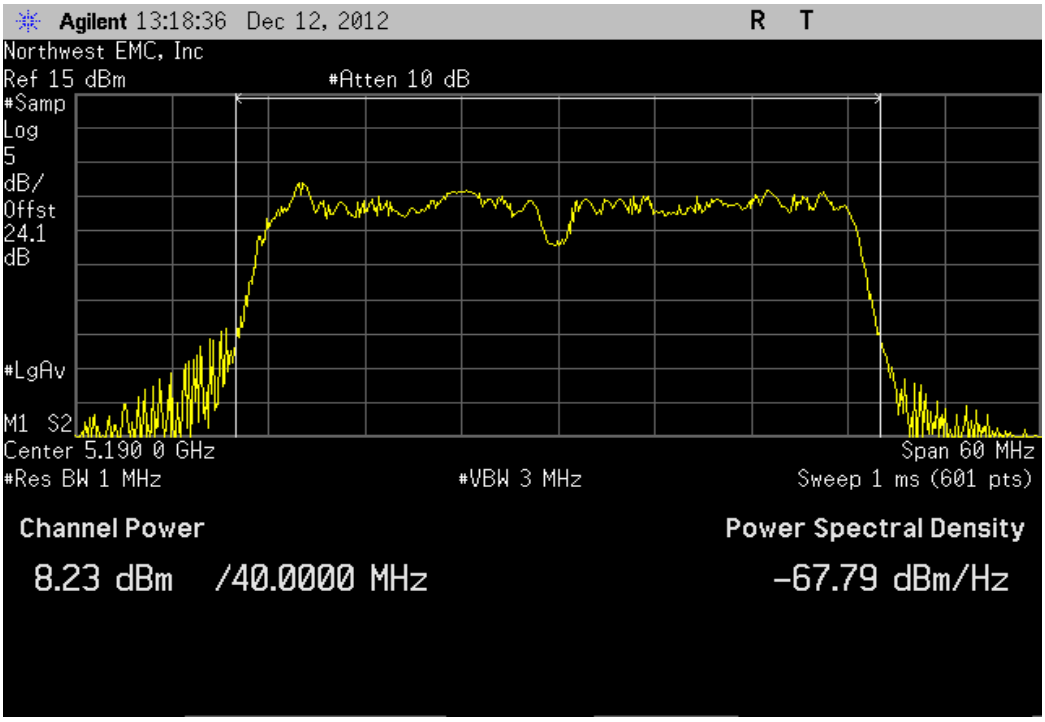


Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				10.634 dBm	< 24 dBm	Pass



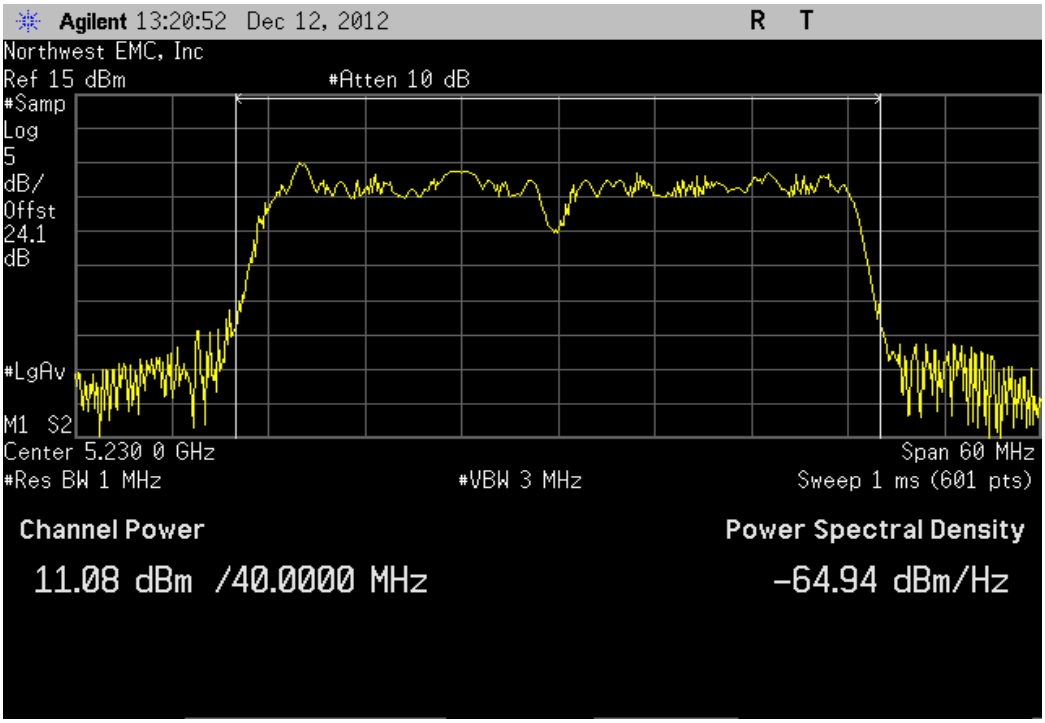
Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				8.234 dBm	< 17 dBm	Pass



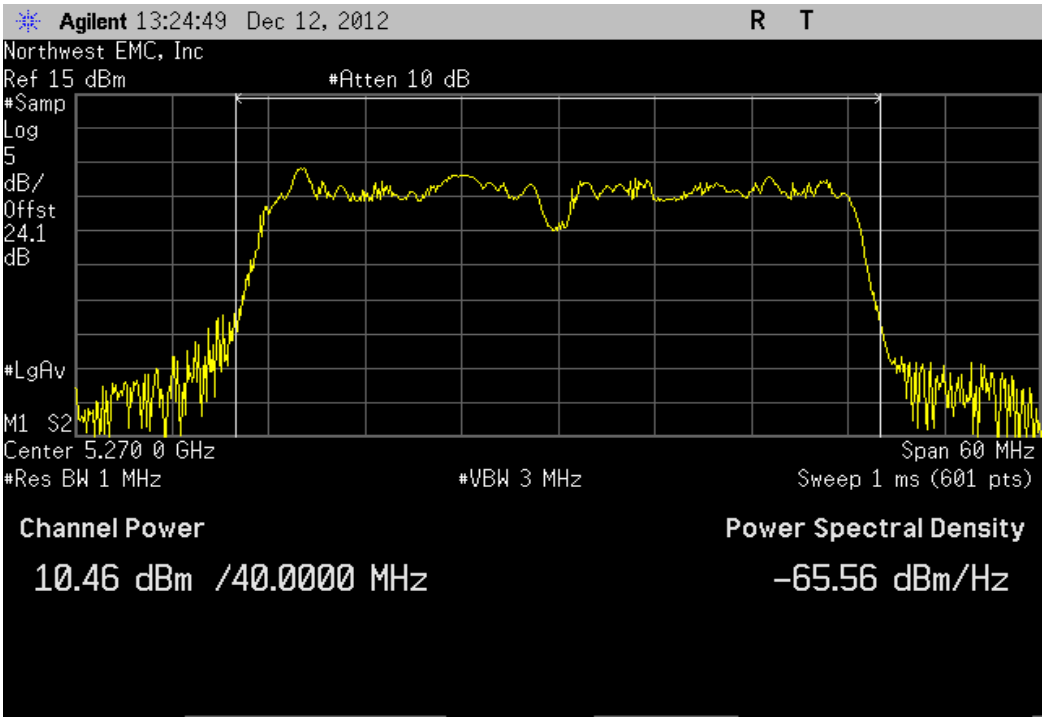
Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				11.076 dBm	< 17 dBm	Pass



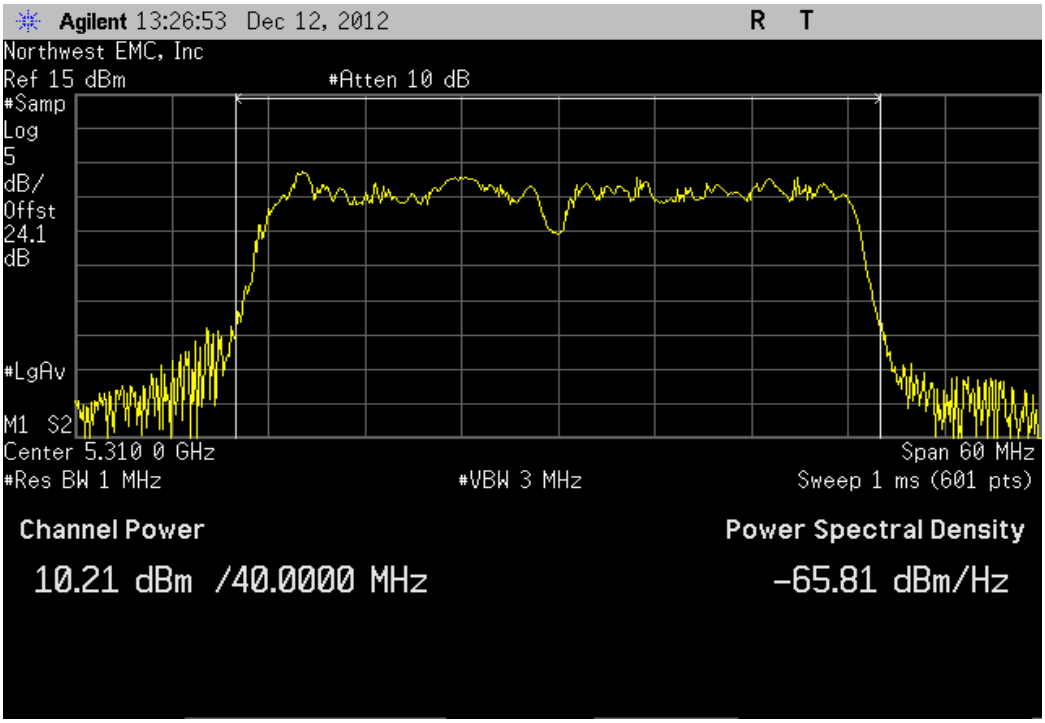
Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				10.464 dBm	< 24 dBm	Pass



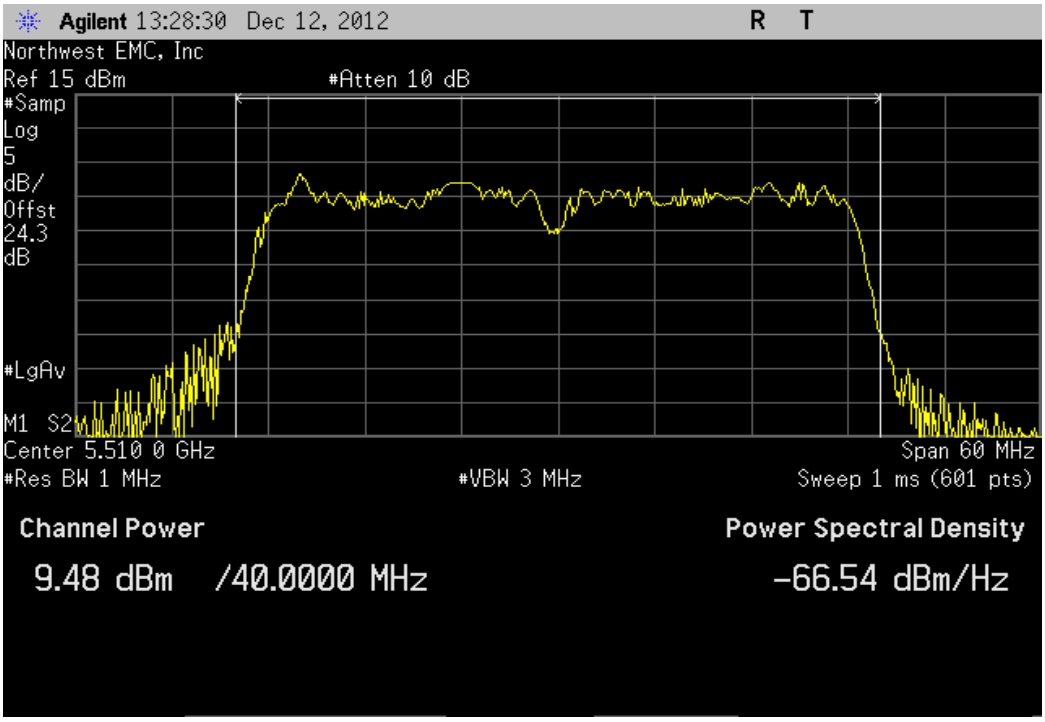
Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				10.21 dBm	< 24 dBm	Pass



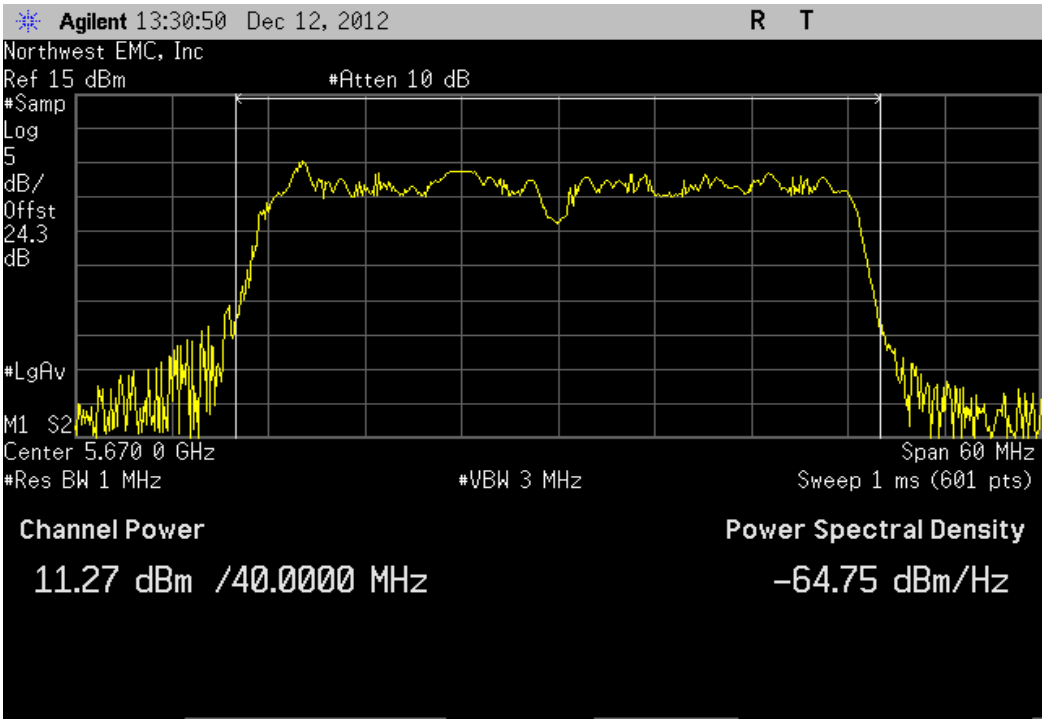
Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				9.479 dBm	< 24 dBm	Pass



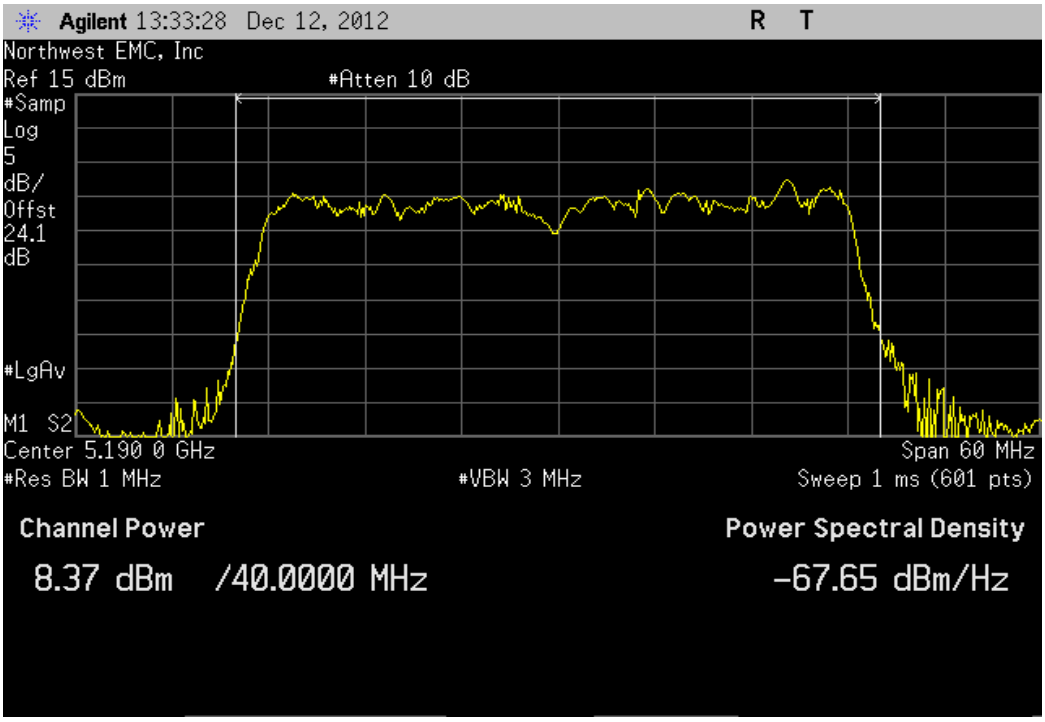
Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				11.272 dBm	< 24 dBm	Pass



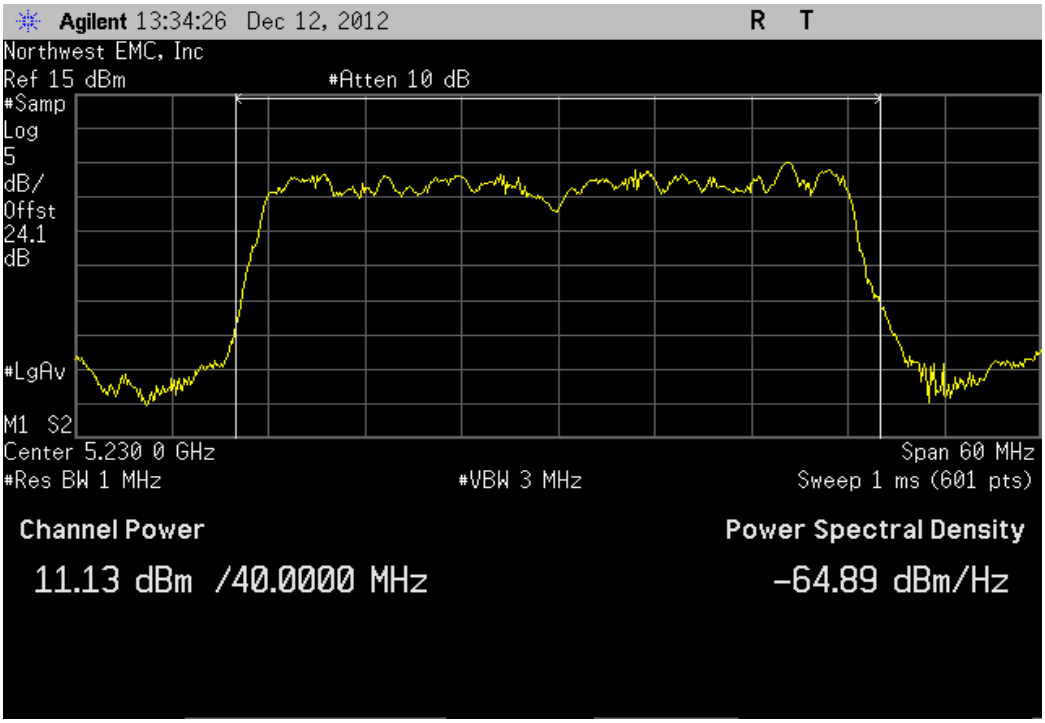
Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				8.373 dBm	< 17 dBm	Pass

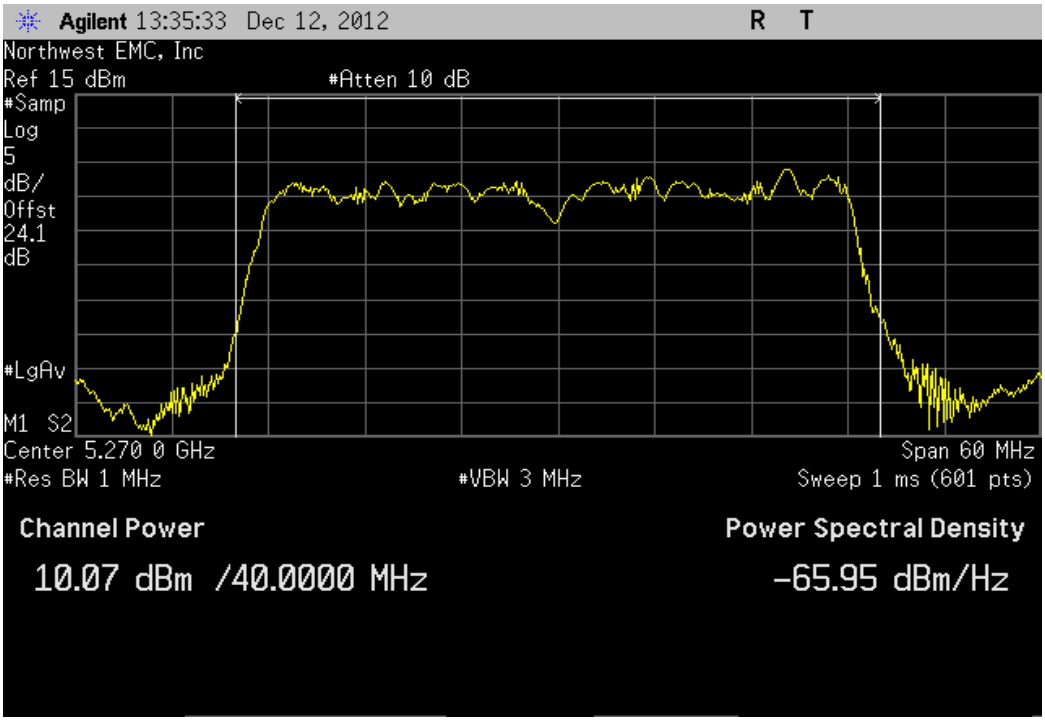


Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

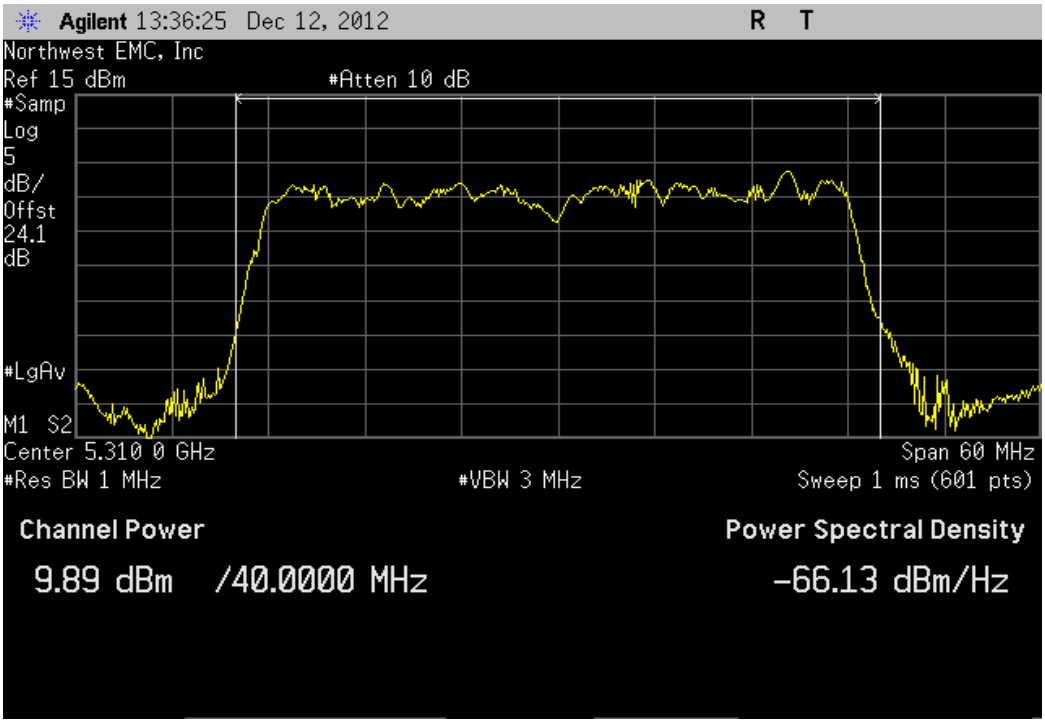
				Value	Limit	Result
				11.132 dBm	< 17 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz							
					Value	Limit	Result
					10.069 dBm	< 24 dBm	Pass

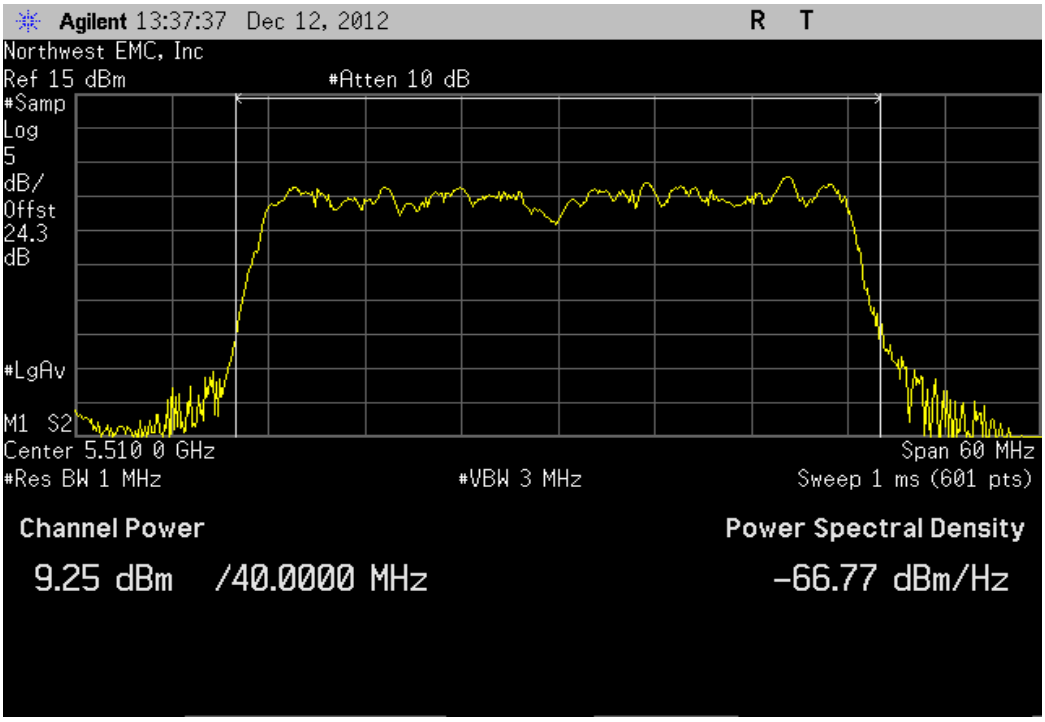


Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz							
					Value	Limit	Result
					9.889 dBm	< 24 dBm	Pass



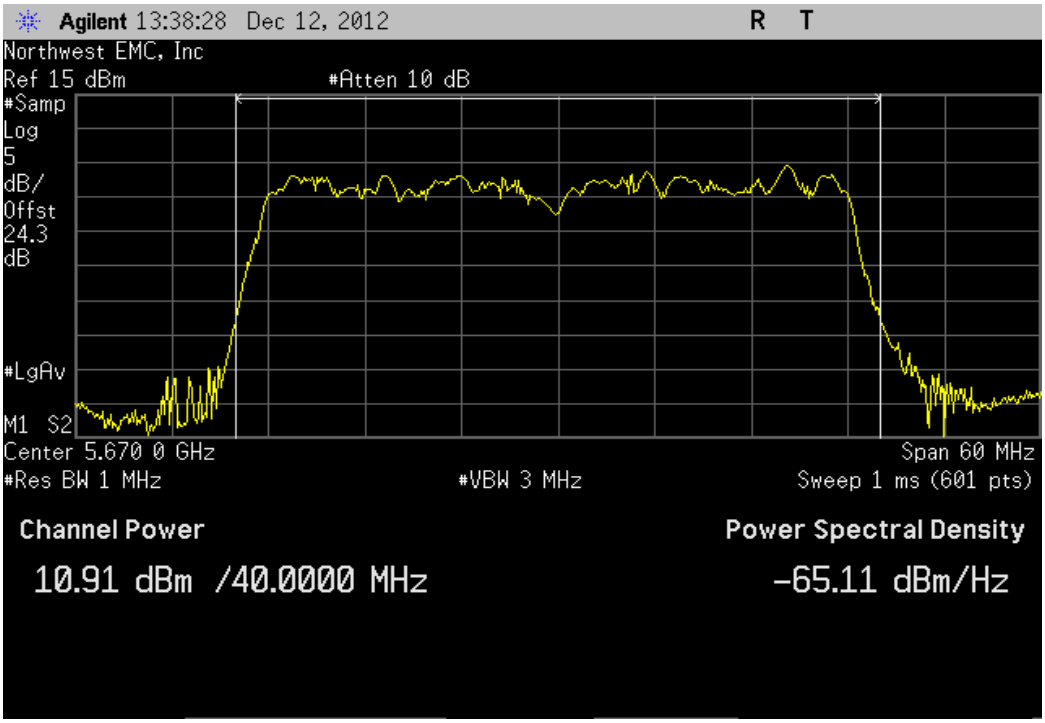
Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				9.254 dBm	< 24 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				10.913 dBm	< 24 dBm	Pass



Peak Power Spectral Density

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW ≥ 3 MHz
- Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT is operating on antenna port A only.

Peak Power Spectral Density

EUT:	1514			**Work Order:**	MCSO1638
Serial Number:	000109423753			**Date:**	12/12/12
Customer:	Microsoft Corporation			**Temperature:**	22°C
Attendees:	None			**Humidity:**	35%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Brandon Hobbs Rod Peloquin	**Power:**	110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for b, g and n modes

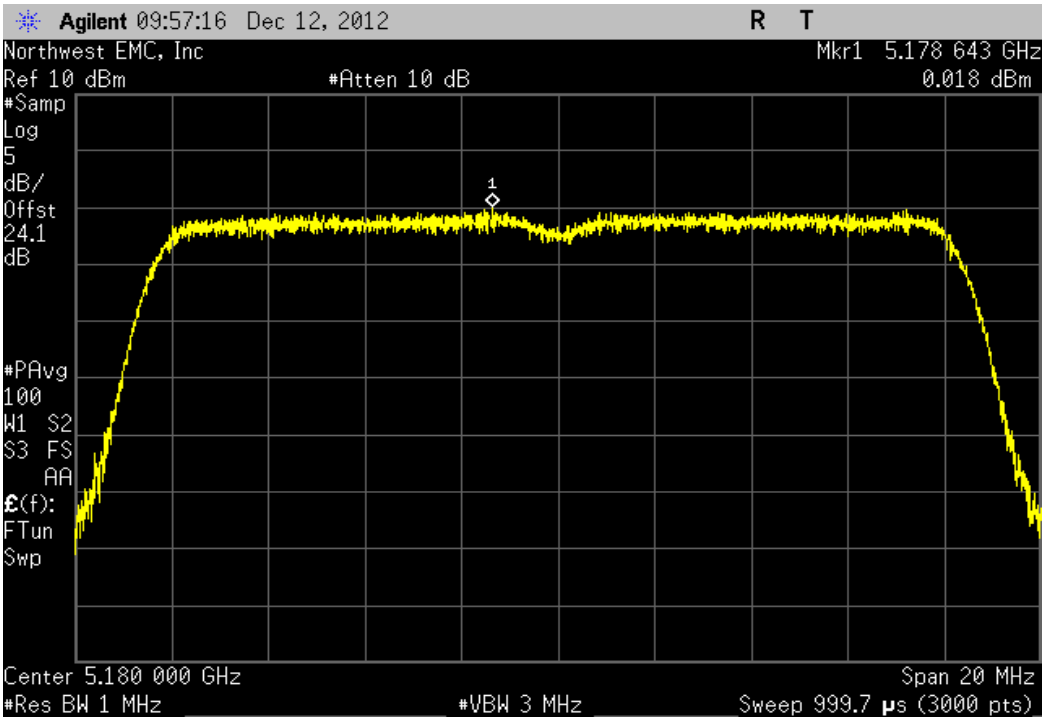
DEVIATIONS FROM TEST STANDARD

None

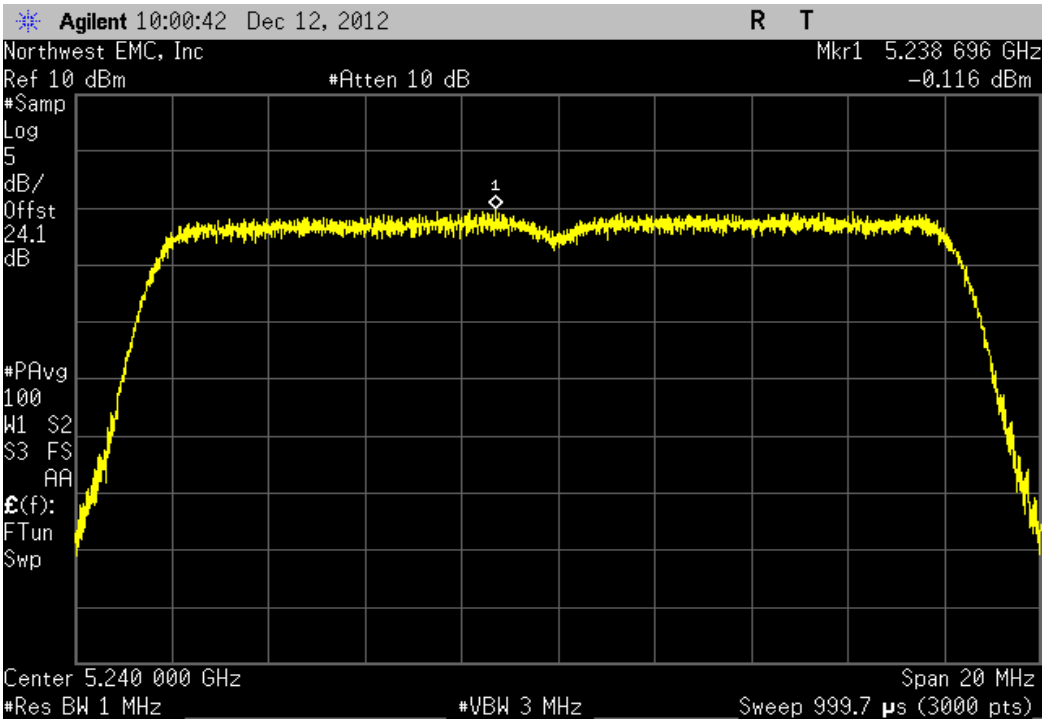
Configuration #	4	*Signature*

	Value (dBm / MHz)	Limit (dBm / MHz)	Result
20 MHz			
802.11(a) 6 Mbps			
Ch 36, Low Channel 5180 MHz	0.018	4	Pass
Ch 48, High Channel 5240 MHz	-0.116	4	Pass
Ch 52, Low Channel 5260 MHz	0.641	11	Pass
Ch 64, High Channel 5320 MHz	0.097	11	Pass
Ch 100, Low Channel 5500 MHz	0.081	11	Pass
Ch 116, Mid Channel 5580 MHz	0.489	11	Pass
Ch 140, High Channel 5700 MHz	0.489	11	Pass
802.11(n) MCS0			
Ch 36, Low Channel 5180 MHz	0.498	4	Pass
Ch 48, High Channel 5240 MHz	0.135	4	Pass
Ch 52, Low Channel 5260 MHz	0.666	11	Pass
Ch 64, High Channel 5320 MHz	0.456	11	Pass
Ch 100, Low Channel 5500 MHz	-0.066	11	Pass
Ch 116, Mid Channel 5580 MHz	0.813	11	Pass
Ch 140, High Channel 5700 MHz	0.445	11	Pass

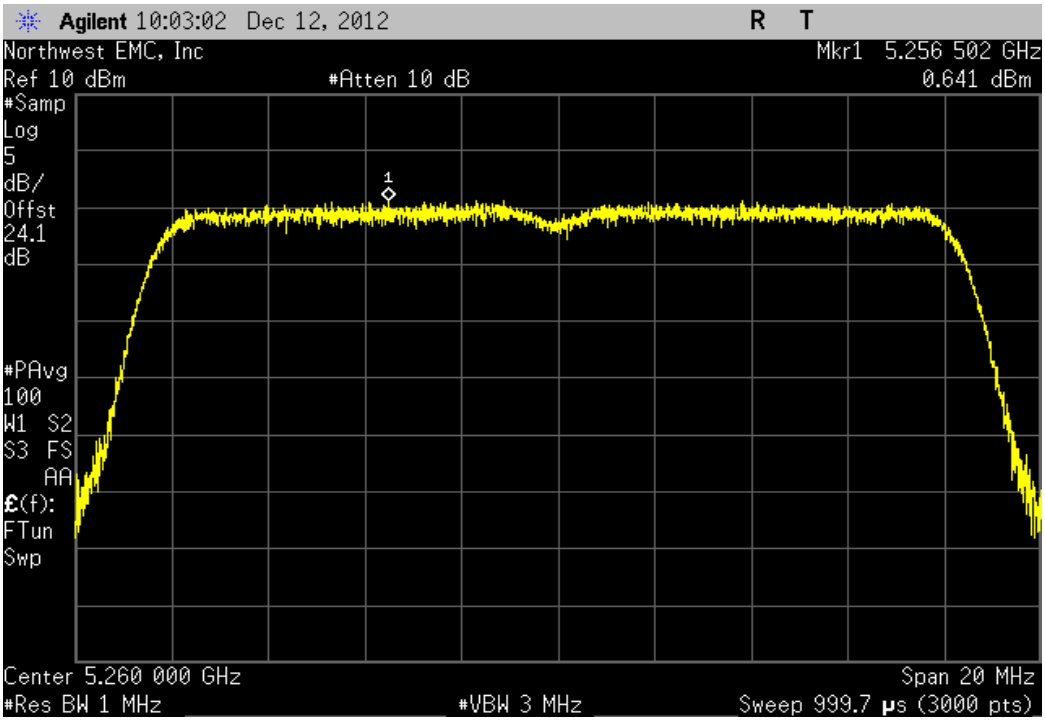
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.018	4	Pass



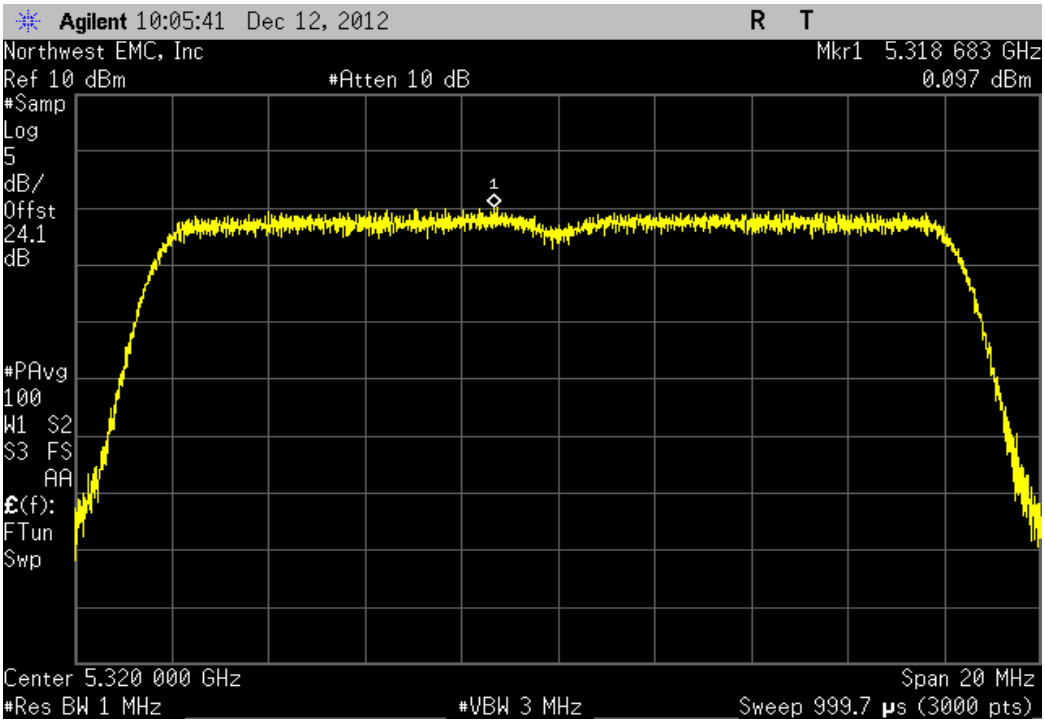
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					-0.116	4	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.641	11	Pass

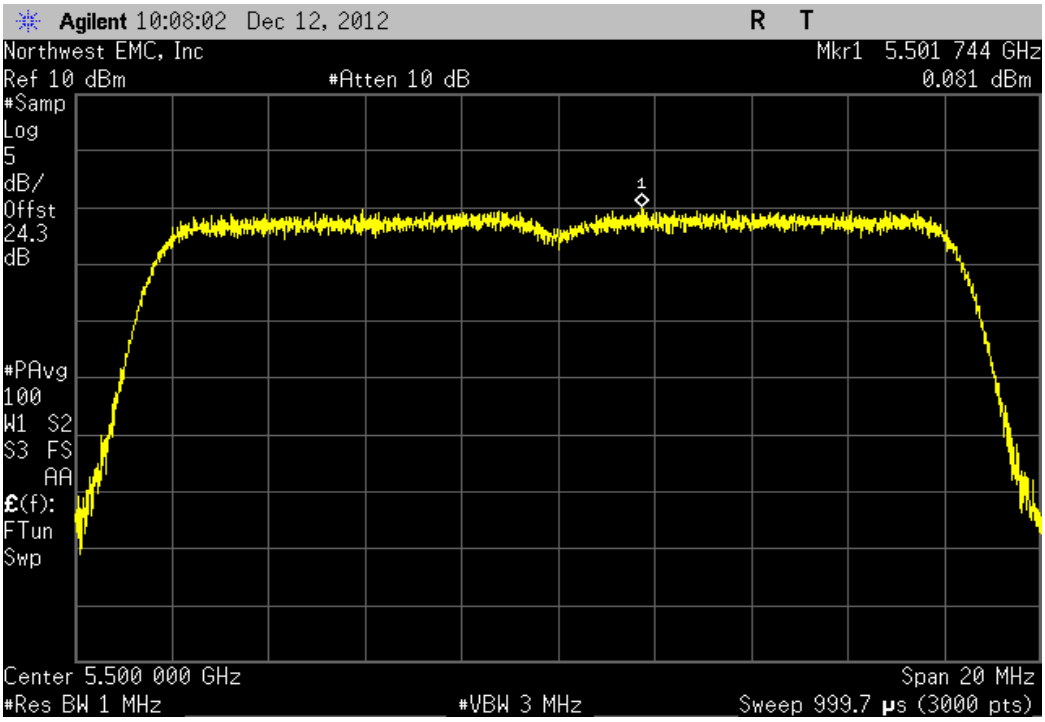


20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.097	11	Pass

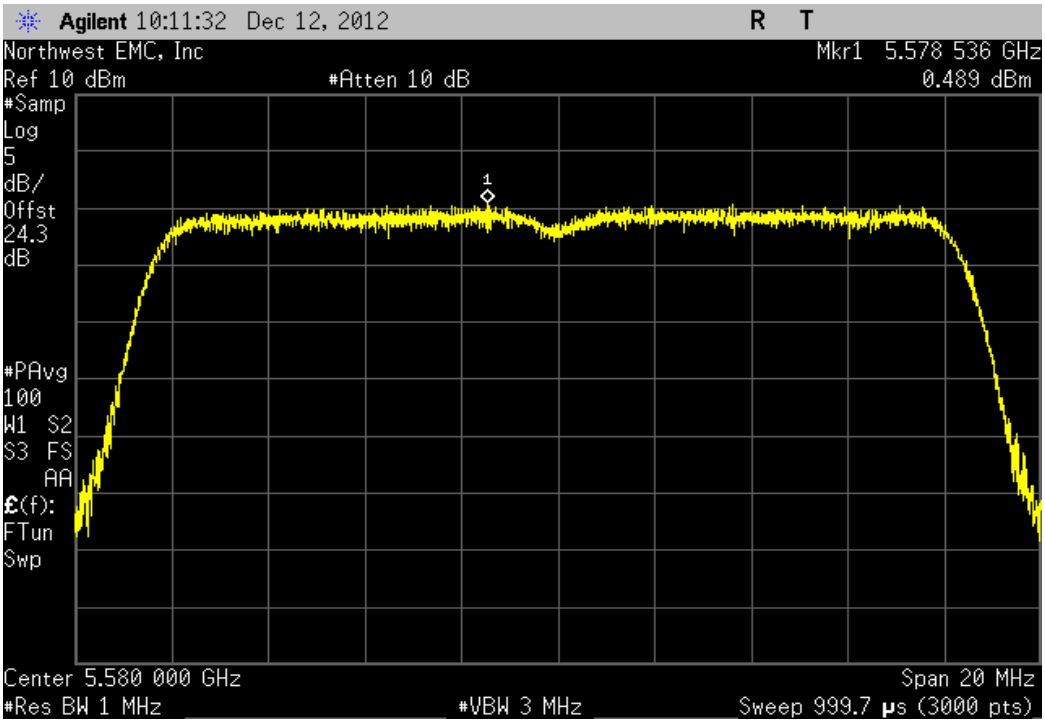


Peak Power Spectral Density

20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.081	11	Pass

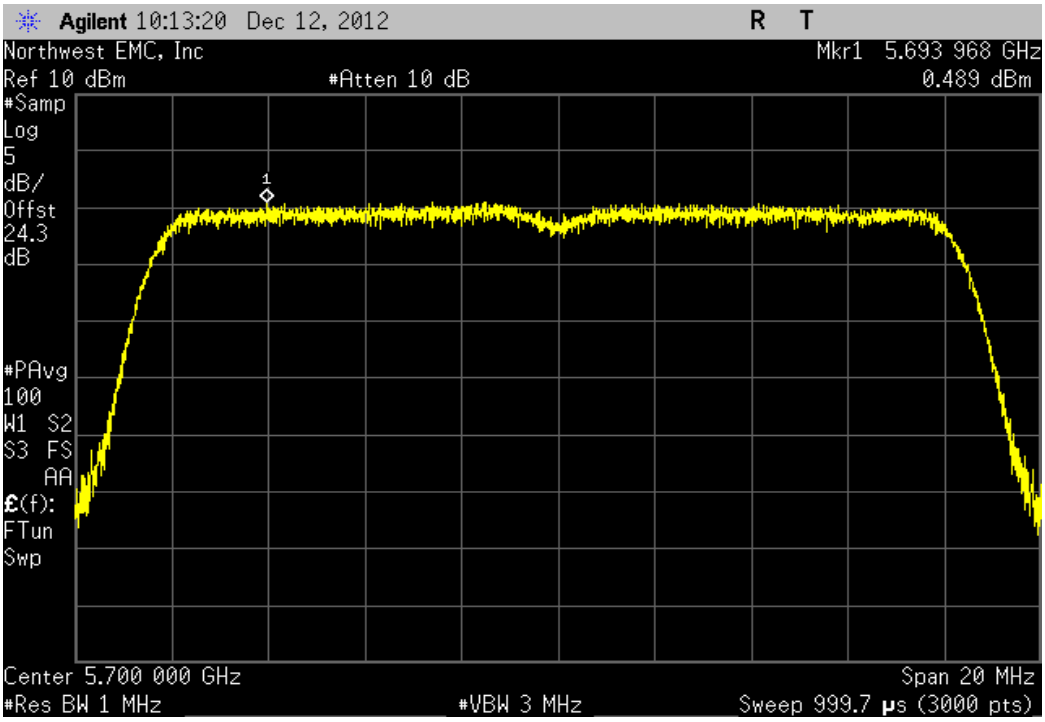


20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.489	11	Pass

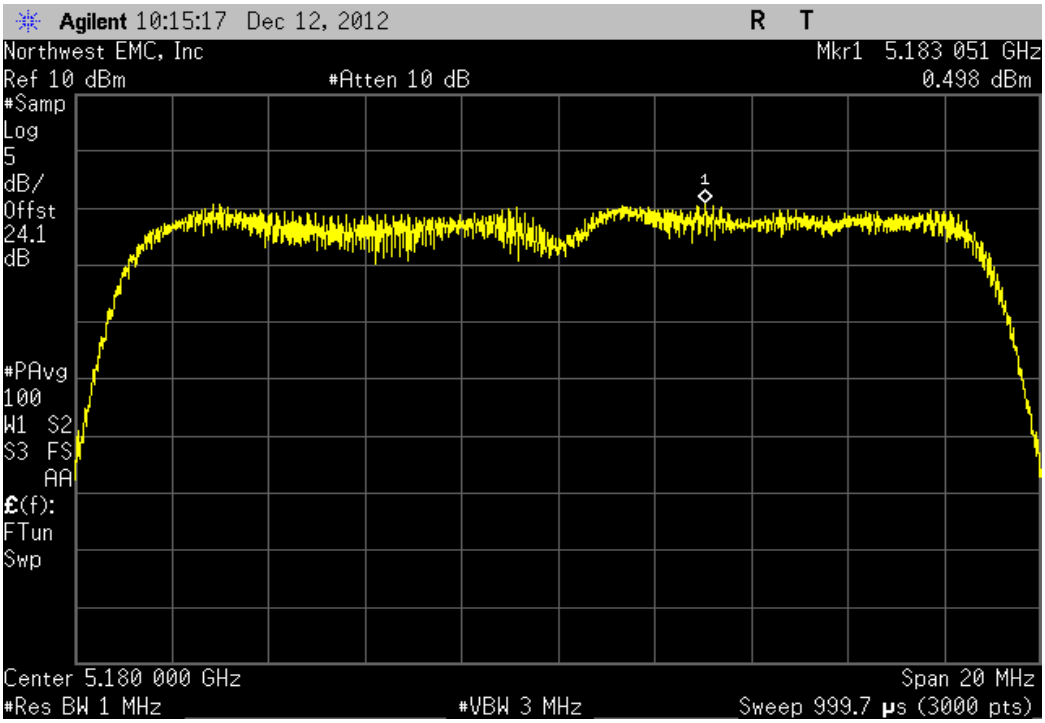


Peak Power Spectral Density

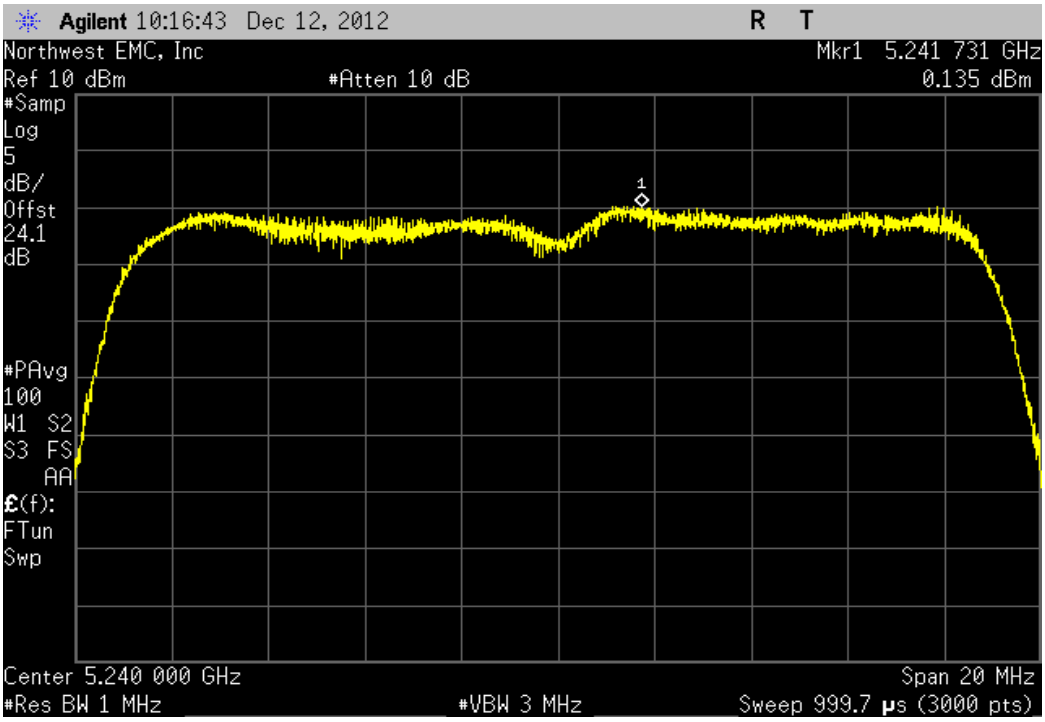
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.489	11	Pass



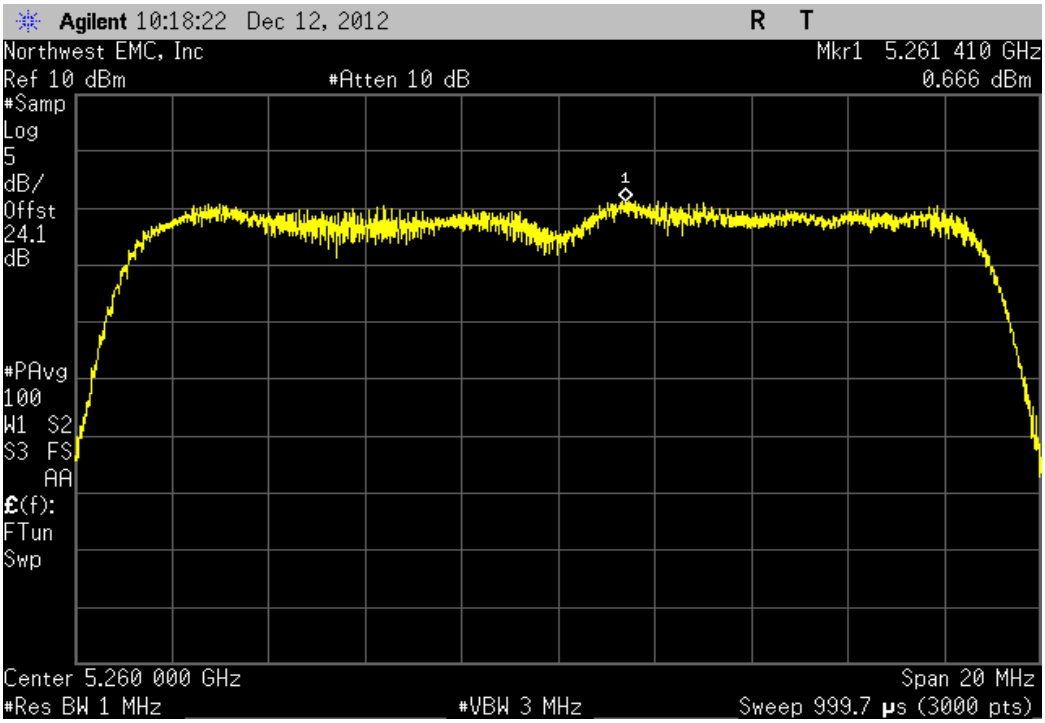
20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.498	4	Pass



20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.135	4	Pass

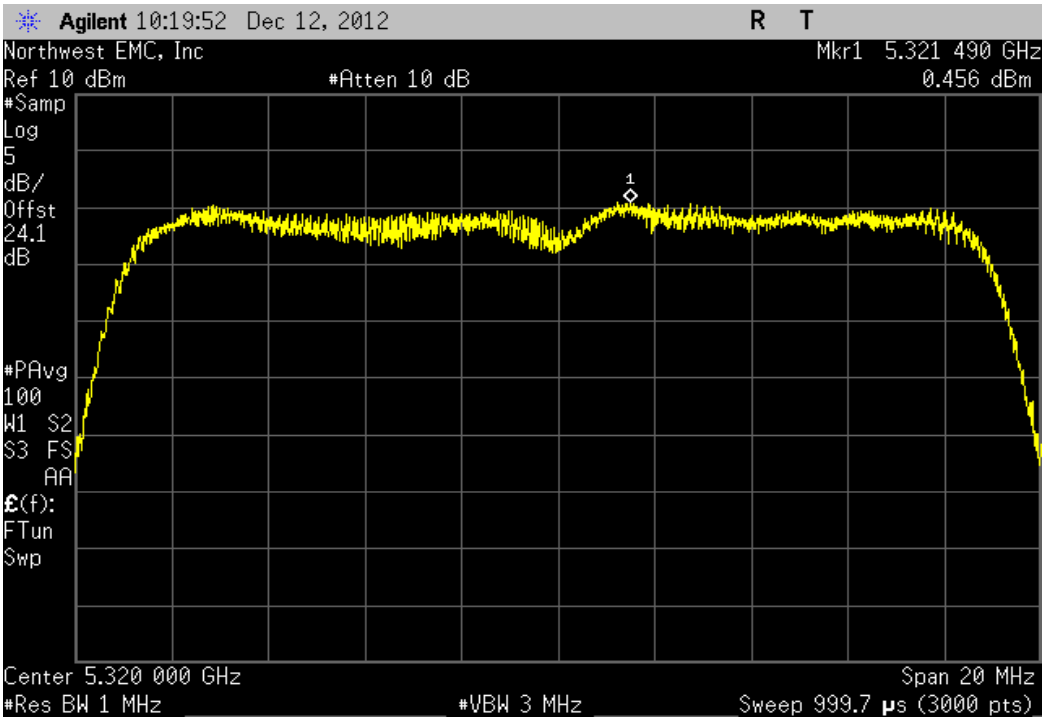


20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.666	11	Pass

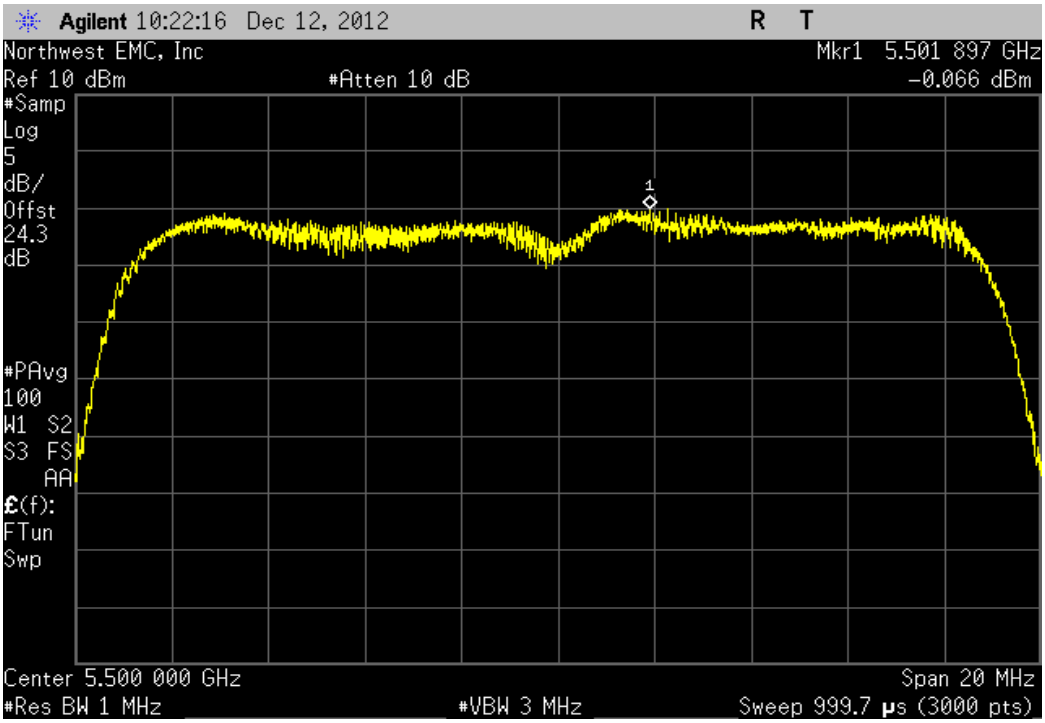


Peak Power Spectral Density

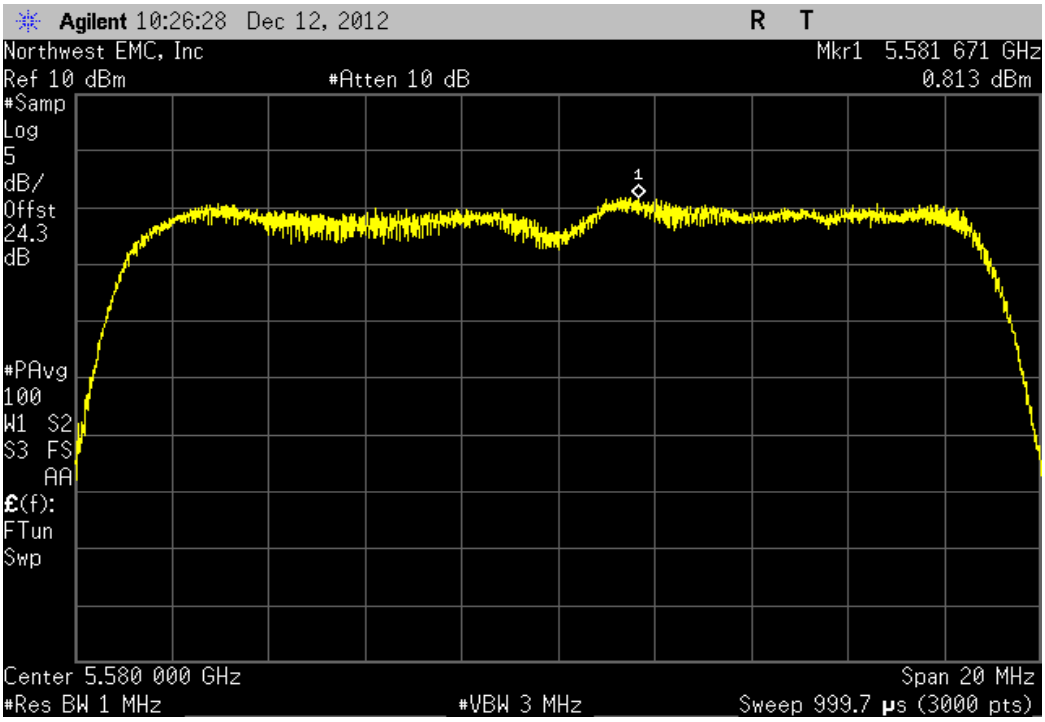
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.456	11	Pass



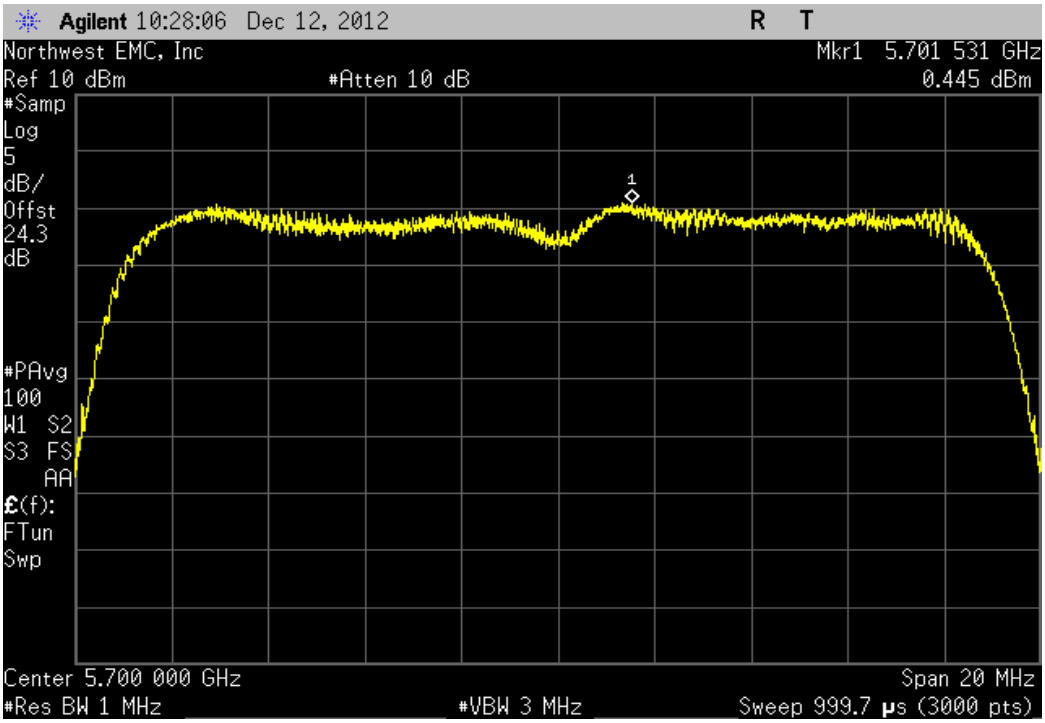
20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					-0.066	11	Pass



20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.813	11	Pass



20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz							
					Value (dBm / MHz)	Limit (dBm / MHz)	Result
					0.445	11	Pass



Peak Power Spectral Density

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT is operating on antenna port A and B

Peak Power Spectral Density

EUT:	1514	Work Order:	MSCO1638
Serial Number:	000109423753	Date:	12/12/12
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	35%
Project:	None	Barometric Pres.:	1011
Tested by:	Brandon Hobbs Rod Peloquin	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for n modes.

DEVIATIONS FROM TEST STANDARD

None

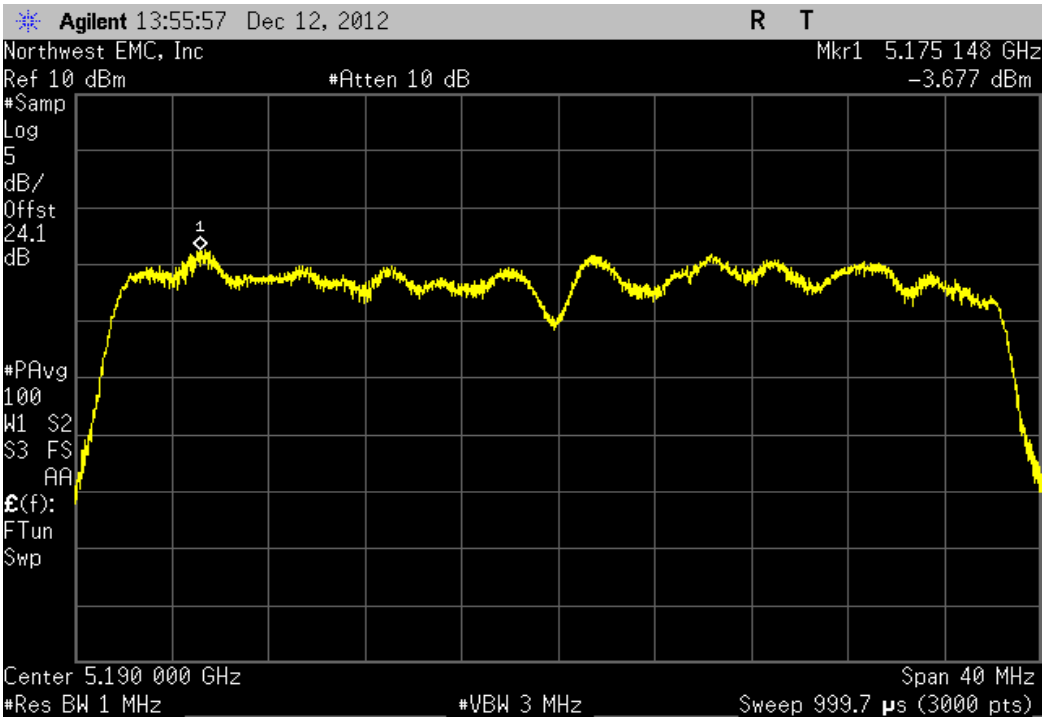
Configuration #	4	Signature

			Value (dBm / MHz)
Chain A			
	40 MHz		
		802.11(n) MCS15	
		Ch 36/40, Low Channel 5190 MHz	-3.677
		Ch 44/48, High Channel 5230 MHz	-0.644
		Ch 52/56, Low Channel 5270 MHz	-0.746
		Ch 60/64, High Channel 5310 MHz	-1.142
		Ch 100/104, Low Channel 5510 MHz	-3.008
		Ch 132/136, High Channel 5670 MHz	-0.339
Chain B			
	20 MHz		
		802.11(n) MCS8	
		Ch 36, Low Channel 5180 MHz	0.912
		Ch 48, High Channel 5240 MHz	0.369
		Ch 52, Low Channel 5260 MHz	1.293
		Ch 64, High Channel 5320 MHz	-0.142
		Ch 100, Low Channel 5500 MHz	0.348
		Ch 116, Mid Channel 5580 MHz	0.532
		Ch 140, High Channel 5700 MHz	0.607
	40 MHz		
		802.11(n) MCS8	
		Ch 36/40, Low Channel 5190 MHz	-4.978
		Ch 44/48, High Channel 5230 MHz	-2.113
		Ch 52/56, Low Channel 5270 MHz	-2.752
		Ch 60/64, High Channel 5310 MHz	-3.103
		Ch 100/104, Low Channel 5510 MHz	-3.579
		Ch 132/136, High Channel 5670 MHz	-2.159

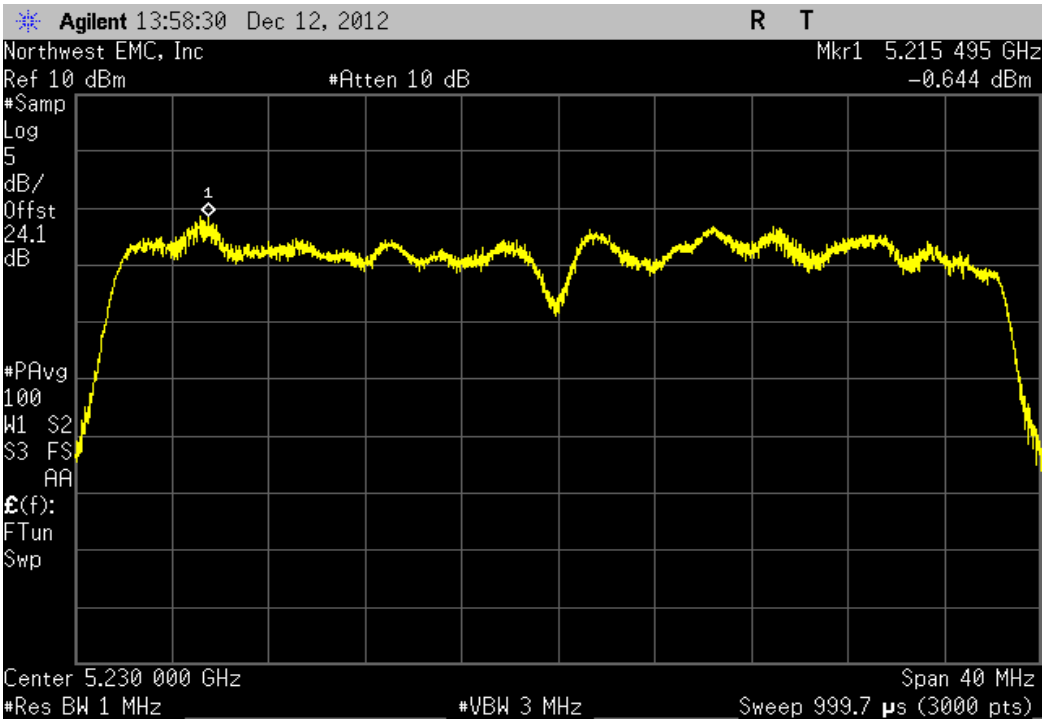
			Value (dBm / MHz)	Summing Factor (dbm)	Summed Power (dBm / MHz)	Limit (dBm / MHz)	Results
Chain A							
	40 MHz						
		802.11(n) MCS15					
		Ch 36/40, Low Channel 5190 MHz	-3.677	3	-0.677	4	Pass
		Ch 44/48, High Channel 5230 MHz	-0.644	3	2.356	4	Pass
		Ch 52/56, Low Channel 5270 MHz	-0.746	3	2.254	11	Pass
		Ch 60/64, High Channel 5310 MHz	-1.142	3	1.858	11	Pass
		Ch 100/104, Low Channel 5510 MHz	-3.008	3	-0.008	11	Pass
		Ch 132/136, High Channel 5670 MHz	-0.339	3	2.661	11	Pass
Chain B							
	20 MHz						
		802.11(n) MCS8					
		Ch 36, Low Channel 5180 MHz	0.912	3	3.91	4	Pass
		Ch 48, High Channel 5240 MHz	0.369	3	3.37	4	Pass
		Ch 52, Low Channel 5260 MHz	1.293	3	4.293	11	Pass
		Ch 64, High Channel 5320 MHz	-0.142	3	2.858	11	Pass
		Ch 100, Low Channel 5500 MHz	0.348	3	3.348	11	Pass
		Ch 116, Mid Channel 5580 MHz	0.532	3	3.532	11	Pass
		Ch 140, High Channel 5700 MHz	0.607	3	3.607	11	Pass
	40 MHz						
		802.11(n) MCS8					
		Ch 36/40, Low Channel 5190 MHz	-4.978	3	-1.978	4	Pass
		Ch 44/48, High Channel 5230 MHz	-2.113	3	0.887	4	Pass
		Ch 52/56, Low Channel 5270 MHz	-2.752	3	0.248	11	Pass
		Ch 60/64, High Channel 5310 MHz	-3.103	3	-0.103	11	Pass
		Ch 100/104, Low Channel 5510 MHz	-3.579	3	-0.579	11	Pass
		Ch 132/136, High Channel 5670 MHz	-2.159	3	0.841	11	Pass

Peak Power Spectral Density

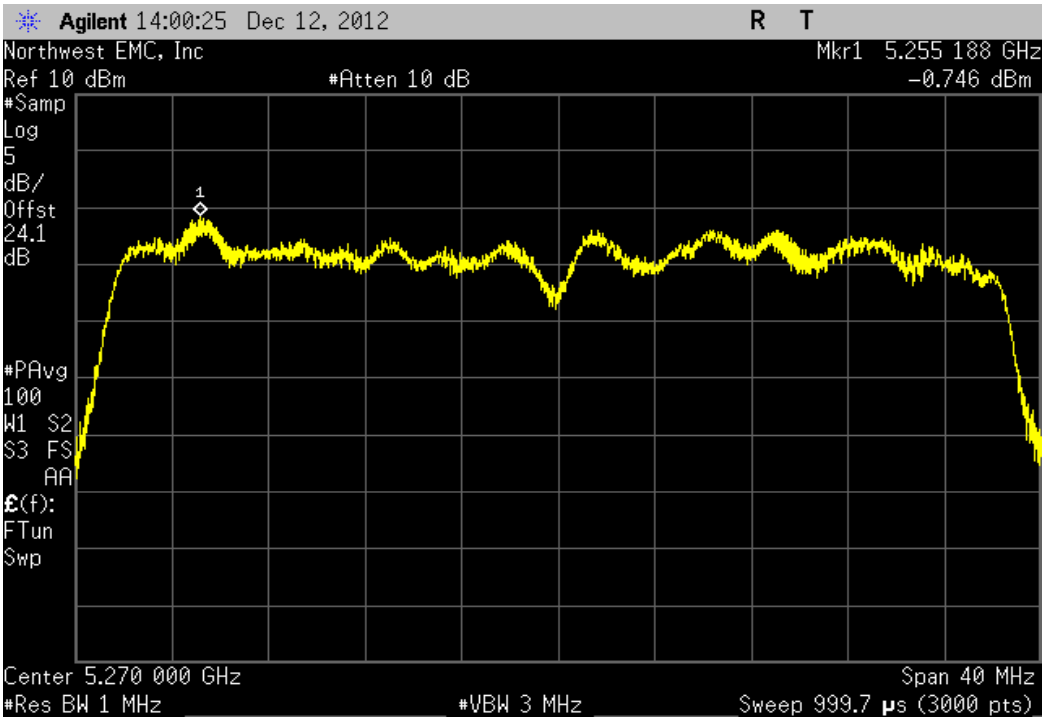
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz							
					Value (dBm / MHz)		
					-3.677	4	Pass



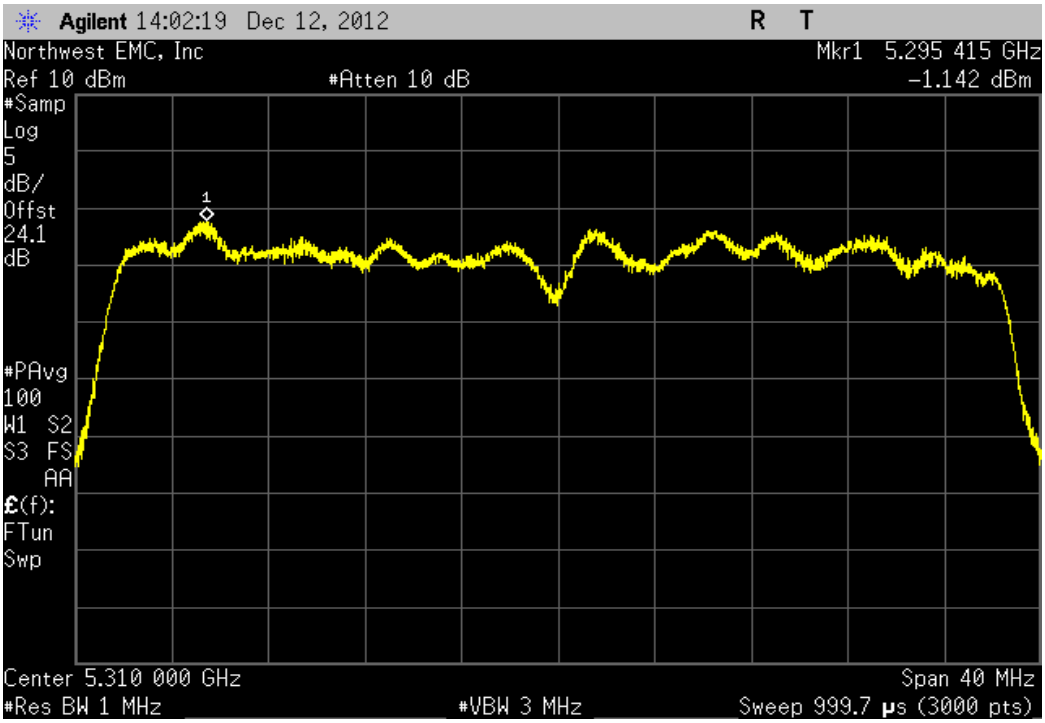
Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz							
					Value (dBm / MHz)		
					-0.644	4	Pass



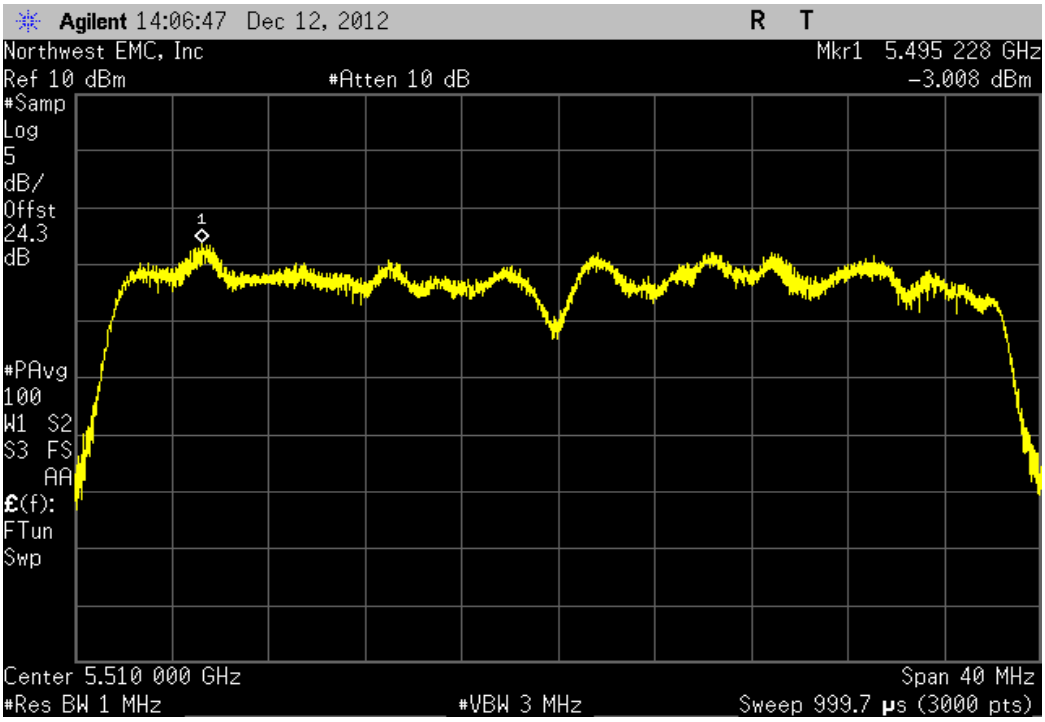
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz							
					Value (dBm / MHz)		
					-0.746	11	Pass



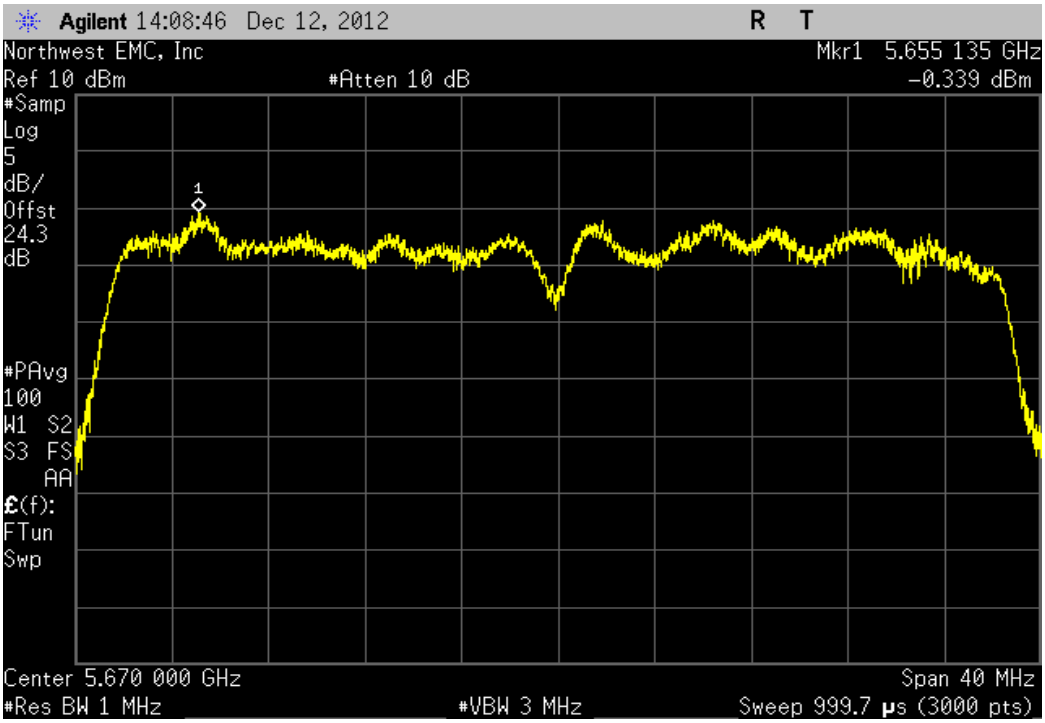
Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz							
					Value (dBm / MHz)		
					-1.142	11	Pass



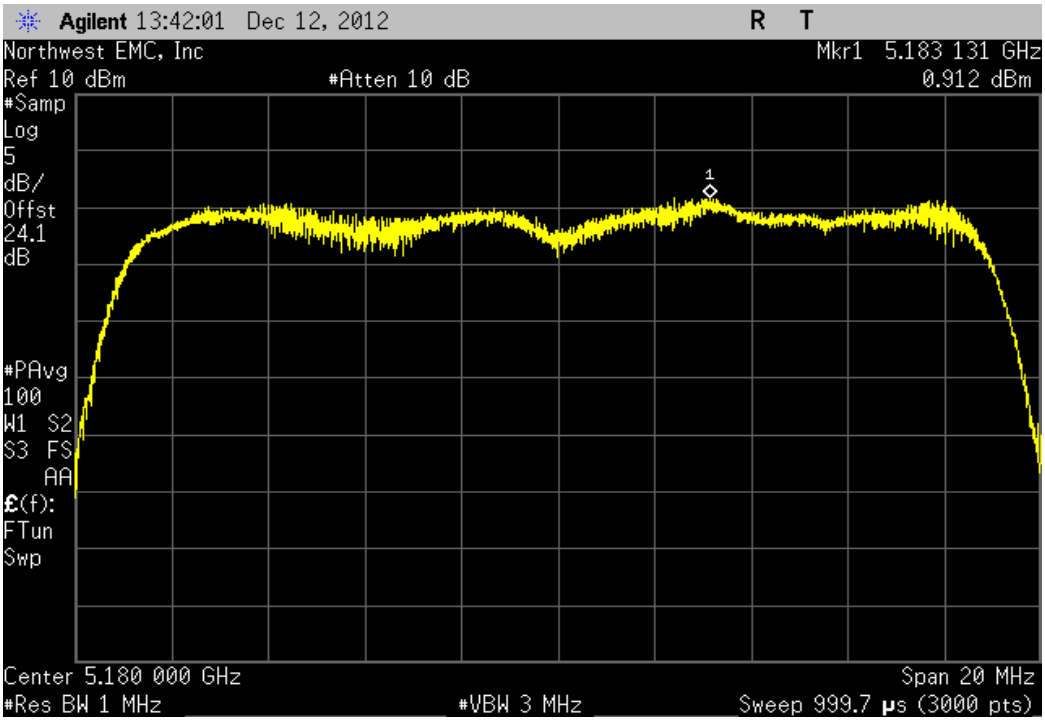
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz							
					Value (dBm / MHz)		
					-3.008	11	Pass



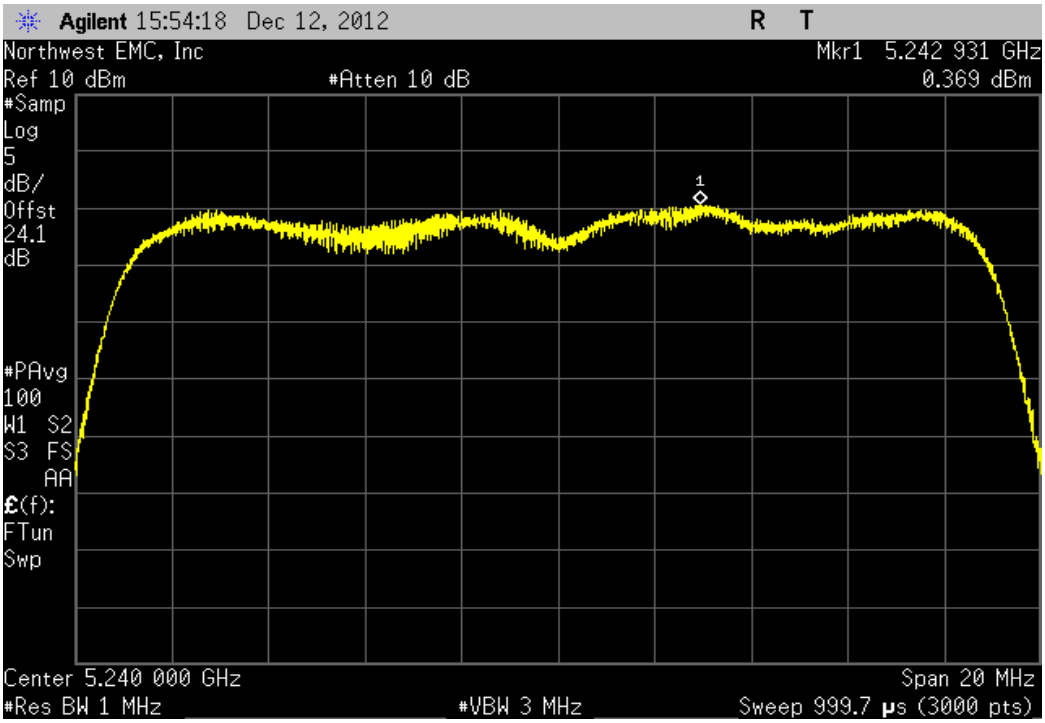
Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz							
					Value (dBm / MHz)		
					-0.339	11	Pass



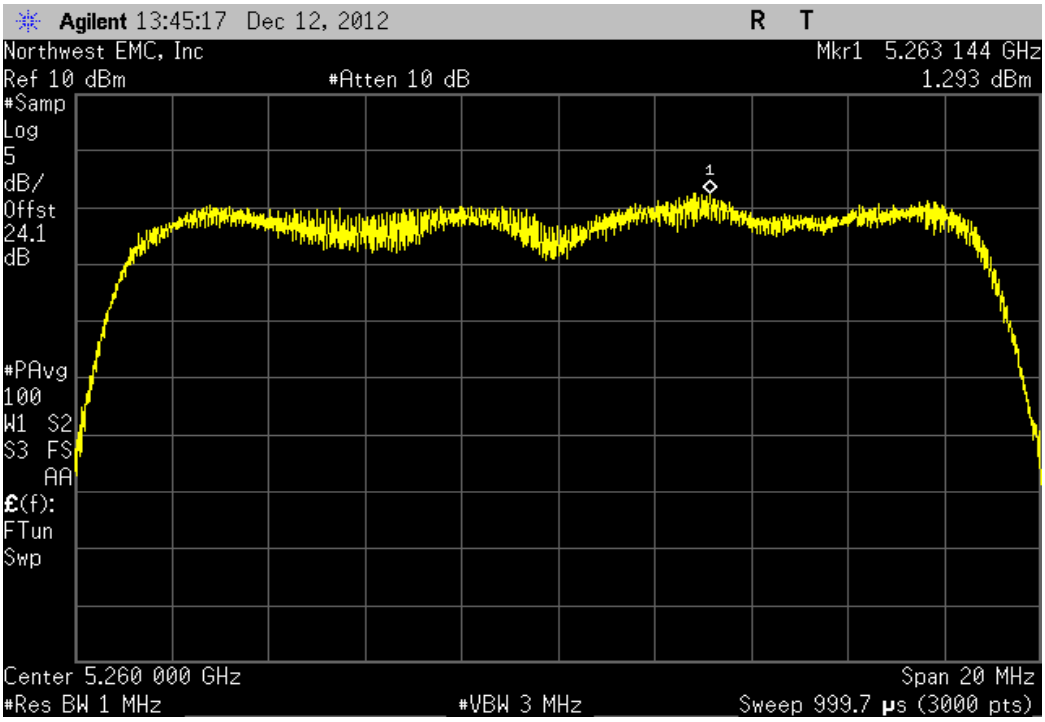
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz							
					Value (dBm / MHz)		
					0.912	4	Pass



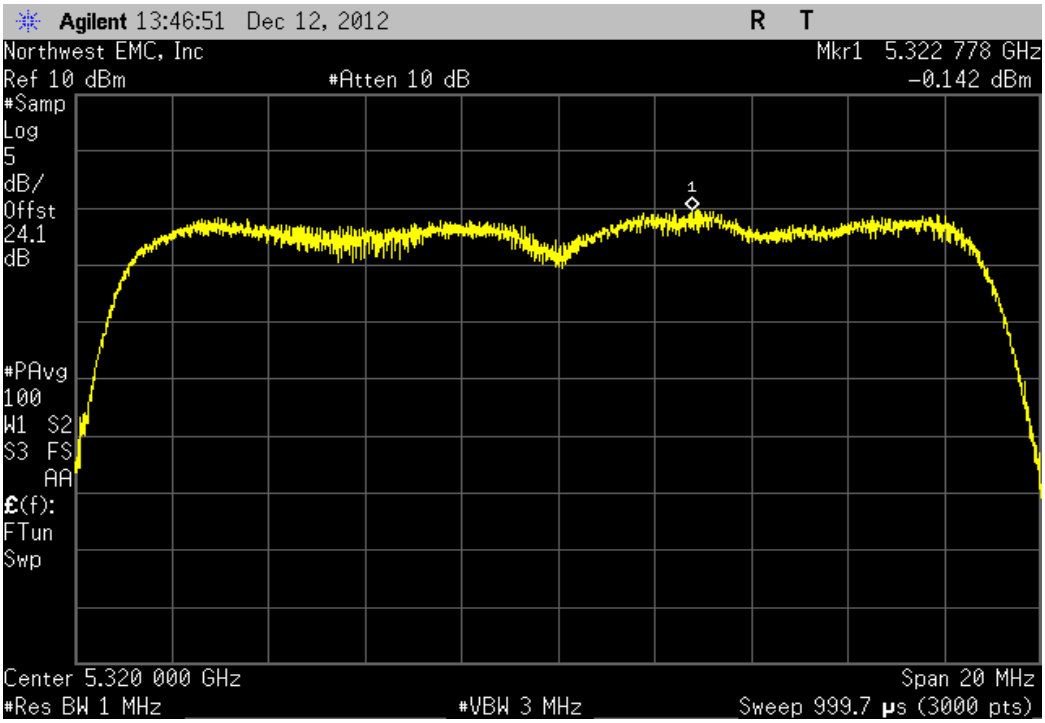
Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz							
					Value (dBm / MHz)		
					0.369	4	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz							
					Value (dBm / MHz)		
					1.293	11	Pass

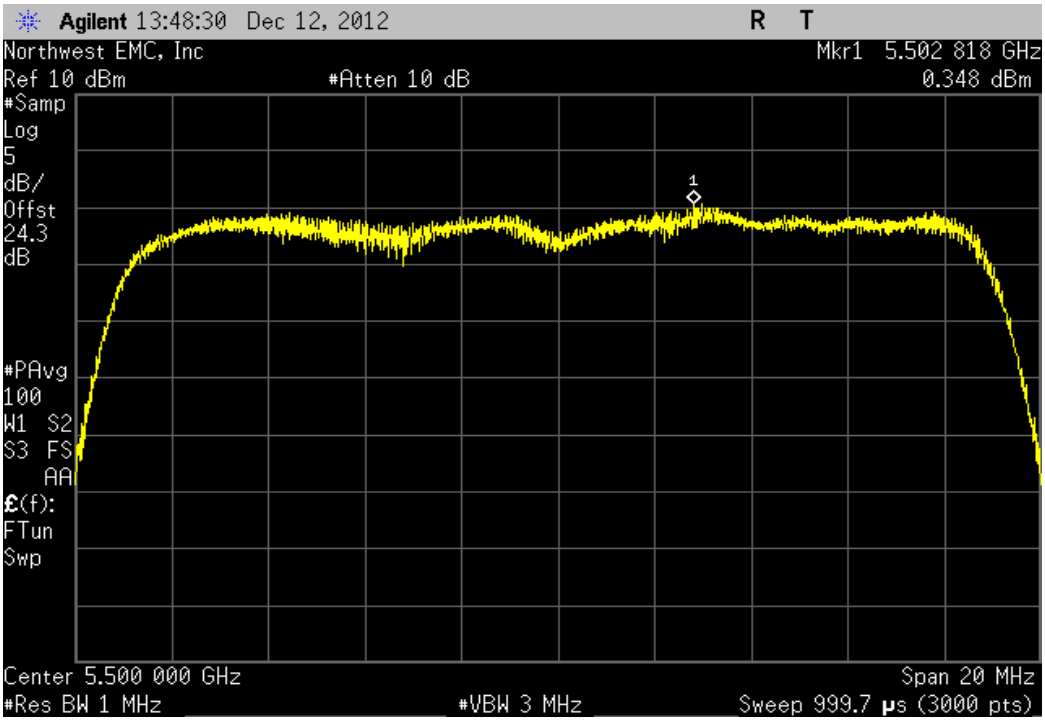


Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz							
					Value (dBm / MHz)		
					-0.142	11	Pass

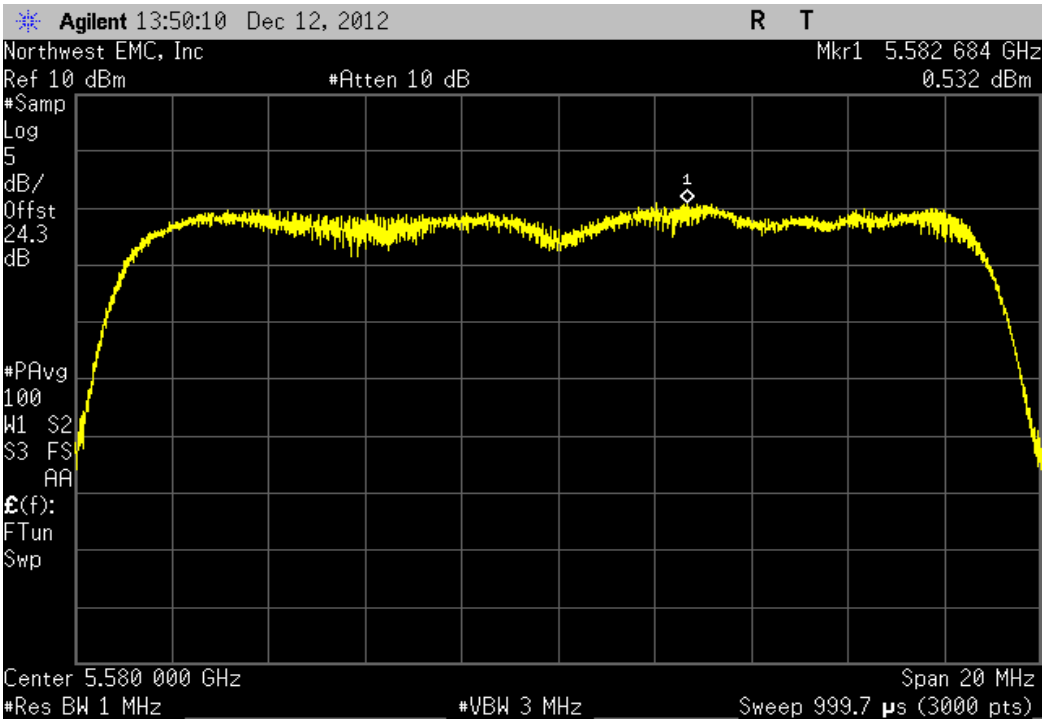


Peak Power Spectral Density

Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz							
					Value (dBm / MHz)		
					0.348	11	Pass

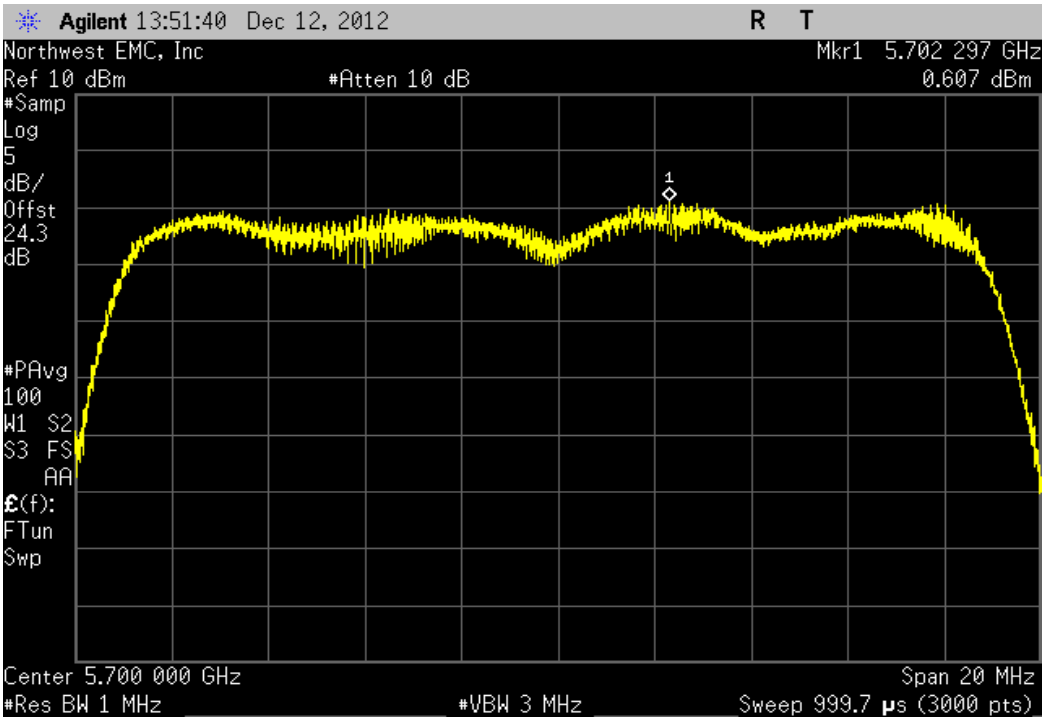


Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz							
					Value (dBm / MHz)		
					0.532	11	Pass

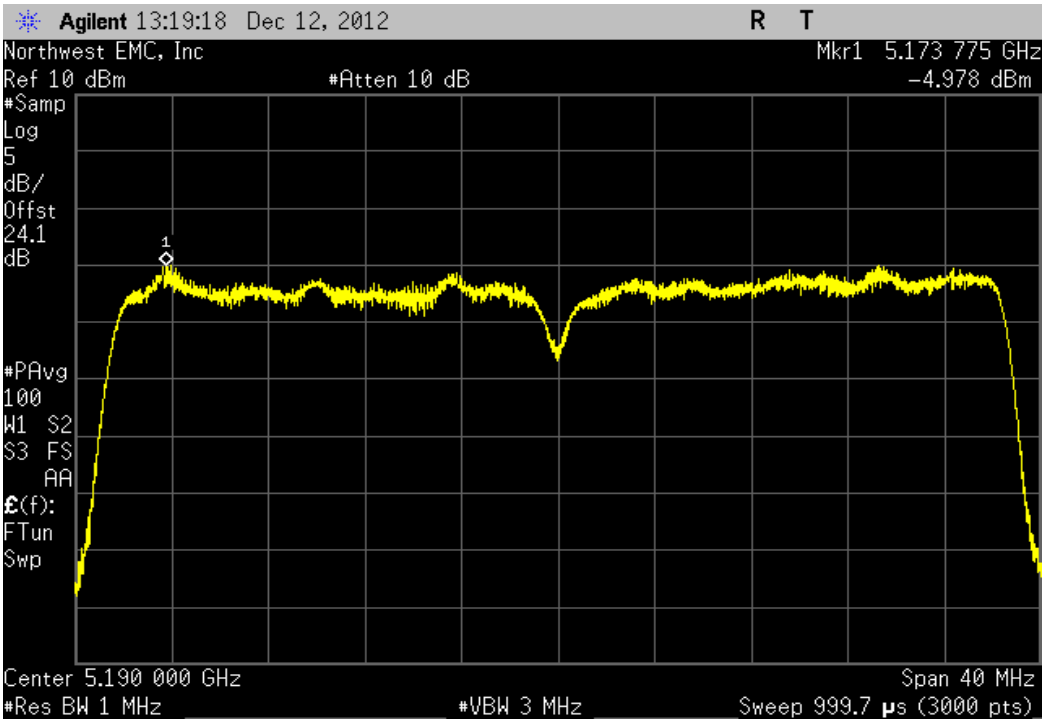


Peak Power Spectral Density

Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz							
					Value (dBm / MHz)		
					0.607	11	Pass

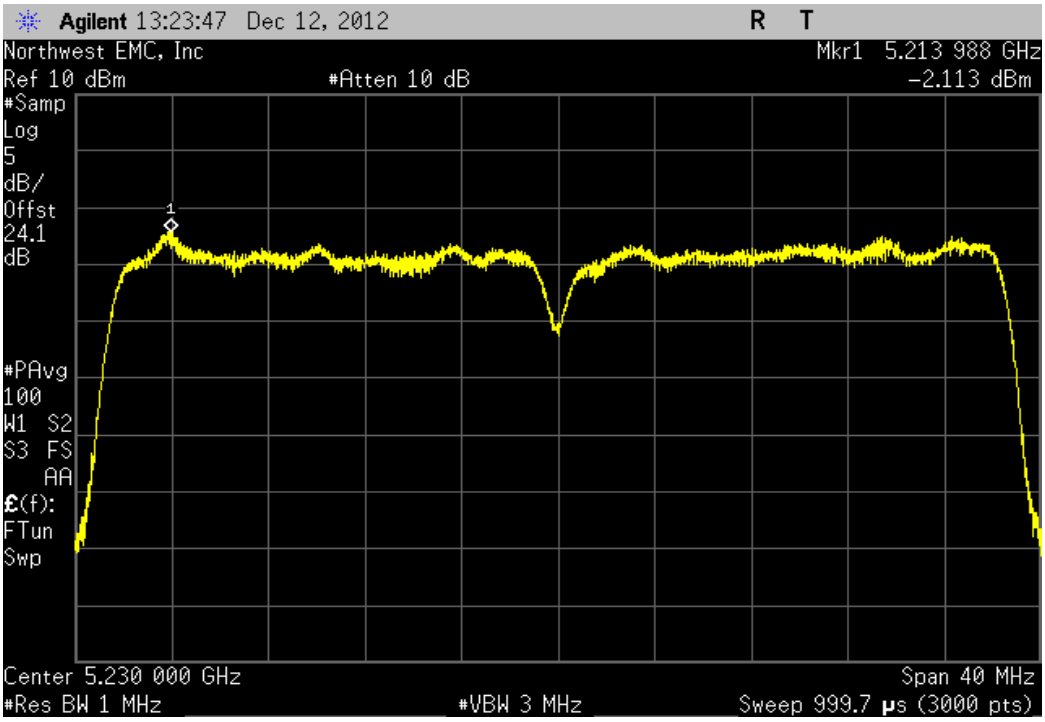


Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz							
					Value (dBm / MHz)		
					-4.978	4	Pass

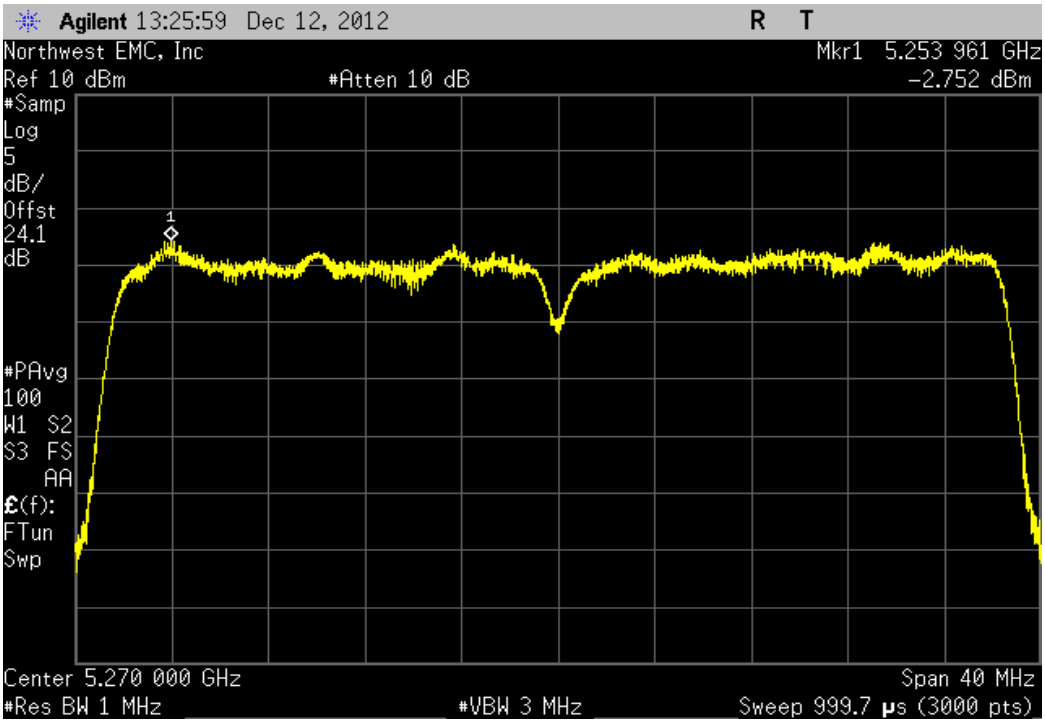


Peak Power Spectral Density

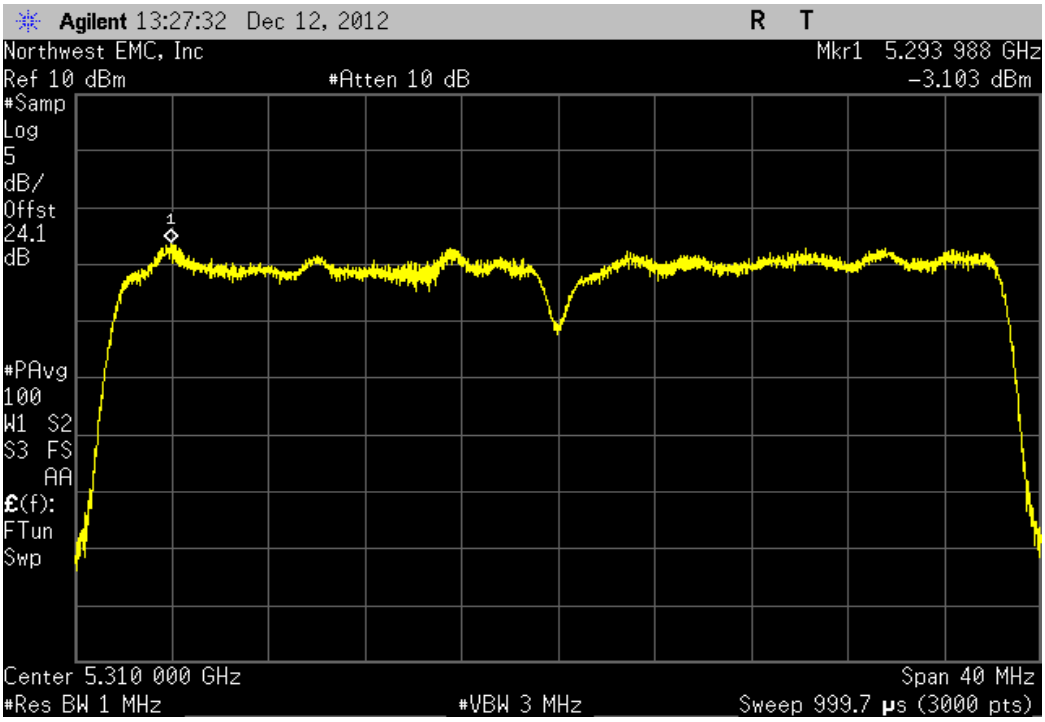
Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz							
					Value (dBm / MHz)		
					-2.113	4	Pass



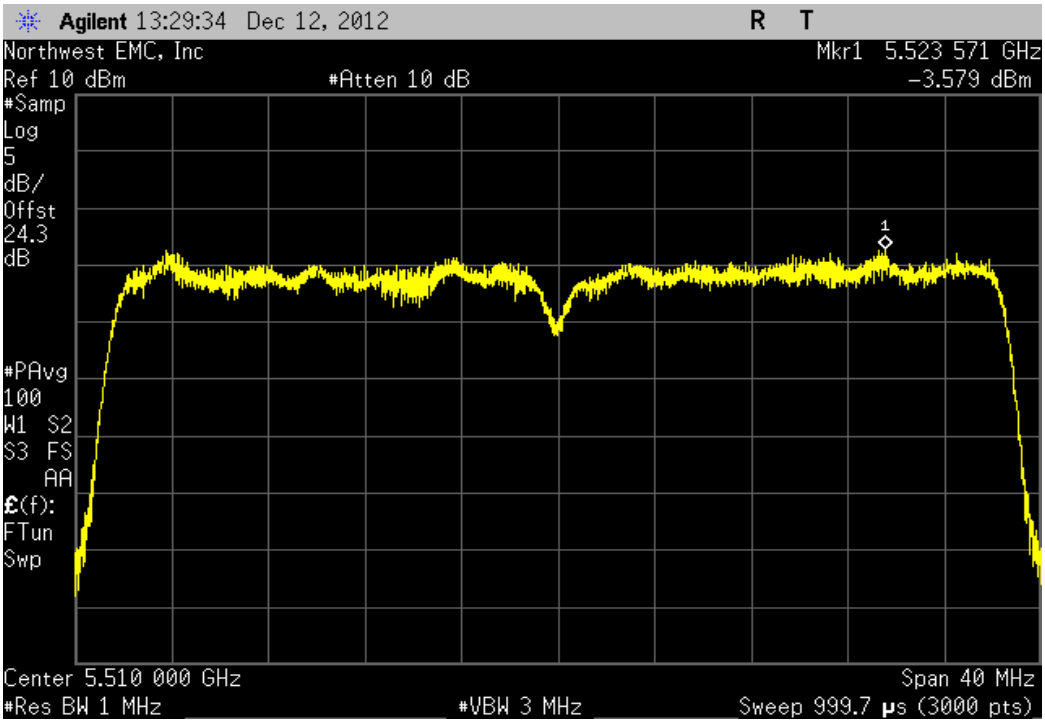
Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz							
					Value (dBm / MHz)		
					-2.752	11	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz							
					Value (dBm / MHz)		
					-3.103	11	Pass

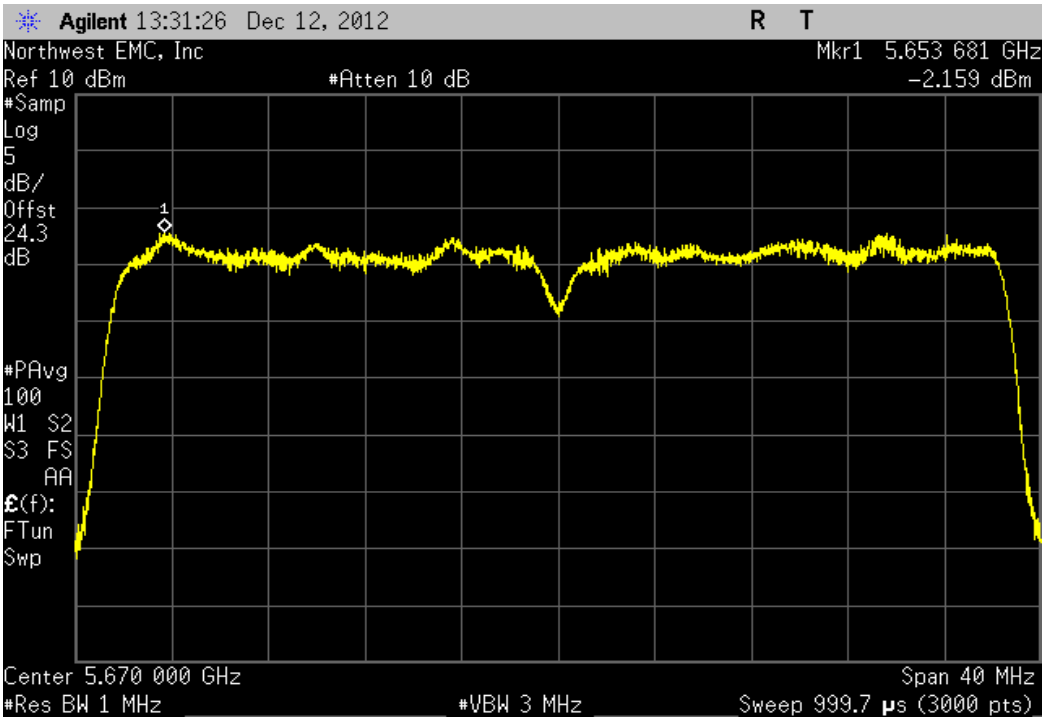


Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz							
					Value (dBm / MHz)		
					-3.579	11	Pass



Peak Power Spectral Density

Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz						
				Value (dBm / MHz)		
				-2.159	11	Pass



Peak Excursion

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

➢1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold..

➢2nd Trace: The same procedure and settings as was used for peak power spectral density

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT was operating on antenna port A only.

Peak Excursion

EUT:	1514			**Work Order:**	MCSO1638
Serial Number:	000109423753			**Date:**	11/06/12
Customer:	Microsoft Corporation			**Temperature:**	22°C
Attendees:	None			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	1018
Tested by:	Brandon Hobbs Rod Peloquin	**Power:**	110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for b, g and n modes

DEVIATIONS FROM TEST STANDARD

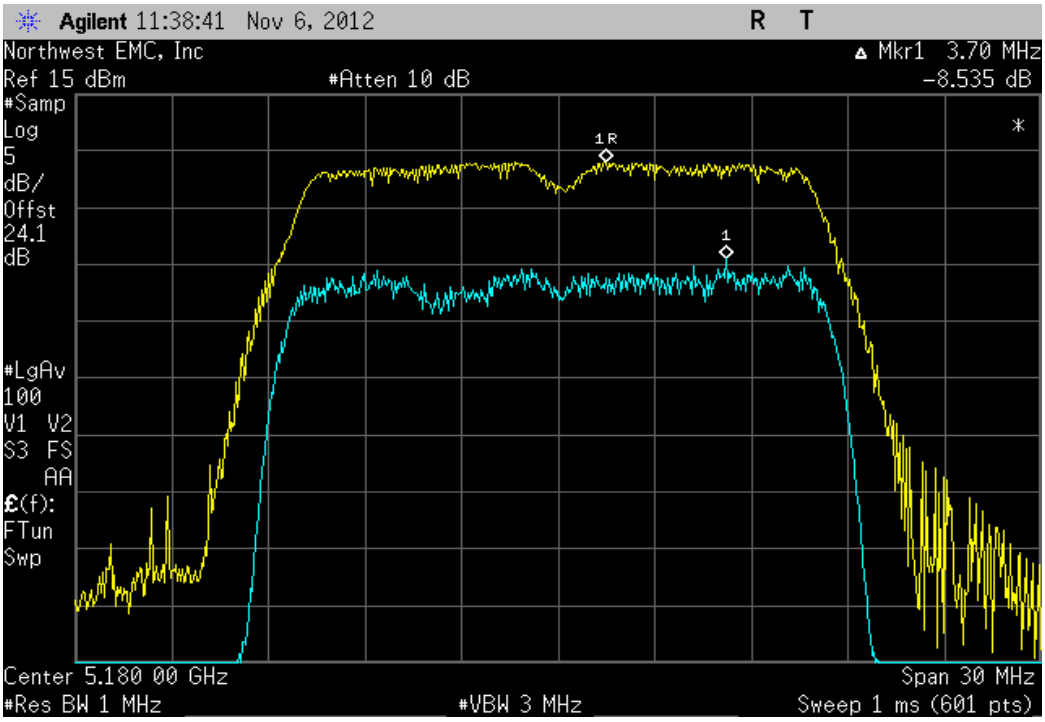
None

Configuration #	1	Signature

	Value	Limit	Result
20 MHz			
802.11(a) 6 Mbps			
Ch 36, Low Channel 5180 MHz	8.535 dB	≤ 13 dB	Pass
Ch 48, High Channel 5240 MHz	9.227 dB	≤ 13 dB	Pass
Ch 52, Low Channel 5260 MHz	9.18 dB	≤ 13 dB	Pass
Ch 64, High Channel 5320 MHz	9.327 dB	≤ 13 dB	Pass
Ch 100, Low Channel 5500 MHz	8.935 dB	≤ 13 dB	Pass
Ch 116, Mid Channel 5580 MHz	8.807 dB	≤ 13 dB	Pass
Ch 140, High Channel 5700 MHz	9.051 dB	≤ 13 dB	Pass
802.11(n) MCS0			
Ch 36, Low Channel 5180 MHz	7.443 dB	≤ 13 dB	Pass
Ch 48, High Channel 5240 MHz	7.818 dB	≤ 13 dB	Pass
Ch 52, Low Channel 5260 MHz	7.753 dB	≤ 13 dB	Pass
Ch 64, High Channel 5320 MHz	8.112 dB	≤ 13 dB	Pass
Ch 100, Low Channel 5500 MHz	7.953 dB	≤ 13 dB	Pass
Ch 116, Mid Channel 5580 MHz	7.539 dB	≤ 13 dB	Pass
Ch 140, High Channel 5700 MHz	8.259 dB	≤ 13 dB	Pass

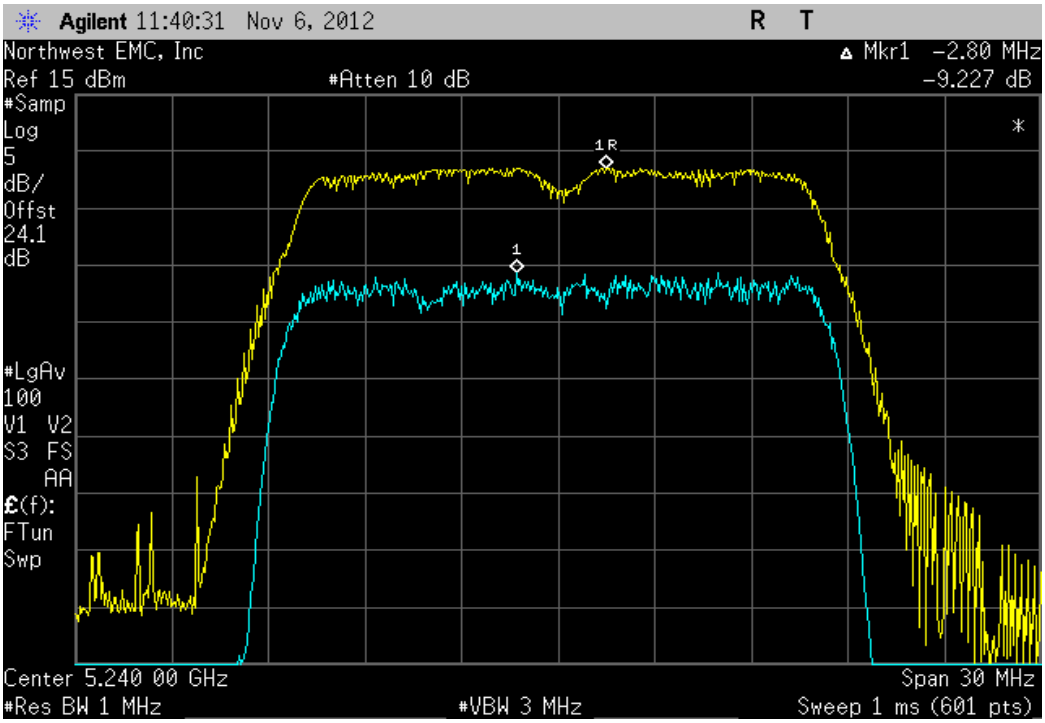
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				8.535 dB	≤ 13 dB	Pass



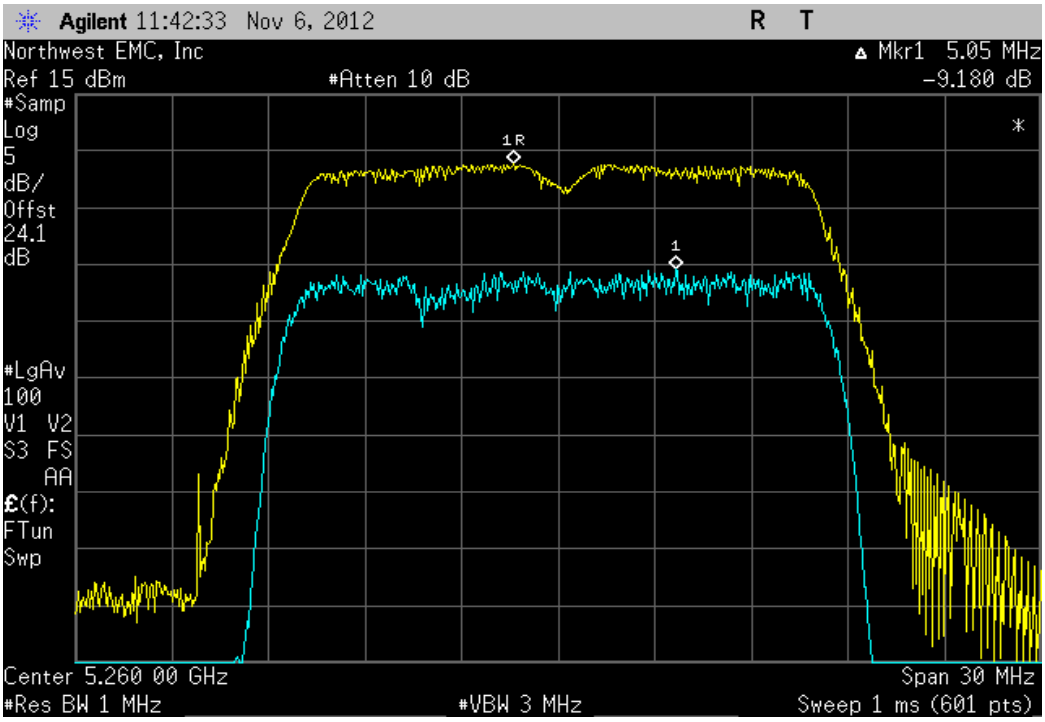
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				9.227 dB	≤ 13 dB	Pass



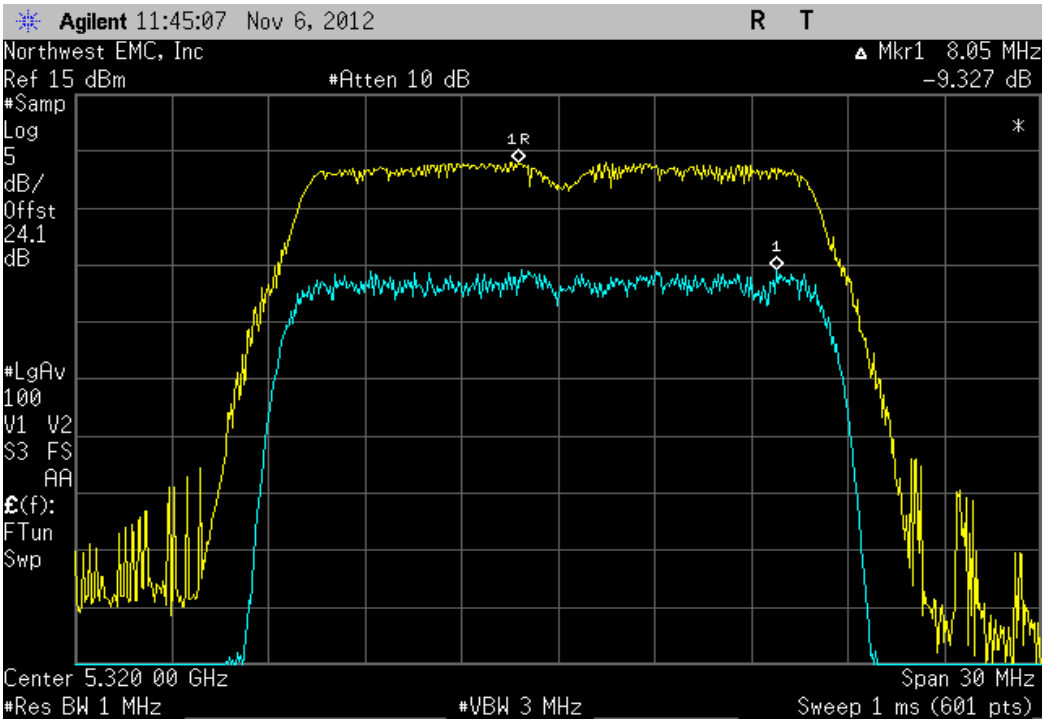
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				9.18 dB	≤ 13 dB	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

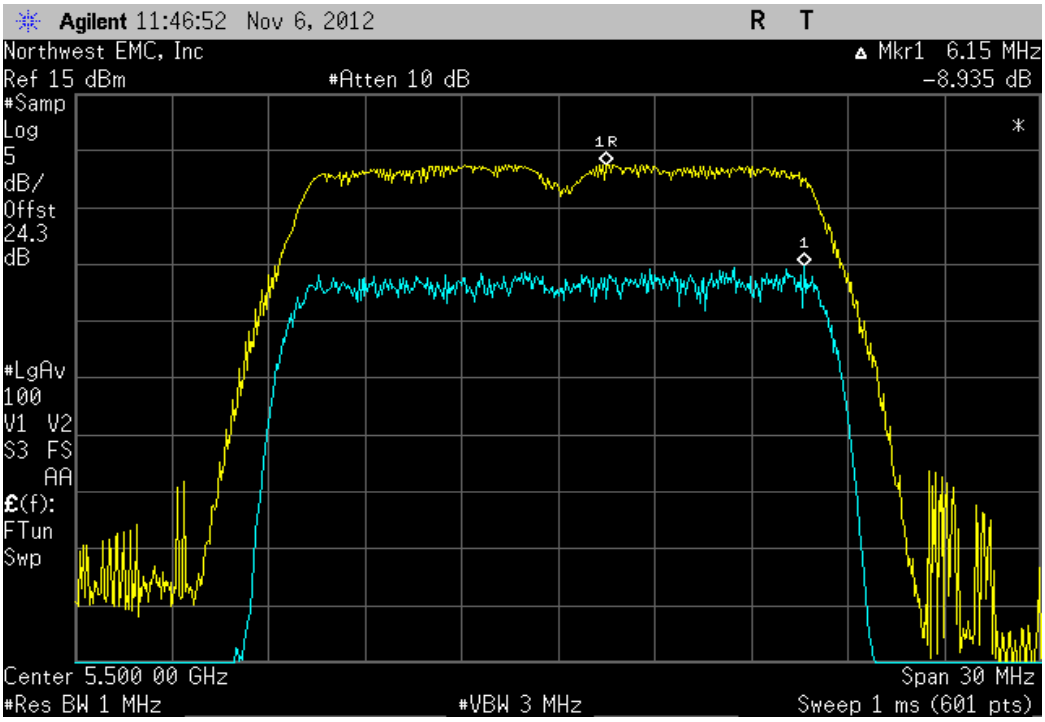
				Value	Limit	Result
				9.327 dB	≤ 13 dB	Pass



Peak Excursion

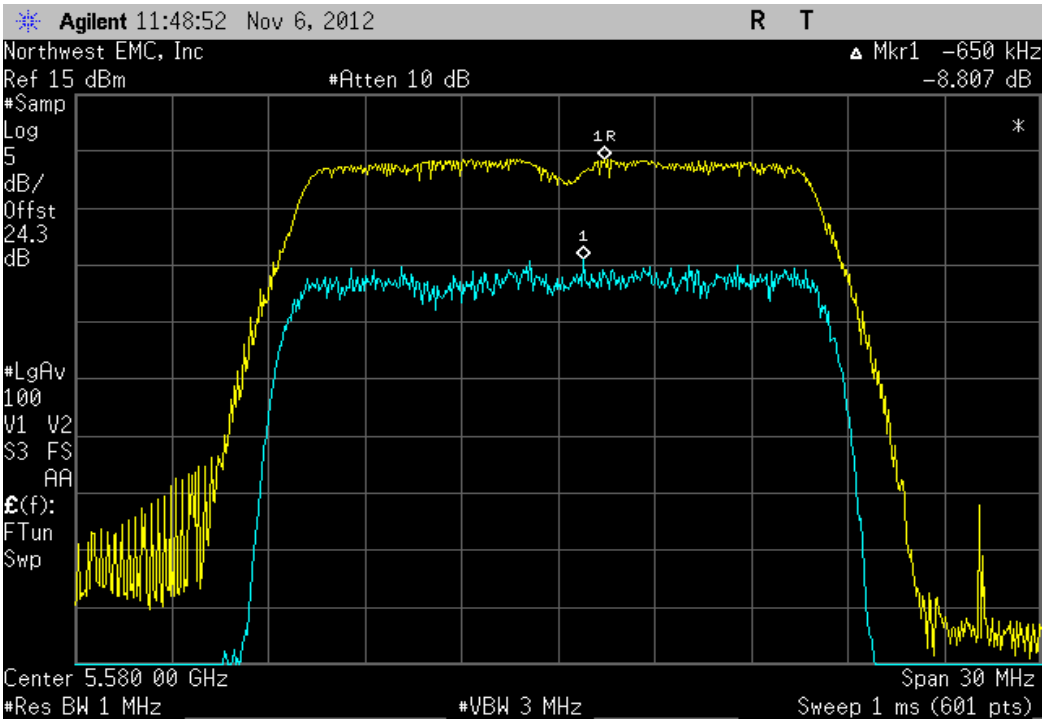
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				8.935 dB	≤ 13 dB	Pass



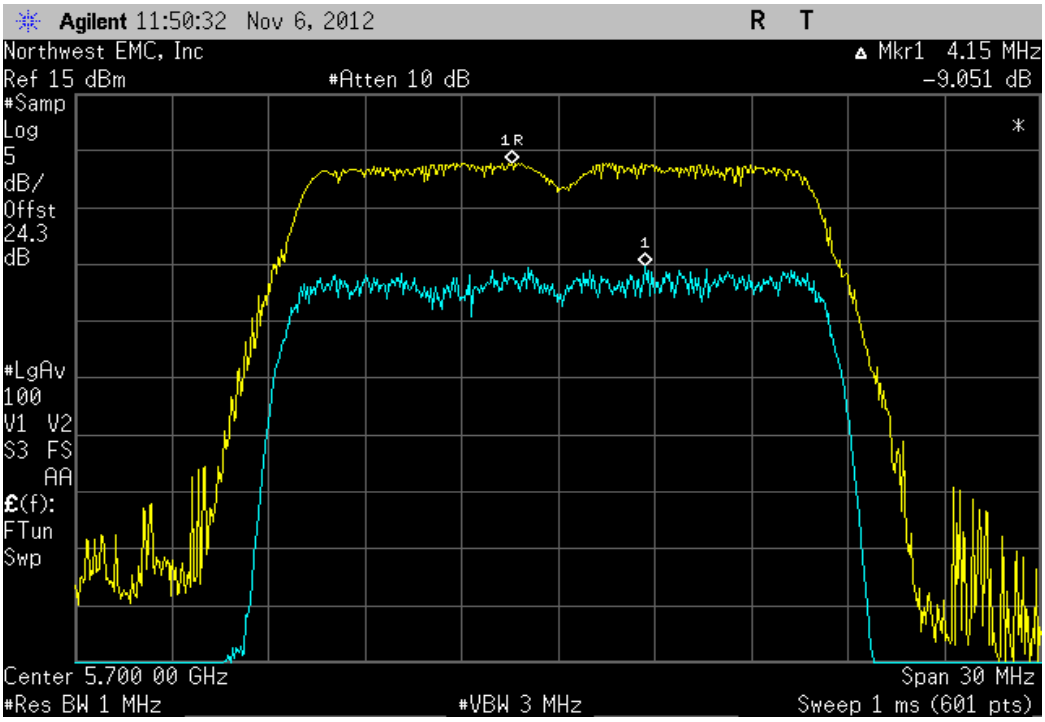
20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				8.807 dB	≤ 13 dB	Pass



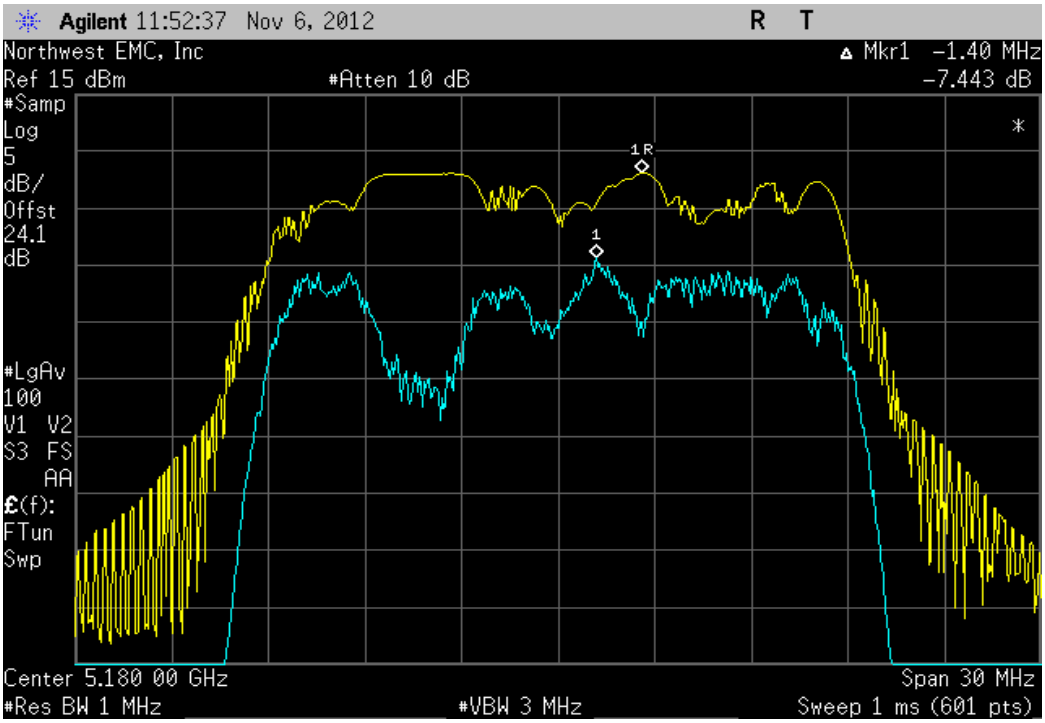
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				9.051 dB	≤ 13 dB	Pass



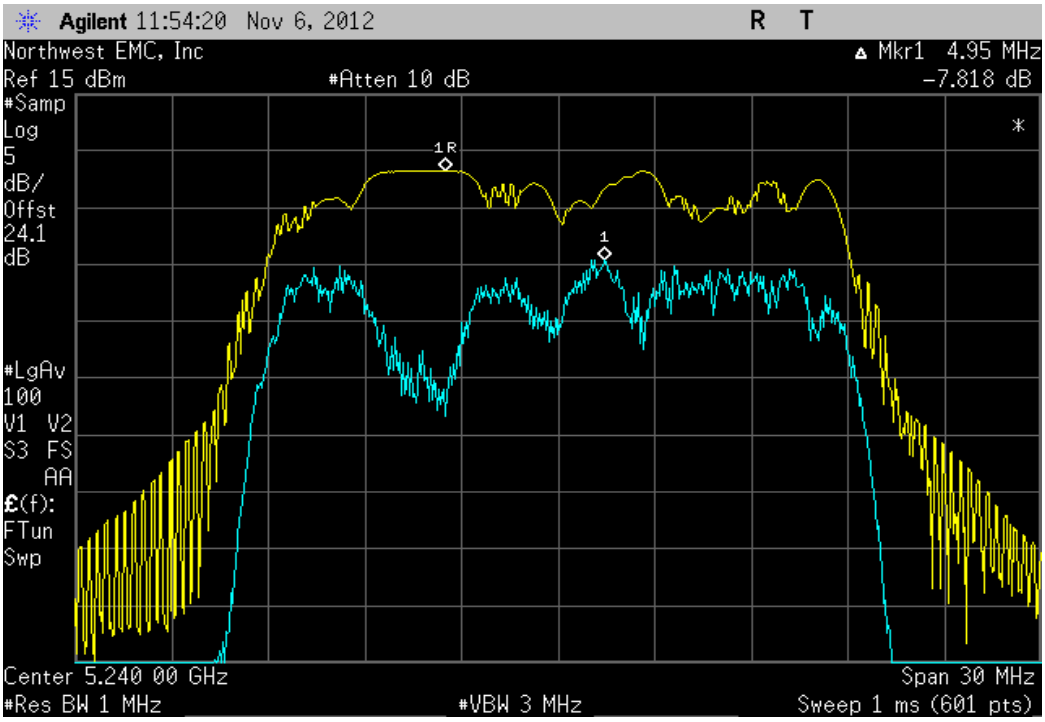
20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				7.443 dB	≤ 13 dB	Pass



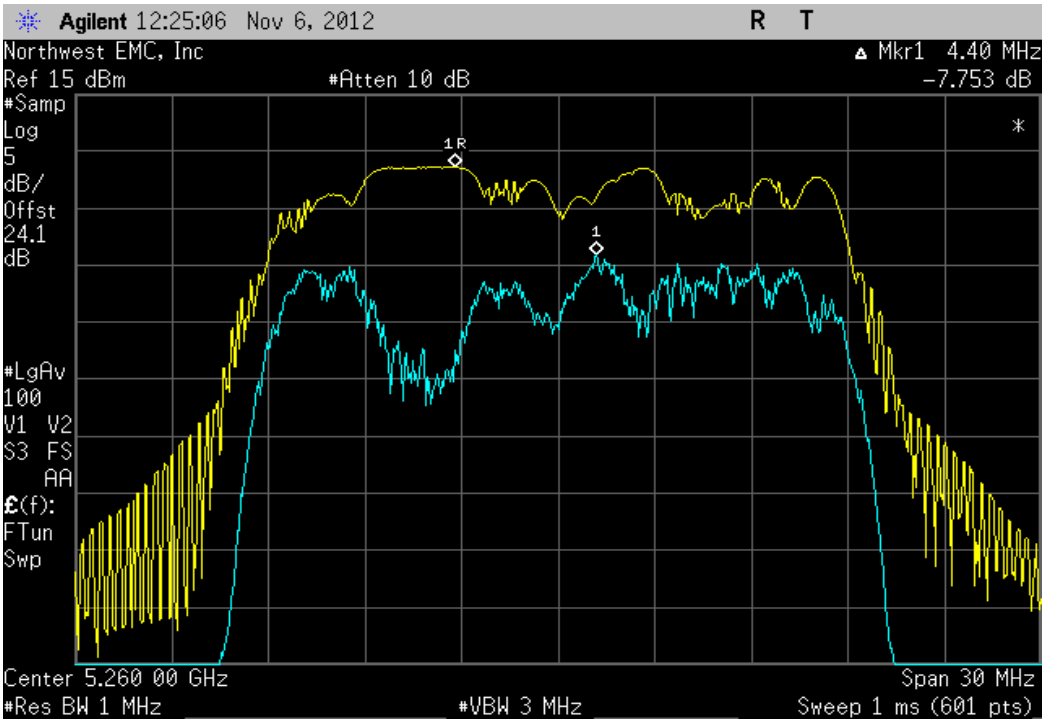
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

Value	Limit	Result
7.818 dB	≤ 13 dB	Pass



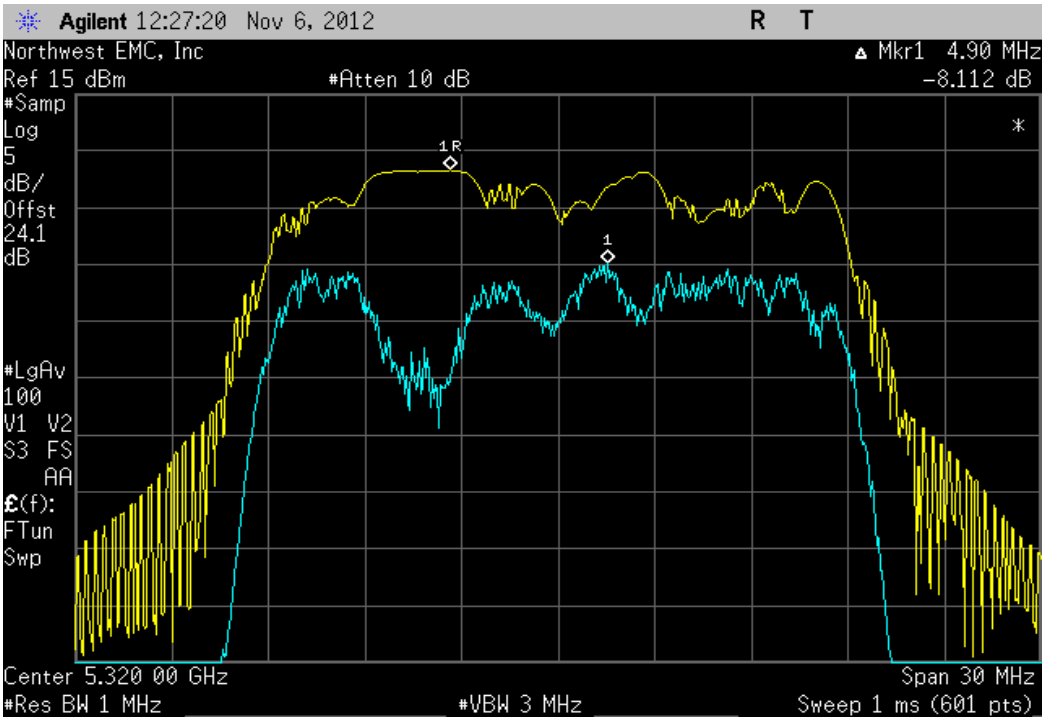
20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

Value	Limit	Result
7.753 dB	≤ 13 dB	Pass



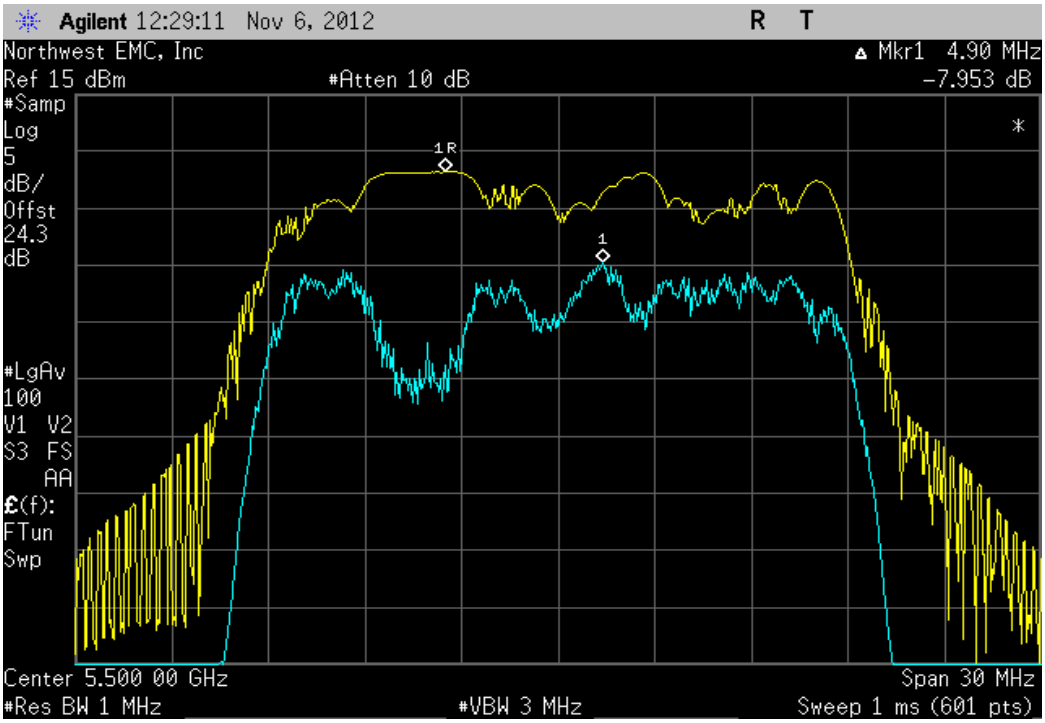
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

					Value	Limit	Result
					8.112 dB	≤ 13 dB	Pass



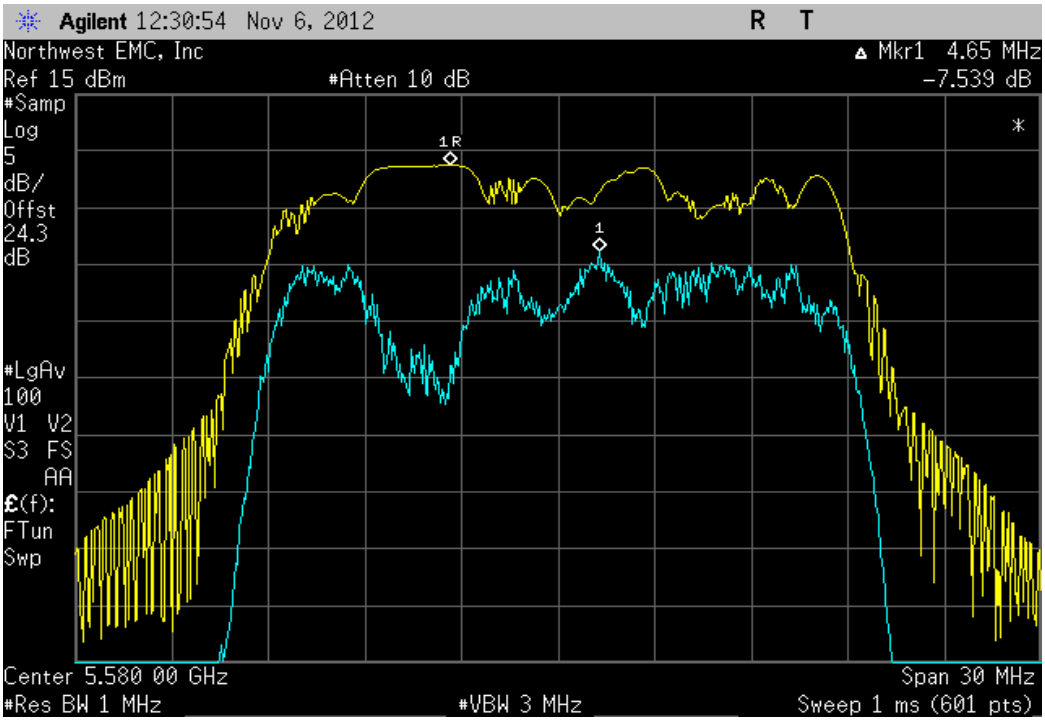
20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

					Value	Limit	Result
					7.953 dB	≤ 13 dB	Pass



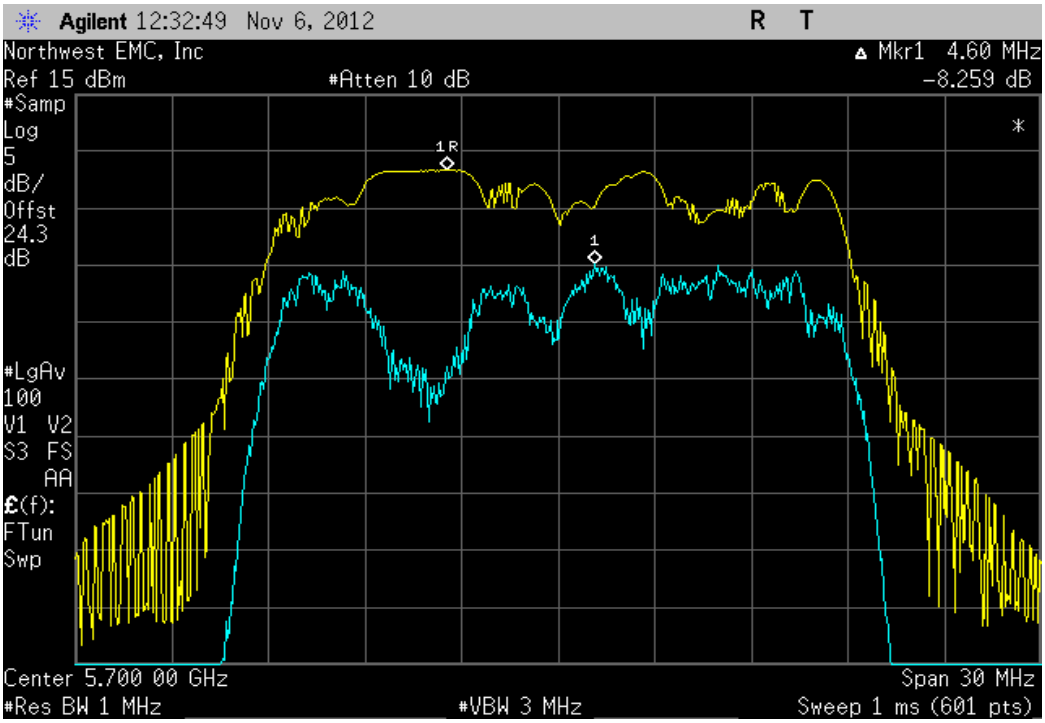
20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				7.539 dB	≤ 13 dB	Pass



20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				8.259 dB	≤ 13 dB	Pass



Peak Excursion

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

➢1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold..

➢2nd Trace: The same procedure and settings as was used for peak power spectral density

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.
The EUT is operating on antenna port A and B.

Peak Excursion

EUT:	1514			**Work Order:**	MCSO1638
Serial Number:	000109423753			**Date:**	11/06/12
Customer:	Microsoft Corporation			**Temperature:**	22°C
Attendees:	None			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	1018
Tested by:	Brandon Hobbs Rod Peloquin	**Power:**	110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. Testing was completed using the modulation that produced the highes conducted output power for n modes.

DEVIATIONS FROM TEST STANDARD

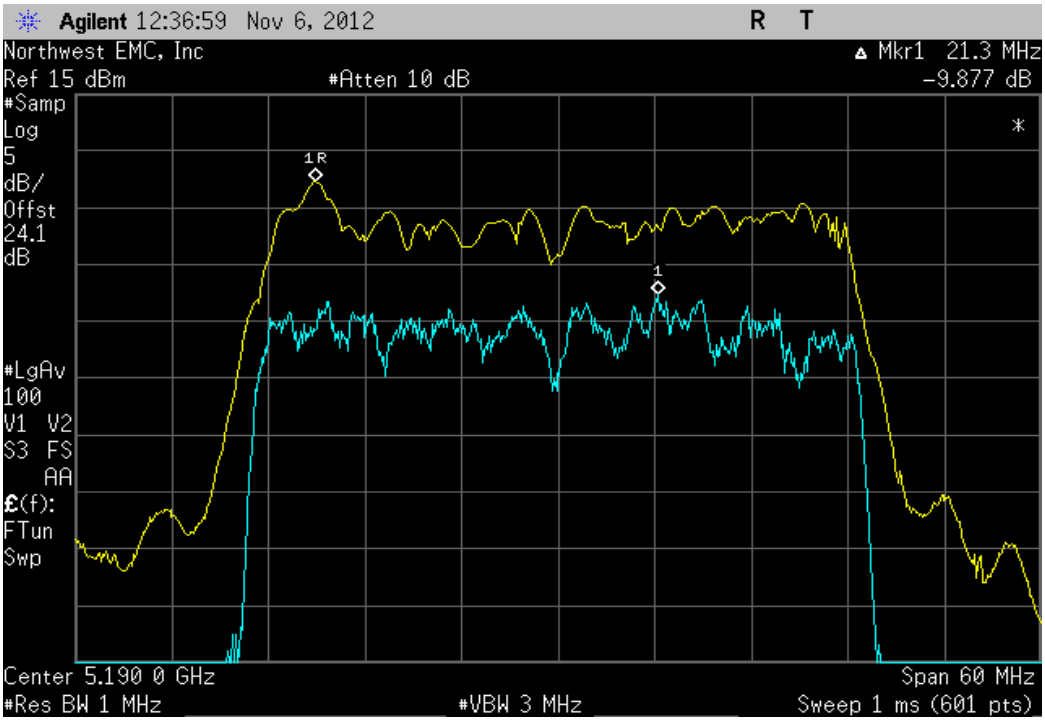
None

Configuration #	1	Signature

			Value	Limit	Result
Chain A					
	40 MHz				
		802.11(n) MCS15			
		Ch 36/40, Low Channel 5190 MHz	9.877 dB	≤ 13 dB	Pass
		Ch 44/48, High Channel 5230 MHz	9.733 dB	≤ 13 dB	Pass
		Ch 52/56, Low Channel 5270 MHz	9.518 dB	≤ 13 dB	Pass
		Ch 60/64, High Channel 5310 MHz	10.059 dB	≤ 13 dB	Pass
		Ch 100/104, Low Channel 5510 MHz	10.45 dB	≤ 13 dB	Pass
		Ch 132/136, High Channel 5670 MHz	10.297 dB	≤ 13 dB	Pass
Chain B					
	20 MHz				
		802.11(n) MCS8			
		Ch 36, Low Channel 5180 MHz	8.8 dB	≤ 13 dB	Pass
		Ch 48, High Channel 5240 MHz	8.348 dB	≤ 13 dB	Pass
		Ch 52, Low Channel 5260 MHz	8.804 dB	≤ 13 dB	Pass
		Ch 64, High Channel 5320 MHz	8.495 dB	≤ 13 dB	Pass
		Ch 100, Low Channel 5500 MHz	8.557 dB	≤ 13 dB	Pass
		Ch 116, Mid Channel 5580 MHz	8.266 dB	≤ 13 dB	Pass
		Ch 140, High Channel 5700 MHz	8.902 dB	≤ 13 dB	Pass
	40 MHz				
		802.11(n) MCS8			
		Ch 36/40, Low Channel 5190 MHz	9.585 dB	≤ 13 dB	Pass
		Ch 44/48, High Channel 5230 MHz	9.223 dB	≤ 13 dB	Pass
		Ch 52/56, Low Channel 5270 MHz	9.679 dB	≤ 13 dB	Pass
		Ch 60/64, High Channel 5310 MHz	9.116 dB	≤ 13 dB	Pass
		Ch 100/104, Low Channel 5510 MHz	9.522 dB	≤ 13 dB	Pass
		Ch 132/136, High Channel 5670 MHz	9.966 dB	≤ 13 dB	Pass

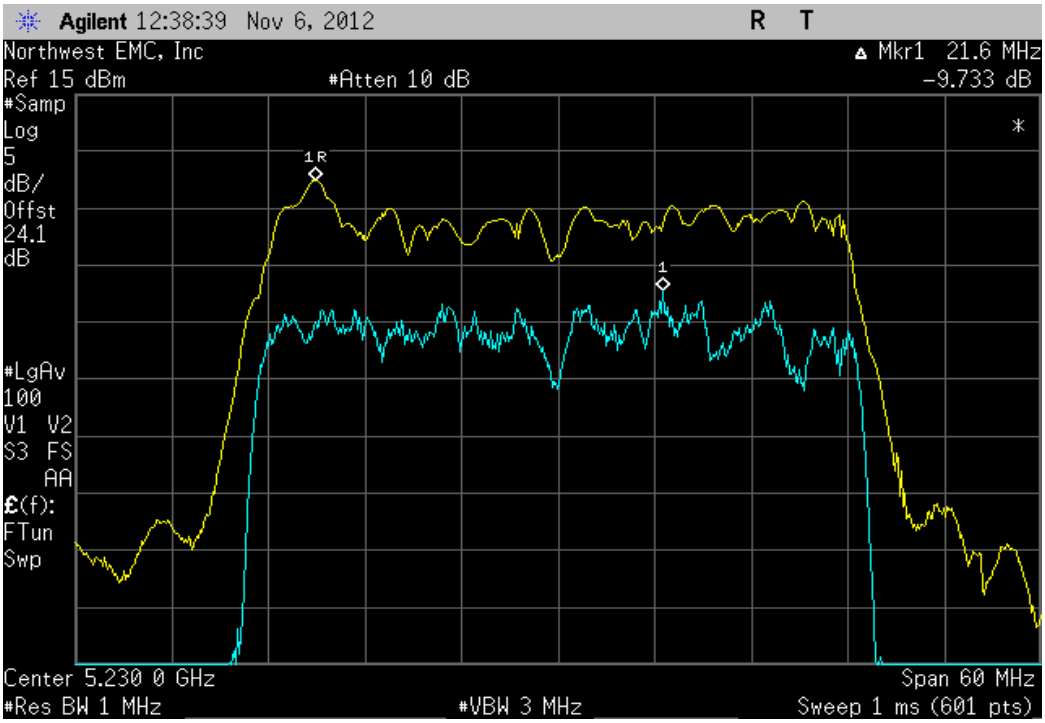
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				9.877 dB	≤ 13 dB	Pass



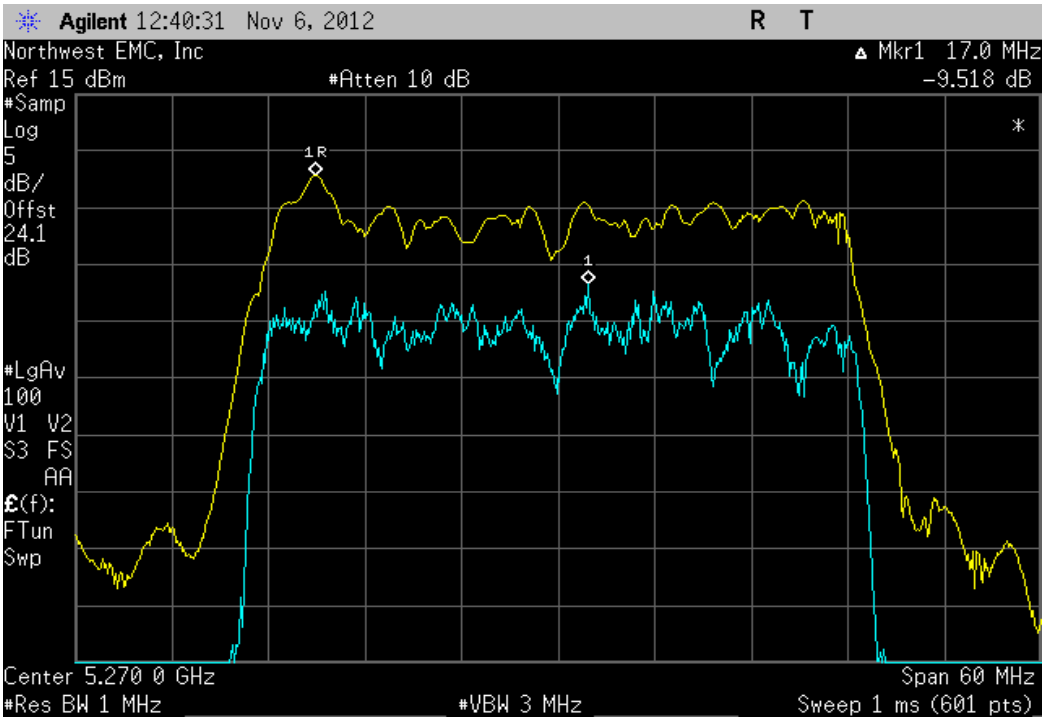
Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				9.733 dB	≤ 13 dB	Pass



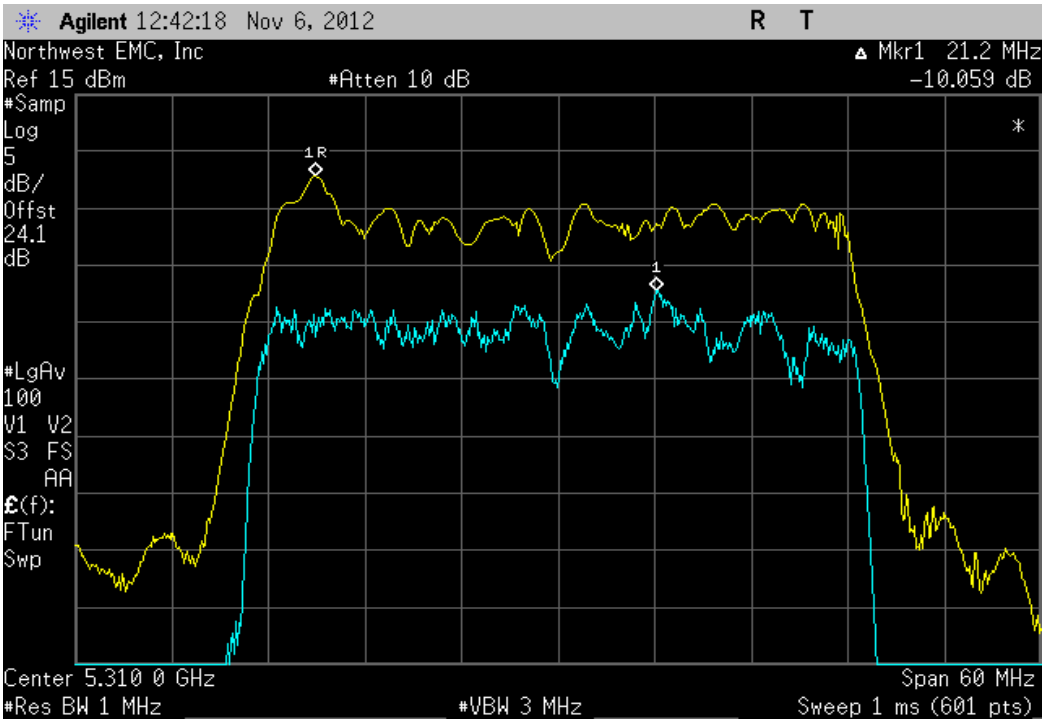
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

					Value	Limit	Result
					9.518 dB	≤ 13 dB	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

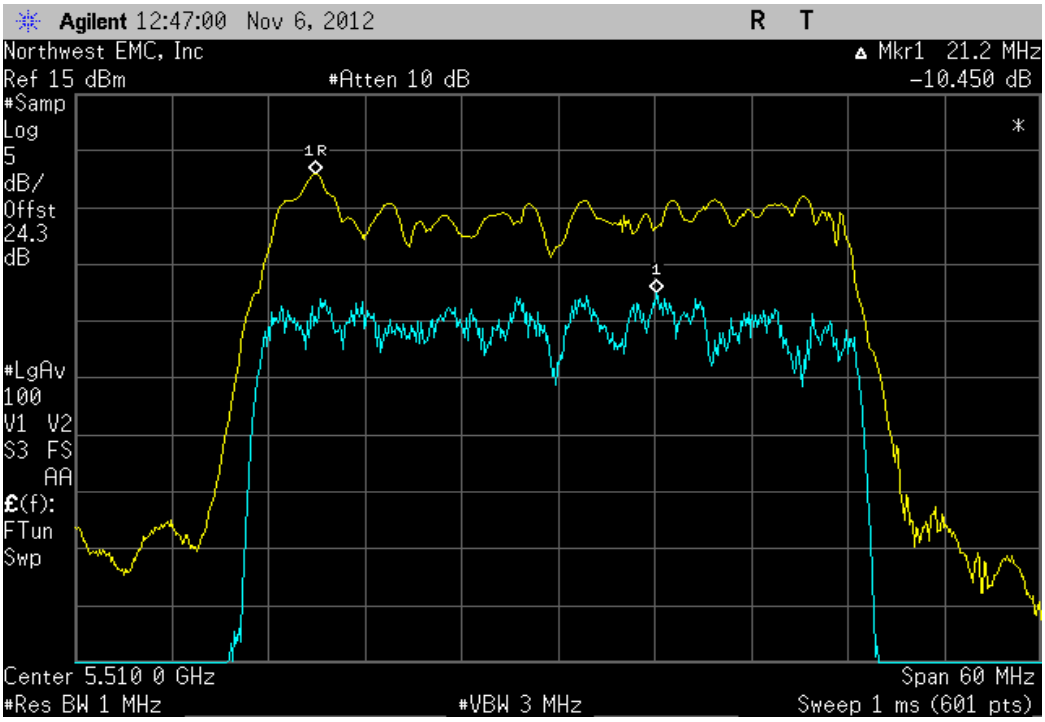
					Value	Limit	Result
					10.059 dB	≤ 13 dB	Pass



Peak Excursion

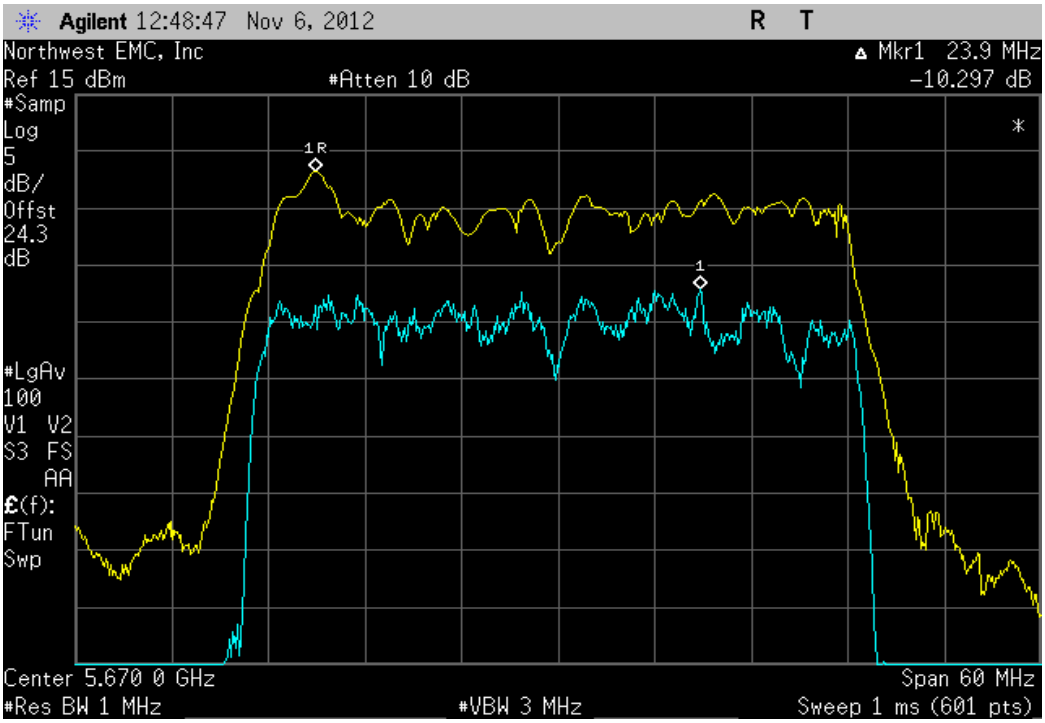
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				10.45 dB	≤ 13 dB	Pass



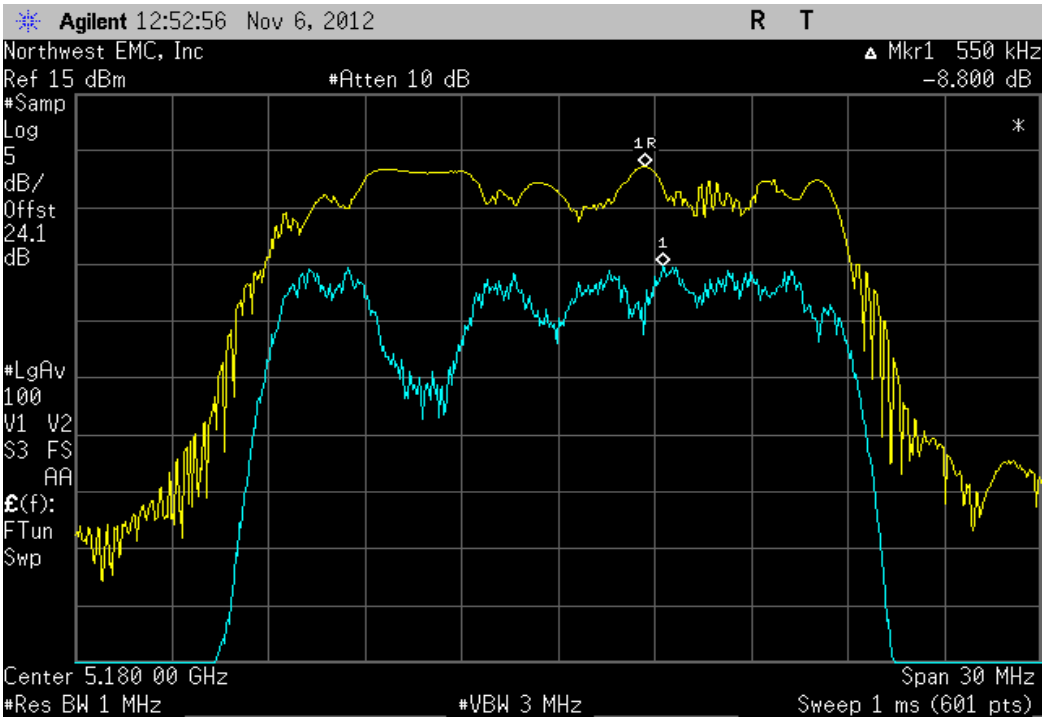
Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				10.297 dB	≤ 13 dB	Pass



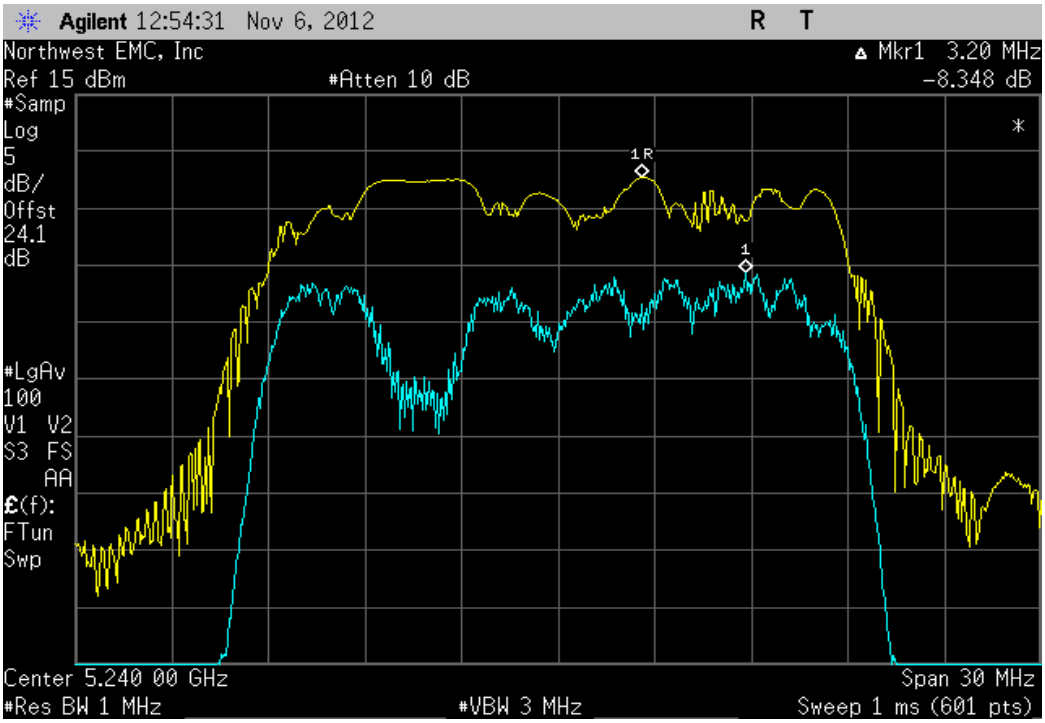
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

					Value	Limit	Result
					8.8 dB	≤ 13 dB	Pass



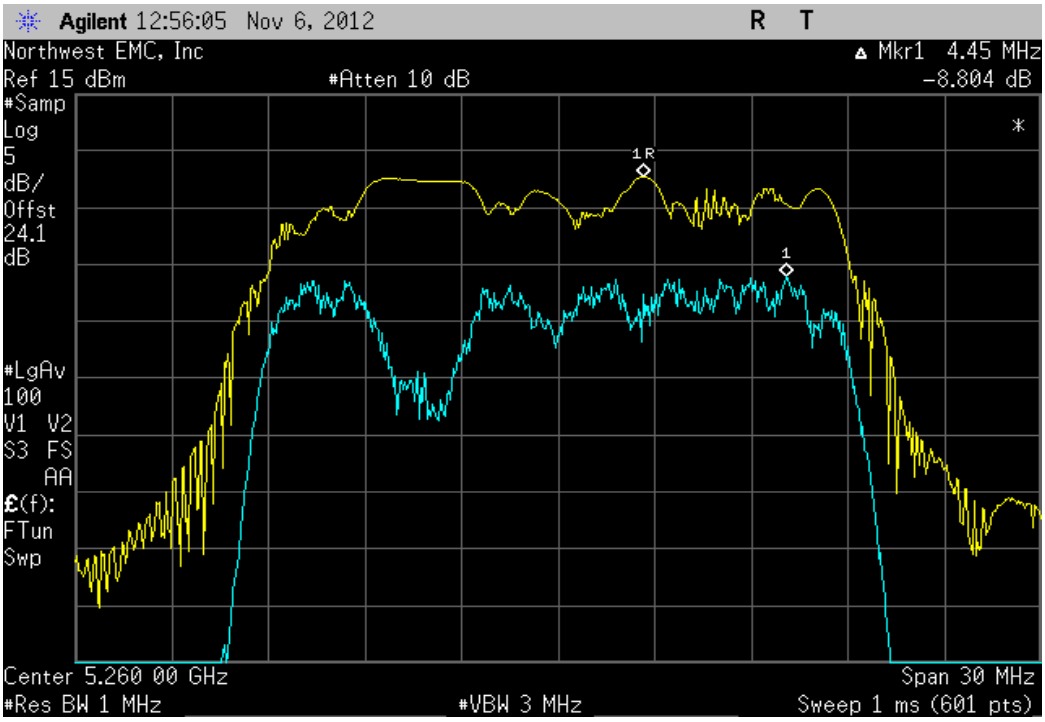
Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

					Value	Limit	Result
					8.348 dB	≤ 13 dB	Pass



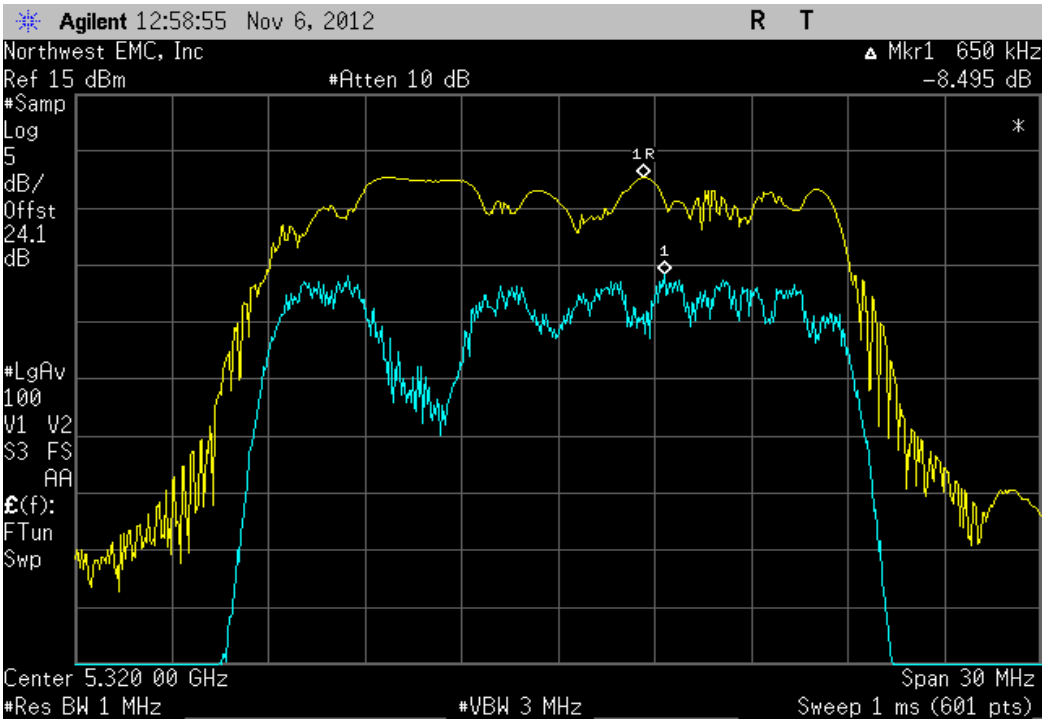
Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

Value	Limit	Result
8.804 dB	≤ 13 dB	Pass



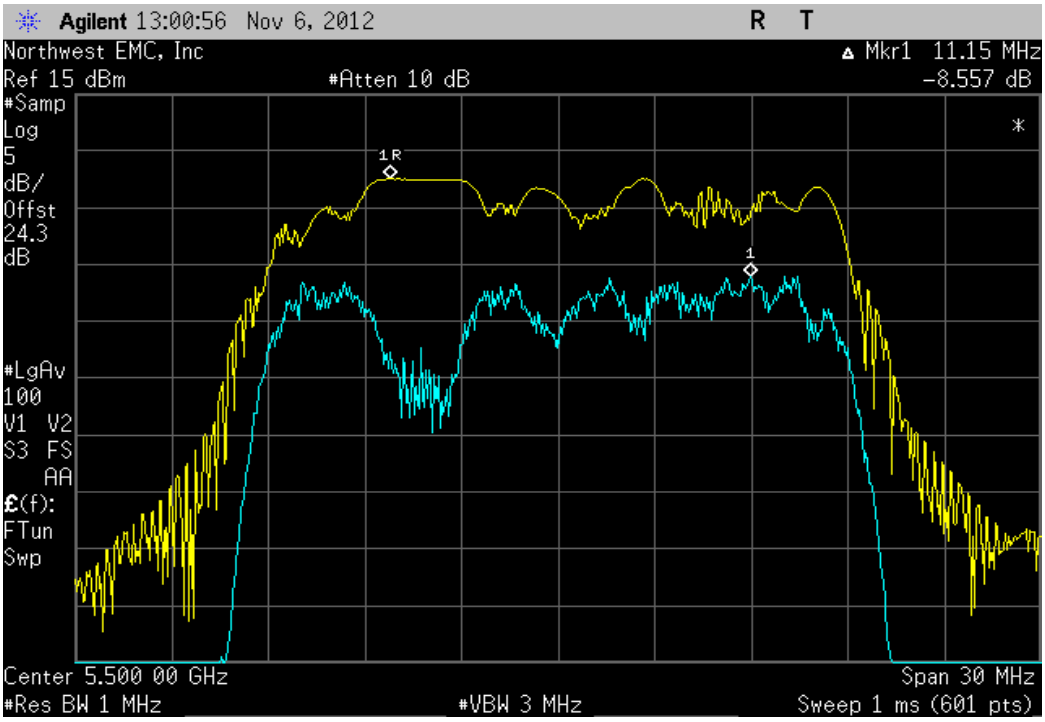
Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

Value	Limit	Result
8.495 dB	≤ 13 dB	Pass



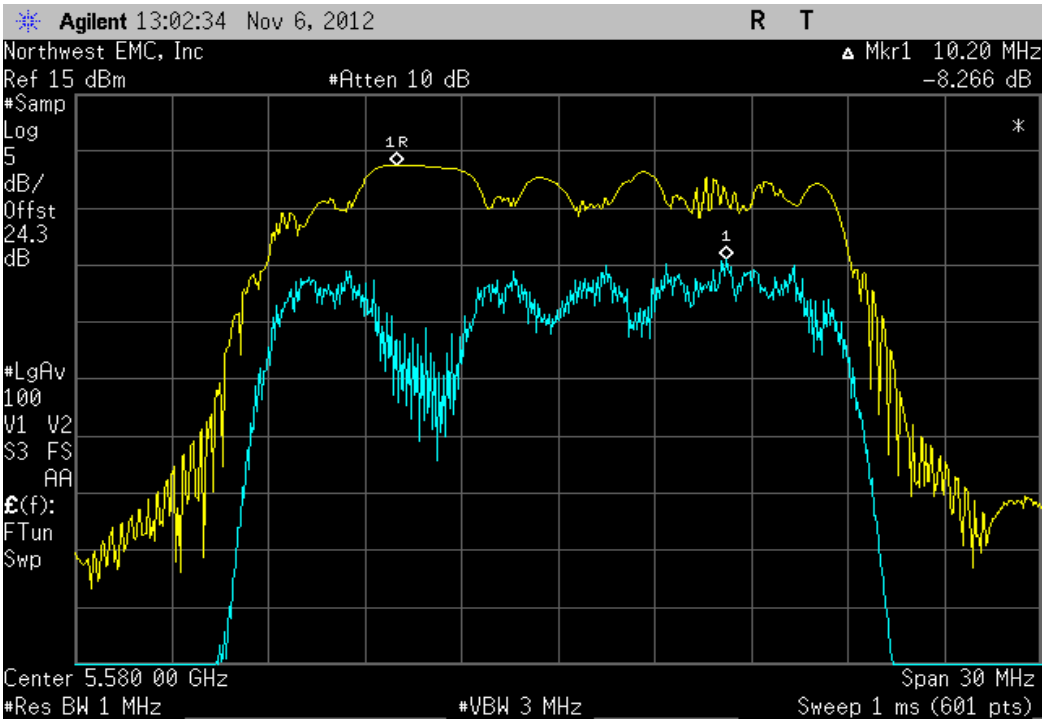
Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				8.557 dB	≤ 13 dB	Pass



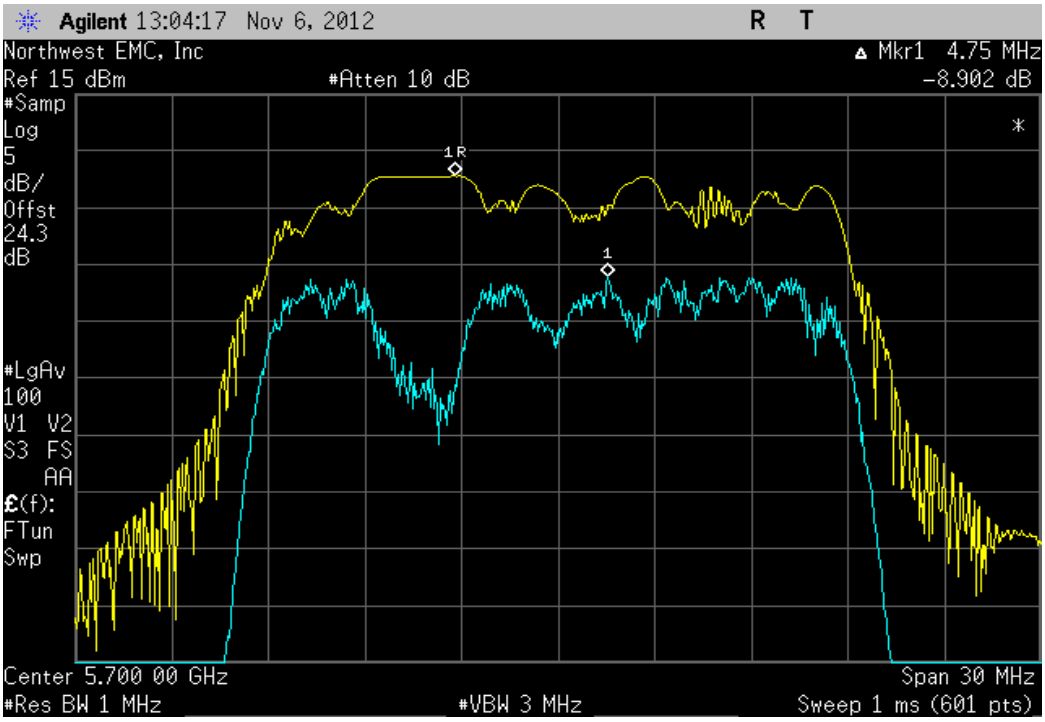
Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				8.266 dB	≤ 13 dB	Pass



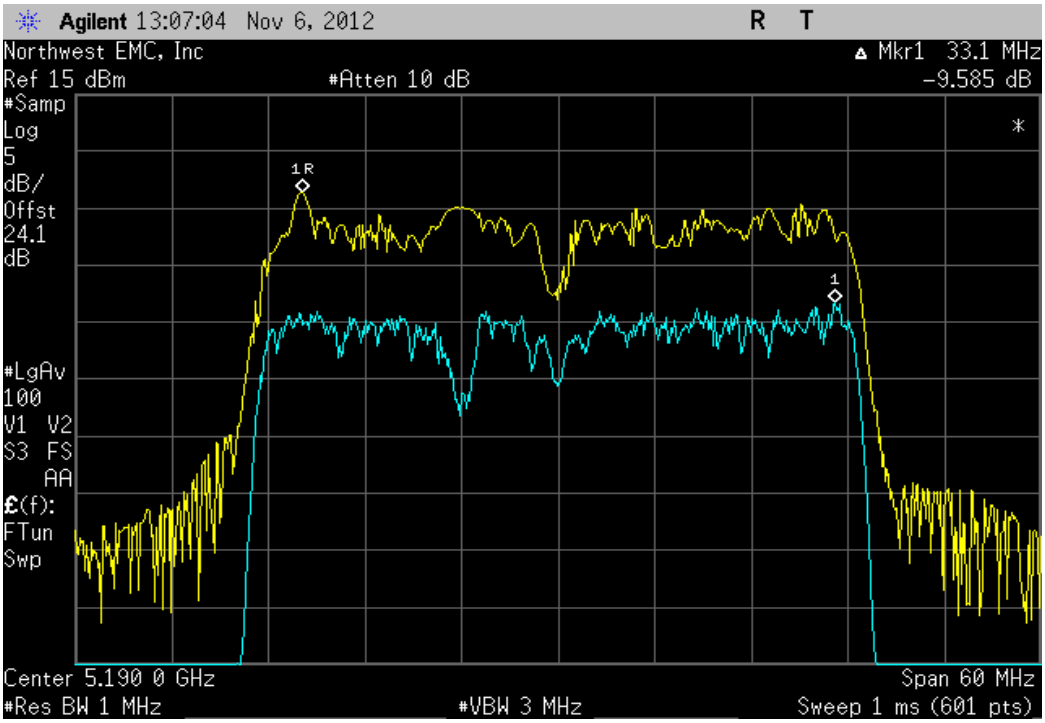
Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				8.902 dB	≤ 13 dB	Pass



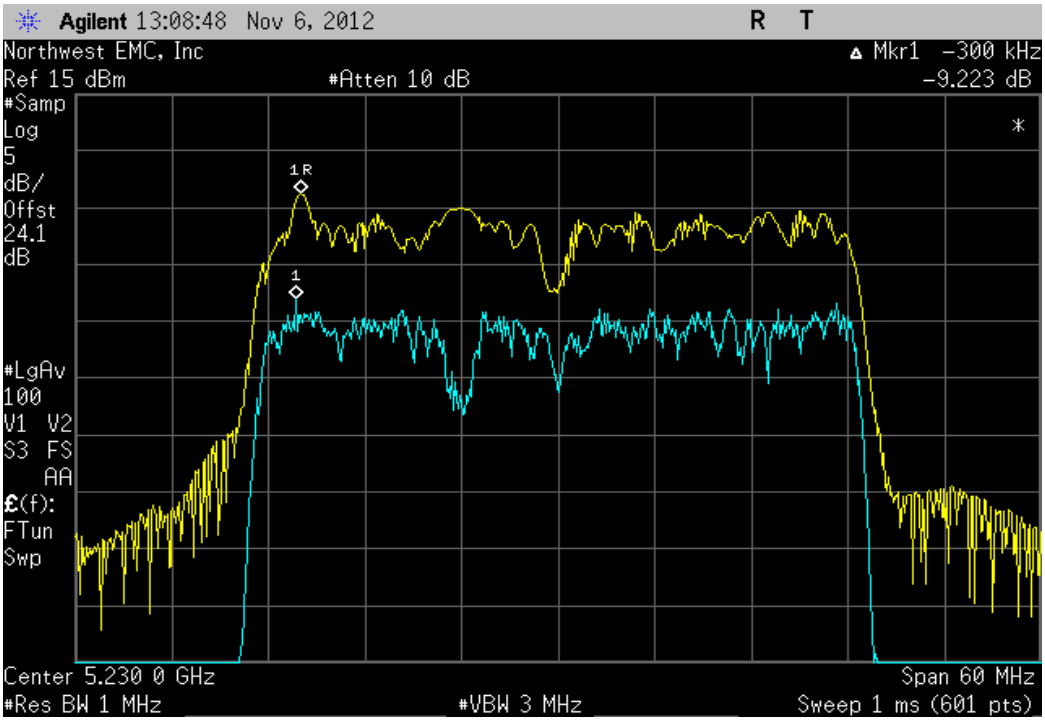
Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				9.585 dB	≤ 13 dB	Pass



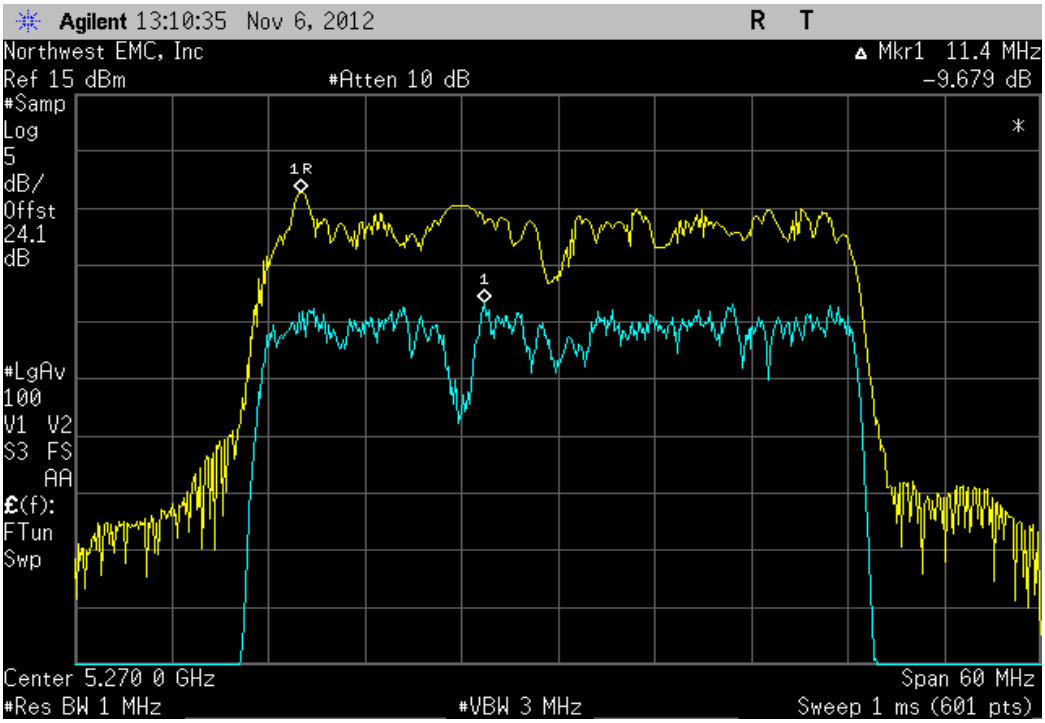
Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

Value	Limit	Result
9.223 dB	≤ 13 dB	Pass



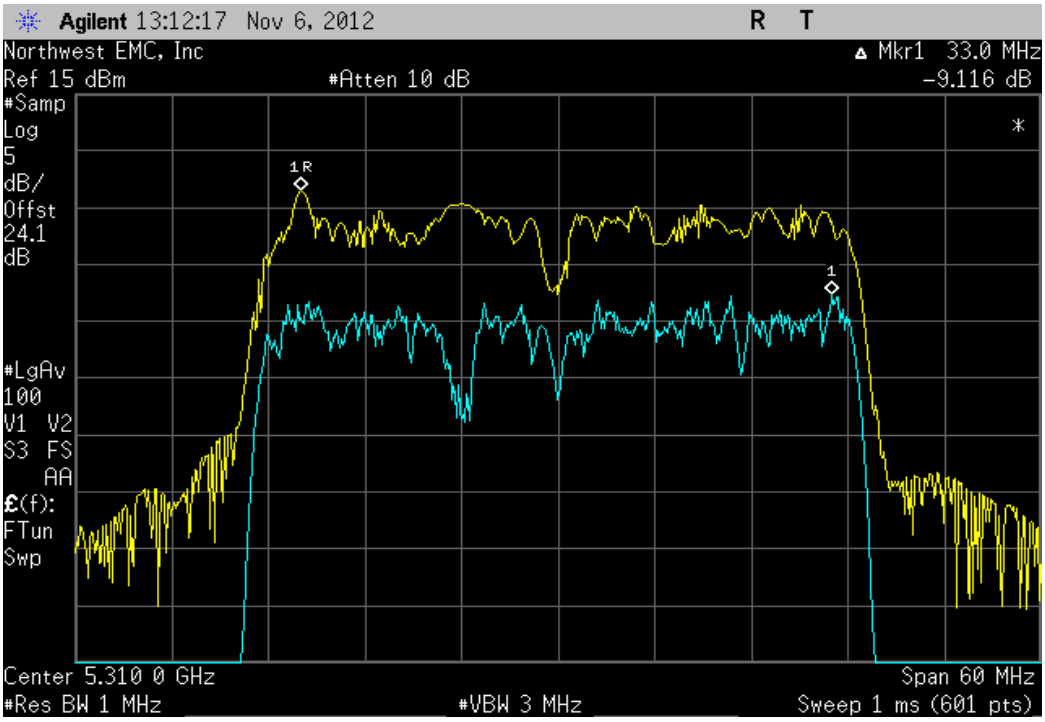
Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

Value	Limit	Result
9.679 dB	≤ 13 dB	Pass



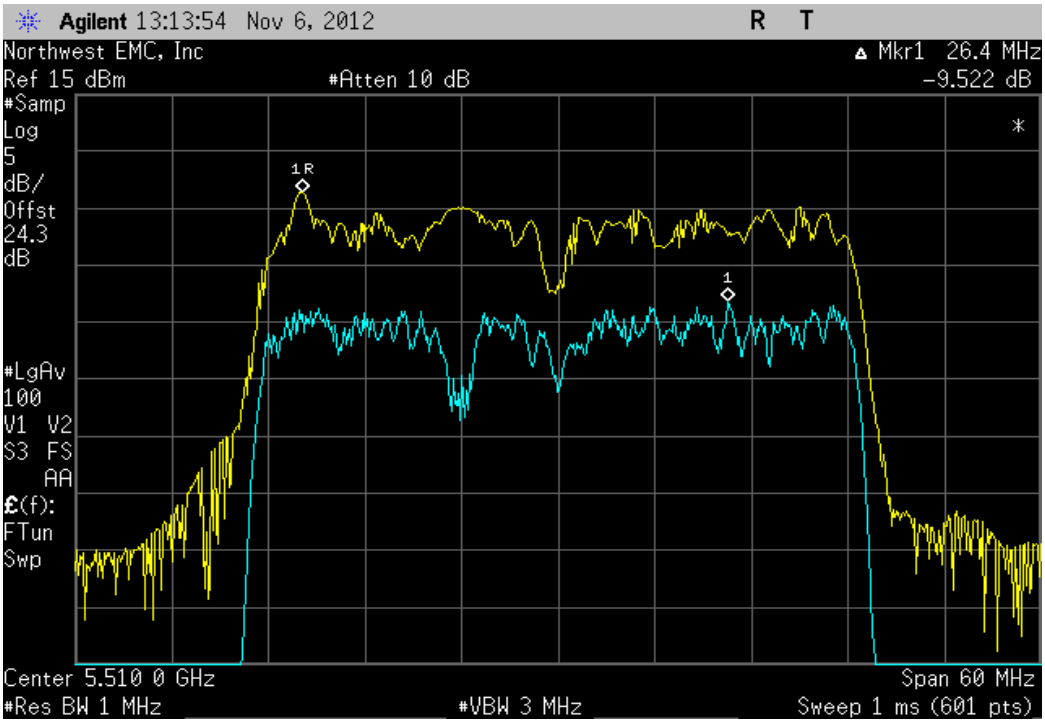
Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				9.116 dB	≤ 13 dB	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

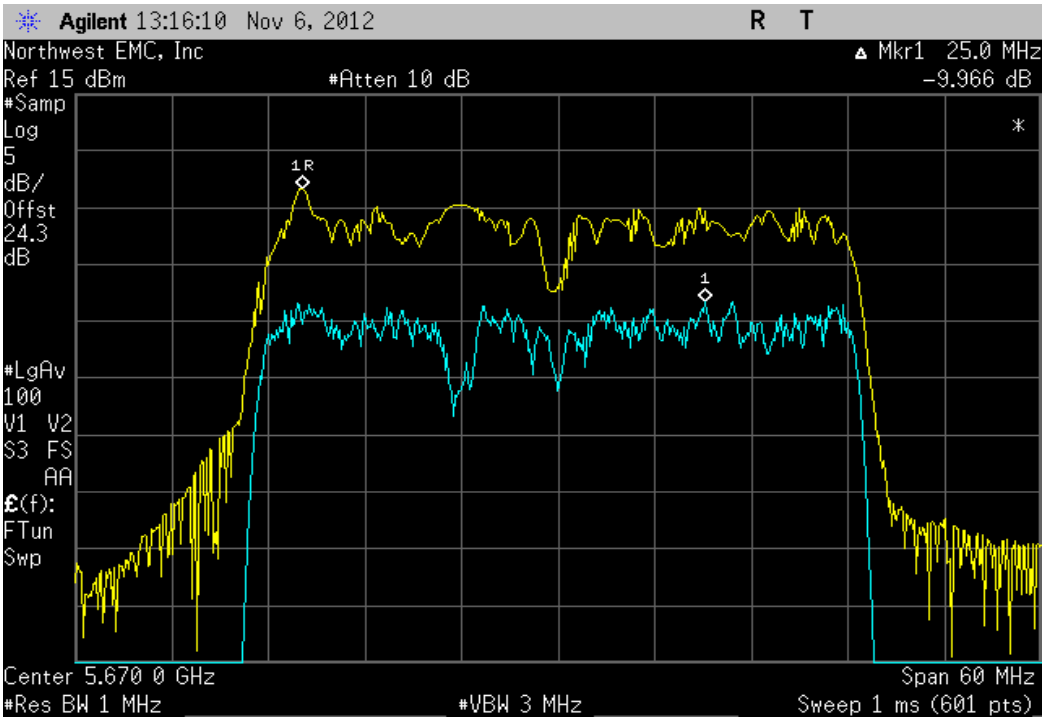
				Value	Limit	Result
				9.522 dB	≤ 13 dB	Pass



Peak Excursion

Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				9.966 dB	≤ 13 dB	Pass



Band Edge Compliance

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
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	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 spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

Please refer to the Power Table located elsewhere in this report for radio power operating level during testing.

The EUT was operating on antenna port A only.

Band Edge Compliance

EUT:	1514			**Work Order:**	MCSO1638
Serial Number:	000109423753			**Date:**	11/06/12
Customer:	Microsoft Corporation			**Temperature:**	22°C
Attendees:	None			**Humidity:**	50%
Project:	None			**Barometric Pres.:**	1018
Tested by:	Brandon Hobbs Rod Peloquin	**Power:**	110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD

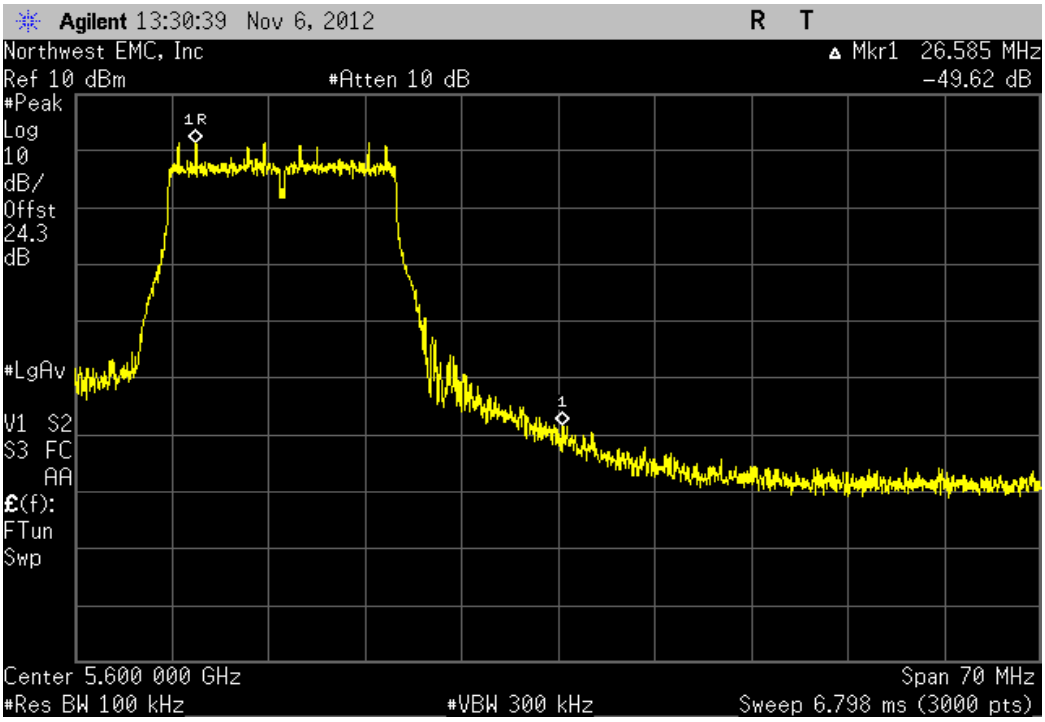
None

Configuration #	1	Signature

		Value	Limit	Result
802.11(a) 6 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-49.62 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-32.22 dBc	≤ -20 dBc	Pass
802.11(a) 36 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-49.32 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-30.53 dBc	≤ -20 dBc	Pass
802.11(a) 54 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-51.62 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-30.28 dBc	≤ -20 dBc	Pass
802.11(n) MCS0				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-48.78 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-26.95 dBc	≤ -20 dBc	Pass
802.11(n) MCS7				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-49.02 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-27.49 dBc	≤ -20 dBc	Pass

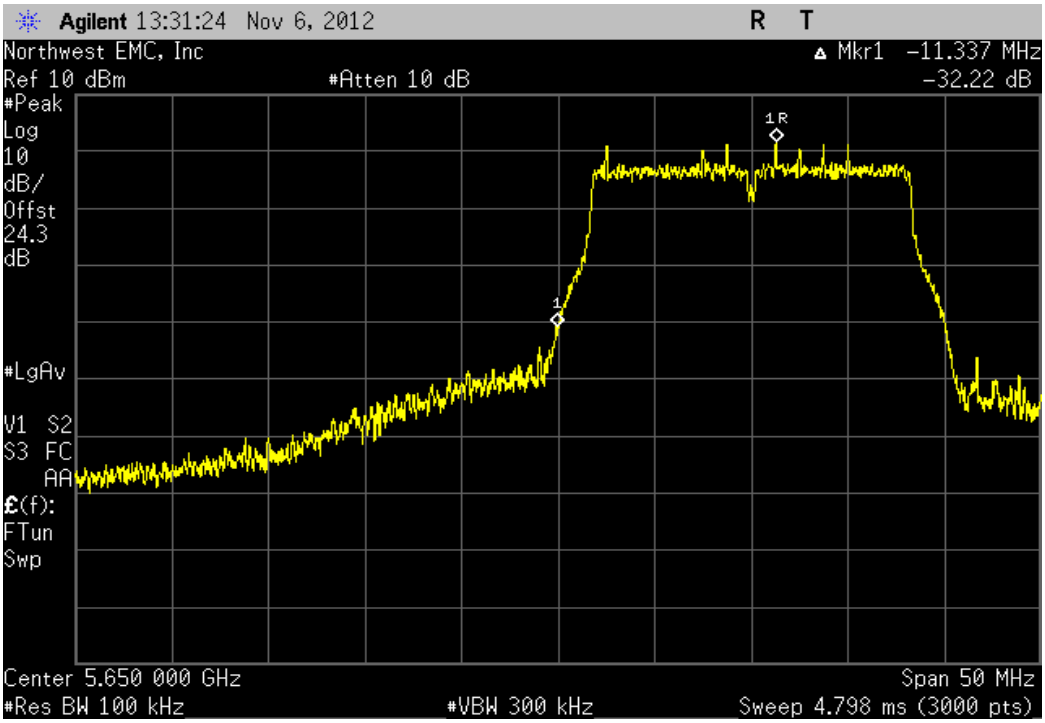
802.11(a) 6 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-49.62 dBc	≤ -20 dBc	Pass



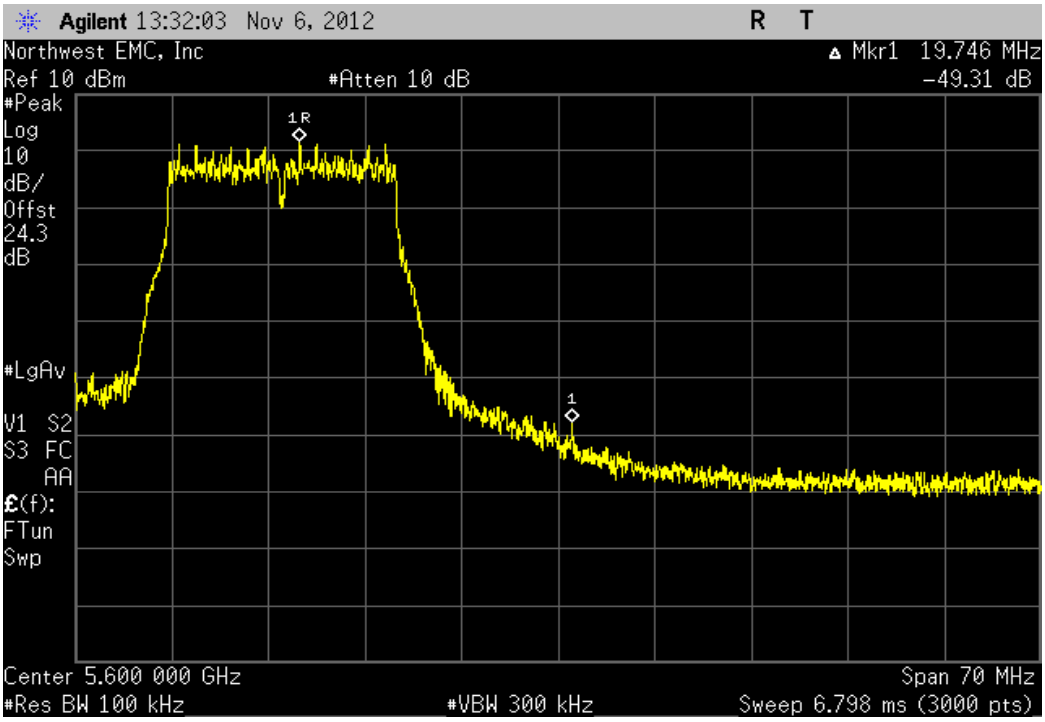
802.11(a) 6 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-32.22 dBc	≤ -20 dBc	Pass



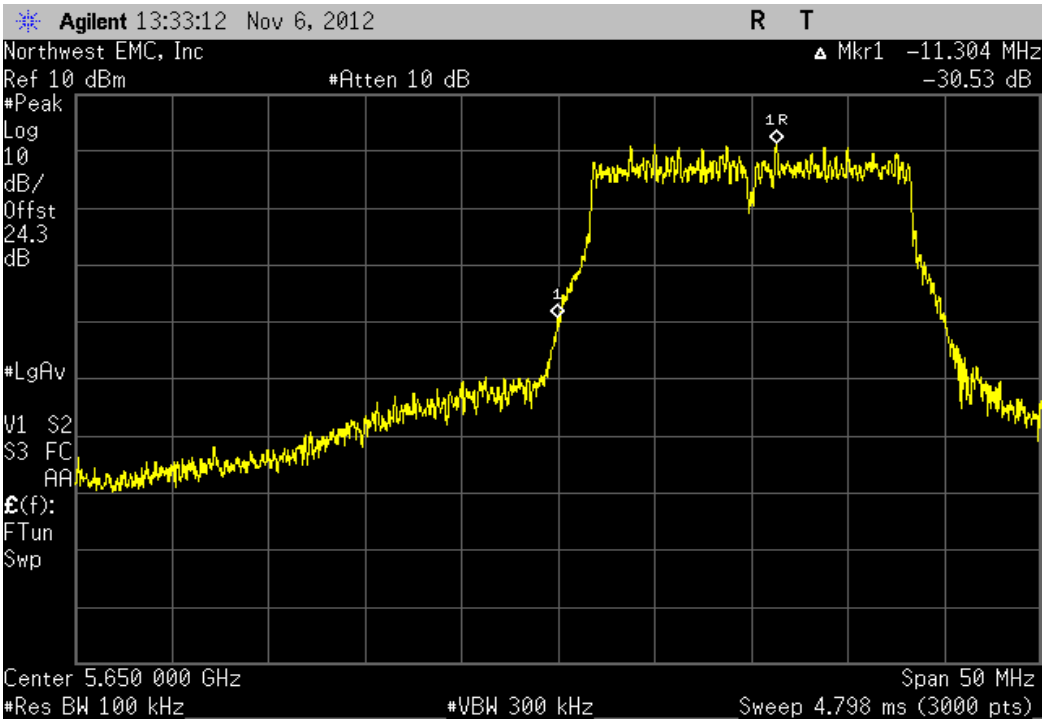
802.11(a) 36 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-49.32 dBc	≤ -20 dBc	Pass



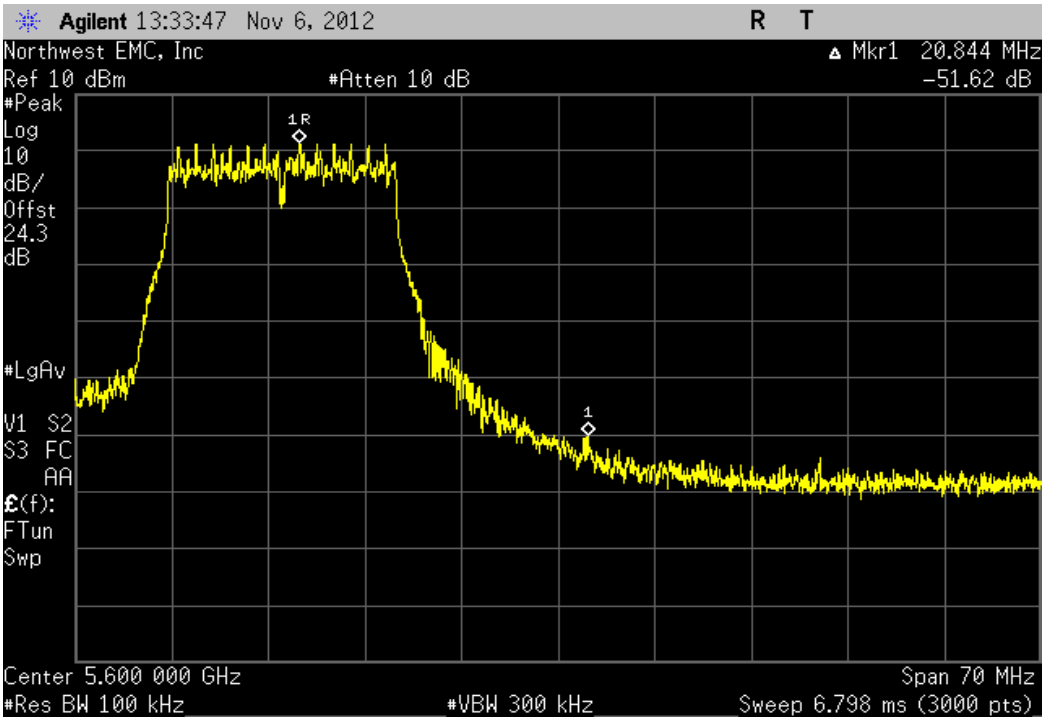
802.11(a) 36 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-30.53 dBc	≤ -20 dBc	Pass



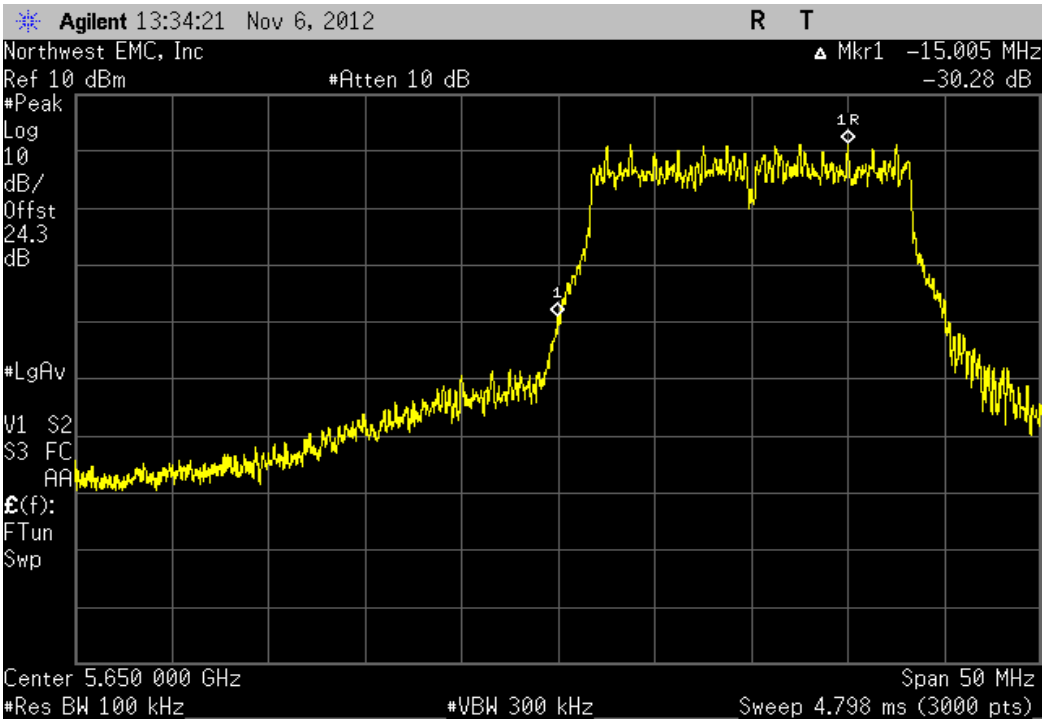
802.11(a) 54 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-51.62 dBc	≤ -20 dBc	Pass



802.11(a) 54 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

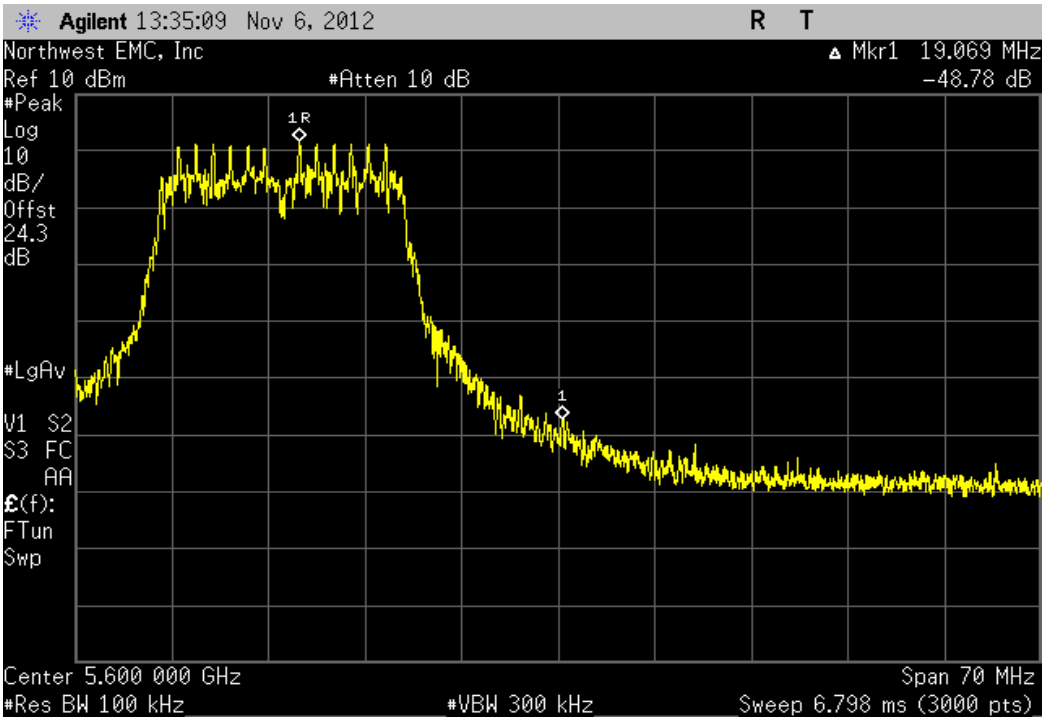
				Value	Limit	Result
				-30.28 dBc	≤ -20 dBc	Pass



Band Edge Compliance

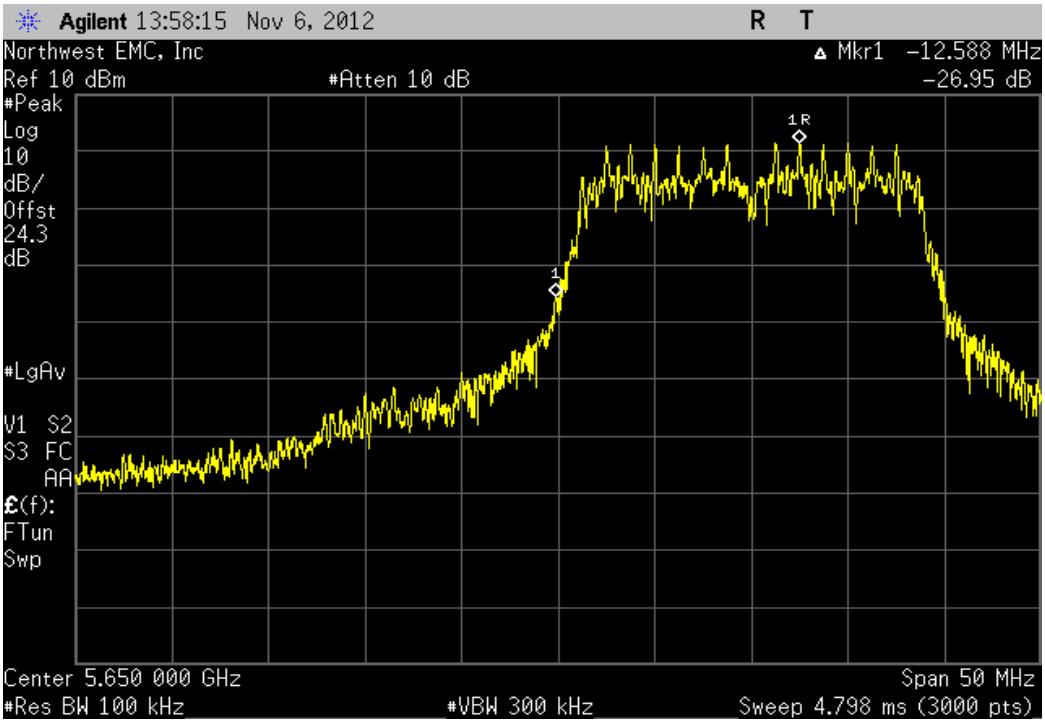
802.11(n) MCS0, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-48.78 dBc	≤ -20 dBc	Pass



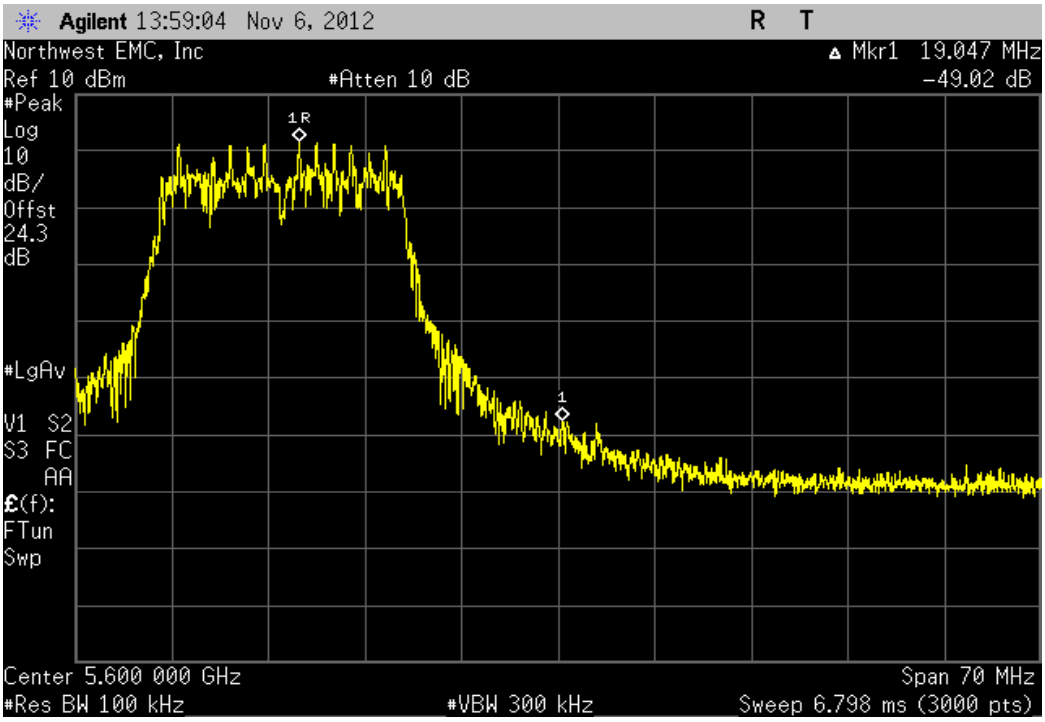
802.11(n) MCS0, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-26.95 dBc	≤ -20 dBc	Pass



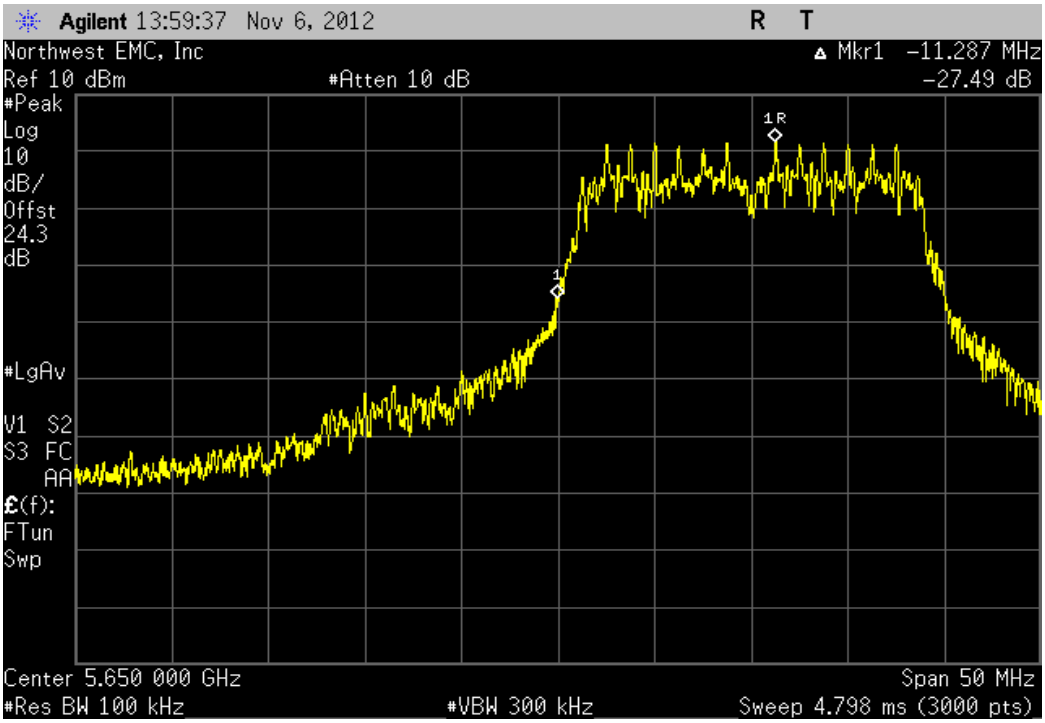
802.11(n) MCS7, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-49.02 dBc	≤ -20 dBc	Pass



802.11(n) MCS7, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-27.49 dBc	≤ -20 dBc	Pass



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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/15/2011	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	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

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

Variation of Ambient Temperature

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.

NOTE: The product is not designed to operate below -10° C and is programmed to shut down below this temperature.

A direct connect measurement was made between the EUT's antenna cable 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 at the mid channel of each band to determine frequency stability. If the frequency variation is less than 100 ppm, the EUT will meet the requirement of 15.407(g), that the emissions are maintained within the band of operation.

The EUT is operating on Antenna Port A only.

Frequency Stability

EUT:	1514	Work Order:	MCSO1638
Serial Number:	000109423753	Date:	11/05/12
Customer:	Microsoft Corporation	Temperature:	22.3°C
Attendees:	None	Humidity:	52%
Project:	None	Barometric Pres.:	1013
Tested by:	Brandon Hobbs Rod Peloquin	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2012	ANSI C63.10:2009

COMMENTS

The EUT is operating at 100% duty cycle. All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations. NOTE: The product is not designed to operate below -10° C and is programmed to shut down below this temperature.

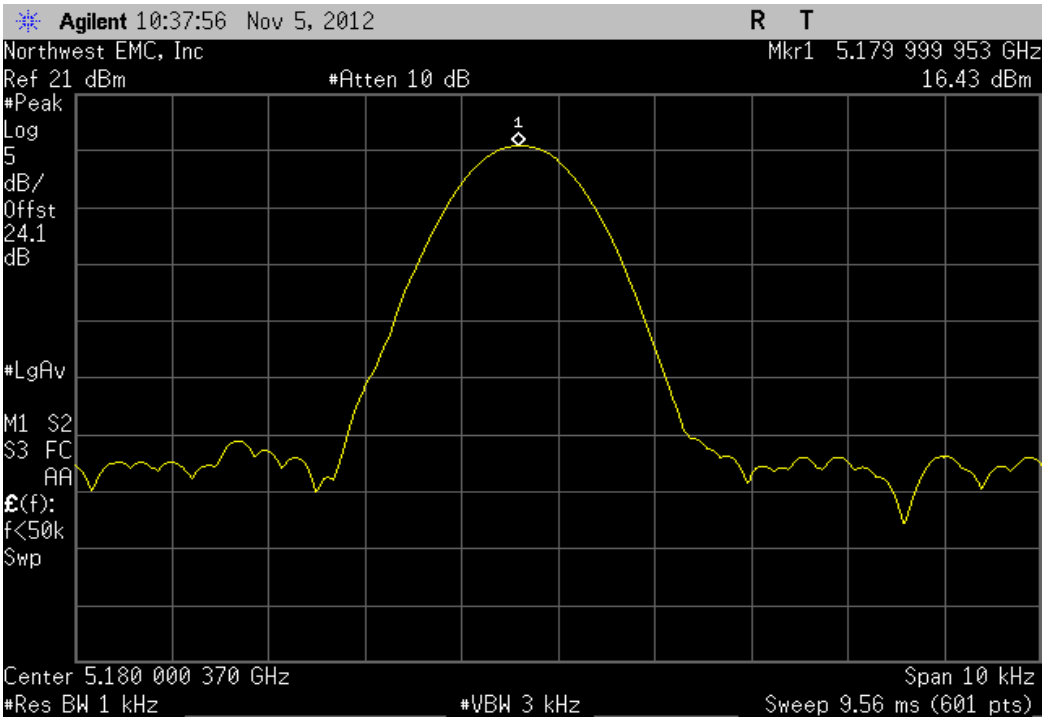
DEVIATIONS FROM TEST STANDARD

None

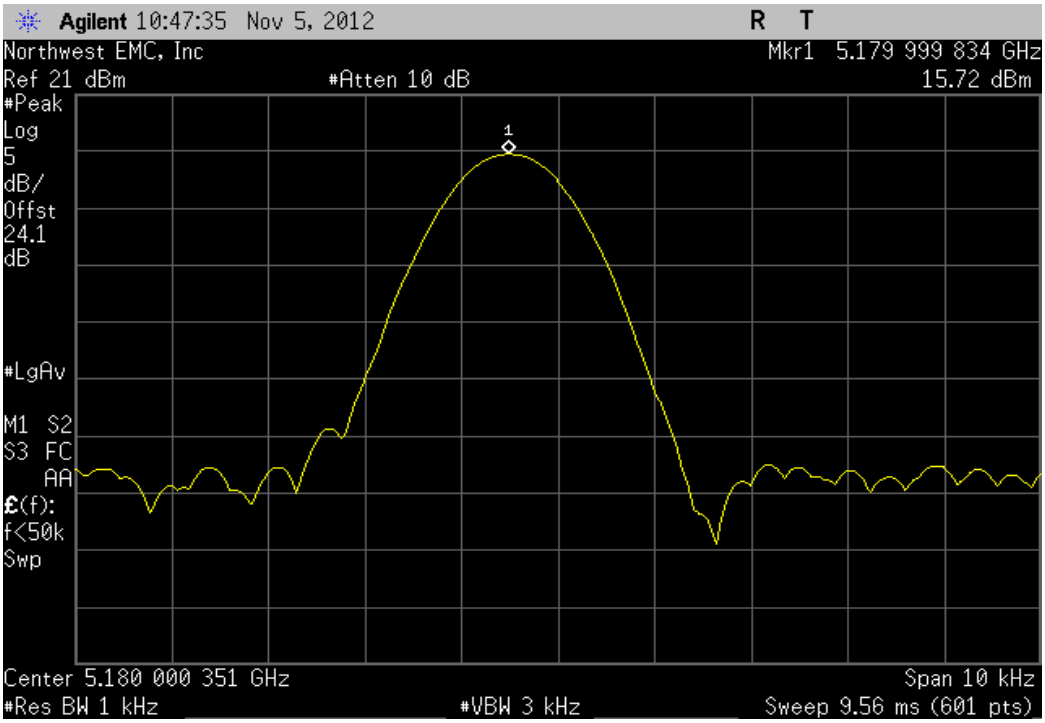
Configuration #	2	Signature

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
5150 MHz - 5250 MHz - Low Channel, 5180 MHz					
Voltage: 115%	5179.999953	5180	0.01	100	Pass
Voltage: 100%	5179.999834	5180	0.03	100	Pass
Voltage: 85%	5179.999868	5180	0.03	100	Pass
Temperature: +50°	5180.000789	5180	0.15	100	Pass
Temperature: +40°	5179.999636	5180	0.07	100	Pass
Temperature: +30°	5180.000116	5180	0.02	100	Pass
Temperature: +20°	5179.999688	5180	0.06	100	Pass
Temperature: +10°	5179.999419	5180	0.11	100	Pass
Temperature: 0°	5179.999119	5180	0.17	100	Pass
Temperature: -10°	5179.999586	5180	0.08	100	Pass
Temperature: -20°	N/A	N/A	N/A	N/A	N/A
Temperature: -30°	N/A	N/A	N/A	N/A	N/A
5250 MHz - 5350 MHz - High Channel, 5320 MHz					
Voltage: 115%	5320.000039	5320	0.01	100	Pass
Voltage: 100%	5319.99987	5320	0.02	100	Pass
Voltage: 85%	5319.999922	5320	0.01	100	Pass
Temperature: +50°	5320.000641	5320	0.12	100	Pass
Temperature: +40°	5319.999705	5320	0.06	100	Pass
Temperature: +30°	5320.000072	5320	0.01	100	Pass
Temperature: +20°	5319.999806	5320	0.04	100	Pass
Temperature: +10°	5319.999471	5320	0.1	100	Pass
Temperature: 0°	5319.999154	5320	0.16	100	Pass
Temperature: -10°	5319.999638	5320	0.07	100	Pass
Temperature: -20°	N/A	N/A	N/A	N/A	N/A
Temperature: -30°	N/A	N/A	N/A	N/A	N/A
5470 MHz - 5725 MHz - Low Channel, 5500 MHz					
Voltage: 115%	5500.00005	5500	0.01	100	Pass
Voltage: 100%	5499.999885	5500	0.02	100	Pass
Voltage: 85%	5499.999934	5500	0.01	100	Pass
Temperature: +50°	5500.000669	5500	0.12	100	Pass
Temperature: +40°	5499.999751	5500	0.05	100	Pass
Temperature: +30°	5499.999967	5500	0.01	100	Pass
Temperature: +20°	5499.999817	5500	0.03	100	Pass
Temperature: +10°	5499.999517	5500	0.09	100	Pass
Temperature: 0°	5499.999184	5500	0.15	100	Pass
Temperature: -10°	5499.999651	5500	0.06	100	Pass
Temperature: -20°	N/A	N/A	N/A	N/A	N/A
Temperature: -30°	N/A	N/A	N/A	N/A	N/A
5470 MHz - 5725 MHz - High Channel, 5700 MHz					
Voltage: 115%	5700.000019	5700	0	100	Pass
Voltage: 100%	5699.999819	5700	0.03	100	Pass
Voltage: 85%	5699.999903	5700	0.02	100	Pass
Temperature: +50°	5700.001054	5700	0.18	100	Pass
Temperature: +40°	5699.999936	5700	0.01	100	Pass
Temperature: +30°	5699.999919	5700	0.01	100	Pass
Temperature: +20°	5699.999786	5700	0.04	100	Pass
Temperature: +10°	5699.999453	5700	0.1	100	Pass
Temperature: 0°	5699.999119	5700	0.15	100	Pass
Temperature: -10°	5699.999686	5700	0.06	100	Pass
Temperature: -20°	N/A	N/A	N/A	N/A	N/A
Temperature: -30°	N/A	N/A	N/A	N/A	N/A

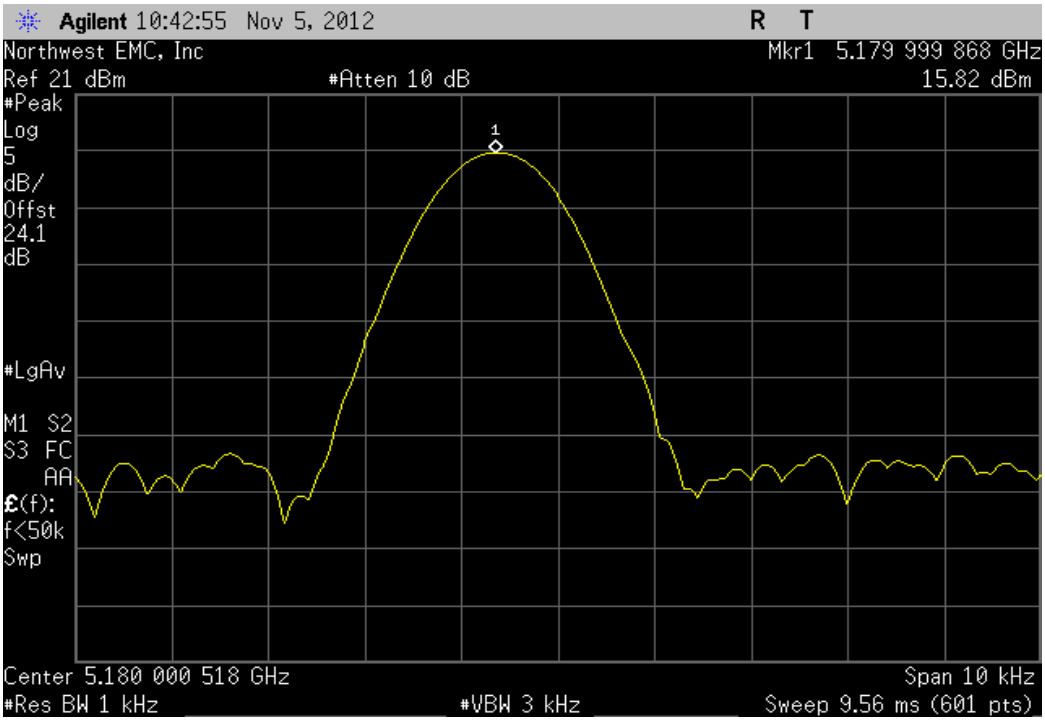
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999953	5180	0.01	100	Pass



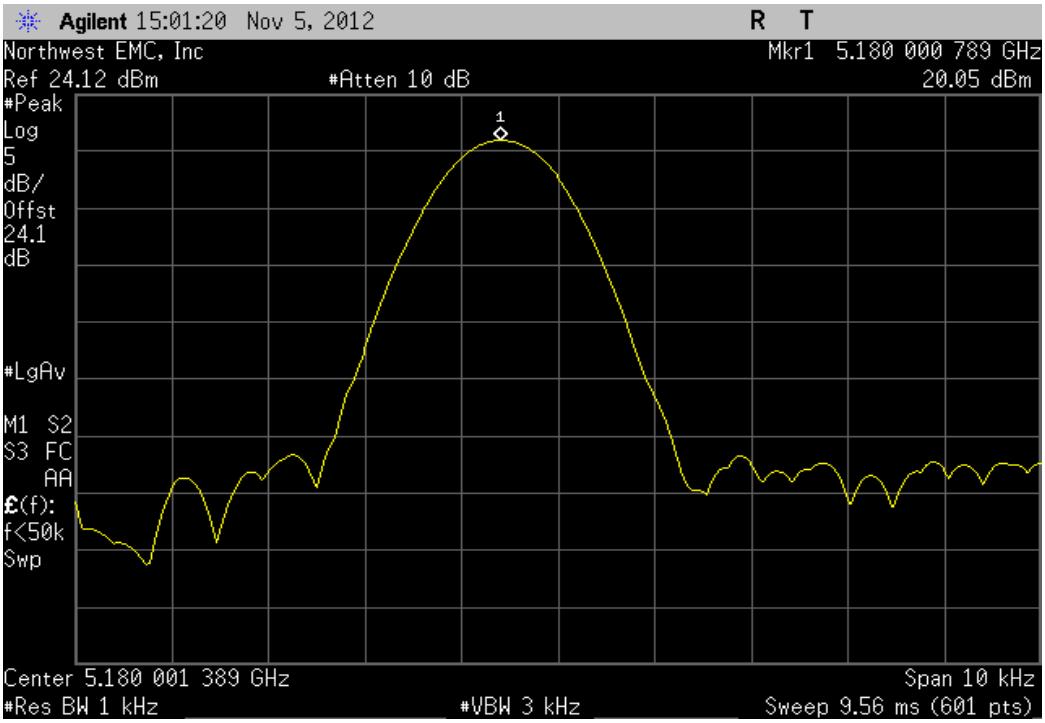
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999834	5180	0.03	100	Pass



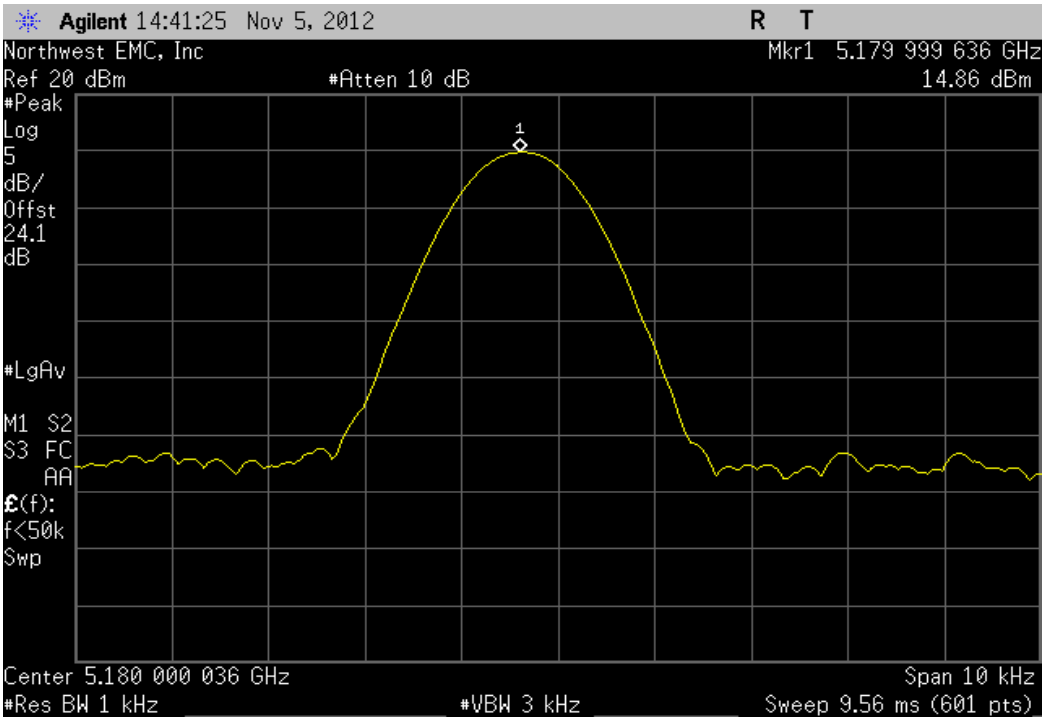
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999868	5180	0.03	100	Pass



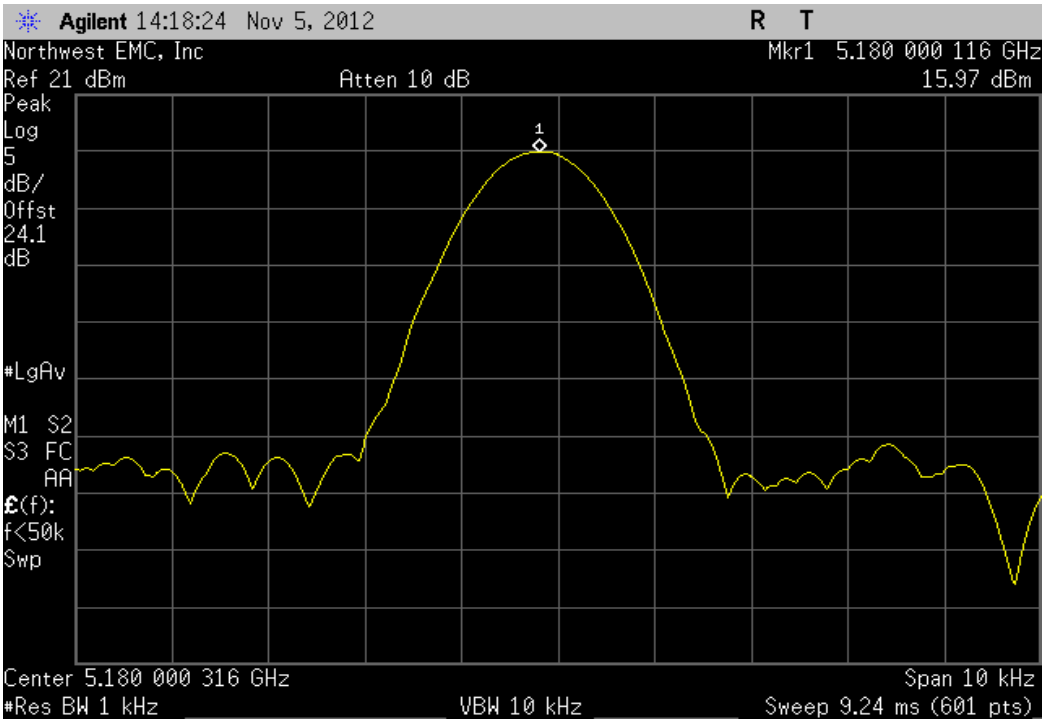
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000789	5180	0.15	100	Pass



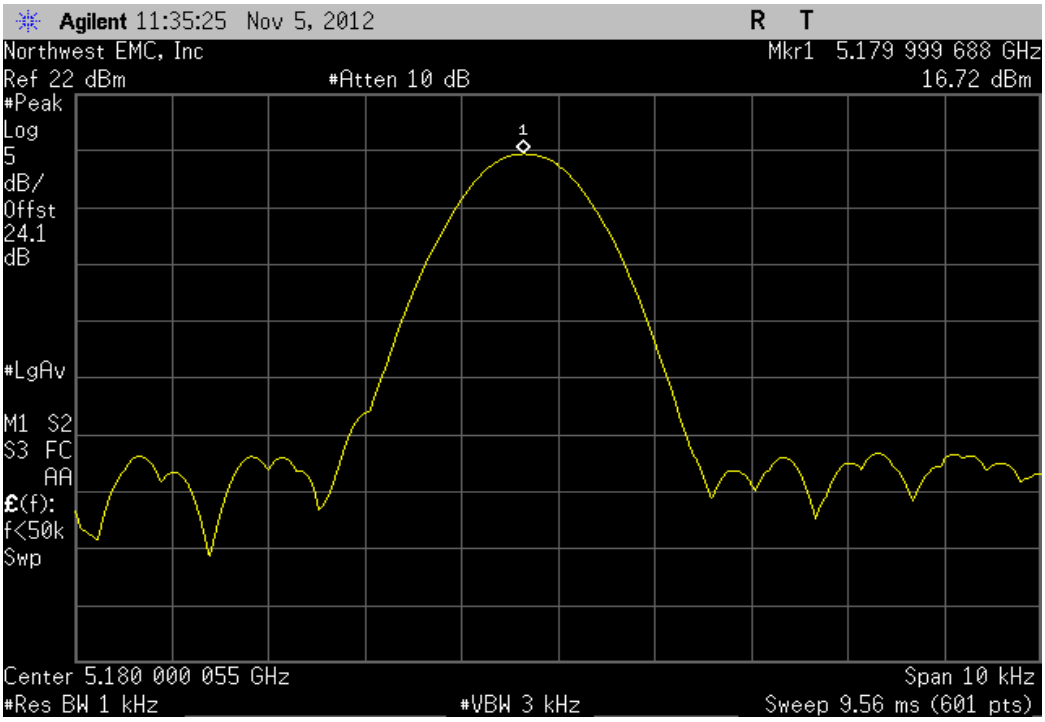
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999636	5180	0.07	100	Pass



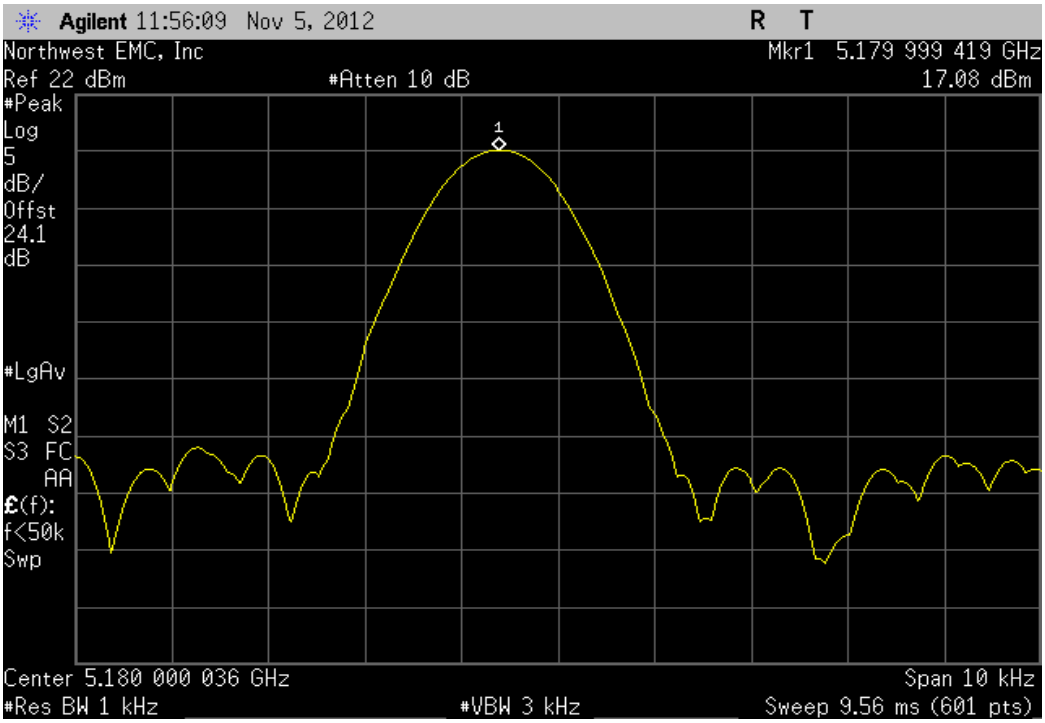
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000116	5180	0.02	100	Pass



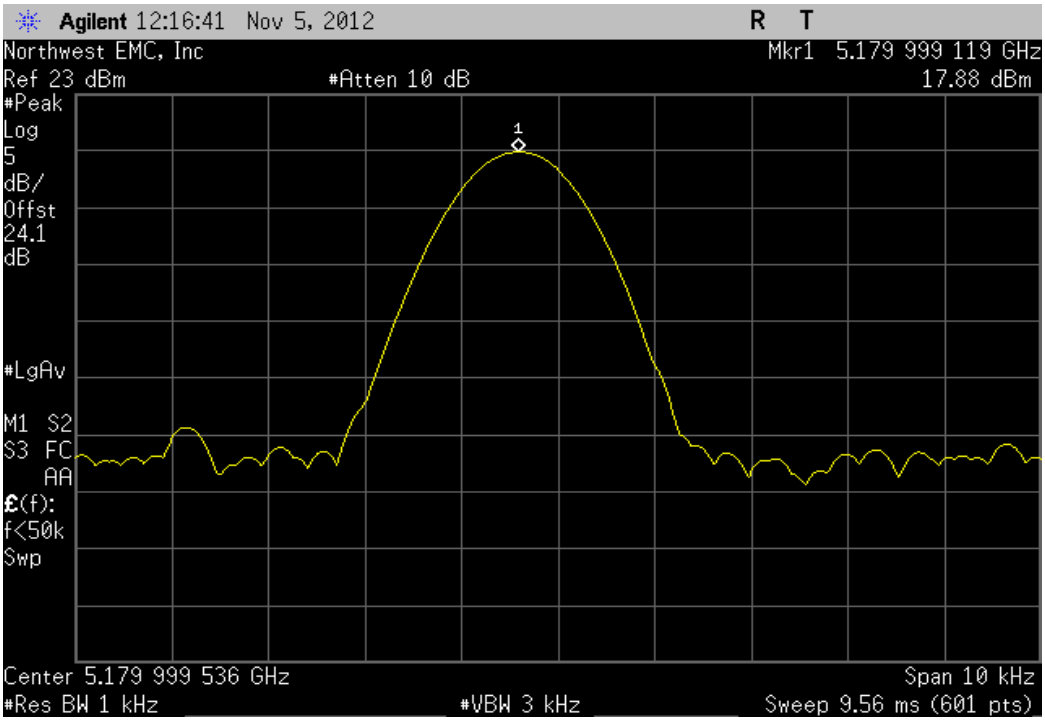
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999688	5180	0.06	100	Pass



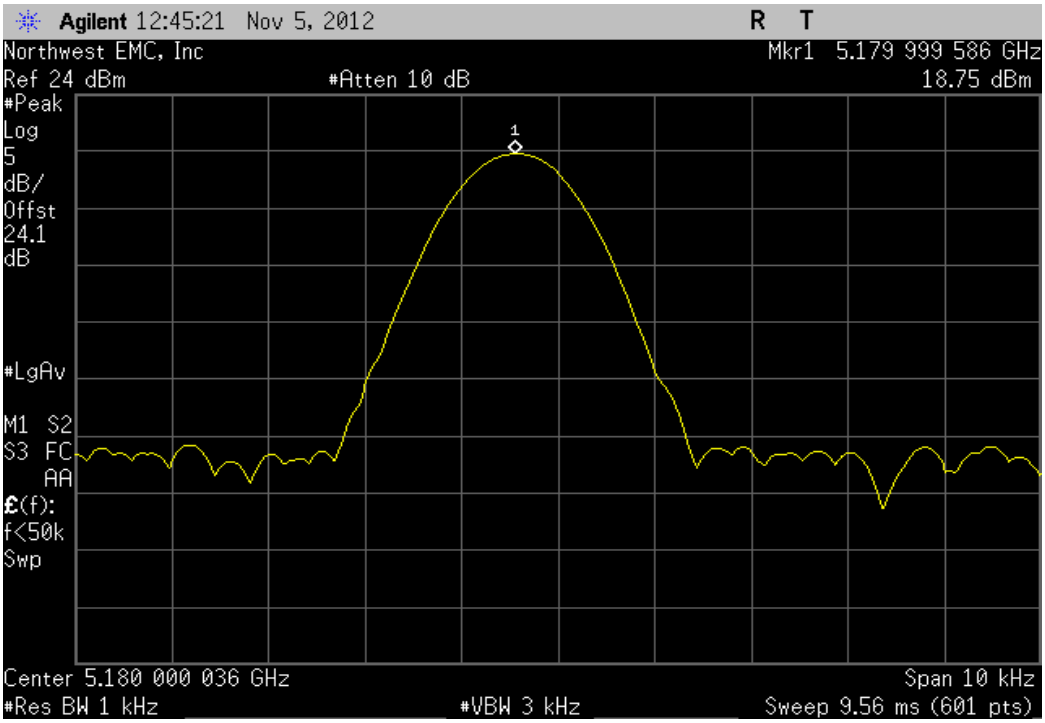
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999419	5180	0.11	100	Pass



5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999119	5180	0.17	100	Pass

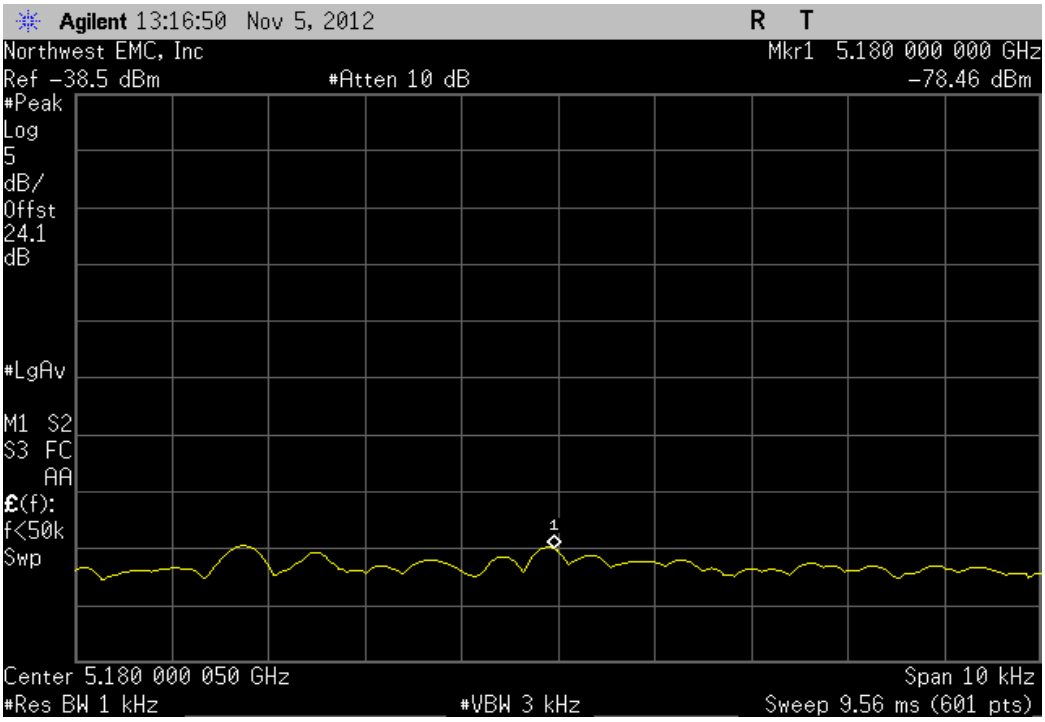


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.999586	5180	0.08	100	Pass

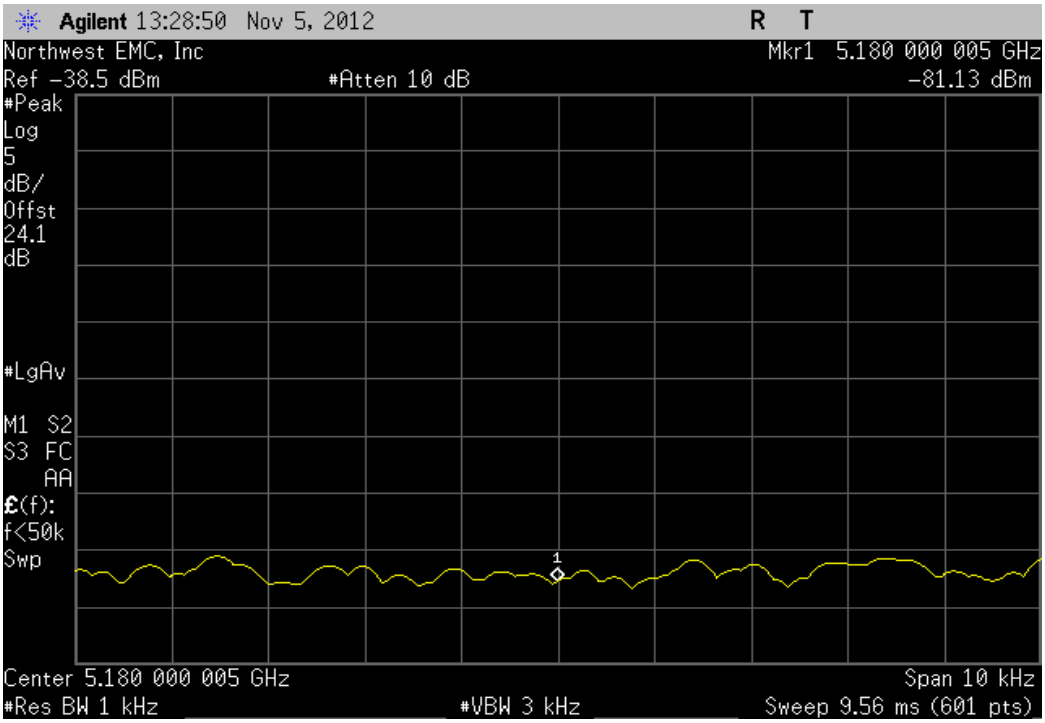


Frequency Stability

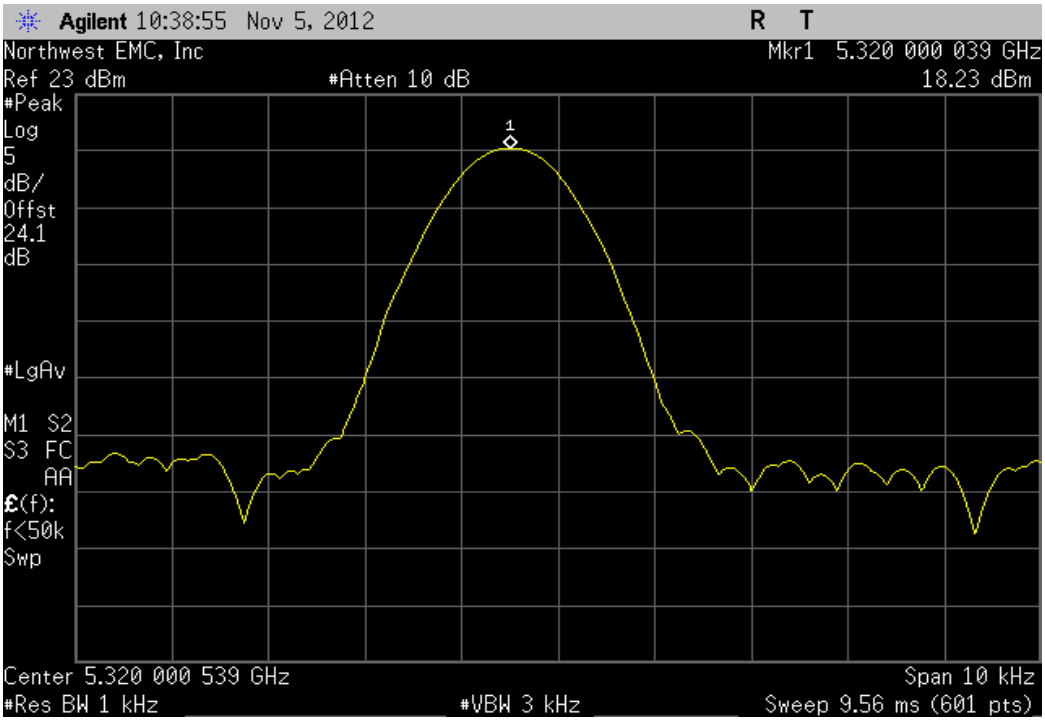
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



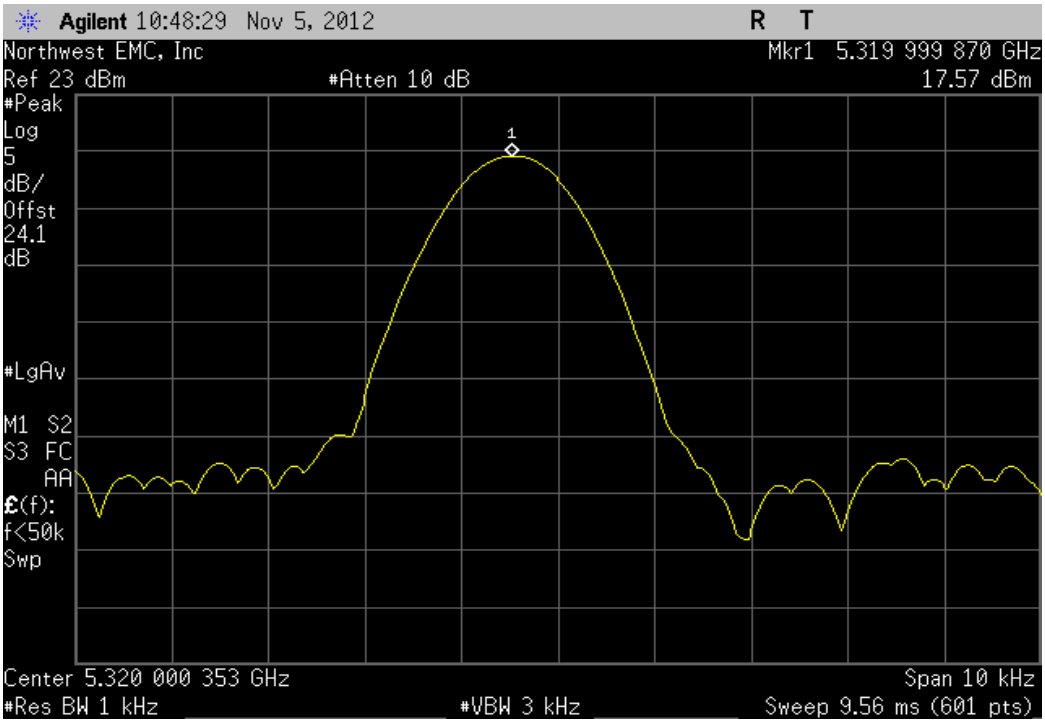
5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



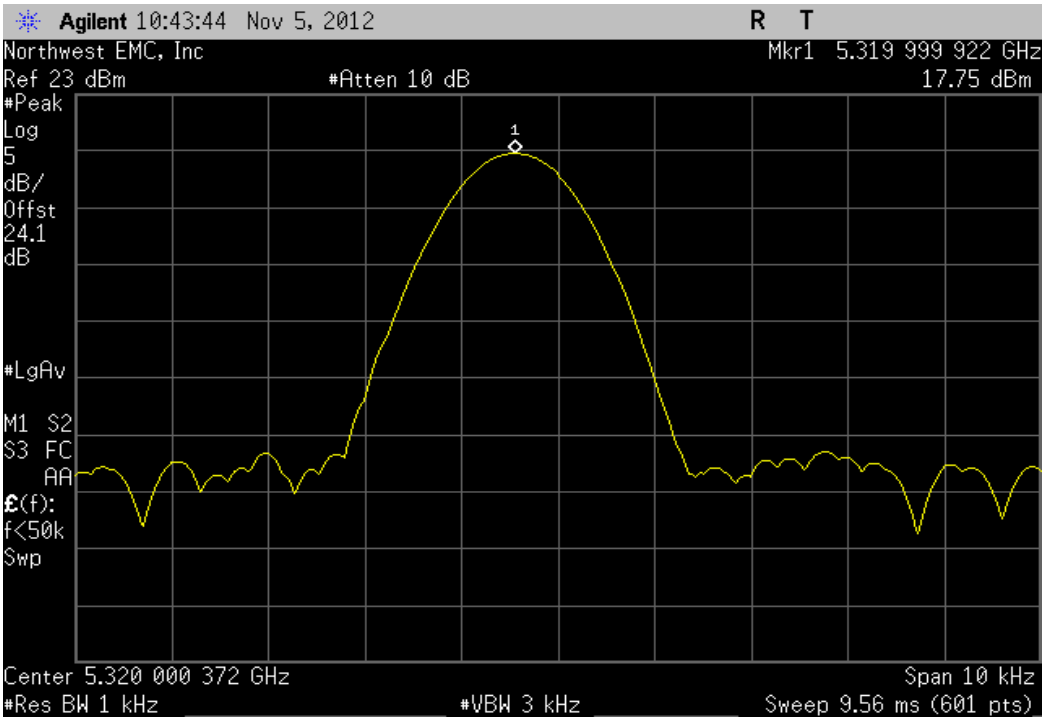
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000039	5320	0.01	100	Pass



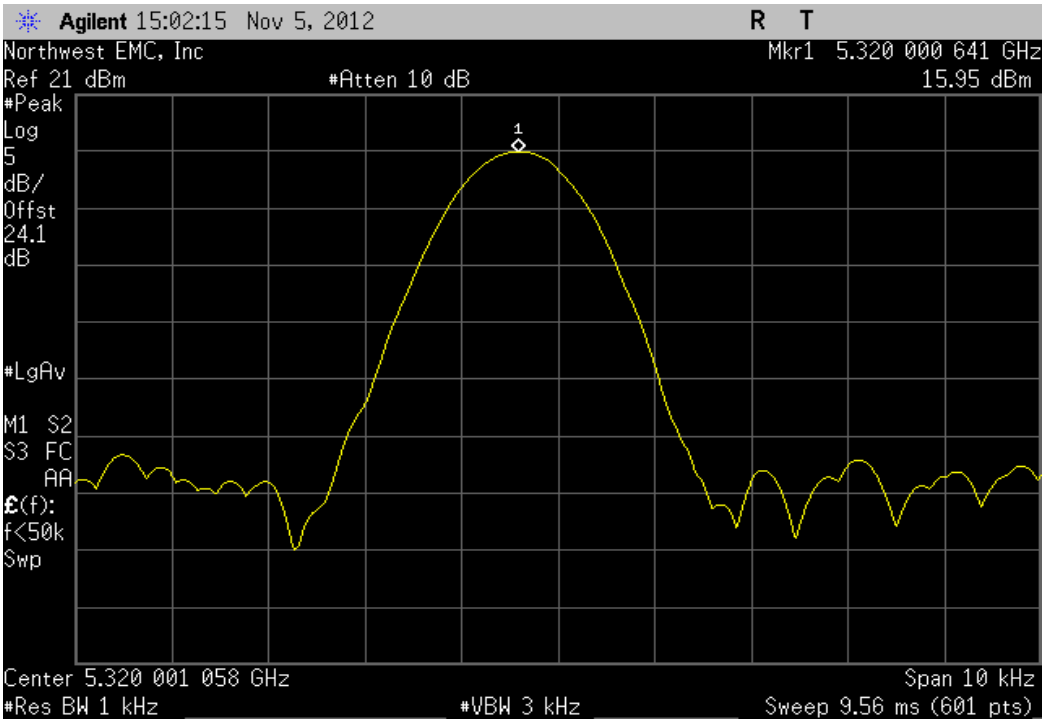
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.99987	5320	0.02	100	Pass



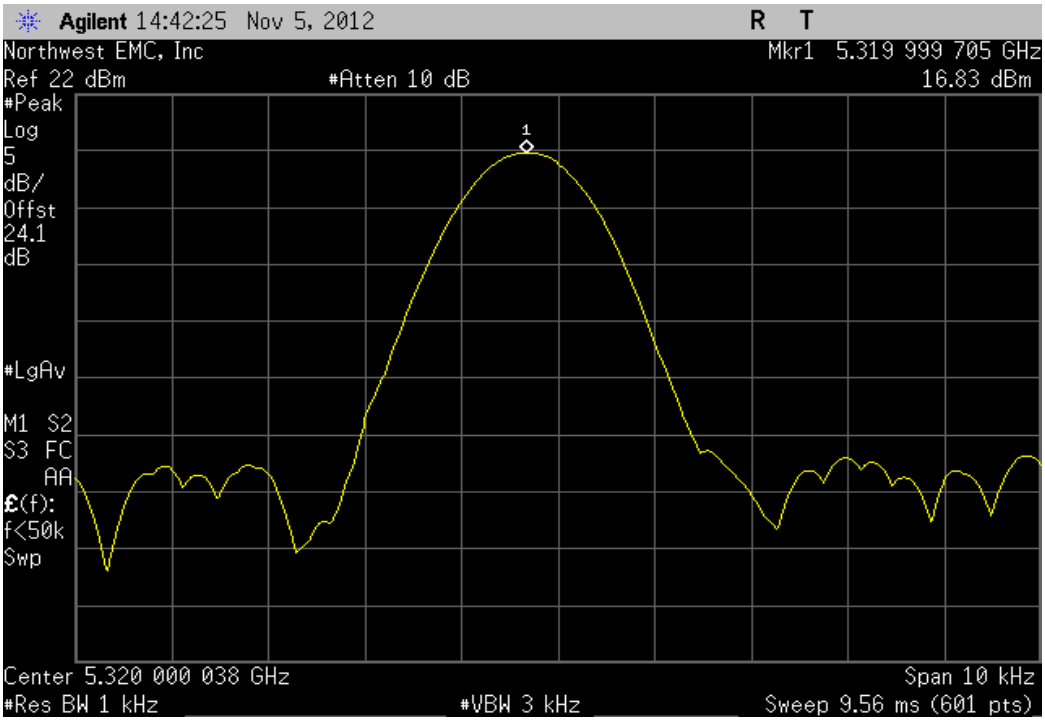
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999922	5320	0.01	100	Pass



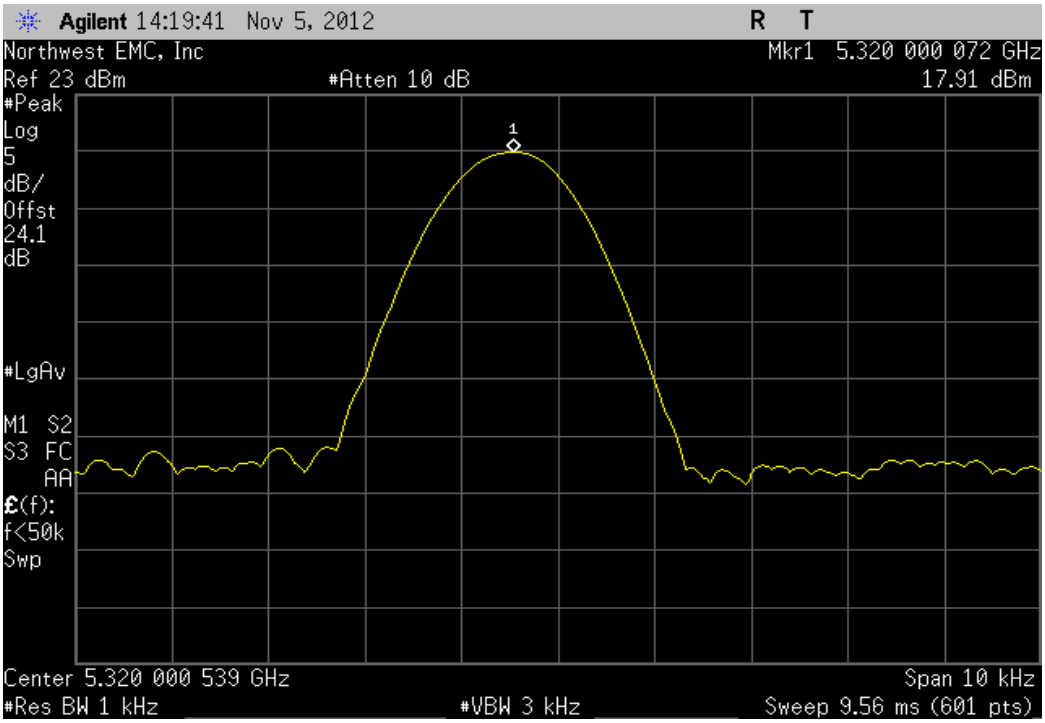
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000641	5320	0.12	100	Pass



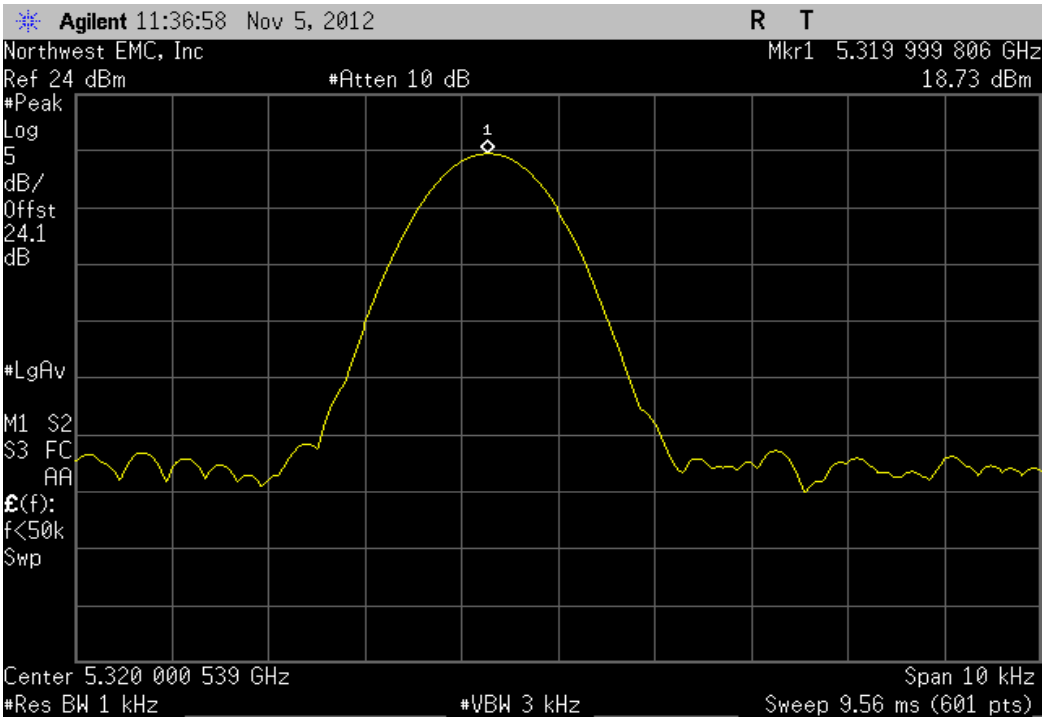
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999705	5320	0.06	100	Pass



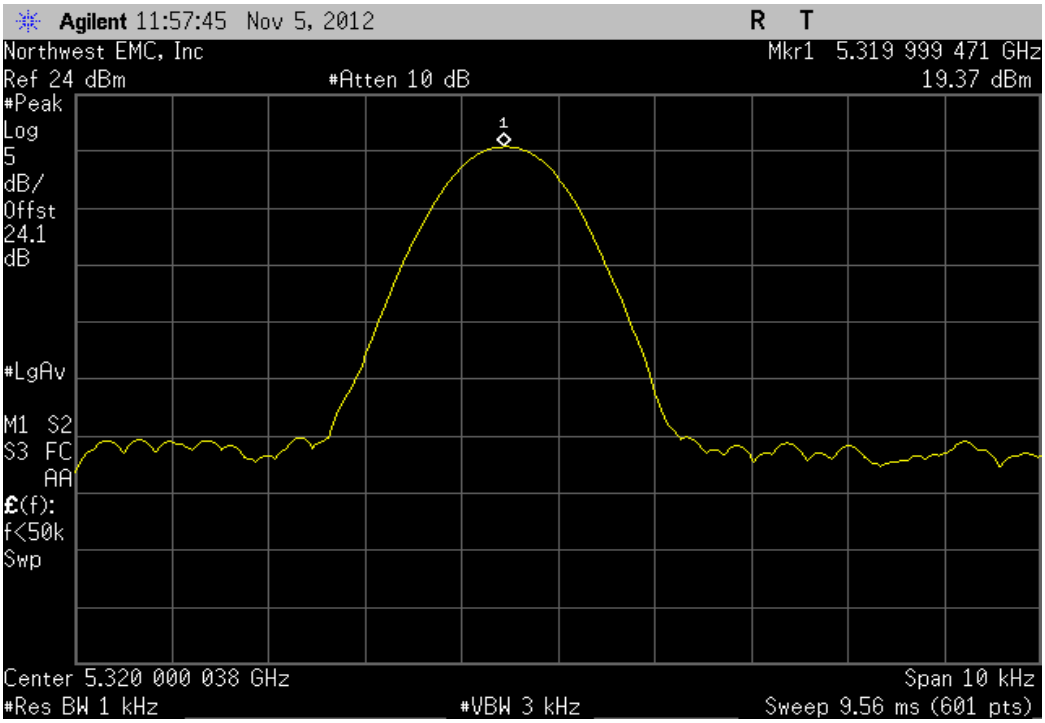
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000072	5320	0.01	100	Pass



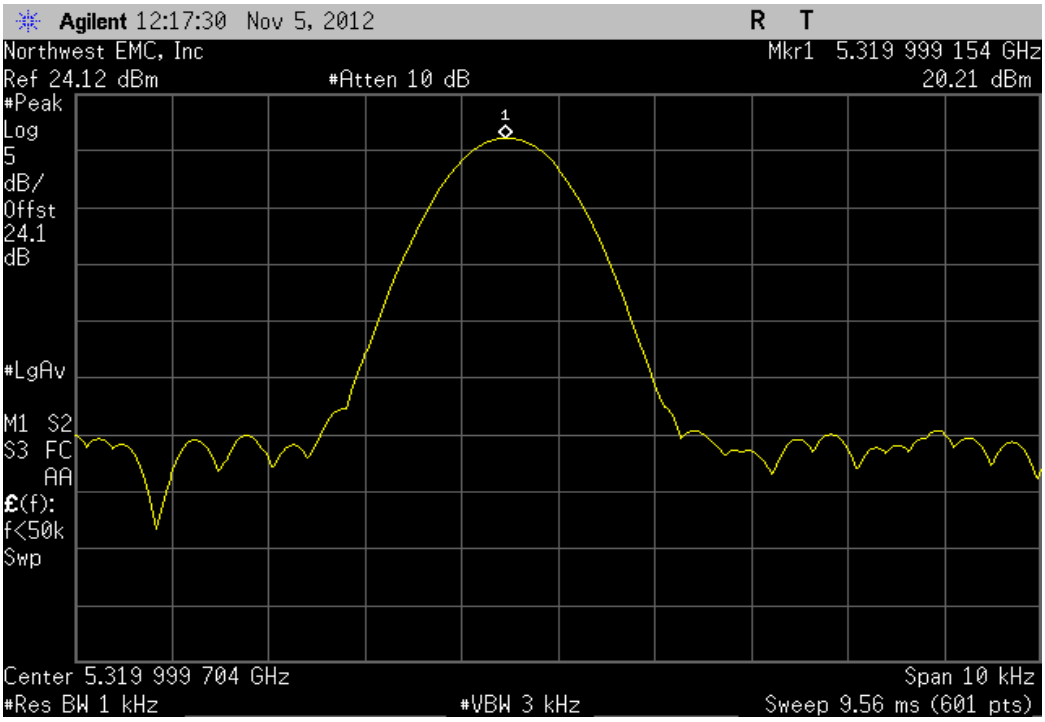
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999806	5320	0.04	100	Pass



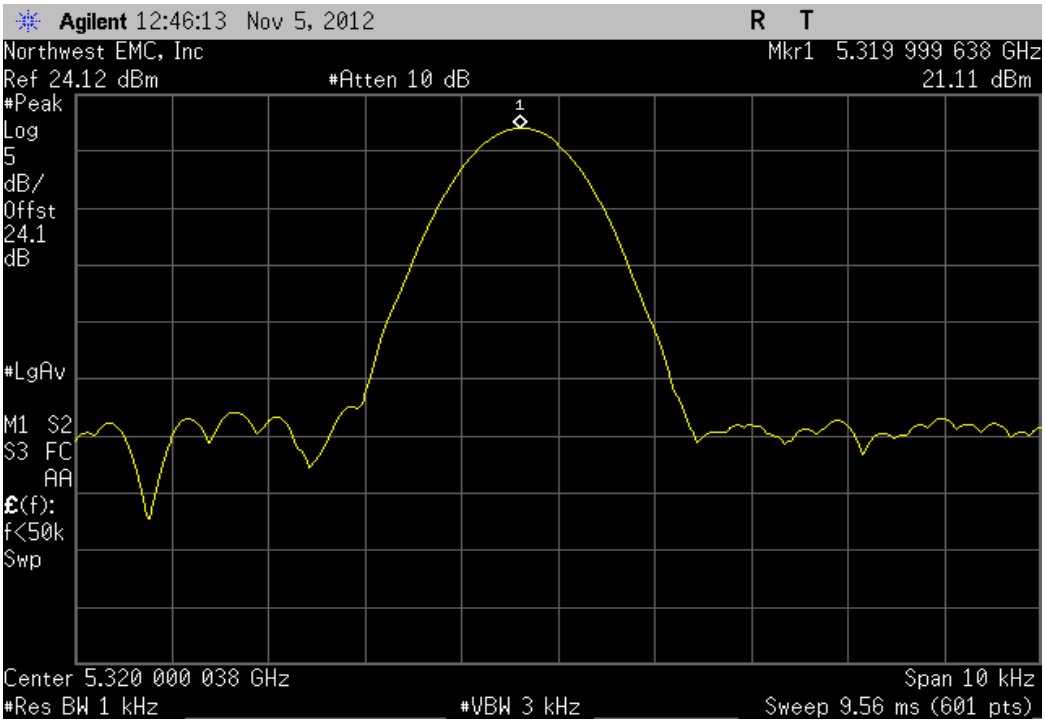
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999471	5320	0.1	100	Pass



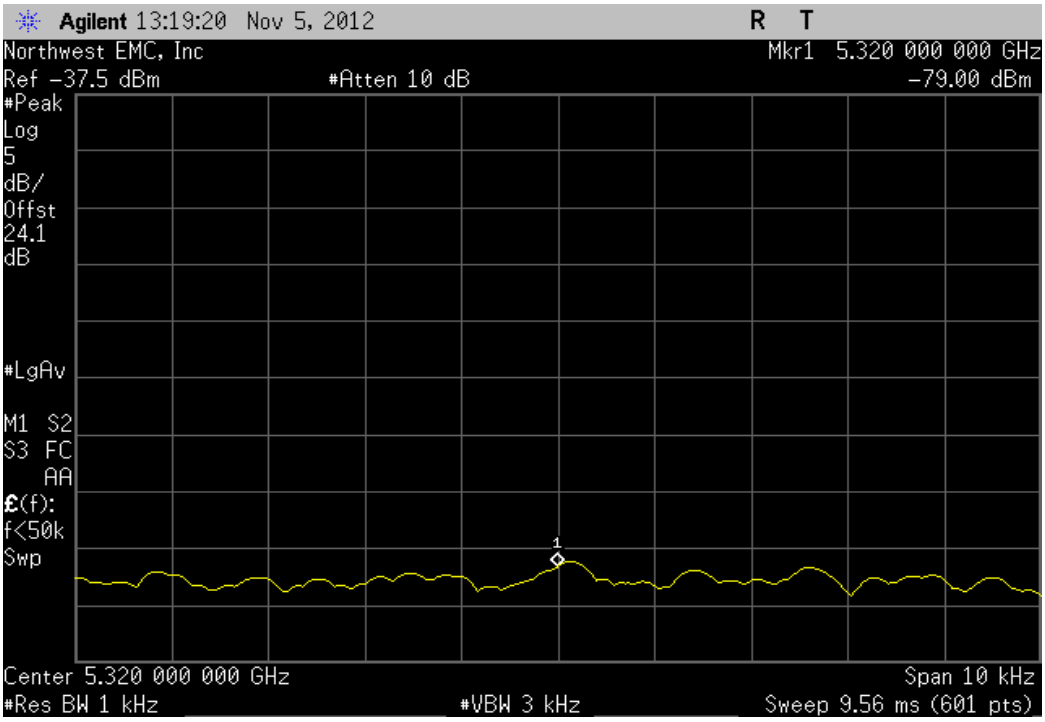
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999154	5320	0.16	100	Pass



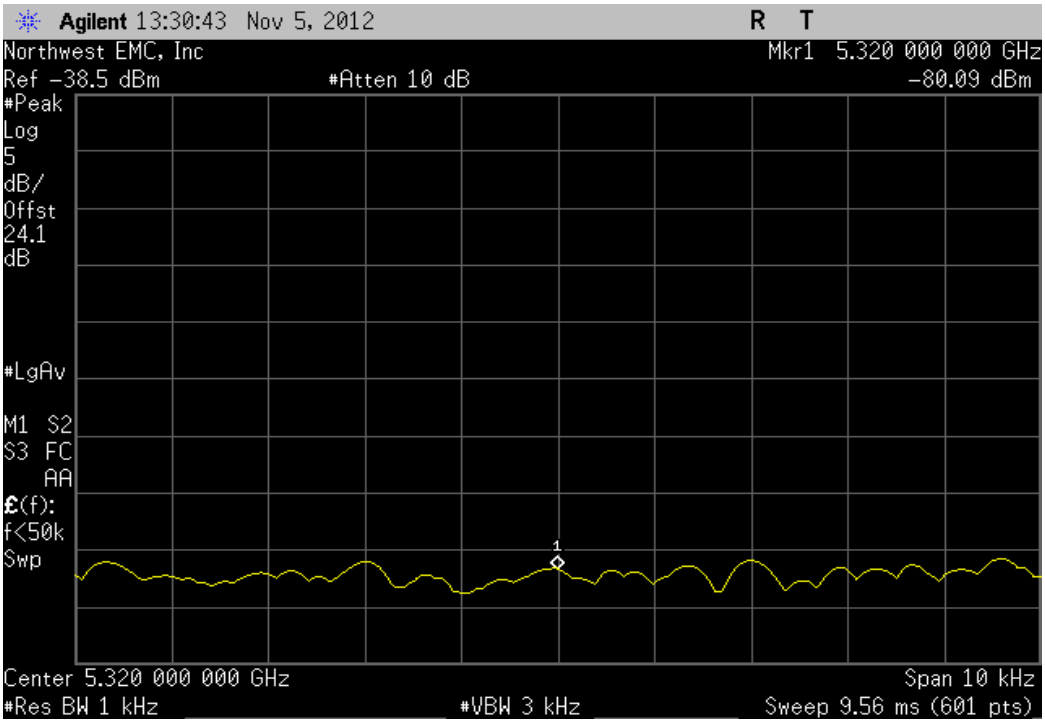
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999638	5320	0.07	100	Pass



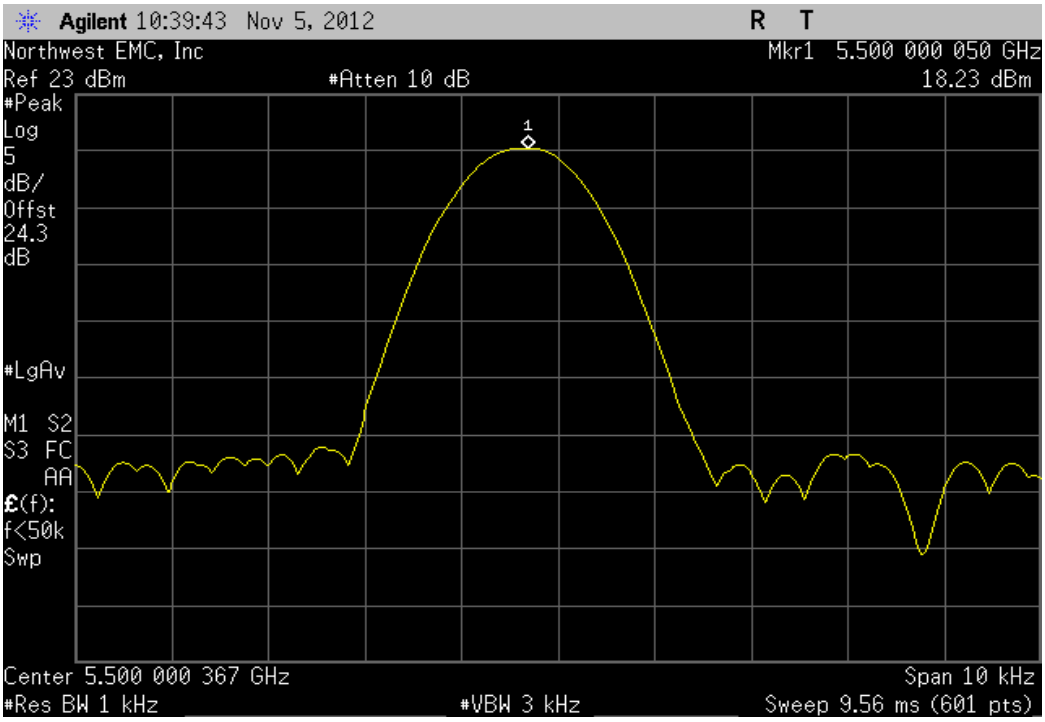
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



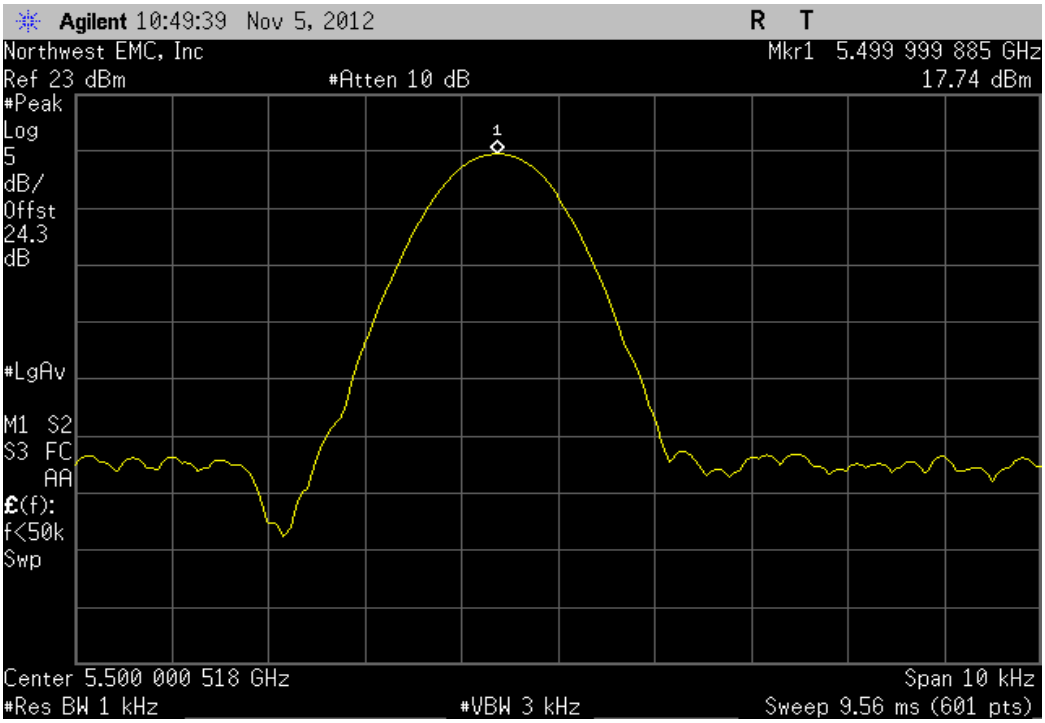
5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



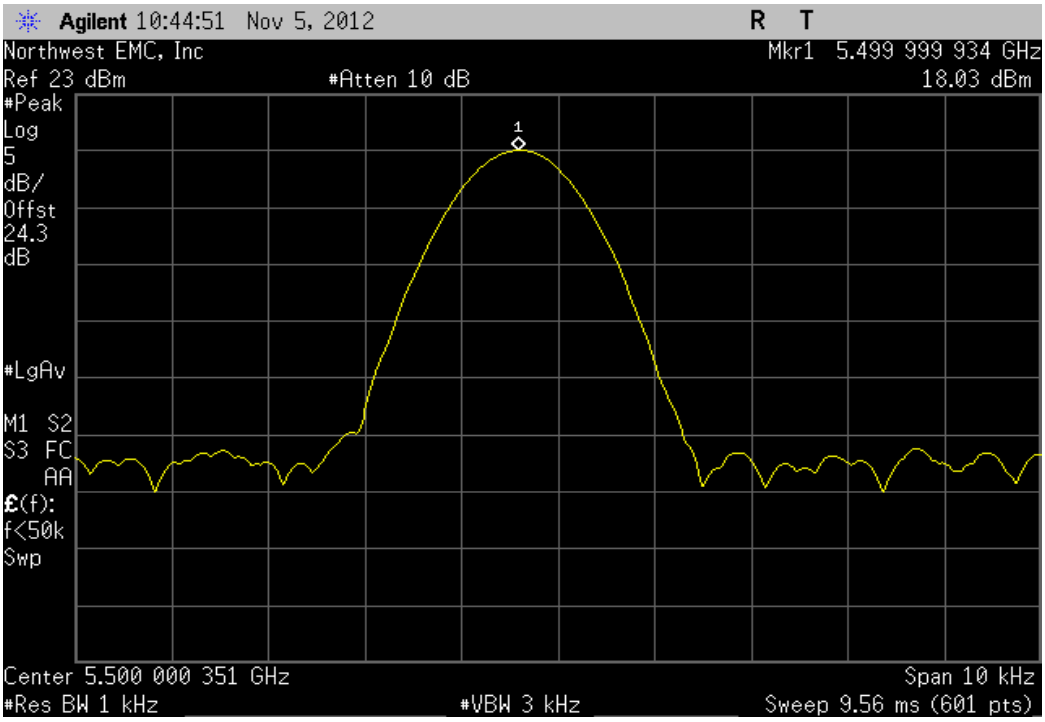
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.00005	5500	0.01	100	Pass



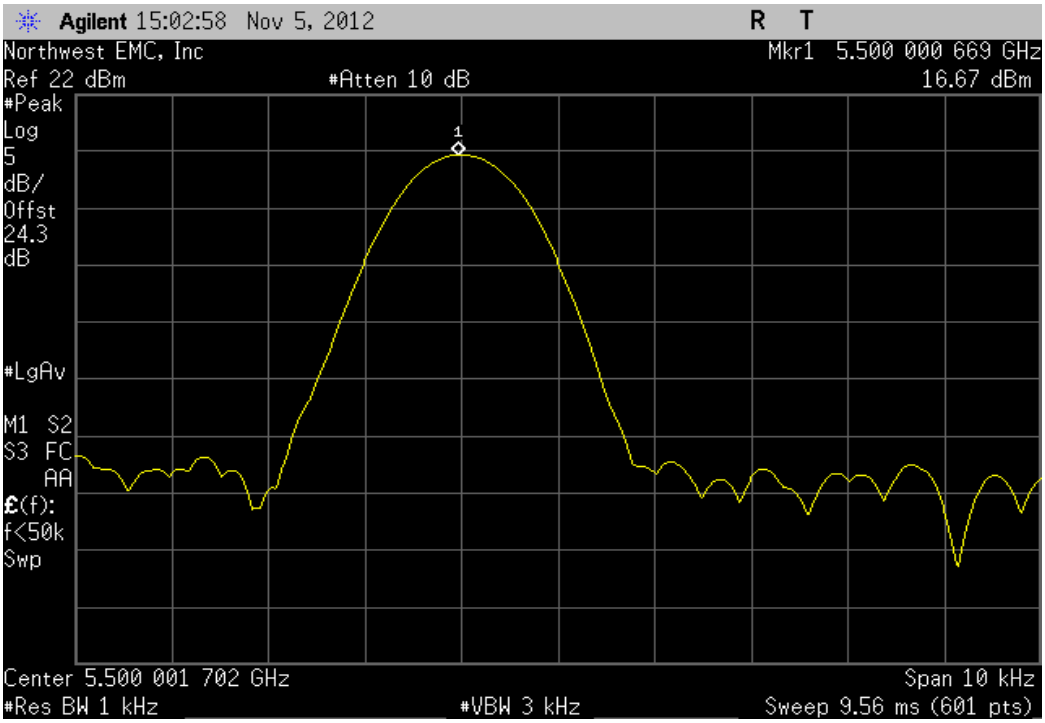
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999885	5500	0.02	100	Pass



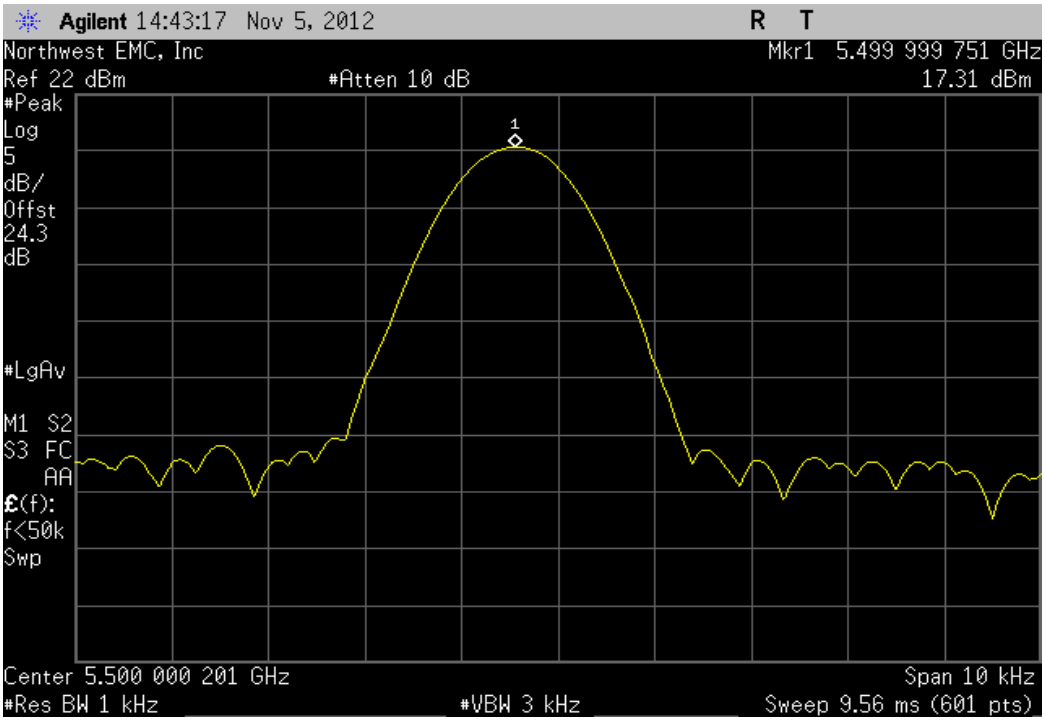
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999934	5500	0.01	100	Pass



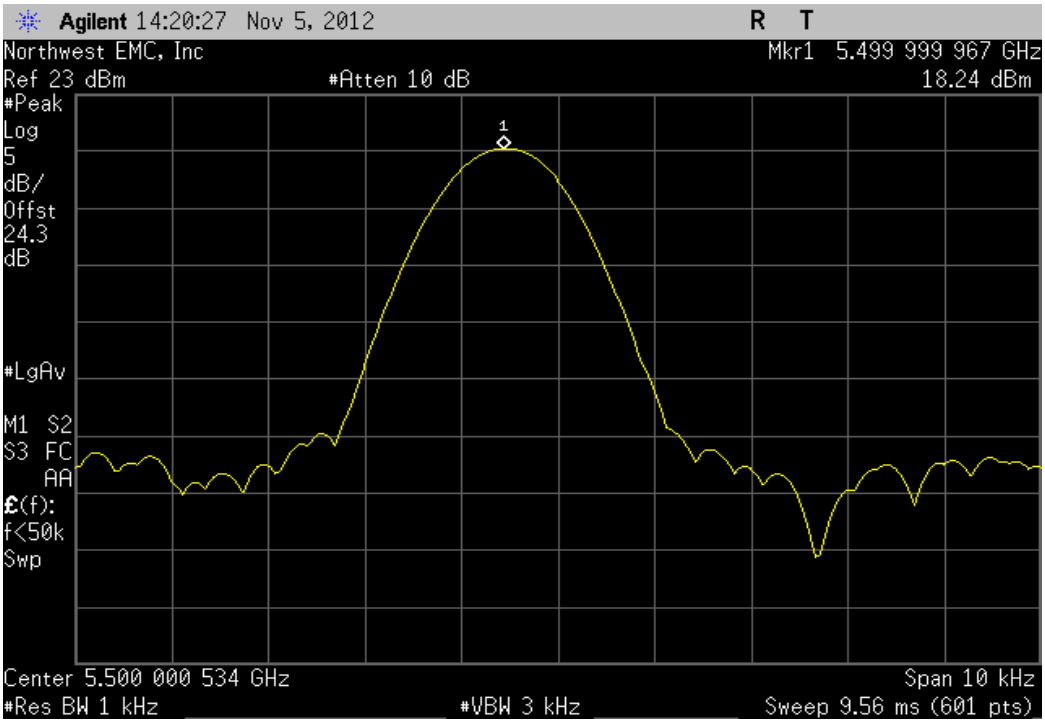
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.000669	5500	0.12	100	Pass



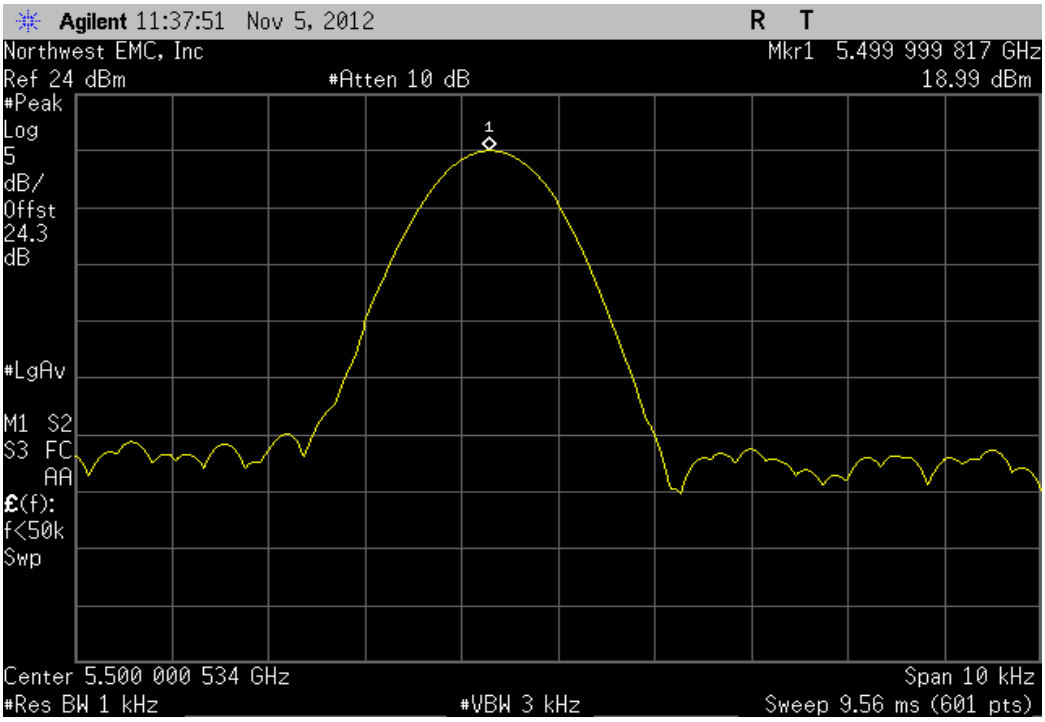
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999751	5500	0.05	100	Pass



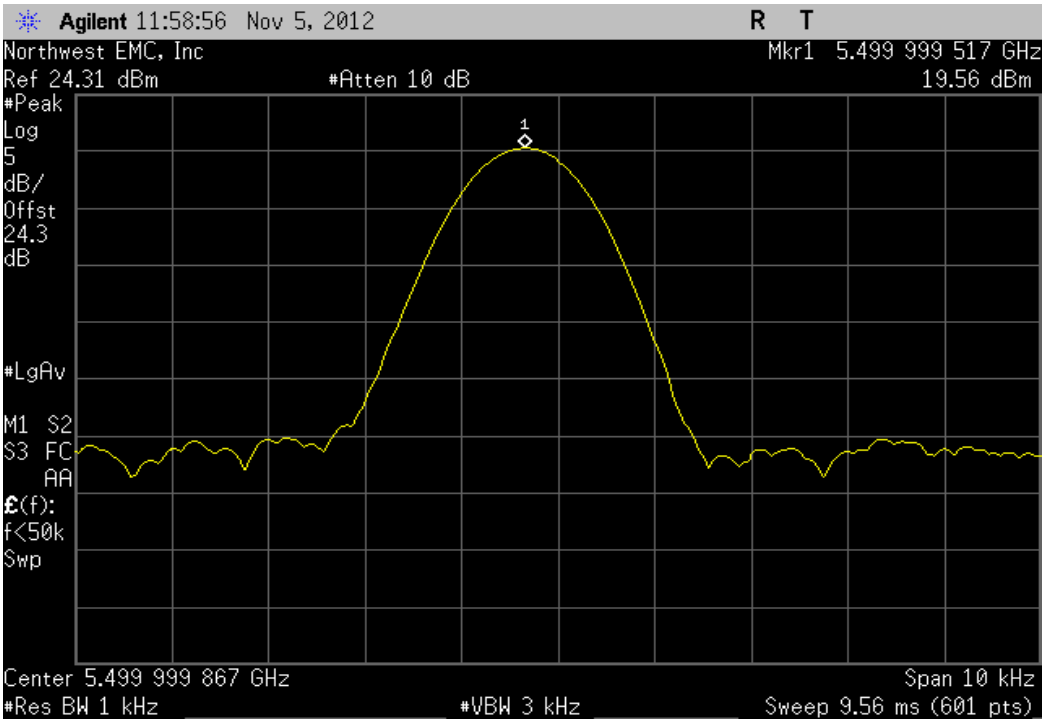
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999967	5500	0.01	100	Pass



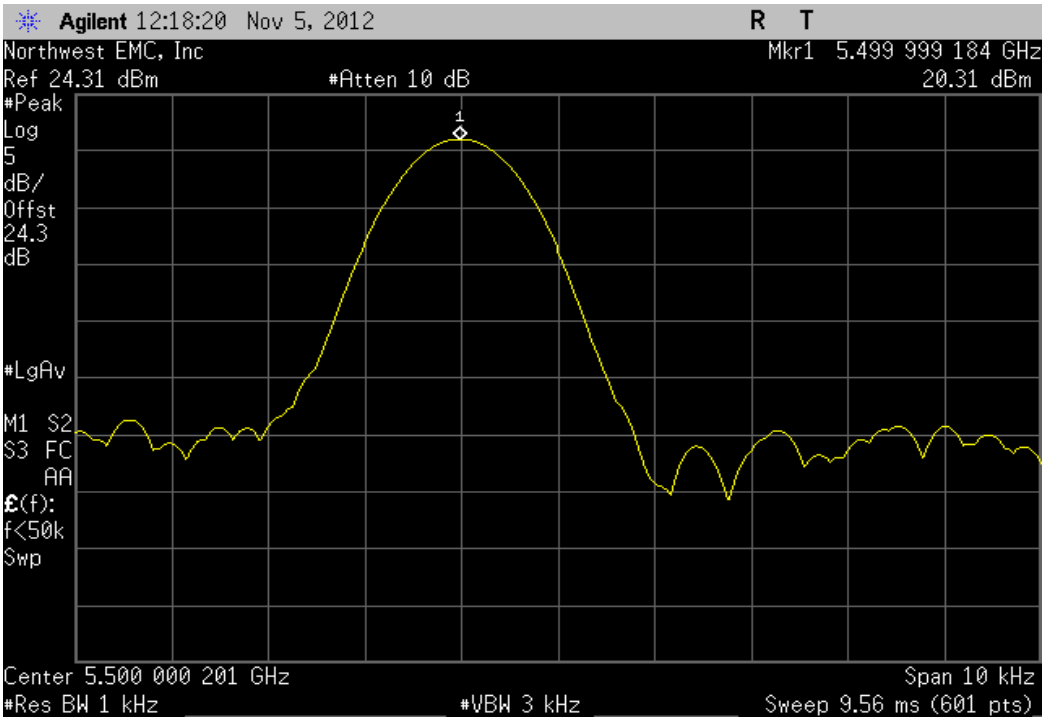
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999817	5500	0.03	100	Pass



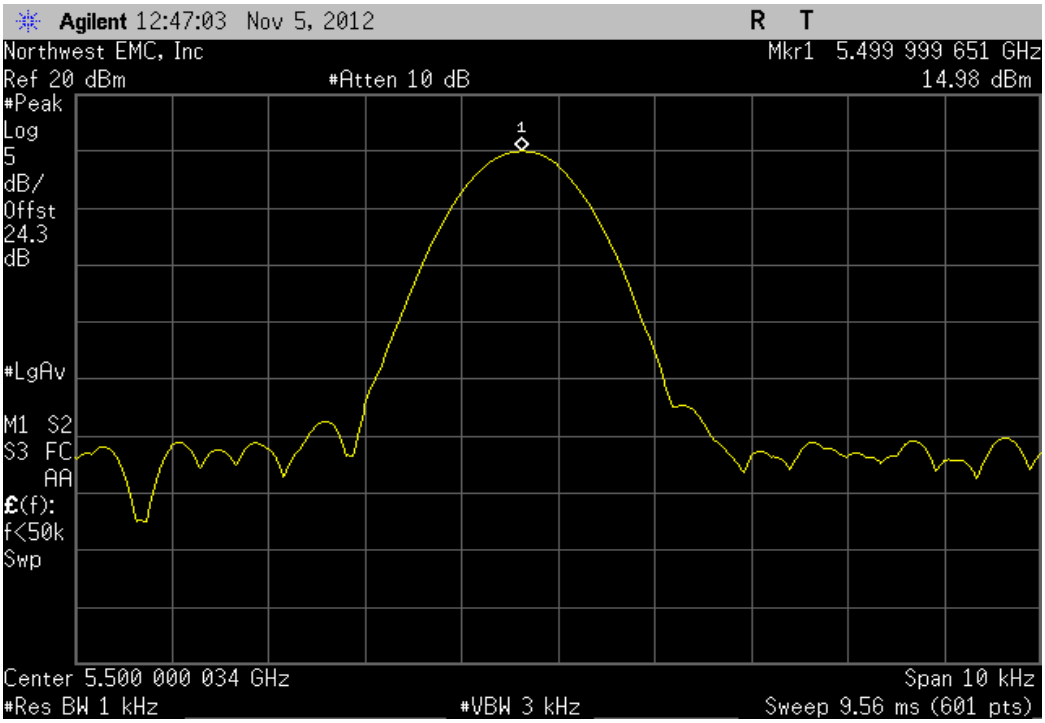
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999517	5500	0.09	100	Pass



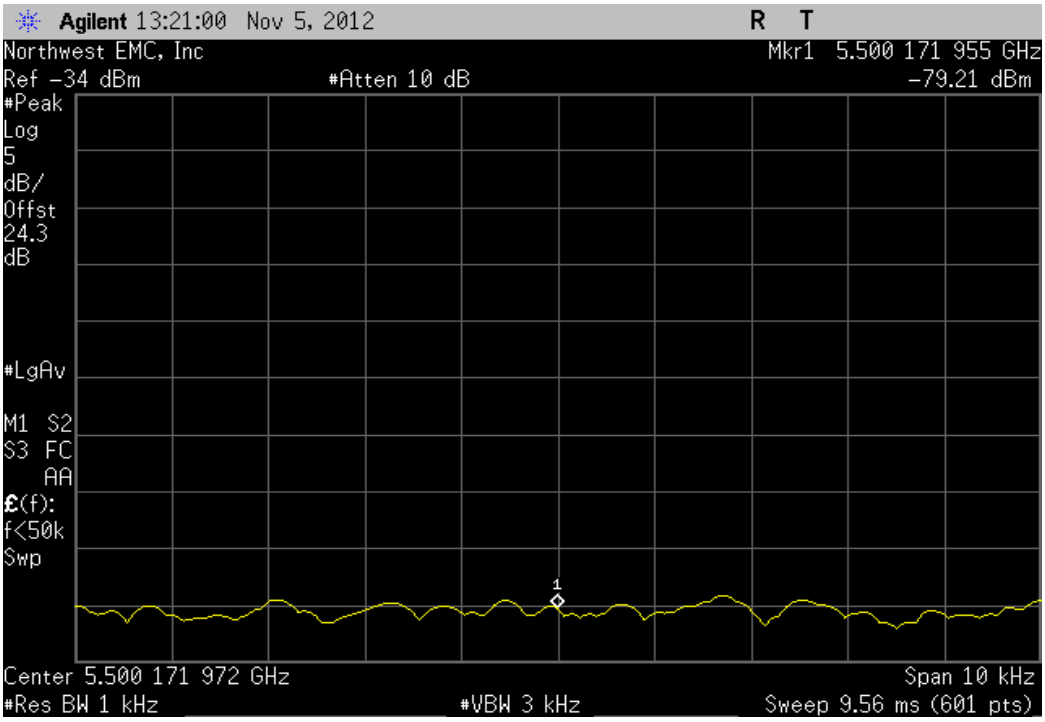
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999184	5500	0.15	100	Pass



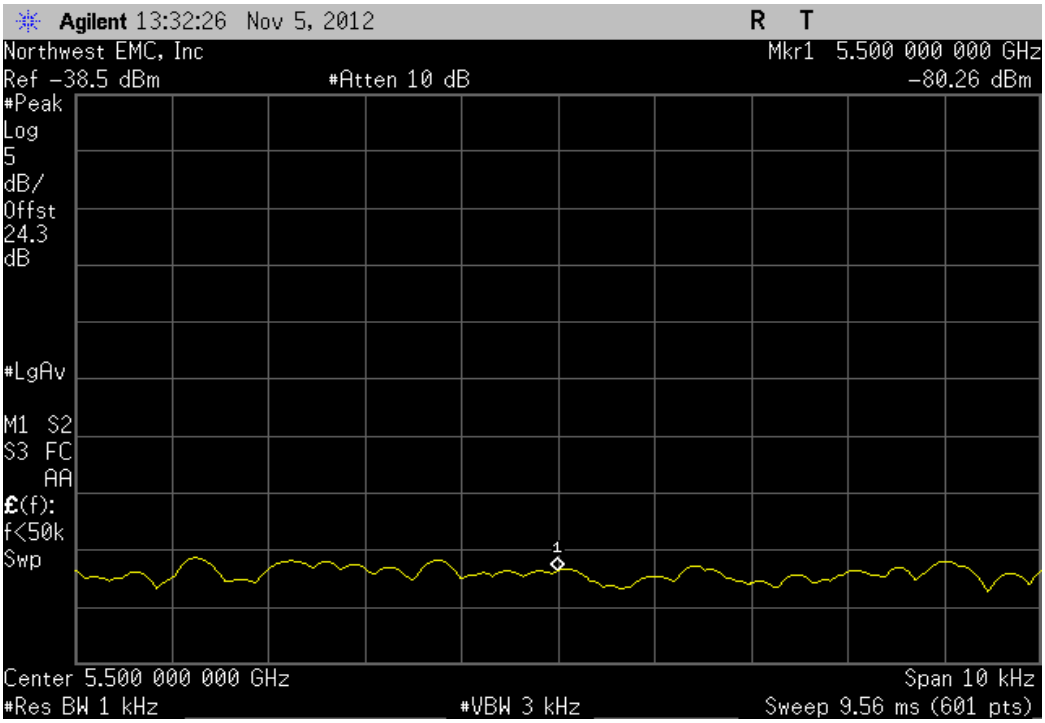
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.999651	5500	0.06	100	Pass



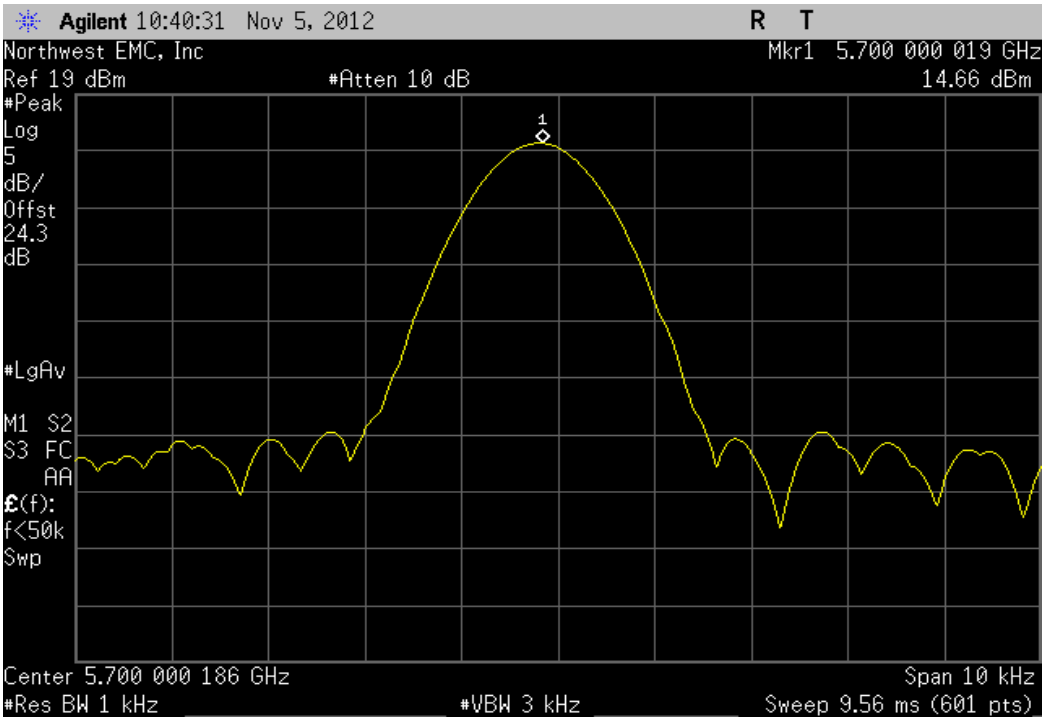
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



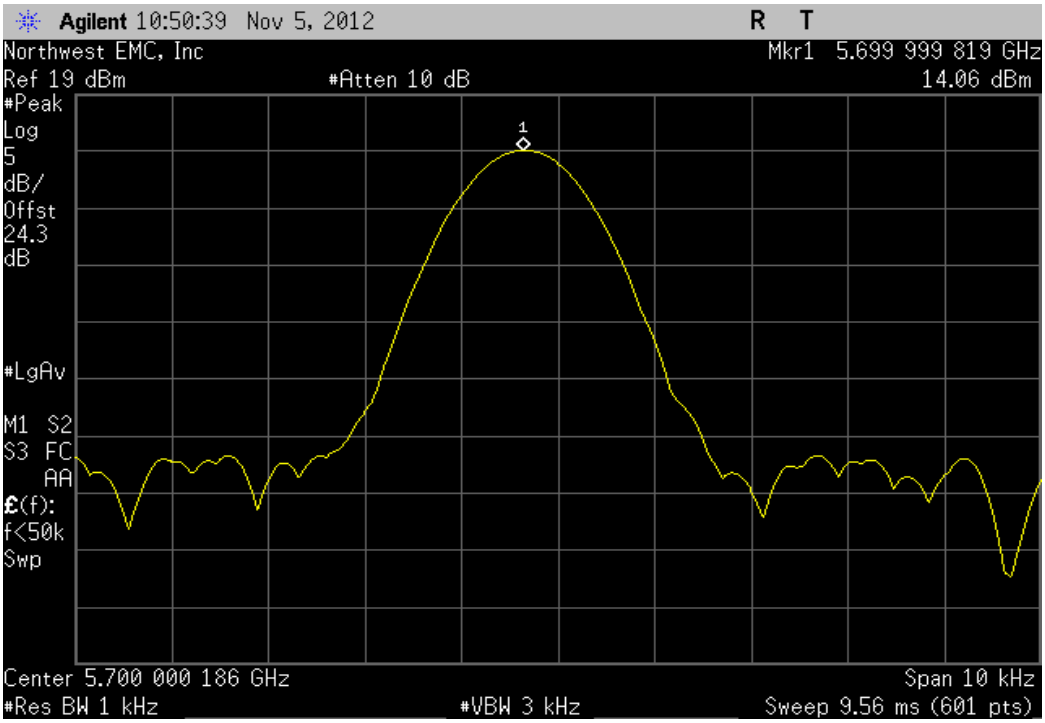
5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



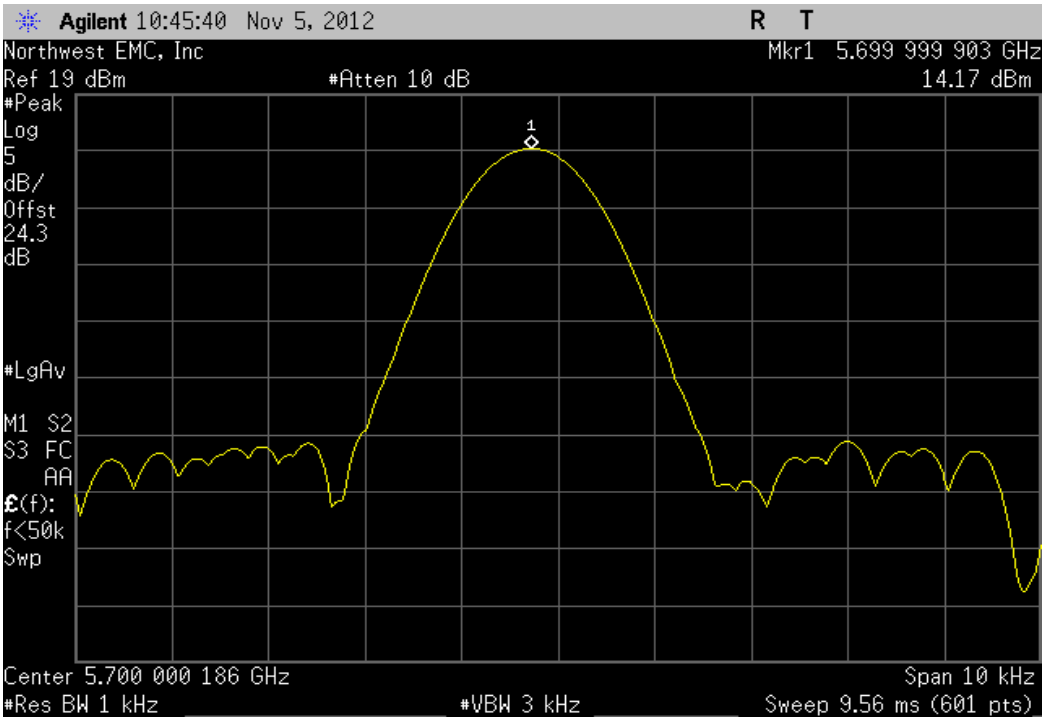
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.000019	5700	0	100	Pass



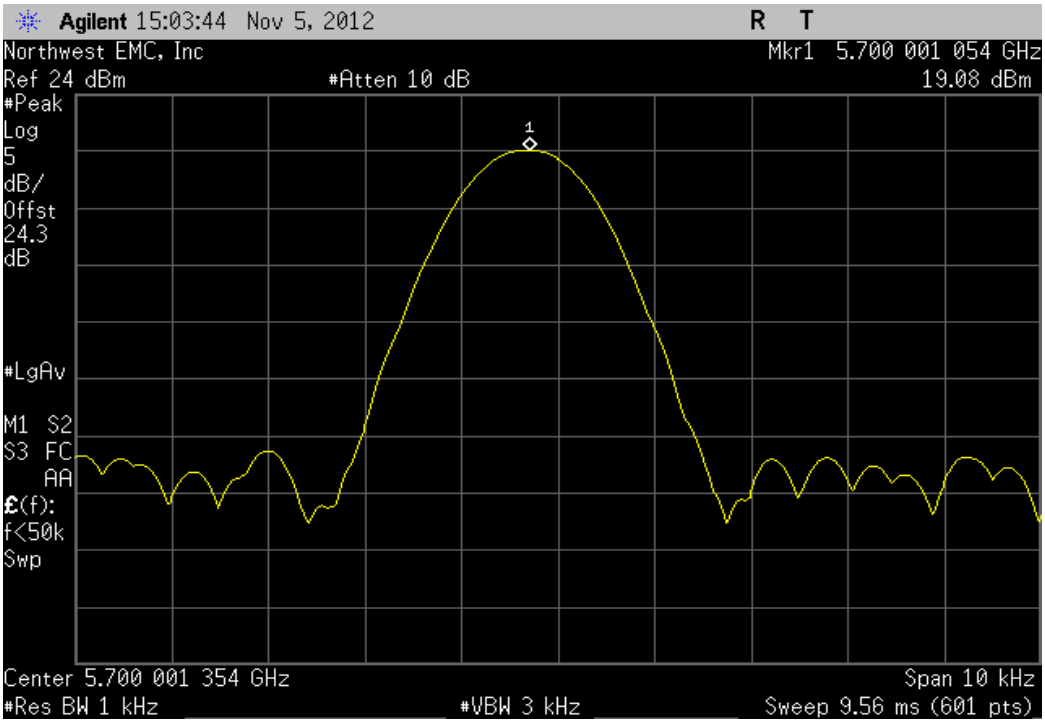
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999819	5700	0.03	100	Pass



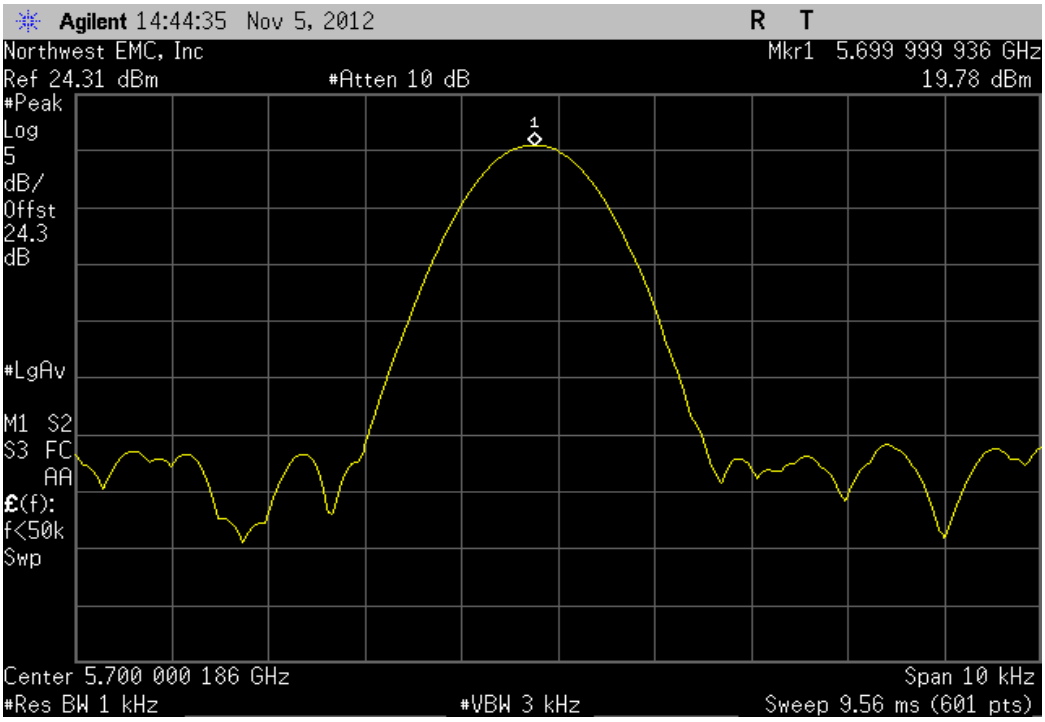
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999903	5700	0.02	100	Pass



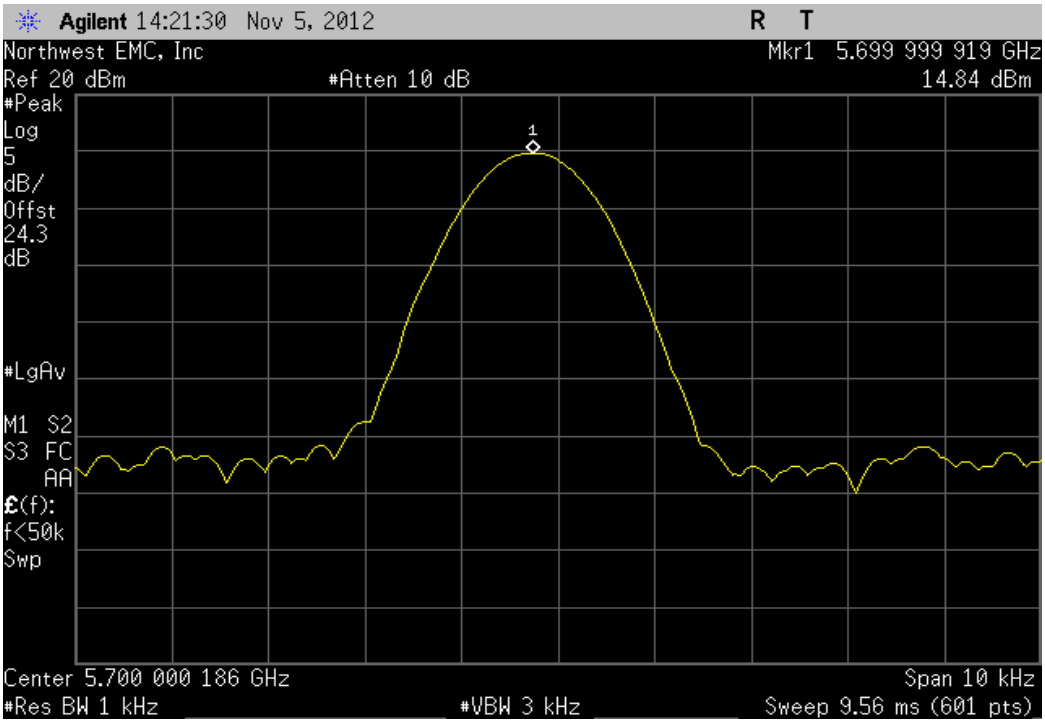
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001054	5700	0.18	100	Pass



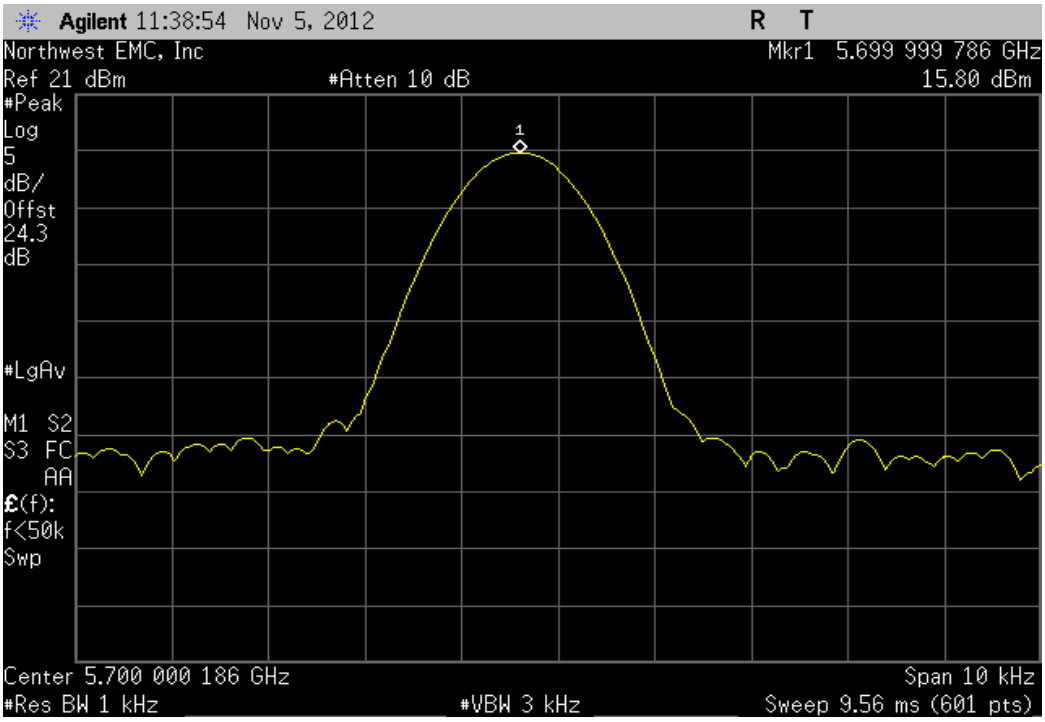
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999936	5700	0.01	100	Pass



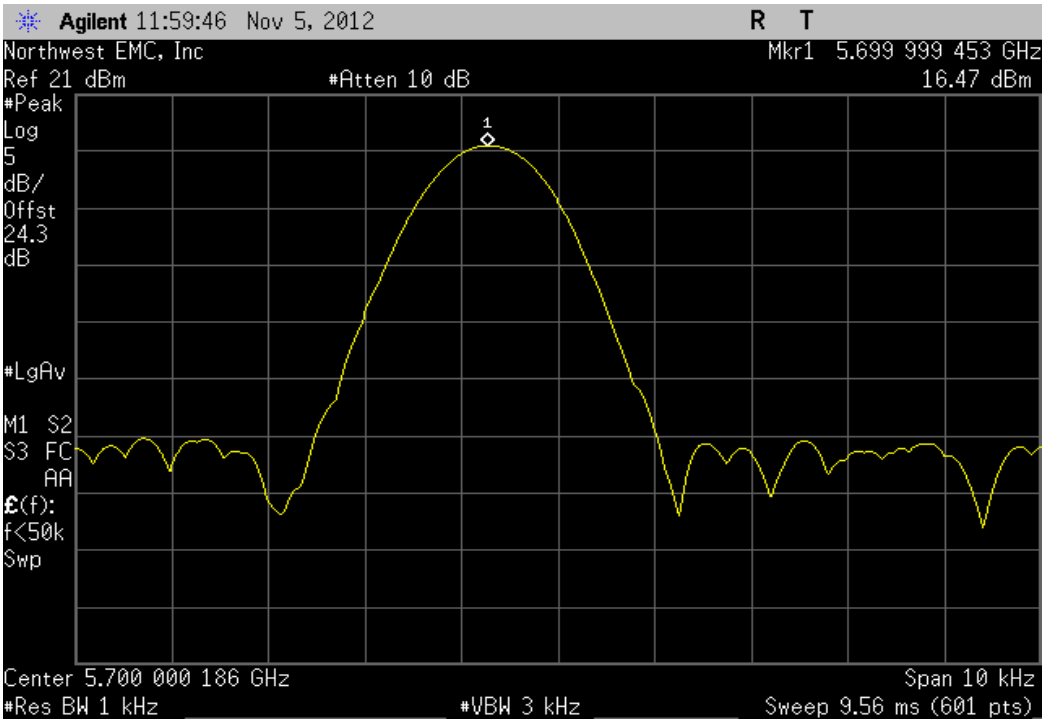
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999919	5700	0.01	100	Pass



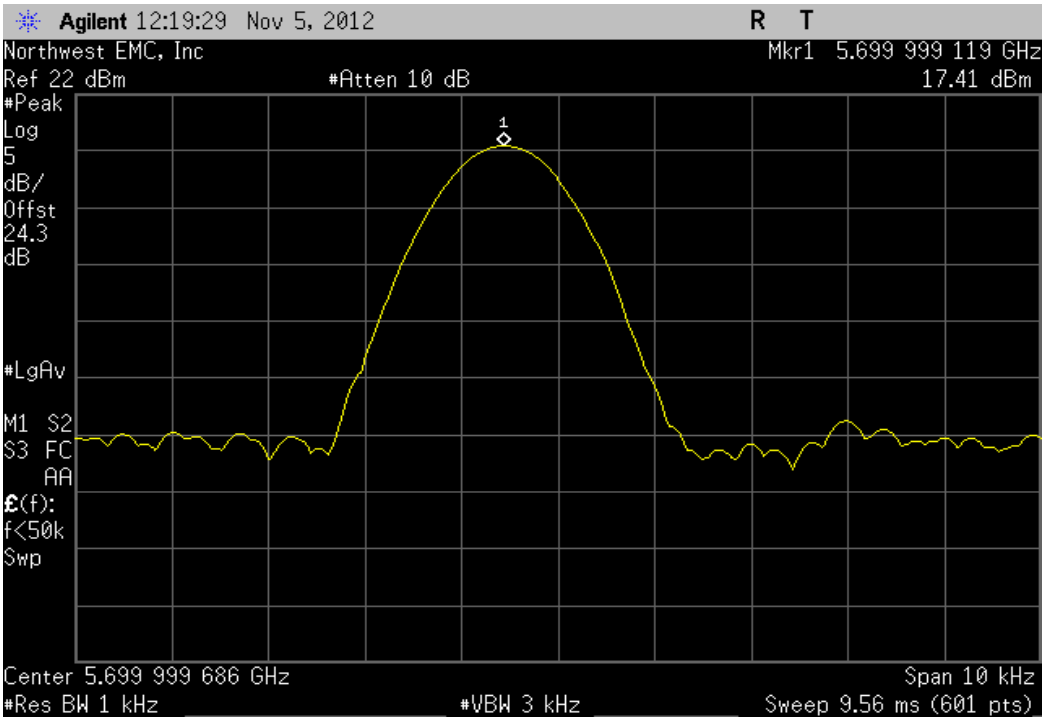
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999786	5700	0.04	100	Pass



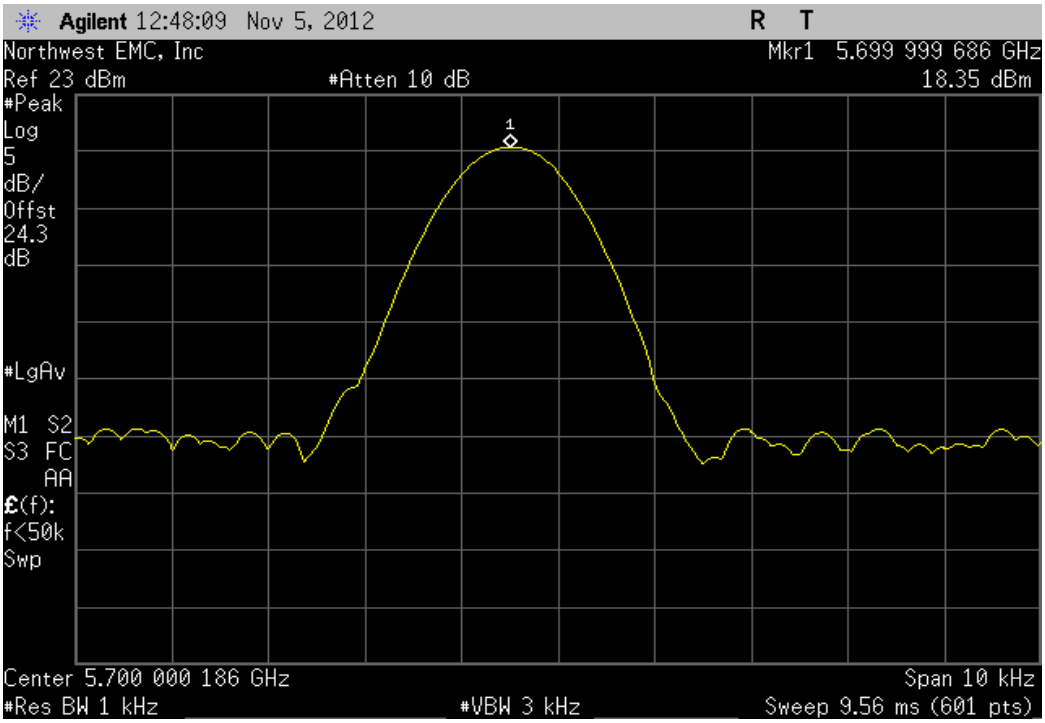
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999453	5700	0.1	100	Pass



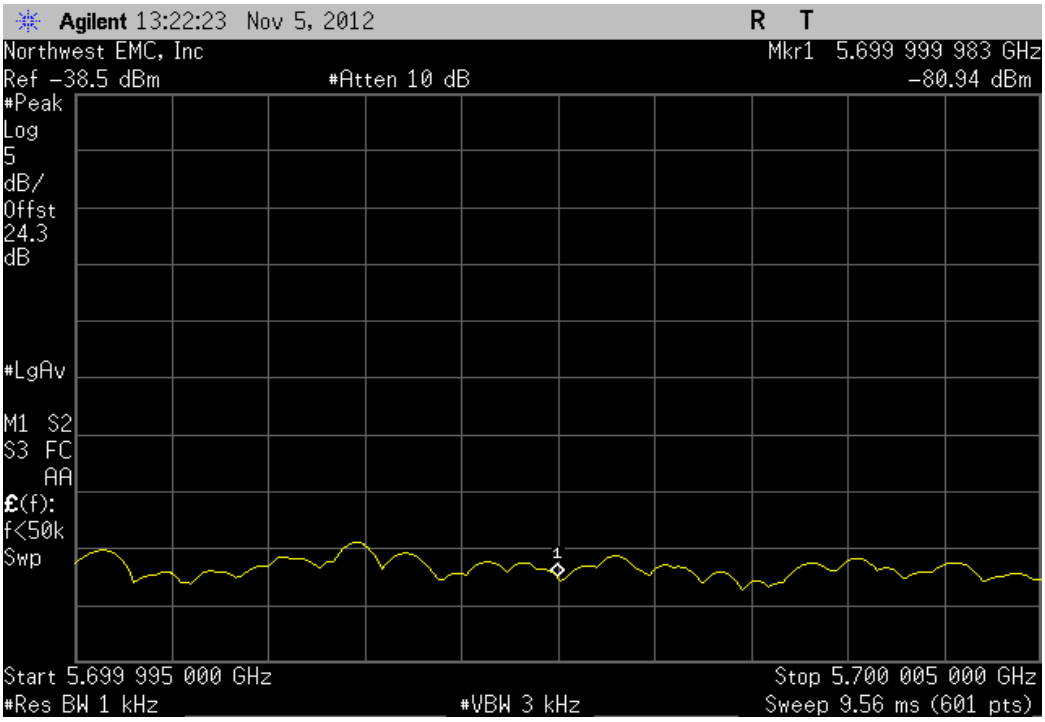
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999119	5700	0.15	100	Pass



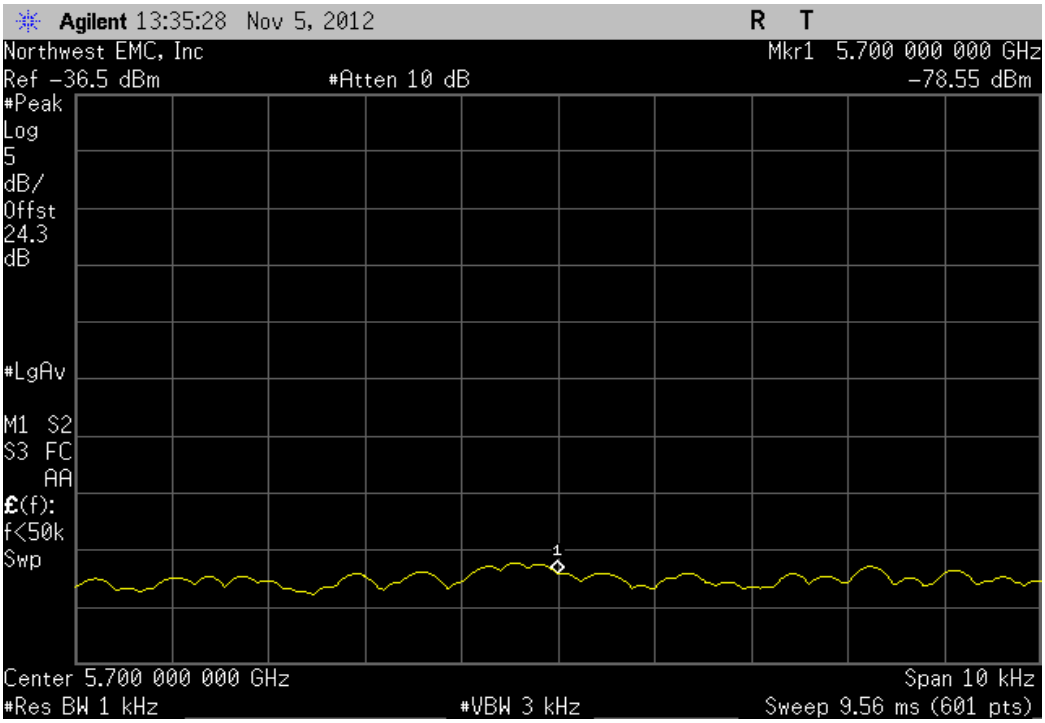
5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999686	5700	0.06	100	Pass



5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		N/A	N/A	N/A	N/A	N/A



SPURIOUS RADIATED EMISSIONS

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 transmit 802.11a, 100% duty cycle.

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1631 - 2

MCSO1631 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40 GHz

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
Antenna, Horn	EMCO	3115	AHE	NCR	0 mo
OC Cable	ESM Cable Corp.	KMKM-72	OCV	6/28/2012	12 mo
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVR	6/28/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-10	AIW	NCR	0 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24 mo
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

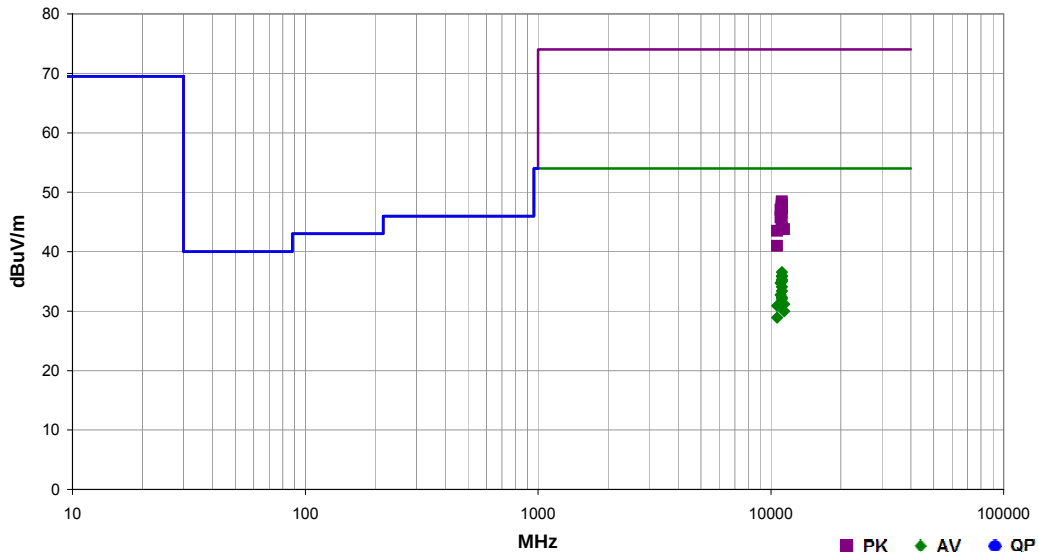
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/08/12		
Project:	None	**Temperature:**	20.4 °C		
Job Site:	EV01	**Humidity:**	39% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1009 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	54	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



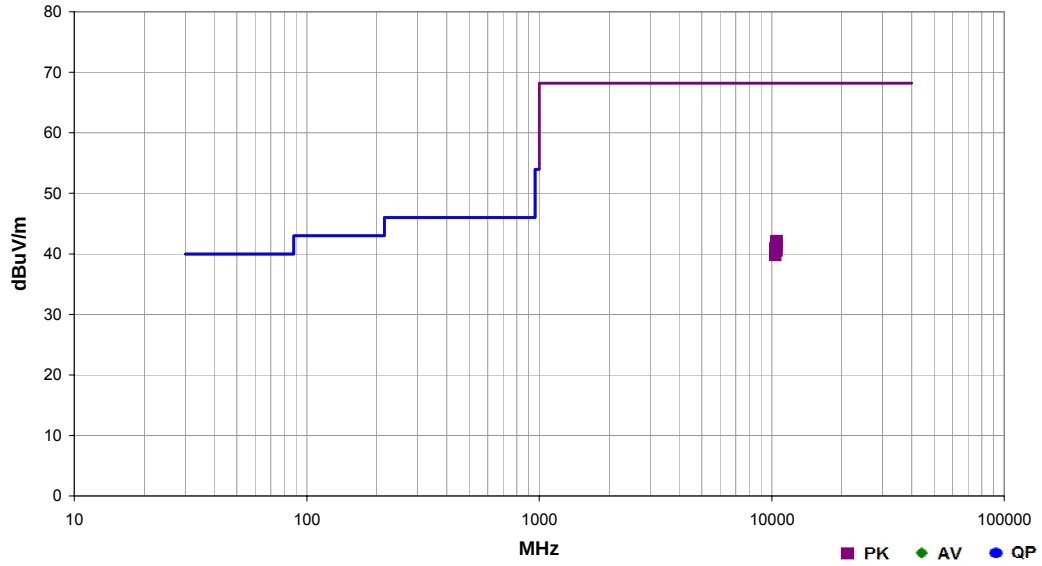
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11158.570	45.9	-9.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	36.6	54.0	-17.4	CH 116 (5580MHz), 36 Mbps, EUT On Side
11160.500	45.2	-9.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	CH 116 (5580MHz), 54 Mbps, EUT On Side
11160.040	45.2	-9.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	CH 116 (5580MHz), 6 Mbps, EUT On Side
11159.980	45.2	-9.3	1.0	64.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	CH 116 (5580MHz), MCS8, EUT On Side
11159.960	44.6	-9.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	35.3	54.0	-18.7	CH 116 (5580MHz), MCS7, EUT On Side
11159.940	44.6	-9.3	1.0	63.0	3.0	0.0	Vert	AV	0.0	35.3	54.0	-18.7	CH 116 (5580MHz), MCS0, EUT On Side
11159.970	44.3	-9.3	1.0	64.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	CH 116 (5580MHz), MCS8, EUT On Side
11000.080	45.3	-10.6	1.0	66.0	3.0	0.0	Vert	AV	0.0	34.7	54.0	-19.3	CH 100 (5500MHz), 6 Mbps, EUT On Side
11160.040	43.4	-9.3	1.3	118.0	3.0	0.0	Horz	AV	0.0	34.1	54.0	-19.9	CH 116 (5580MHz), 6 Mbps, EUT On Side
11160.080	42.7	-9.3	1.2	327.0	3.0	0.0	Vert	AV	0.0	33.4	54.0	-20.6	CH 116 (5580MHz), 6 Mbps, EUT Vertical
11000.160	43.3	-10.6	1.2	62.0	3.0	0.0	Horz	AV	0.0	32.7	54.0	-21.3	CH 100 (5500MHz), 6 Mbps, EUT On Side
11160.120	41.6	-9.3	1.0	181.0	3.0	0.0	Horz	AV	0.0	32.3	54.0	-21.7	CH 116 (5580MHz), 6 Mbps, EUT Horizontal
11160.000	41.4	-9.3	1.1	226.0	3.0	0.0	Vert	AV	0.0	32.1	54.0	-21.9	CH 116 (5580MHz), 6 Mbps, EUT Horizontal
11400.010	38.6	-7.4	1.0	71.0	3.0	0.0	Vert	AV	0.0	31.2	54.0	-22.8	CH 140 (5700MHz), 6 Mbps, EUT On Side
11159.980	40.4	-9.3	1.5	10.0	3.0	0.0	Horz	AV	0.0	31.1	54.0	-22.9	CH 116 (5580MHz), 6 Mbps, EUT Vertical
10640.060	42.7	-11.8	1.1	55.0	3.0	0.0	Horz	AV	0.0	30.9	54.0	-23.1	CH 64 (5320MHz), 6 Mbps, EUT On Side
11400.050	37.4	-7.4	1.2	66.0	3.0	0.0	Horz	AV	0.0	30.0	54.0	-24.0	CH 140 (5700MHz), 6 Mbps, EUT On Side
10640.090	40.7	-11.8	1.2	71.0	3.0	0.0	Vert	AV	0.0	28.9	54.0	-25.1	CH 64 (5320MHz), 6 Mbps, EUT On Side
11156.460	57.8	-9.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	CH 116 (5580MHz), 6 Mbps, EUT On Side
11158.330	57.5	-9.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	CH 116 (5580MHz), 54 Mbps, EUT On Side
11157.940	57.2	-9.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	CH 116 (5580MHz), 36 Mbps, EUT On Side
11164.240	57.0	-9.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	CH 116 (5580MHz), MCS7, EUT On Side
11158.040	56.8	-9.3	1.0	64.0	3.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	CH 116 (5580MHz), MCS8, EUT On Side
11164.290	56.7	-9.3	1.0	63.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	CH 116 (5580MHz), MCS0, EUT On Side
11158.290	56.7	-9.3	1.0	64.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	CH 116 (5580MHz), MCS8, EUT On Side
11160.740	56.4	-9.3	1.3	118.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	CH 116 (5580MHz), 6 Mbps, EUT On Side
11001.570	57.6	-10.6	1.0	66.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	CH 100 (5500MHz), 6 Mbps, EUT On Side
11161.740	56.0	-9.3	1.2	327.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	CH 116 (5580MHz), 6 Mbps, EUT Vertical
11001.730	56.3	-10.6	1.2	62.0	3.0	0.0	Horz	PK	0.0	45.7	74.0	-28.3	CH 100 (5500MHz), 6 Mbps, EUT On Side
11161.380	54.3	-9.3	1.0	181.0	3.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	CH 116 (5580MHz), 6 Mbps, EUT Horizontal
11159.680	53.3	-9.3	1.1	226.0	3.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	CH 116 (5580MHz), 6 Mbps, EUT Horizontal
11156.190	53.2	-9.4	1.5	10.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	CH 116 (5580MHz), 6 Mbps, EUT Vertical
11400.810	51.2	-7.4	1.0	71.0	3.0	0.0	Vert	PK	0.0	43.8	74.0	-30.2	CH 140 (5700MHz), 6 Mbps, EUT On Side
10640.070	55.3	-11.8	1.1	55.0	3.0	0.0	Horz	PK	0.0	43.5	74.0	-30.5	CH 64 (5320MHz), 6 Mbps, EUT On Side
10641.530	52.8	-11.8	1.2	71.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	CH 64 (5320MHz), 6 Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/08/12		
Project:	None	**Temperature:**	20.4 °C		
Job Site:	EV01	**Humidity:**	39% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1009 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	54	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



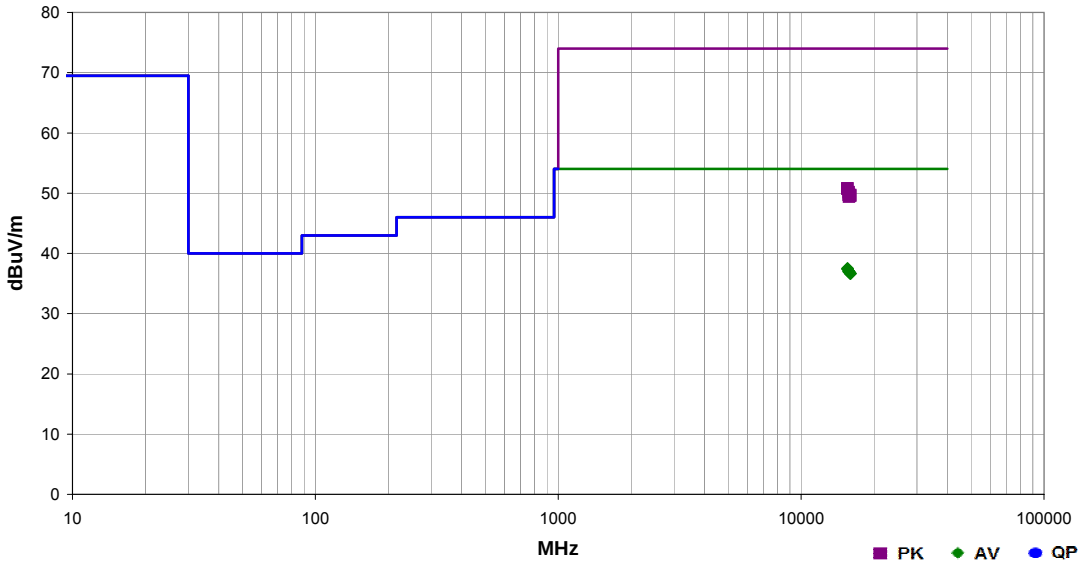
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
10519.880	54.3	-12.2	1.0	58.0	3.0	0.0	Horz	PK	0.0	42.1	68.2	-26.1	CH 52 (5260MHz), 6 Mbps, EUT On Side
10480.030	54.2	-12.3	1.0	56.0	3.0	0.0	Horz	PK	0.0	41.9	68.2	-26.3	CH 48 (5240MHz), 6 Mbps, EUT On Side
10480.010	53.7	-12.3	1.1	61.0	3.0	0.0	Vert	PK	0.0	41.4	68.2	-26.8	CH 48 (5240MHz), 6 Mbps, EUT On Side
10362.130	53.2	-12.3	1.1	62.0	3.0	0.0	Vert	PK	0.0	40.9	68.2	-27.3	CH 36 (5180MHz), 6 Mbps, EUT On Side
10520.090	52.8	-12.2	1.2	70.0	3.0	0.0	Vert	PK	0.0	40.6	68.2	-27.6	CH 52 (5260MHz), 6 Mbps, EUT On Side
10358.890	52.1	-12.3	1.0	56.0	3.0	0.0	Horz	PK	0.0	39.8	68.2	-28.4	CH 36 (5180MHz), 6 Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/12/12		
Project:	None	**Temperature:**	18.5 °C		
Job Site:	EV01	**Humidity:**	46% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1022 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	56	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



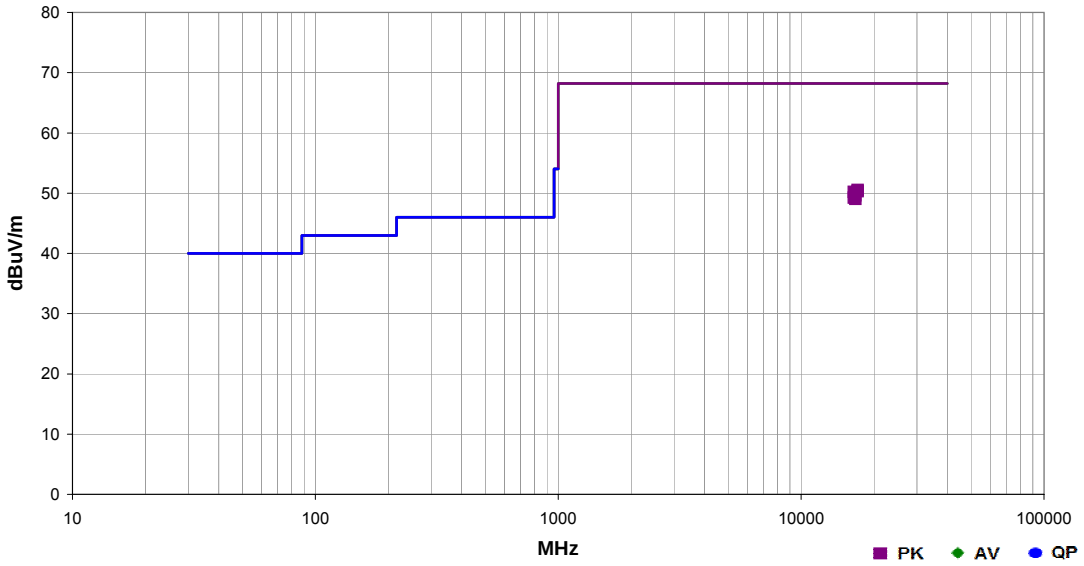
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
15538.020	26.4	11.1	1.0	316.0	3.0	0.0	Vert	AV	0.0	37.5	54.0	-16.5	CH 36 (5180MHz), 6 Mbps, EUT On Side
15538.690	26.3	11.1	1.0	329.0	3.0	0.0	Horz	AV	0.0	37.4	54.0	-16.6	CH 36 (5180MHz), 6 Mbps, EUT On Side
15718.000	26.2	10.8	1.0	104.0	3.0	0.0	Vert	AV	0.0	37.0	54.0	-17.0	CH 48 (5240MHz), 6 Mbps, EUT On Side
15718.070	26.2	10.8	1.0	233.0	3.0	0.0	Horz	AV	0.0	37.0	54.0	-17.0	CH 48 (5240MHz), 6 Mbps, EUT On Side
15778.320	26.1	10.8	1.4	356.0	3.0	0.0	Vert	AV	0.0	36.9	54.0	-17.1	CH 52 (5260MHz), 6 Mbps, EUT On Side
15778.250	26.1	10.8	1.0	5.0	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	CH 52 (5260MHz), 6 Mbps, EUT On Side
15961.860	25.6	11.0	1.0	340.0	3.0	0.0	Horz	AV	0.0	36.6	54.0	-17.4	CH 64 (5320MHz), 6 Mbps, EUT On Side
15961.120	25.6	11.0	1.0	91.0	3.0	0.0	Vert	AV	0.0	36.6	54.0	-17.4	CH 64 (5320MHz), 6 Mbps, EUT On Side
15539.940	39.7	11.1	1.0	316.0	3.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	CH 36 (5180MHz), 6 Mbps, EUT On Side
15538.170	39.6	11.1	1.0	329.0	3.0	0.0	Horz	PK	0.0	50.7	74.0	-23.3	CH 36 (5180MHz), 6 Mbps, EUT On Side
15720.860	39.3	10.8	1.0	104.0	3.0	0.0	Vert	PK	0.0	50.1	74.0	-23.9	CH 48 (5240MHz), 6 Mbps, EUT On Side
15718.820	38.9	10.8	1.0	233.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	CH 48 (5240MHz), 6 Mbps, EUT On Side
15778.130	38.9	10.8	1.0	5.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	CH 52 (5260MHz), 6 Mbps, EUT On Side
15959.630	38.6	11.0	1.0	91.0	3.0	0.0	Vert	PK	0.0	49.6	74.0	-24.4	CH 64 (5320MHz), 6 Mbps, EUT On Side
15958.590	38.5	11.0	1.0	340.0	3.0	0.0	Horz	PK	0.0	49.5	74.0	-24.5	CH 64 (5320MHz), 6 Mbps, EUT On Side
15780.330	38.6	10.8	1.4	356.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	CH 52 (5260MHz), 6 Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/12/12		
Project:	None	**Temperature:**	18.5 °C		
Job Site:	EV01	**Humidity:**	46% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1022 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	56	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



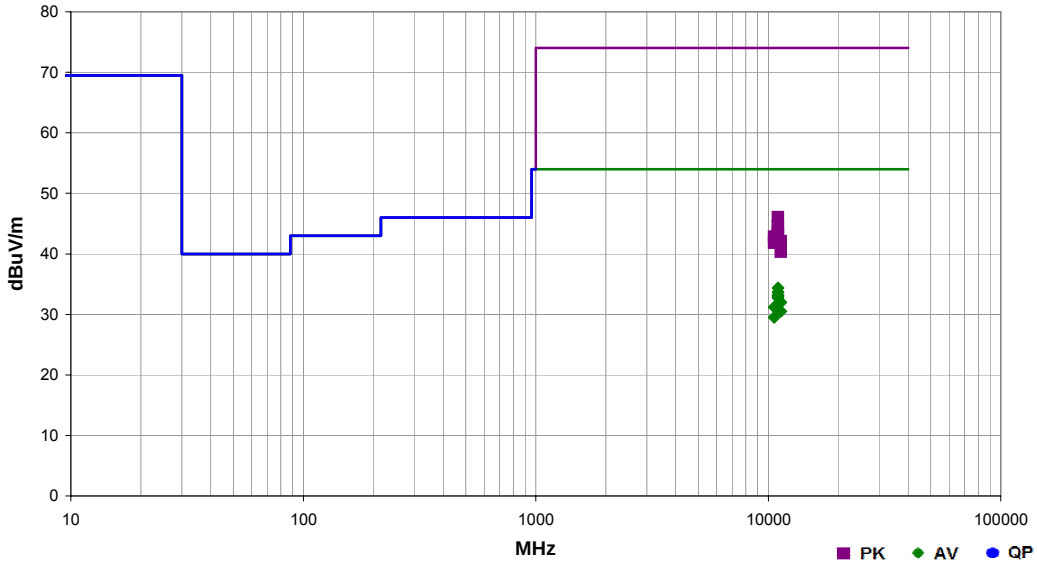
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
17098.430	38.8	11.7	1.5	316.0	3.0	0.0	Horz	PK	0.0	50.5	68.2	-17.7	CH 140 (5700MHz), 6 Mbps, EUT On Side
17098.060	38.6	11.7	1.0	212.0	3.0	0.0	Vert	PK	0.0	50.3	68.2	-17.9	CH 140 (5700MHz), 6 Mbps, EUT On Side
16501.750	39.0	11.2	1.0	188.0	3.0	0.0	Vert	PK	0.0	50.2	68.2	-18.0	CH 100 (5500MHz), 6 Mbps, EUT On Side
16741.190	38.3	11.3	1.0	88.0	3.0	0.0	Vert	PK	0.0	49.6	68.2	-18.6	CH 116 (5580MHz), 6 Mbps, EUT On Side
16499.390	38.0	11.2	1.5	241.0	3.0	0.0	Horz	PK	0.0	49.2	68.2	-19.0	CH 100 (5500MHz), 6 Mbps, EUT On Side
16740.820	37.7	11.3	1.8	134.0	3.0	0.0	Horz	PK	0.0	49.0	68.2	-19.2	CH 116 (5580MHz), 6 Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/12/12		
Project:	None	**Temperature:**	18.5 °C		
Job Site:	EV01	**Humidity:**	46% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1022 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	57	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



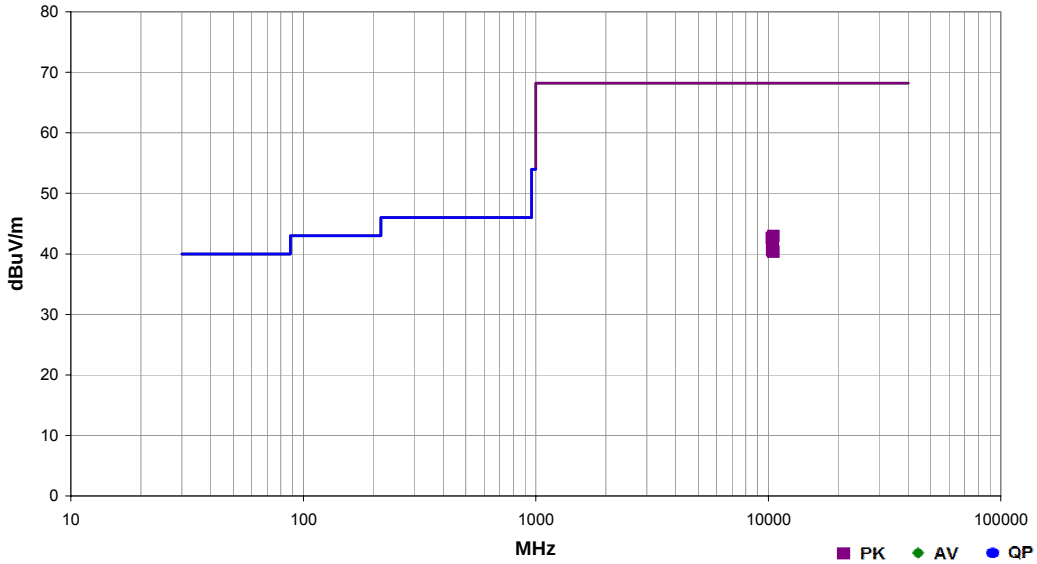
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
11019.600	44.8	-10.4	1.0	58.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	CH 100/104 (5510MHz), MCS8, EUT On Side
11019.600	44.1	-10.4	1.3	65.0	3.0	0.0	Horz	AV	0.0	33.7	54.0	-20.3	CH 100/104 (5510MHz), MCS8, EUT On Side
11024.070	43.6	-10.4	1.0	59.0	3.0	0.0	Vert	AV	0.0	33.2	54.0	-20.8	CH 100/104 (5510MHz), MCS0, EUT On Side
11017.870	43.5	-10.4	1.0	59.0	3.0	0.0	Vert	AV	0.0	33.1	54.0	-20.9	CH 100/104 (5510MHz), MCS7, EUT On Side
11012.400	43.2	-10.5	1.0	58.0	3.0	0.0	Vert	AV	0.0	32.7	54.0	-21.3	CH 100/104 (5510MHz), MCS15, EUT On Side
11339.470	39.9	-7.9	1.2	65.0	3.0	0.0	Vert	AV	0.0	32.0	54.0	-22.0	CH 132/136 (5670MHz), MCS8, EUT On Side
10619.750	43.1	-11.9	1.2	58.0	3.0	0.0	Horz	AV	0.0	31.2	54.0	-22.8	CH 60/64 (5310MHz), MCS8, EUT On Side
11339.450	38.4	-7.9	1.3	92.0	3.0	0.0	Horz	AV	0.0	30.5	54.0	-23.5	CH 132/136 (5670MHz), MCS8, EUT On Side
10619.600	41.4	-11.9	1.0	25.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	CH 60/64 (5310MHz), MCS8, EUT On Side
11018.200	56.5	-10.4	1.0	58.0	3.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	CH 100/104 (5510MHz), MCS15, EUT On Side
11028.730	55.0	-10.4	1.0	59.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	CH 100/104 (5510MHz), MCS7, EUT On Side
11023.800	54.1	-10.4	1.0	59.0	3.0	0.0	Vert	PK	0.0	43.7	74.0	-30.3	CH 100/104 (5510MHz), MCS0, EUT On Side
11019.330	53.6	-10.4	1.0	58.0	3.0	0.0	Vert	PK	0.0	43.2	74.0	-30.8	CH 100/104 (5510MHz), MCS8, EUT On Side
10618.100	54.7	-11.9	1.2	58.0	3.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	CH 60/64 (5310MHz), MCS8, EUT On Side
11024.350	53.0	-10.4	1.3	65.0	3.0	0.0	Horz	PK	0.0	42.6	74.0	-31.4	CH 100/104 (5510MHz), MCS8, EUT On Side
11337.630	50.0	-7.9	1.2	65.0	3.0	0.0	Vert	PK	0.0	42.1	74.0	-31.9	CH 132/136 (5670MHz), MCS8, EUT On Side
10617.000	53.7	-11.9	1.0	25.0	3.0	0.0	Vert	PK	0.0	41.8	74.0	-32.2	CH 60/64 (5310MHz), MCS8, EUT On Side
11336.550	48.3	-7.9	1.3	92.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	CH 132/136 (5670MHz), MCS8, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/12/12		
Project:	None	**Temperature:**	18.5 °C		
Job Site:	EV01	**Humidity:**	46% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1022 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	57	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



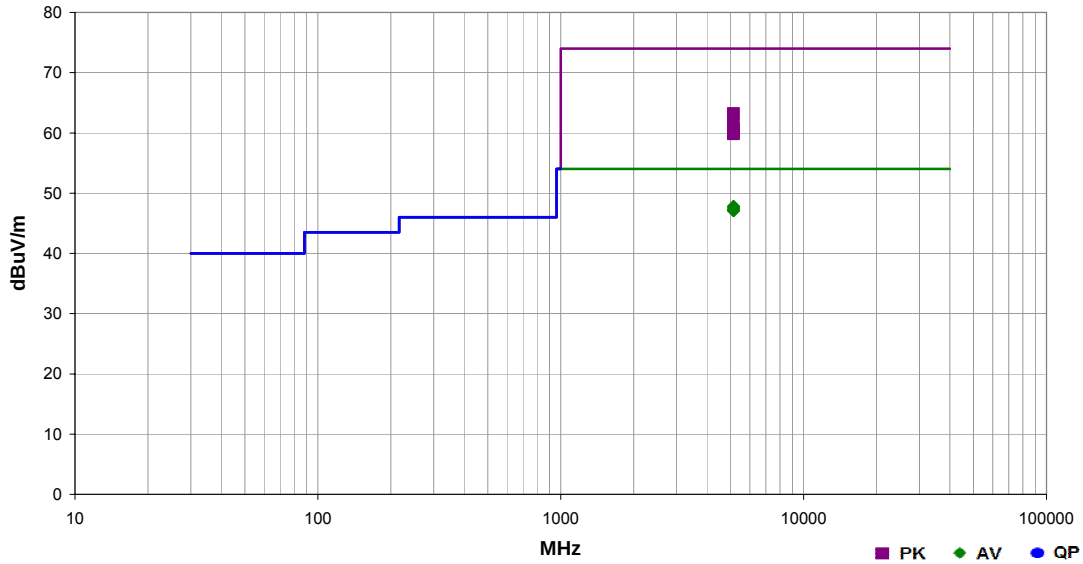
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
10536.550	55.1	-12.2	1.1	47.0	3.0	0.0	Vert	PK	0.0	42.9	68.2	-25.3	CH 52/56 (5270MHz), MCS8, EUT On Side
10384.700	54.9	-12.3	1.2	42.0	3.0	0.0	Vert	PK	0.0	42.6	68.2	-25.6	CH 36/40 (5190MHz), MCS8, EUT On Side
10456.100	54.6	-12.3	1.2	50.0	3.0	0.0	Vert	PK	0.0	42.3	68.2	-25.9	CH 44/48 (5230MHz), MCS8, EUT On Side
10456.650	52.9	-12.3	1.2	57.0	3.0	0.0	Horz	PK	0.0	40.6	68.2	-27.6	CH 44/48 (5230MHz), MCS8, EUT On Side
10389.250	52.9	-12.3	1.2	57.0	3.0	0.0	Horz	PK	0.0	40.6	68.2	-27.6	CH 36/40 (5190MHz), MCS8, EUT On Side
10547.000	52.5	-12.1	1.3	66.0	3.0	0.0	Horz	PK	0.0	40.4	68.2	-27.8	CH 52/56 (5270MHz), MCS8, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/13/12		
Project:	None	**Temperature:**	20.2 °C		
Job Site:	EV01	**Humidity:**	47% RH		
Serial Number:	000012424053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	1				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level				
Deviations:	None				
Comments:	See comments below for channel, data rate, and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	89	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



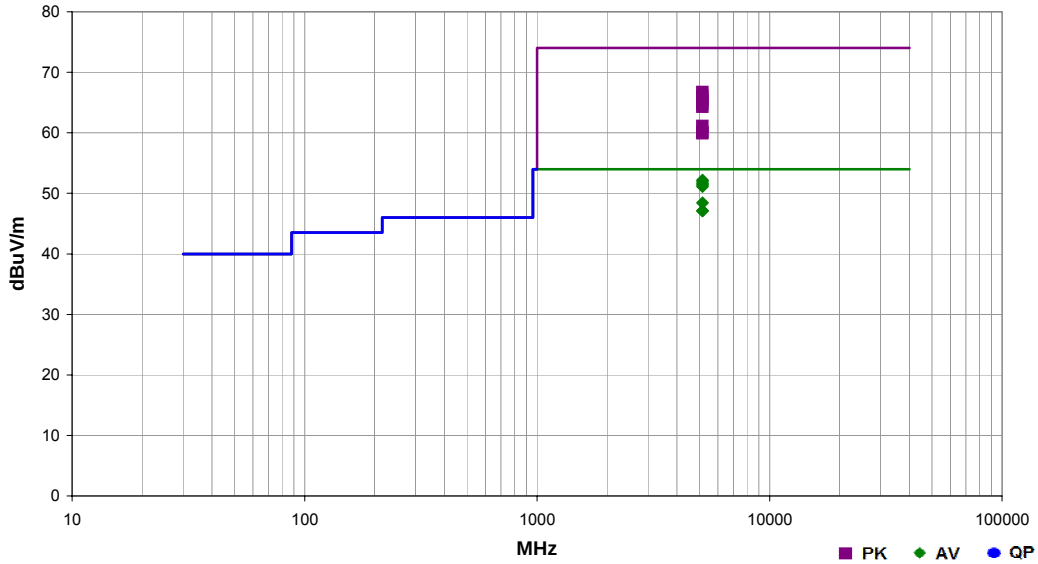
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5148.193	20.5	36.8	1.2	62.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	CH 36 (5180MHz), MCS8, EUT Vertical
5148.190	20.5	36.8	1.2	62.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	CH 36 (5180MHz), MCS15, EUT Vertical
5148.000	20.3	36.8	1.1	57.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	CH 36 (5180MHz), MCS15, EUT On Side
5148.053	20.1	36.8	1.1	57.0	1.0	0.0	Vert	AV	-9.5	47.4	54.0	-6.6	CH 36 (5180MHz), MCS8, EUT On Side
5149.837	19.9	36.8	1.2	9.0	1.0	0.0	Horz	AV	-9.5	47.2	54.0	-6.8	CH 36 (5180MHz), 54 Mbps, EUT Vertical
5149.793	19.9	36.8	1.2	9.0	1.0	0.0	Horz	AV	-9.5	47.2	54.0	-6.8	CH 36 (5180MHz), MCS7, EUT Vertical
5149.593	19.9	36.8	1.1	9.0	1.0	0.0	Horz	AV	-9.5	47.2	54.0	-6.8	CH 36 (5180MHz), 6 Mbps, EUT Vertical
5149.663	19.9	36.8	1.2	9.0	1.0	0.0	Horz	AV	-9.5	47.2	54.0	-6.8	CH 36 (5180MHz), MCS0, EUT Vertical
5149.527	19.9	36.8	1.2	9.0	1.0	0.0	Horz	AV	-9.5	47.2	54.0	-6.8	CH 36 (5180MHz), 36 Mbps, EUT Vertical
5149.907	19.8	36.8	1.1	1.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	CH 36 (5180MHz), 54 Mbps, EUT On Side
5149.787	19.8	36.8	1.1	1.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	CH 36 (5180MHz), 6 Mbps, EUT On Side
5149.617	19.8	36.8	1.1	1.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	CH 36 (5180MHz), 36 Mbps, EUT On Side
5148.550	19.8	36.8	1.1	1.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	CH 36 (5180MHz), MCS0, EUT On Side
5148.177	19.8	36.8	1.1	1.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	CH 36 (5180MHz), MCS7, EUT On Side
5149.267	35.9	36.8	1.2	62.0	1.0	0.0	Horz	PK	-9.5	63.2	74.0	-10.8	CH 36 (5180MHz), MCS15, EUT Vertical
5148.667	35.8	36.8	1.2	62.0	1.0	0.0	Horz	PK	-9.5	63.1	74.0	-10.9	CH 36 (5180MHz), MCS8, EUT Vertical
5149.360	33.9	36.8	1.2	9.0	1.0	0.0	Horz	PK	-9.5	61.2	74.0	-12.8	CH 36 (5180MHz), MCS7, EUT Vertical
5149.380	33.6	36.8	1.2	9.0	1.0	0.0	Horz	PK	-9.5	60.9	74.0	-13.1	CH 36 (5180MHz), 54 Mbps, EUT Vertical
5148.250	33.2	36.8	1.2	9.0	1.0	0.0	Horz	PK	-9.5	60.5	74.0	-13.5	CH 36 (5180MHz), 6 Mbps, EUT Vertical
5148.043	33.2	36.8	1.1	57.0	1.0	0.0	Vert	PK	-9.5	60.5	74.0	-13.5	CH 36 (5180MHz), MCS8, EUT On Side
5149.477	33.1	36.8	1.2	9.0	1.0	0.0	Horz	PK	-9.5	60.4	74.0	-13.6	CH 36 (5180MHz), MCS0, EUT Vertical
5148.390	33.0	36.8	1.1	57.0	1.0	0.0	Vert	PK	-9.5	60.3	74.0	-13.7	CH 36 (5180MHz), MCS15, EUT On Side
5148.347	32.9	36.8	1.1	1.0	1.0	0.0	Vert	PK	-9.5	60.2	74.0	-13.8	CH 36 (5180MHz), MCS7, EUT On Side
5149.870	32.8	36.8	1.1	1.0	1.0	0.0	Vert	PK	-9.5	60.1	74.0	-13.9	CH 36 (5180MHz), 54 Mbps, EUT On Side
5149.523	32.8	36.8	1.1	1.0	1.0	0.0	Vert	PK	-9.5	60.1	74.0	-13.9	CH 36 (5180MHz), 36 Mbps, EUT On Side
5149.707	32.7	36.8	1.2	9.0	1.0	0.0	Horz	PK	-9.5	60.0	74.0	-14.0	CH 36 (5180MHz), 36 Mbps, EUT Vertical
5148.647	32.6	36.8	1.1	1.0	1.0	0.0	Vert	PK	-9.5	59.9	74.0	-14.1	CH 36 (5180MHz), MCS0, EUT On Side
5148.530	32.5	36.8	1.1	1.0	1.0	0.0	Vert	PK	-9.5	59.8	74.0	-14.2	CH 36 (5180MHz), 6 Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/16/12		
Project:	None	**Temperature:**	20.5 °C		
Job Site:	EV01	**Humidity:**	39% RH		
Serial Number:	000092324253	**Barometric Pres.:**	1014 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level unless noted otherwise.				
Deviations:	None				
Comments:	See comments below for channel, data rate, EUT orientation, and power level.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	94	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



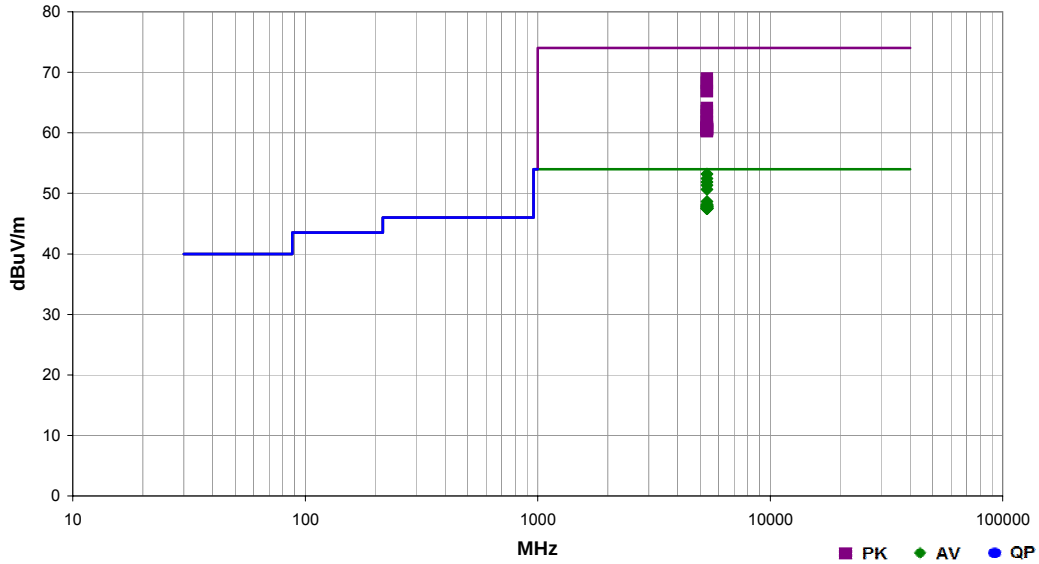
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5149.083	24.9	36.8	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	52.2	54.0	-1.8	CH 36/40 (5190MHz), MCS15, EUT On Side, 9dBm
5148.007	24.6	36.8	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	51.9	54.0	-2.1	CH 36/40 (5190MHz), MCS0, EUT On Side, 9dBm
5150.000	24.3	36.9	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	51.6	54.0	-2.4	CH 36/40 (5190MHz), MCS15, EUT On Side, 9dBm
5149.380	24.1	36.8	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	51.4	54.0	-2.6	CH 36/40 (5190MHz), MCS8, EUT On Side, 9dBm
5148.857	23.8	36.8	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	51.1	54.0	-2.9	CH 36/40 (5190MHz), MCS7, EUT On Side, 9dBm
5150.000	21.1	36.9	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	48.4	54.0	-5.6	CH 36/40 (5190MHz), MCS8, EUT On Side, 9dBm
5148.090	19.8	36.8	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.1	54.0	-6.9	CH 36/40 (5190MHz), MCS0, EUT On Side, 9dBm
5148.003	19.8	36.8	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.1	54.0	-6.9	CH 36/40 (5190MHz), MCS7, EUT On Side, 9dBm
5149.997	39.4	36.8	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	66.7	74.0	-7.3	CH 36/40 (5190MHz), MCS15, EUT On Side, 9dBm
5148.047	38.8	36.8	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	66.1	74.0	-7.9	CH 36/40 (5190MHz), MCS0, EUT On Side, 9dBm
5149.127	38.1	36.8	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	65.4	74.0	-8.6	CH 36/40 (5190MHz), MCS15, EUT On Side, 9dBm
5148.330	37.5	36.8	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	64.8	74.0	-9.2	CH 36/40 (5190MHz), MCS8, EUT On Side, 9dBm
5149.923	37.0	36.8	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	64.3	74.0	-9.7	CH 36/40 (5190MHz), MCS7, EUT On Side, 9dBm
5149.993	33.8	36.8	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	61.1	74.0	-12.9	CH 36/40 (5190MHz), MCS8, EUT On Side, 9dBm
5148.190	32.8	36.8	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	60.1	74.0	-13.9	CH 36/40 (5190MHz), MCS0, EUT On Side, 9dBm
5148.283	32.6	36.8	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	59.9	74.0	-14.1	CH 36/40 (5190MHz), MCS7, EUT On Side, 9dBm

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/16/12		
Project:	None	**Temperature:**	20.5 °C		
Job Site:	EV01	**Humidity:**	39% RH		
Serial Number:	000092324253	**Barometric Pres.:**	1014 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level unless noted otherwise.				
Deviations:	None				
Comments:	See comments below for channel, data rate, EUT orientation, and power level.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	95	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**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
5350.780	25.5	37.2	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	53.2	54.0	-0.8	CH 60/64 (5310MHz), MCS15, EUT On Side, 12dBm
5350.020	24.8	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	52.5	54.0	-1.5	CH 60/64 (5310MHz), MCS15, EUT On Side, 12dBm
5351.043	24.2	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	51.9	54.0	-2.1	CH 60/64 (5310MHz), MCS7, EUT On Side, 12dBm
5350.000	23.7	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	51.4	54.0	-2.6	CH 60/64 (5310MHz), MCS0, EUT On Side, 12dBm
5350.617	23.0	37.2	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	50.7	54.0	-3.3	CH 60/64 (5310MHz), MCS8, EUT On Side, 12dBm
5351.173	41.3	37.2	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	69.0	74.0	-5.0	CH 60/64 (5310MHz), MCS15, EUT On Side, 12dBm
5351.040	21.0	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	48.7	54.0	-5.3	CH 60/64 (5310MHz), MCS7, EUT On Side, 12dBm
5350.150	40.6	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	68.3	74.0	-5.7	CH 60/64 (5310MHz), MCS15, EUT On Side, 12dBm
5350.990	20.5	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	48.2	54.0	-5.8	CH 60/64 (5310MHz), MCS8, EUT On Side, 12dBm
5351.317	20.4	37.2	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	48.1	54.0	-5.9	CH 64 (5320MHz), MCS8, EUT On Side
5350.003	20.4	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	48.1	54.0	-5.9	CH 60/64 (5310MHz), MCS0, EUT On Side, 12dBm
5350.170	20.3	37.2	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	48.0	54.0	-6.0	CH 64 (5320MHz), MCS15, EUT On Side
5351.410	20.2	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	47.9	54.0	-6.1	CH 64 (5320MHz), MCS0, EUT On Side
5350.120	20.2	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	47.9	54.0	-6.1	CH 64 (5320MHz), 36Mbps, EUT On Side
5350.297	20.1	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	CH 64 (5320MHz), 54Mbps, EUT On Side
5350.130	20.1	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	CH 64 (5320MHz), 6Mbps, EUT On Side
5350.063	20.1	37.2	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	CH 64 (5320MHz), MCS7, EUT On Side
5351.583	19.9	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	CH 64 (5320MHz), MCS15, EUT On Side
5350.540	19.9	37.2	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	CH 64 (5320MHz), MCS8, EUT On Side
5351.770	19.8	37.2	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	CH 64 (5320MHz), 54Mbps, EUT On Side
5350.813	19.8	37.2	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	CH 64 (5320MHz), MCS0, EUT On Side
5350.767	19.8	37.2	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	CH 64 (5320MHz), 36Mbps, EUT On Side
5350.333	19.8	37.2	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	CH 64 (5320MHz), 6Mbps, EUT On Side
5350.103	19.8	37.2	1.2	-1.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	CH 64 (5320MHz), MCS7, EUT On Side
5351.000	39.2	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	66.9	74.0	-7.1	CH 60/64 (5310MHz), MCS7, EUT On Side, 12dBm
5350.240	39.2	37.2	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	66.9	74.0	-7.1	CH 60/64 (5310MHz), MCS8, EUT On Side, 12dBm
5351.177	36.4	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	64.1	74.0	-9.9	CH 60/64 (5310MHz), MCS0, EUT On Side, 12dBm
5350.170	35.9	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	63.6	74.0	-10.4	CH 60/64 (5310MHz), MCS8, EUT On Side, 12dBm
5350.843	35.2	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	62.9	74.0	-11.1	CH 60/64 (5310MHz), MCS7, EUT On Side, 12dBm
5350.630	34.2	37.2	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	61.9	74.0	-12.1	CH 64 (5320MHz), MCS8, EUT On Side
5350.213	34.0	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	61.7	74.0	-12.3	CH 64 (5320MHz), 6Mbps, EUT On Side
5351.860	33.3	37.2	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	61.0	74.0	-13.0	CH 64 (5320MHz), 36Mbps, EUT On Side
5351.097	33.2	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	60.9	74.0	-13.1	CH 64 (5320MHz), 54Mbps, EUT On Side
5350.367	33.2	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	60.9	74.0	-13.1	CH 64 (5320MHz), 36Mbps, EUT On Side

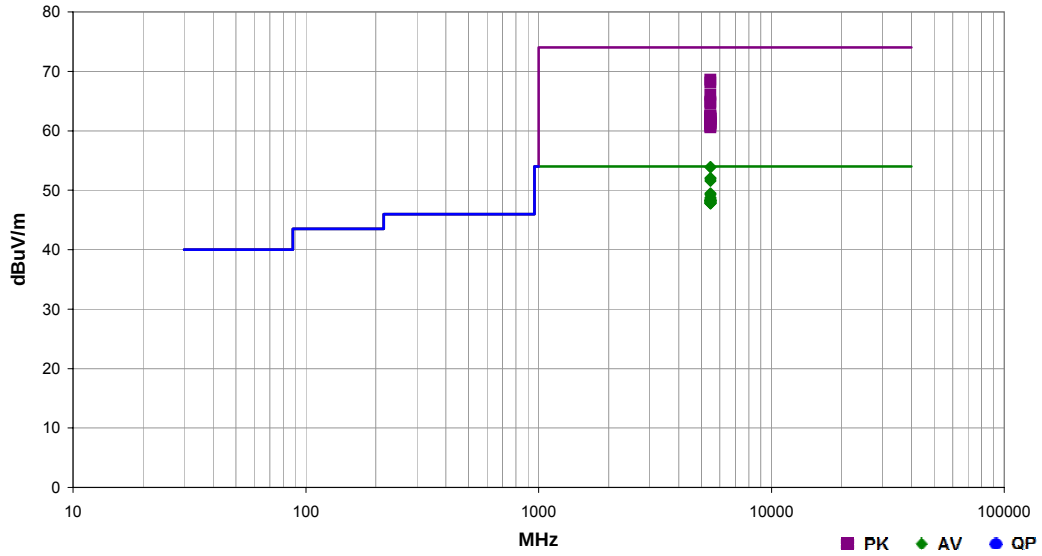
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5350.777	33.0	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	60.7	74.0	-13.3	CH 64 (5320MHz), MCS0, EUT On Side
5350.580	33.0	37.2	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	60.7	74.0	-13.3	CH 64 (5320MHz), MCS7, EUT On Side
5350.250	33.0	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	60.7	74.0	-13.3	CH 64 (5320MHz), MCS8, EUT On Side
5350.930	32.9	37.2	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	60.6	74.0	-13.4	CH 64 (5320MHz), MCS7, EUT On Side
5350.693	32.9	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	60.6	74.0	-13.4	CH 60/64 (5310MHz), MCS0, EUT On Side, 12dBm
5350.587	32.9	37.2	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	60.6	74.0	-13.4	CH 64 (5320MHz), MCS0, EUT On Side
5351.540	32.8	37.2	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	60.5	74.0	-13.5	CH 64 (5320MHz), MCS15, EUT On Side
5351.903	32.7	37.2	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	60.4	74.0	-13.6	CH 64 (5320MHz), 6Mbps, EUT On Side
5351.257	32.6	37.2	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	60.3	74.0	-13.7	CH 64 (5320MHz), MCS15, EUT On Side
5350.667	32.6	37.2	1.2	-1.0	1.0	0.0	Horz	PK	-9.5	60.3	74.0	-13.7	CH 64 (5320MHz), 54Mbps, EUT On Side

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1631	**Date:**	11/16/12		
Project:	None	**Temperature:**	20.5 °C		
Job Site:	EV01	**Humidity:**	39% RH		
Serial Number:	000092324253	**Barometric Pres.:**	1014 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	Mike Boucher				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit 802.11a, 100% duty cycle, 13dBm power level unless noted otherwise.				
Deviations:	None				
Comments:	See comments below for channel, data rate, EUT orientation, and power level.				

Test Specifications	**Test Method**
FCC 15.407:2012	ANSI C63.10:2009

Run #	96	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**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
5470.000	25.9	37.5	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	53.9	54.0	-0.1	CH 100/104 (5510MHz), MCS15, EUT On Side, 10dBm
5468.000	25.9	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	53.9	54.0	-0.1	CH 100/104 (5510MHz), MCS0, EUT On Side, 10dBm
5470.000	24.1	37.5	1.1	-1.0	1.0	0.0	Vert	AV	-9.5	52.1	54.0	-1.9	CH 100/104 (5510MHz), MCS8, EUT On Side, 10dBm
5470.000	23.9	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	51.9	54.0	-2.1	CH 100/104 (5510MHz), MCS15, EUT On Side, 10dBm
5469.087	23.6	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	51.6	54.0	-2.4	CH 100/104 (5510MHz), MCS7, EUT On Side, 10dBm
5468.000	21.5	37.5	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	49.5	54.0	-4.5	CH 100/104 (5510MHz), MCS0, EUT On Side, 10dBm
5469.983	21.3	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	49.3	54.0	-4.7	CH 100/104 (5510MHz), MCS8, EUT On Side, 10dBm
5468.180	20.8	37.5	1.1	-1.0	1.0	0.0	Horz	AV	-9.5	48.8	54.0	-5.2	CH 100/104 (5510MHz), MCS7, EUT On Side, 10dBm
5469.997	20.6	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.6	54.0	-5.4	CH 100 (5500MHz), MCS15, EUT On Side
5469.933	40.6	37.5	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	68.6	74.0	-5.4	CH 100/104 (5510MHz), MCS15, EUT On Side, 10dBm
5468.717	20.4	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.4	54.0	-5.6	CH 100 (5500MHz), MCS8, EUT On Side
5470.000	20.3	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.3	54.0	-5.7	CH 100 (5500MHz), 6Mbps, EUT On Side
5470.000	20.3	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.3	54.0	-5.7	CH 100 (5500MHz), MCS0, EUT On Side
5469.870	20.3	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.3	54.0	-5.7	CH 100 (5500MHz), MCS7, EUT On Side
5470.000	20.2	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	48.2	54.0	-5.8	CH 100 (5500MHz), MCS8, EUT On Side
5469.807	20.2	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.2	54.0	-5.8	CH 100 (5500MHz), 54Mbps, EUT On Side
5469.457	20.2	37.5	1.0	-1.0	1.0	0.0	Vert	AV	-9.5	48.2	54.0	-5.8	CH 100 (5500MHz), 36Mbps, EUT On Side
5470.000	20.1	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	48.1	54.0	-5.9	CH 100 (5500MHz), MCS15, EUT On Side
5468.403	40.1	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	68.1	74.0	-5.9	CH 100/104 (5510MHz), MCS0, EUT On Side, 10dBm
5469.943	19.9	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	CH 100 (5500MHz), 6Mbps, EUT On Side
5469.693	19.9	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	CH 100 (5500MHz), 36Mbps, EUT On Side
5469.130	19.9	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	CH 100 (5500MHz), MCS0, EUT On Side
5468.223	19.9	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	CH 100 (5500MHz), MCS7, EUT On Side
5469.330	19.8	37.5	1.0	-1.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	CH 100 (5500MHz), 54Mbps, EUT On Side
5469.990	38.1	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	66.1	74.0	-7.9	CH 100/104 (5510MHz), MCS15, EUT On Side, 10dBm
5469.890	36.9	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	64.9	74.0	-9.1	CH 100/104 (5510MHz), MCS7, EUT On Side, 10dBm
5469.993	36.6	37.5	1.1	-1.0	1.0	0.0	Vert	PK	-9.5	64.6	74.0	-9.4	CH 100/104 (5510MHz), MCS8, EUT On Side, 10dBm
5468.563	34.6	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	62.6	74.0	-11.4	CH 100/104 (5510MHz), MCS8, EUT On Side, 10dBm
5468.027	34.6	37.5	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	62.6	74.0	-11.4	CH 100/104 (5510MHz), MCS0, EUT On Side, 10dBm
5469.313	34.4	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	62.4	74.0	-11.6	CH 100 (5500MHz), MCS8, EUT On Side
5469.517	34.2	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	62.2	74.0	-11.8	CH 100 (5500MHz), MCS15, EUT On Side
5469.717	34.1	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	62.1	74.0	-11.9	CH 100 (5500MHz), 36Mbps, EUT On Side
5469.500	34.0	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	62.0	74.0	-12.0	CH 100 (5500MHz), MCS8, EUT On Side
5469.380	34.0	37.5	1.1	-1.0	1.0	0.0	Horz	PK	-9.5	62.0	74.0	-12.0	CH 100/104 (5510MHz), MCS7, EUT On Side, 10dBm
5468.207	34.0	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	62.0	74.0	-12.0	CH 100 (5500MHz), MCS0, EUT On Side
5468.980	33.6	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	61.6	74.0	-12.4	CH 100 (5500MHz), 54Mbps, EUT On Side

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
5468.570	33.5	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	61.5	74.0	-12.5	CH 100 (5500MHz), MCS7, EUT On Side
5468.177	33.4	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	61.4	74.0	-12.6	CH 100 (5500MHz), 36Mbps, EUT On Side
5468.417	33.3	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	61.3	74.0	-12.7	CH 100 (5500MHz), MCS15, EUT On Side
5468.417	33.3	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	61.3	74.0	-12.7	CH 100 (5500MHz), MCS0, EUT On Side
5468.933	33.2	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	61.2	74.0	-12.8	CH 100 (5500MHz), 54Mbps, EUT On Side
5468.187	33.0	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	61.0	74.0	-13.0	CH 100 (5500MHz), MCS7, EUT On Side
5469.840	32.8	37.5	1.0	-1.0	1.0	0.0	Vert	PK	-9.5	60.8	74.0	-13.2	CH 100 (5500MHz), 6Mbps, EUT On Side
5469.100	32.6	37.5	1.0	-1.0	1.0	0.0	Horz	PK	-9.5	60.6	74.0	-13.4	CH 100 (5500MHz), 6Mbps, EUT On Side

AC POWERLINE CONDUCTED EMISSIONS

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.

MODES OF OPERATION

Transmitting

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1638 - 1

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIN	4/16/2012	12 mo
Receiver	Rohde & Schwarz	ESCI	ARH	3/29/2012	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HHD	2/1/2012	24 mo
Attenuator	Coaxicom	66702 2910-20	RBR	8/7/2012	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	4/27/2012	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

Measurements were made using the bandwidths and detectors specified. No video filter was used.

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 EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

The power levels for the EUT are as follows:
2.4GHz, 20MHz bandwidth = 16dBm
2.4GHz, 40MHz bandwidth = 12dBm
5.0GHz, 20/40MHz bandwidth = 12dBm (Not including the indicated four points below)
5.0GHz, 40MHz bandwidth Channel 36/40 = 9dBm
5.0GHz, 40MHz bandwidth Channel 52/56 = 11dBm
5.0GHz, 40MHz bandwidth Channel 60/64 = 11dBm
5.0GHz, 40MHz bandwidth Channel 100/104 = 10dBm

EUT is transmitting on Antenna A only.

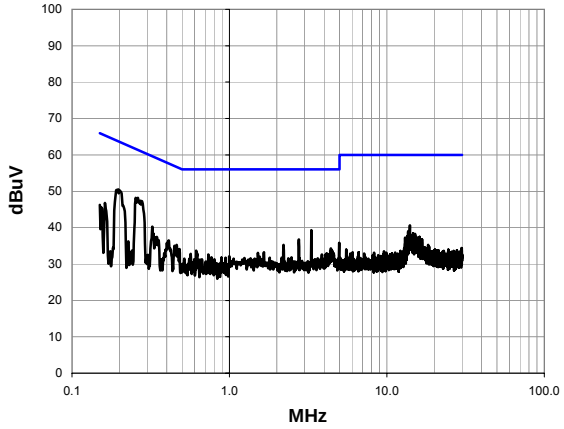
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6 Mbs - 5180Hz (H)				

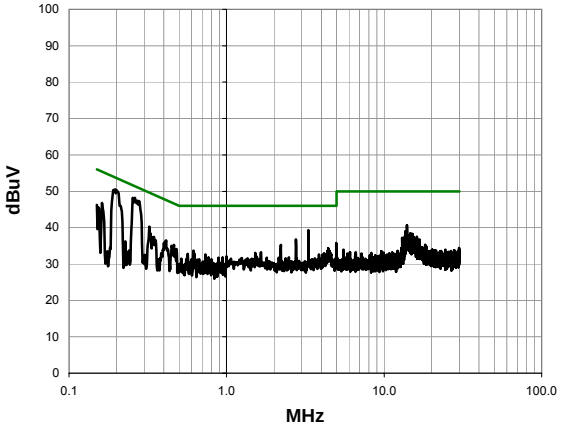
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	3	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	30.1	20.4	50.5	63.8	-13.3
0.254	27.9	20.3	48.2	61.6	-13.4
3.312	18.8	20.5	39.3	56.0	-16.7
0.162	26.4	20.4	46.8	65.4	-18.6
2.760	16.2	20.5	36.7	56.0	-19.3
0.323	20.0	20.3	40.3	59.6	-19.3
13.980	19.4	21.2	40.6	60.0	-19.4
0.150	25.8	20.5	46.3	66.0	-19.7
0.153	25.2	20.4	45.6	65.8	-20.2
4.976	15.1	20.7	35.8	56.0	-20.2
2.208	14.8	20.5	35.3	56.0	-20.7
13.660	17.8	21.2	39.0	60.0	-21.0
0.412	16.2	20.3	36.5	57.6	-21.1
13.910	17.5	21.2	38.7	60.0	-21.3
0.463	15.0	20.3	35.3	56.6	-21.4
0.346	17.2	20.3	37.5	59.1	-21.6
14.680	17.1	21.3	38.4	60.0	-21.6
13.750	17.1	21.2	38.3	60.0	-21.7
4.416	13.6	20.7	34.3	56.0	-21.7
15.120	16.9	21.3	38.2	60.0	-21.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	30.1	20.4	50.5	53.8	-3.3
0.254	27.9	20.3	48.2	51.6	-3.4
3.312	18.8	20.5	39.3	46.0	-6.7
0.162	26.4	20.4	46.8	55.4	-8.6
2.760	16.2	20.5	36.7	46.0	-9.3
0.323	20.0	20.3	40.3	49.6	-9.3
13.980	19.4	21.2	40.6	50.0	-9.4
0.150	25.8	20.5	46.3	56.0	-9.7
0.153	25.2	20.4	45.6	55.8	-10.2
4.976	15.1	20.7	35.8	46.0	-10.2
2.208	14.8	20.5	35.3	46.0	-10.7
13.660	17.8	21.2	39.0	50.0	-11.0
0.412	16.2	20.3	36.5	47.6	-11.1
13.910	17.5	21.2	38.7	50.0	-11.3
0.463	15.0	20.3	35.3	46.6	-11.4
0.346	17.2	20.3	37.5	49.1	-11.6
14.680	17.1	21.3	38.4	50.0	-11.6
13.750	17.1	21.2	38.3	50.0	-11.7
4.416	13.6	20.7	34.3	46.0	-11.7
15.120	16.9	21.3	38.2	50.0	-11.8

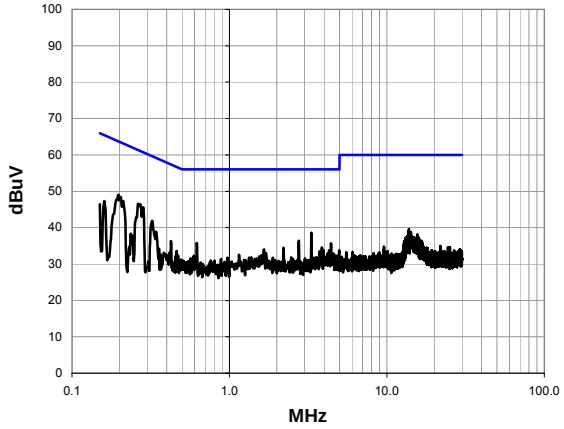
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6 Mbs - 5180Hz (L)				

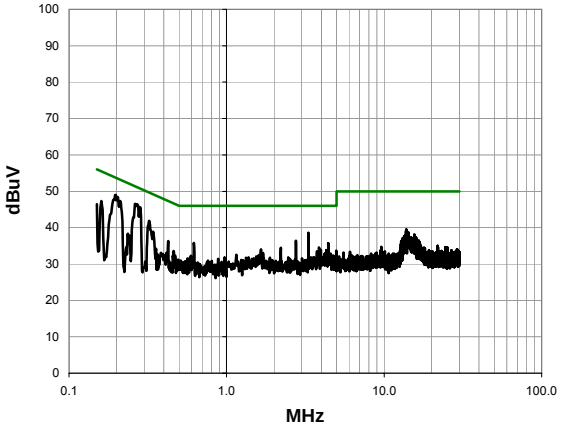
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	4	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.198	28.6	20.4	49.0	63.7	-14.8
0.262	26.2	20.3	46.5	61.4	-14.8
3.312	18.1	20.5	38.6	56.0	-17.4
0.322	21.6	20.3	41.9	59.7	-17.8
0.160	27.0	20.4	47.4	65.5	-18.1
0.150	26.0	20.5	46.5	66.0	-19.5
2.760	15.9	20.5	36.4	56.0	-19.6
0.621	15.5	20.3	35.8	56.0	-20.2
4.416	15.0	20.7	35.7	56.0	-20.3
13.810	18.3	21.2	39.5	60.0	-20.5
0.425	16.0	20.3	36.3	57.3	-21.1
14.220	17.4	21.3	38.7	60.0	-21.3
13.960	17.3	21.2	38.5	60.0	-21.5
3.864	13.9	20.6	34.5	56.0	-21.5
2.208	14.0	20.5	34.5	56.0	-21.5
13.980	17.1	21.2	38.3	60.0	-21.7
15.580	16.8	21.4	38.2	60.0	-21.8
1.656	13.6	20.4	34.0	56.0	-22.0
13.910	16.7	21.2	37.9	60.0	-22.1
15.630	16.5	21.4	37.9	60.0	-22.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.198	28.6	20.4	49.0	53.7	-4.8
0.262	26.2	20.3	46.5	51.4	-4.8
3.312	18.1	20.5	38.6	46.0	-7.4
0.322	21.6	20.3	41.9	49.7	-7.8
0.160	27.0	20.4	47.4	55.5	-8.1
0.150	26.0	20.5	46.5	56.0	-9.5
2.760	15.9	20.5	36.4	46.0	-9.6
0.621	15.5	20.3	35.8	46.0	-10.2
4.416	15.0	20.7	35.7	46.0	-10.3
13.810	18.3	21.2	39.5	50.0	-10.5
0.425	16.0	20.3	36.3	47.3	-11.1
14.220	17.4	21.3	38.7	50.0	-11.3
13.960	17.3	21.2	38.5	50.0	-11.5
3.864	13.9	20.6	34.5	46.0	-11.5
2.208	14.0	20.5	34.5	46.0	-11.5
13.980	17.1	21.2	38.3	50.0	-11.7
15.580	16.8	21.4	38.2	50.0	-11.8
1.656	13.6	20.4	34.0	46.0	-12.0
13.910	16.7	21.2	37.9	50.0	-12.1
15.630	16.5	21.4	37.9	50.0	-12.1

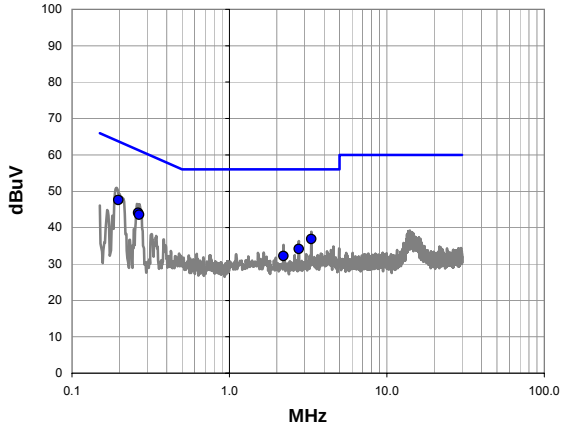
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5240Hz (N)				

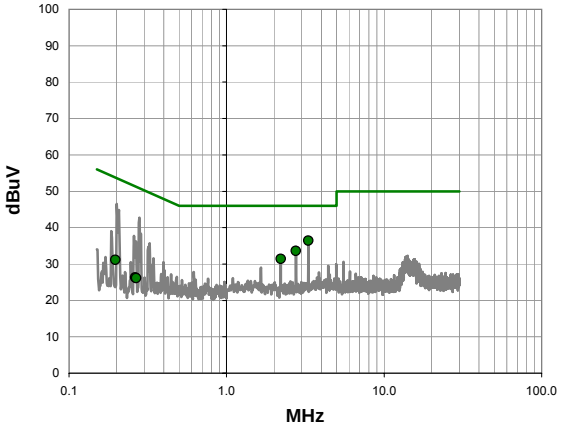
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	5	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.197	27.2	20.4	47.6	63.7	-16.2
0.263	23.7	20.3	44.0	61.3	-17.3
0.267	23.2	20.3	43.5	61.2	-17.7
3.312	16.3	20.5	36.8	56.0	-19.2
2.760	13.6	20.5	34.1	56.0	-21.9
2.208	11.7	20.5	32.2	56.0	-23.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.312	15.9	20.5	36.4	46.0	-9.6
2.760	13.1	20.5	33.6	46.0	-12.4
2.208	10.9	20.5	31.4	46.0	-14.6
0.197	10.8	20.4	31.2	53.7	-22.6
0.263	6.0	20.3	26.3	51.3	-25.0
0.267	5.8	20.3	26.1	51.2	-25.1

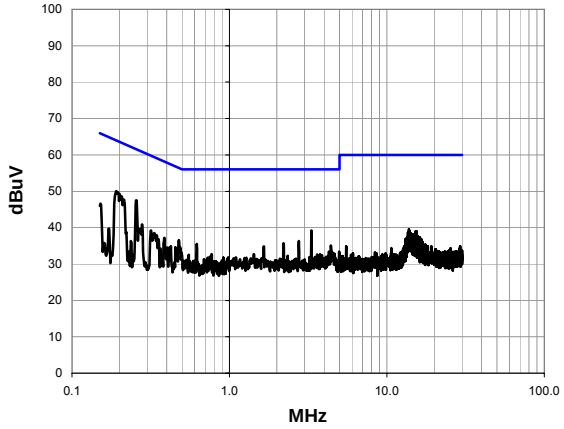
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5240Hz (H)				

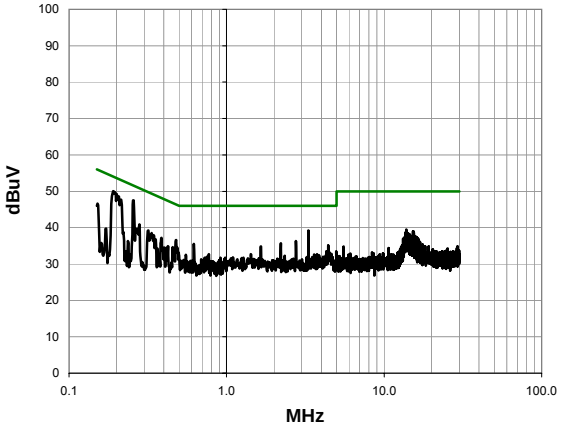
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	6	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	29.7	20.4	50.1	64.0	-14.0
0.255	27.2	20.3	47.5	61.6	-14.0
3.312	18.7	20.5	39.2	56.0	-16.8
0.152	26.2	20.5	46.7	65.9	-19.3
2.760	15.8	20.5	36.3	56.0	-19.7
0.476	16.3	20.3	36.6	56.4	-19.8
0.279	20.6	20.3	40.9	60.8	-19.9
2.208	15.2	20.5	35.7	56.0	-20.3
13.800	18.3	21.2	39.5	60.0	-20.5
0.621	15.2	20.3	35.5	56.0	-20.5
0.318	18.9	20.3	39.2	59.8	-20.6
4.416	14.4	20.7	35.1	56.0	-20.9
0.386	16.9	20.3	37.2	58.1	-21.0
15.430	17.6	21.4	39.0	60.0	-21.0
15.260	17.6	21.4	39.0	60.0	-21.0
13.920	17.7	21.2	38.9	60.0	-21.1
1.656	14.4	20.4	34.8	56.0	-21.2
13.640	17.4	21.2	38.6	60.0	-21.4
14.200	17.2	21.3	38.5	60.0	-21.5
13.690	17.0	21.2	38.2	60.0	-21.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	29.7	20.4	50.1	54.0	-4.0
0.255	27.2	20.3	47.5	51.6	-4.0
3.312	18.7	20.5	39.2	46.0	-6.8
0.152	26.2	20.5	46.7	55.9	-9.3
2.760	15.8	20.5	36.3	46.0	-9.7
0.476	16.3	20.3	36.6	46.4	-9.8
0.279	20.6	20.3	40.9	50.8	-9.9
2.208	15.2	20.5	35.7	46.0	-10.3
13.800	18.3	21.2	39.5	50.0	-10.5
0.621	15.2	20.3	35.5	46.0	-10.5
0.318	18.9	20.3	39.2	49.8	-10.6
4.416	14.4	20.7	35.1	46.0	-10.9
0.386	16.9	20.3	37.2	48.1	-11.0
15.430	17.6	21.4	39.0	50.0	-11.0
15.260	17.6	21.4	39.0	50.0	-11.0
13.920	17.7	21.2	38.9	50.0	-11.1
1.656	14.4	20.4	34.8	46.0	-11.2
13.640	17.4	21.2	38.6	50.0	-11.4
14.200	17.2	21.3	38.5	50.0	-11.5
13.690	17.0	21.2	38.2	50.0	-11.8

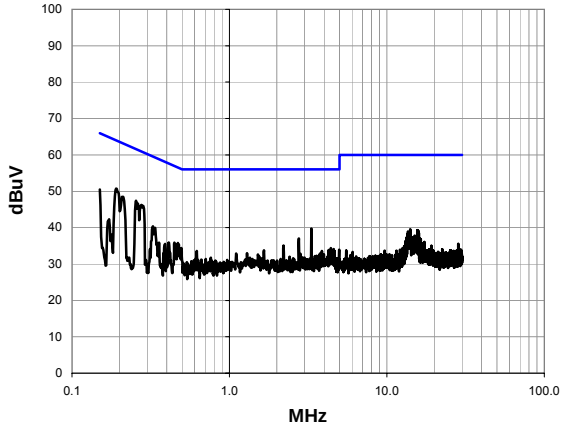
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5260Hz (H)				

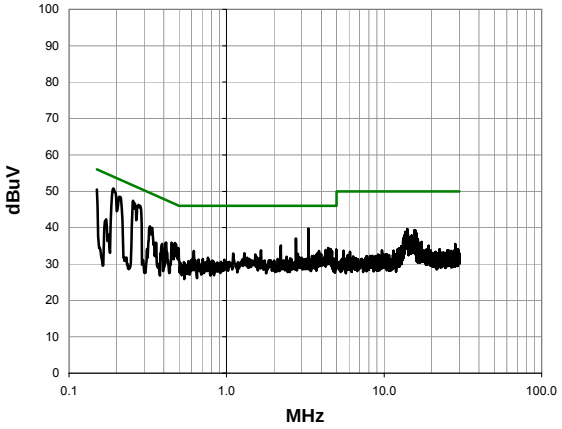
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	7	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	30.4	20.4	50.8	64.0	-13.3
0.255	27.1	20.3	47.4	61.6	-14.1
0.276	25.9	20.3	46.2	60.9	-14.7
0.208	28.1	20.4	48.5	63.3	-14.8
0.150	30.0	20.5	50.5	66.0	-15.5
3.312	19.2	20.5	39.7	56.0	-16.3
2.760	16.5	20.5	37.0	56.0	-19.0
0.327	20.1	20.3	40.4	59.5	-19.1
14.040	18.3	21.3	39.6	60.0	-20.4
0.471	15.5	20.3	35.8	56.5	-20.7
15.610	17.9	21.4	39.3	60.0	-20.7
15.840	17.7	21.4	39.1	60.0	-20.9
2.208	14.6	20.5	35.1	56.0	-20.9
0.448	15.6	20.3	35.9	56.9	-21.0
13.610	17.7	21.2	38.9	60.0	-21.1
13.820	17.5	21.2	38.7	60.0	-21.3
0.456	15.1	20.3	35.4	56.8	-21.4
13.720	17.4	21.2	38.6	60.0	-21.4
15.970	17.1	21.4	38.5	60.0	-21.5
4.416	13.7	20.7	34.4	56.0	-21.6

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	30.4	20.4	50.8	54.0	-3.3
0.255	27.1	20.3	47.4	51.6	-4.1
0.276	25.9	20.3	46.2	50.9	-4.7
0.208	28.1	20.4	48.5	53.3	-4.8
0.150	30.0	20.5	50.5	56.0	-5.5
3.312	19.2	20.5	39.7	46.0	-6.3
2.760	16.5	20.5	37.0	46.0	-9.0
0.327	20.1	20.3	40.4	49.5	-9.1
14.040	18.3	21.3	39.6	50.0	-10.4
0.471	15.5	20.3	35.8	46.5	-10.7
15.610	17.9	21.4	39.3	50.0	-10.7
15.840	17.7	21.4	39.1	50.0	-10.9
2.208	14.6	20.5	35.1	46.0	-10.9
0.448	15.6	20.3	35.9	46.9	-11.0
13.610	17.7	21.2	38.9	50.0	-11.1
13.820	17.5	21.2	38.7	50.0	-11.3
0.456	15.1	20.3	35.4	46.8	-11.4
13.720	17.4	21.2	38.6	50.0	-11.4
15.970	17.1	21.4	38.5	50.0	-11.5
4.416	13.7	20.7	34.4	46.0	-11.6

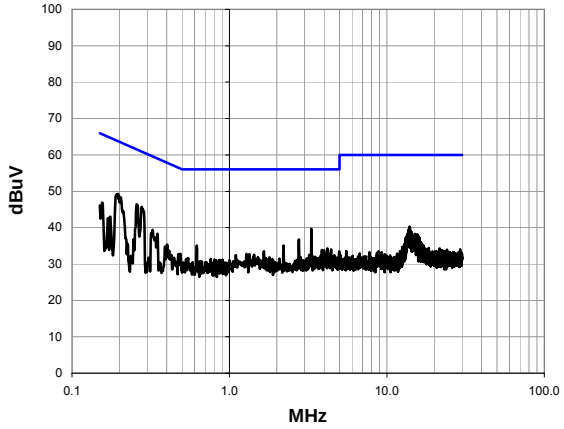
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5260Hz (L)				

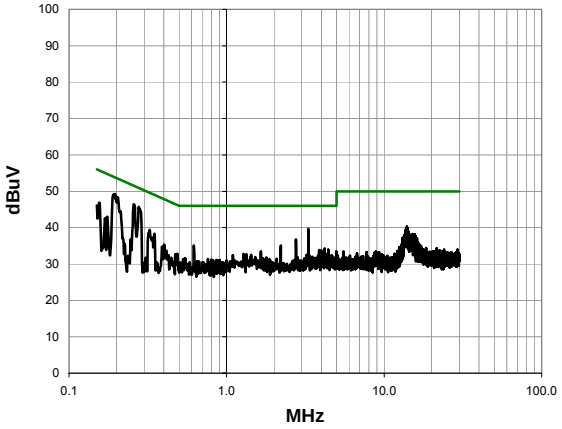
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	8	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	28.9	20.4	49.3	63.8	-14.5
0.257	26.1	20.3	46.4	61.5	-15.1
0.278	25.4	20.3	45.7	60.9	-15.2
3.312	19.1	20.5	39.6	56.0	-16.4
0.155	26.5	20.4	46.9	65.7	-18.8
2.760	16.2	20.5	36.7	56.0	-19.3
13.970	19.0	21.2	40.2	60.0	-19.8
0.150	25.6	20.5	46.1	66.0	-19.9
13.990	18.8	21.2	40.0	60.0	-20.0
0.325	19.1	20.3	39.4	59.6	-20.2
13.710	18.2	21.2	39.4	60.0	-20.6
0.349	18.1	20.3	38.4	59.0	-20.6
13.800	18.0	21.2	39.2	60.0	-20.8
0.621	14.8	20.3	35.1	56.0	-20.9
2.208	14.6	20.5	35.1	56.0	-20.9
14.290	17.6	21.3	38.9	60.0	-21.1
13.930	17.6	21.2	38.8	60.0	-21.2
14.400	17.1	21.3	38.4	60.0	-21.6
14.100	17.1	21.3	38.4	60.0	-21.6
0.176	22.7	20.3	43.0	64.7	-21.7

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	28.9	20.4	49.3	53.8	-4.5
0.257	26.1	20.3	46.4	51.5	-5.1
0.278	25.4	20.3	45.7	50.9	-5.2
3.312	19.1	20.5	39.6	46.0	-6.4
0.155	26.5	20.4	46.9	55.7	-8.8
2.760	16.2	20.5	36.7	46.0	-9.3
13.970	19.0	21.2	40.2	50.0	-9.8
0.150	25.6	20.5	46.1	56.0	-9.9
13.990	18.8	21.2	40.0	50.0	-10.0
0.325	19.1	20.3	39.4	49.6	-10.2
13.710	18.2	21.2	39.4	50.0	-10.6
0.349	18.1	20.3	38.4	49.0	-10.6
13.800	18.0	21.2	39.2	50.0	-10.8
0.621	14.8	20.3	35.1	46.0	-10.9
2.208	14.6	20.5	35.1	46.0	-10.9
14.290	17.6	21.3	38.9	50.0	-11.1
13.930	17.6	21.2	38.8	50.0	-11.2
14.400	17.1	21.3	38.4	50.0	-11.6
14.100	17.1	21.3	38.4	50.0	-11.6
0.176	22.7	20.3	43.0	54.7	-11.7

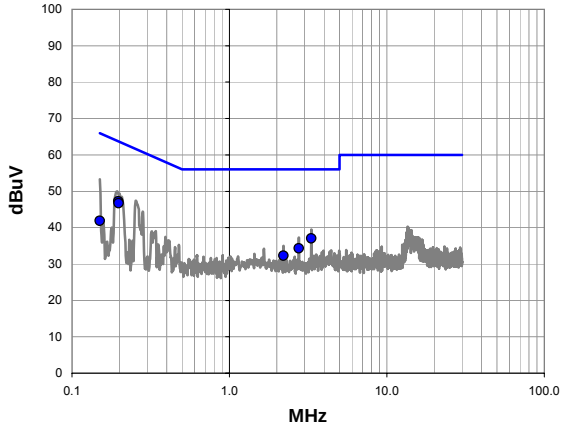
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5320Hz (L)				

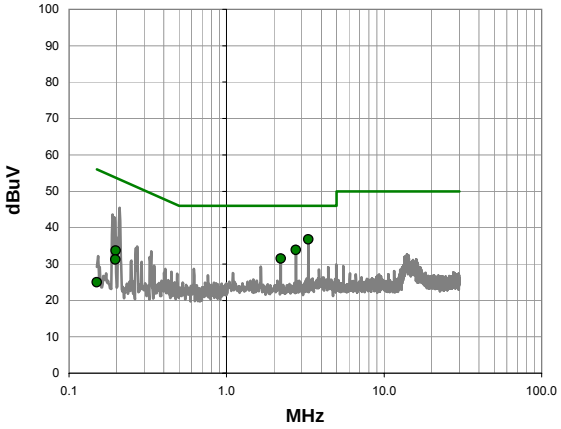
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	9	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.197	26.9	20.4	47.3	63.7	-16.5
0.198	26.3	20.4	46.7	63.7	-17.0
3.312	16.5	20.5	37.0	56.0	-19.0
2.760	13.8	20.5	34.3	56.0	-21.7
2.208	11.8	20.5	32.3	56.0	-23.7
0.150	21.4	20.5	41.9	66.0	-24.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.312	16.2	20.5	36.7	46.0	-9.3
2.760	13.3	20.5	33.8	46.0	-12.2
2.208	11.0	20.5	31.5	46.0	-14.5
0.198	13.3	20.4	33.7	53.7	-20.0
0.197	10.9	20.4	31.3	53.7	-22.5
0.150	4.5	20.5	25.0	56.0	-31.0

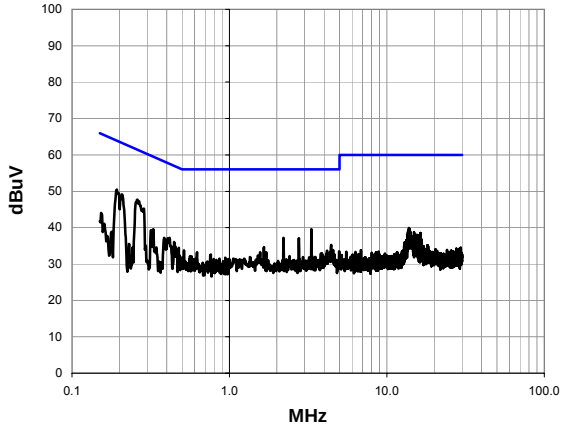
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5320Hz (H)				

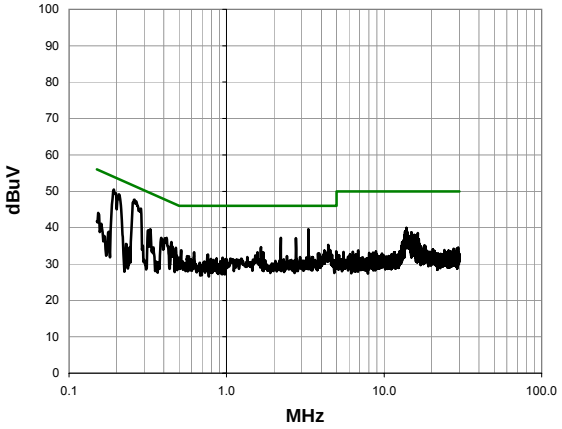
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	10	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.193	30.1	20.4	50.5	63.9	-13.5
0.259	27.3	20.3	47.6	61.5	-13.8
0.208	28.8	20.4	49.2	63.3	-14.1
3.312	19.0	20.5	39.5	56.0	-16.5
2.208	16.7	20.5	37.2	56.0	-18.8
2.760	16.6	20.5	37.1	56.0	-18.9
0.329	19.3	20.3	39.6	59.5	-19.9
13.840	18.7	21.2	39.9	60.0	-20.1
0.417	16.9	20.3	37.2	57.5	-20.3
13.910	18.4	21.2	39.6	60.0	-20.4
0.318	19.0	20.3	39.3	59.8	-20.5
13.810	18.1	21.2	39.3	60.0	-20.7
4.424	14.6	20.7	35.3	56.0	-20.7
0.446	15.8	20.3	36.1	57.0	-20.9
13.710	17.9	21.2	39.1	60.0	-20.9
0.385	16.9	20.3	37.2	58.2	-21.0
13.590	17.7	21.2	38.9	60.0	-21.1
14.050	17.6	21.3	38.9	60.0	-21.1
14.910	17.4	21.3	38.7	60.0	-21.3
1.656	14.2	20.4	34.6	56.0	-21.4

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.193	30.1	20.4	50.5	53.9	-3.5
0.259	27.3	20.3	47.6	51.5	-3.8
0.208	28.8	20.4	49.2	53.3	-4.1
3.312	19.0	20.5	39.5	46.0	-6.5
2.208	16.7	20.5	37.2	46.0	-8.8
2.760	16.6	20.5	37.1	46.0	-8.9
0.329	19.3	20.3	39.6	49.5	-9.9
13.840	18.7	21.2	39.9	50.0	-10.1
0.417	16.9	20.3	37.2	47.5	-10.3
13.910	18.4	21.2	39.6	50.0	-10.4
0.318	19.0	20.3	39.3	49.8	-10.5
13.810	18.1	21.2	39.3	50.0	-10.7
4.424	14.6	20.7	35.3	46.0	-10.7
0.446	15.8	20.3	36.1	47.0	-10.9
13.710	17.9	21.2	39.1	50.0	-10.9
0.385	16.9	20.3	37.2	48.2	-11.0
13.590	17.7	21.2	38.9	50.0	-11.1
14.050	17.6	21.3	38.9	50.0	-11.1
14.910	17.4	21.3	38.7	50.0	-11.3
1.656	14.2	20.4	34.6	46.0	-11.4

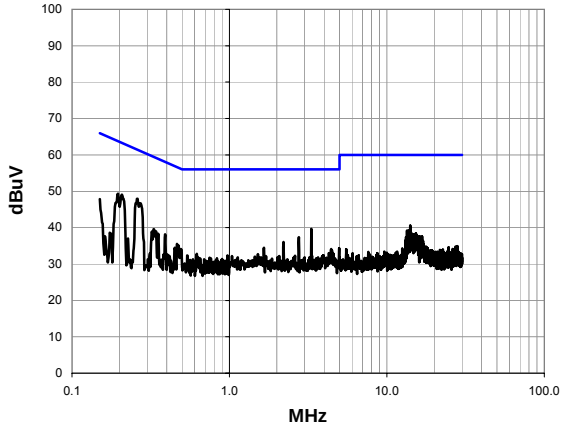
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5500Hz (H)				

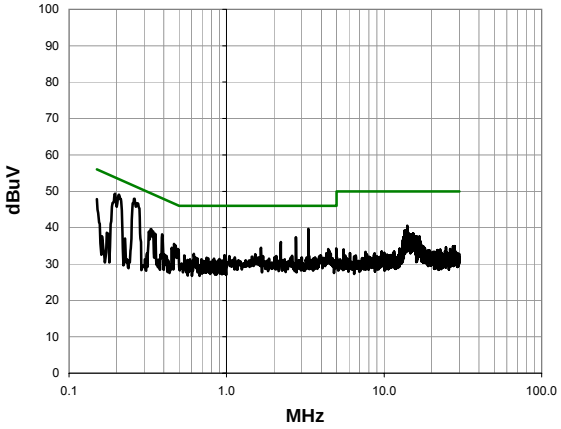
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	11	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.259	27.6	20.3	47.9	61.5	-13.5
0.208	28.7	20.4	49.1	63.3	-14.2
0.196	29.0	20.4	49.4	63.8	-14.4
3.312	19.1	20.5	39.6	56.0	-16.4
0.150	27.4	20.5	47.9	66.0	-18.1
2.760	16.9	20.5	37.4	56.0	-18.6
14.050	19.3	21.3	40.6	60.0	-19.4
0.330	19.3	20.3	39.6	59.4	-19.8
0.390	17.9	20.3	38.2	58.1	-19.9
2.208	15.6	20.5	36.1	56.0	-19.9
0.352	18.1	20.3	38.4	58.9	-20.5
13.780	18.1	21.2	39.3	60.0	-20.7
13.430	17.9	21.2	39.1	60.0	-20.9
0.465	15.2	20.3	35.5	56.6	-21.1
13.840	17.6	21.2	38.8	60.0	-21.2
13.650	17.5	21.2	38.7	60.0	-21.3
14.240	17.3	21.3	38.6	60.0	-21.4
1.656	14.0	20.4	34.4	56.0	-21.6
15.320	17.0	21.4	38.4	60.0	-21.6
15.250	17.0	21.4	38.4	60.0	-21.6

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.259	27.6	20.3	47.9	51.5	-3.5
0.208	28.7	20.4	49.1	53.3	-4.2
0.196	29.0	20.4	49.4	53.8	-4.4
3.312	19.1	20.5	39.6	46.0	-6.4
0.150	27.4	20.5	47.9	56.0	-8.1
2.760	16.9	20.5	37.4	46.0	-8.6
14.050	19.3	21.3	40.6	50.0	-9.4
0.330	19.3	20.3	39.6	49.4	-9.8
0.390	17.9	20.3	38.2	48.1	-9.9
2.208	15.6	20.5	36.1	46.0	-9.9
0.352	18.1	20.3	38.4	48.9	-10.5
13.780	18.1	21.2	39.3	50.0	-10.7
13.430	17.9	21.2	39.1	50.0	-10.9
0.465	15.2	20.3	35.5	46.6	-11.1
13.840	17.6	21.2	38.8	50.0	-11.2
13.650	17.5	21.2	38.7	50.0	-11.3
14.240	17.3	21.3	38.6	50.0	-11.4
1.656	14.0	20.4	34.4	46.0	-11.6
15.320	17.0	21.4	38.4	50.0	-11.6
15.250	17.0	21.4	38.4	50.0	-11.6

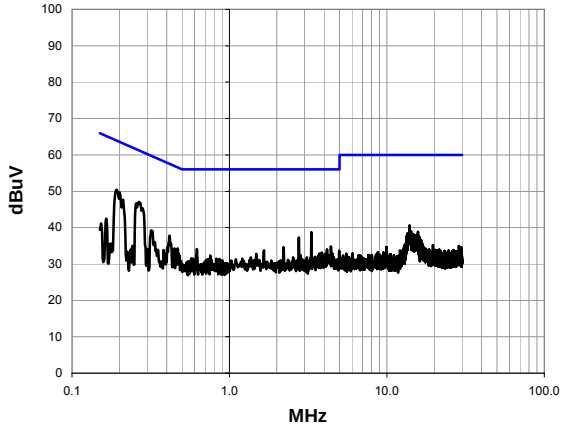
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5500Hz (L)				

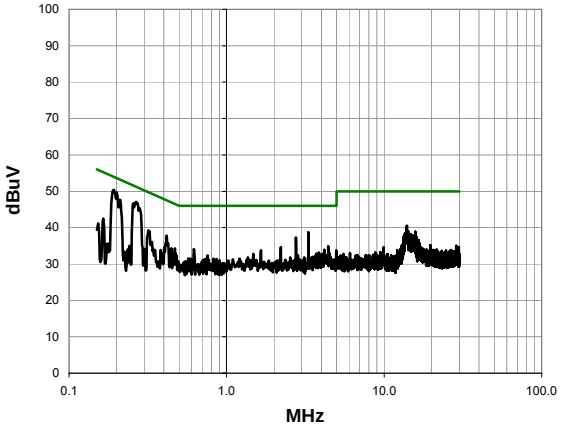
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	12	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.193	30.0	20.4	50.4	63.9	-13.6
0.266	26.7	20.3	47.0	61.3	-14.2
3.312	18.2	20.5	38.7	56.0	-17.3
2.760	16.8	20.5	37.3	56.0	-18.7
13.930	19.3	21.2	40.5	60.0	-19.5
0.417	17.5	20.3	37.8	57.5	-19.7
13.910	19.0	21.2	40.2	60.0	-19.8
0.318	18.9	20.3	39.2	59.8	-20.6
14.040	17.8	21.3	39.1	60.0	-20.9
15.780	17.5	21.4	38.9	60.0	-21.1
14.260	17.6	21.3	38.9	60.0	-21.1
4.416	14.1	20.7	34.8	56.0	-21.2
2.208	14.2	20.5	34.7	56.0	-21.3
14.550	17.0	21.3	38.3	60.0	-21.7
14.720	16.9	21.3	38.2	60.0	-21.8
0.621	13.8	20.3	34.1	56.0	-21.9
14.670	16.8	21.3	38.1	60.0	-21.9
4.168	13.3	20.7	34.0	56.0	-22.0
13.420	16.7	21.2	37.9	60.0	-22.1
15.660	16.5	21.4	37.9	60.0	-22.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.193	30.0	20.4	50.4	53.9	-3.6
0.266	26.7	20.3	47.0	51.3	-4.2
3.312	18.2	20.5	38.7	46.0	-7.3
2.760	16.8	20.5	37.3	46.0	-8.7
13.930	19.3	21.2	40.5	50.0	-9.5
0.417	17.5	20.3	37.8	47.5	-9.7
13.910	19.0	21.2	40.2	50.0	-9.8
0.318	18.9	20.3	39.2	49.8	-10.6
14.040	17.8	21.3	39.1	50.0	-10.9
15.780	17.5	21.4	38.9	50.0	-11.1
14.260	17.6	21.3	38.9	50.0	-11.1
4.416	14.1	20.7	34.8	46.0	-11.2
2.208	14.2	20.5	34.7	46.0	-11.3
14.550	17.0	21.3	38.3	50.0	-11.7
14.720	16.9	21.3	38.2	50.0	-11.8
0.621	13.8	20.3	34.1	46.0	-11.9
14.670	16.8	21.3	38.1	50.0	-11.9
4.168	13.3	20.7	34.0	46.0	-12.0
13.420	16.7	21.2	37.9	50.0	-12.1
15.660	16.5	21.4	37.9	50.0	-12.1

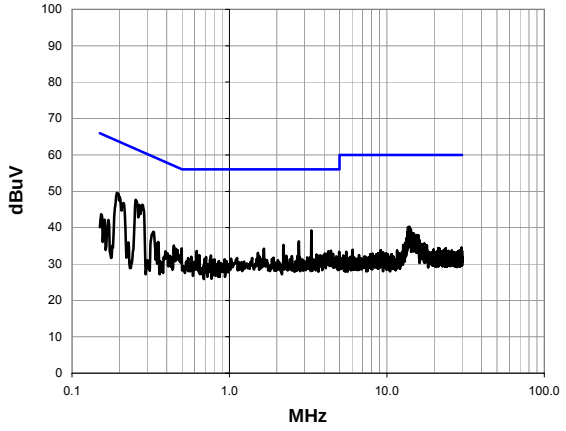
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5580Hz (L)				

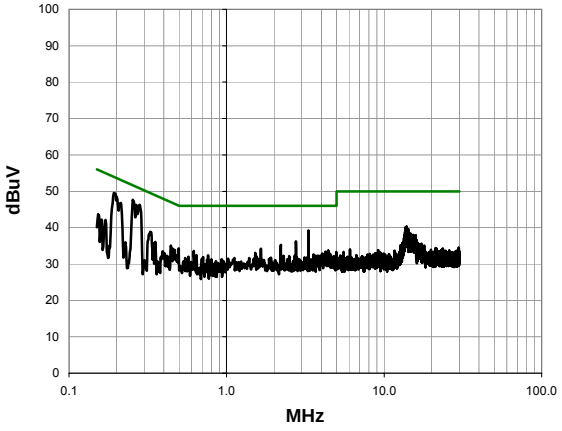
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	13	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.254	27.3	20.3	47.6	61.6	-14.0
0.194	29.2	20.4	49.6	63.9	-14.3
0.267	25.9	20.3	46.2	61.2	-15.0
3.312	18.7	20.5	39.2	56.0	-16.8
13.900	19.0	21.2	40.2	60.0	-19.8
2.760	15.7	20.5	36.2	56.0	-19.8
13.640	18.8	21.2	40.0	60.0	-20.0
13.820	18.4	21.2	39.6	60.0	-20.4
14.230	18.3	21.3	39.6	60.0	-20.4
0.329	18.6	20.3	38.9	59.5	-20.6
2.208	14.8	20.5	35.3	56.0	-20.7
13.950	17.7	21.2	38.9	60.0	-21.1
13.570	17.6	21.2	38.8	60.0	-21.2
14.160	17.4	21.3	38.7	60.0	-21.3
14.110	17.3	21.3	38.6	60.0	-21.4
14.730	17.1	21.3	38.4	60.0	-21.6
1.656	13.8	20.4	34.2	56.0	-21.8
0.497	14.0	20.3	34.3	56.1	-21.8
0.442	14.8	20.3	35.1	57.0	-21.9
15.280	16.6	21.4	38.0	60.0	-22.0

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.254	27.3	20.3	47.6	51.6	-4.0
0.194	29.2	20.4	49.6	53.9	-4.3
0.267	25.9	20.3	46.2	51.2	-5.0
3.312	18.7	20.5	39.2	46.0	-6.8
13.900	19.0	21.2	40.2	50.0	-9.8
2.760	15.7	20.5	36.2	46.0	-9.8
13.640	18.8	21.2	40.0	50.0	-10.0
13.820	18.4	21.2	39.6	50.0	-10.4
14.230	18.3	21.3	39.6	50.0	-10.4
0.329	18.6	20.3	38.9	49.5	-10.6
2.208	14.8	20.5	35.3	46.0	-10.7
13.950	17.7	21.2	38.9	50.0	-11.1
13.570	17.6	21.2	38.8	50.0	-11.2
14.160	17.4	21.3	38.7	50.0	-11.3
14.110	17.3	21.3	38.6	50.0	-11.4
14.730	17.1	21.3	38.4	50.0	-11.6
1.656	13.8	20.4	34.2	46.0	-11.8
0.497	14.0	20.3	34.3	46.1	-11.8
0.442	14.8	20.3	35.1	47.0	-11.9
15.280	16.6	21.4	38.0	50.0	-12.0

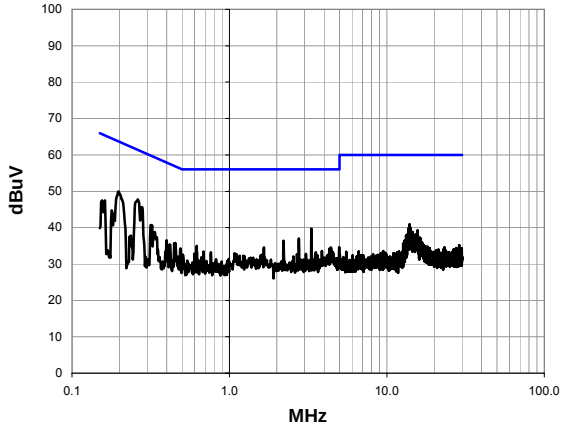
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5580Hz (H)				

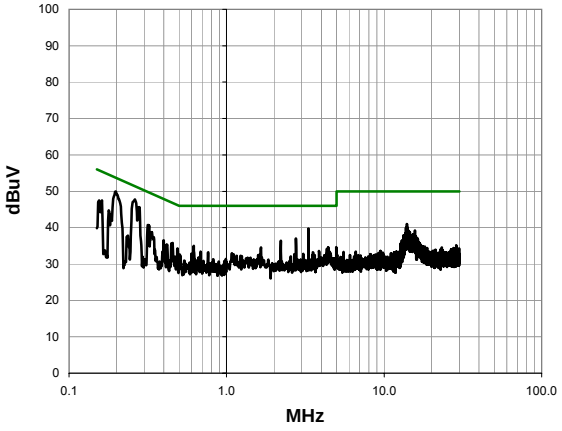
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	14	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.262	27.4	20.3	47.7	61.4	-13.6
0.198	29.6	20.4	50.0	63.7	-13.8
0.274	25.3	20.3	45.6	61.0	-15.4
3.312	19.2	20.5	39.7	56.0	-16.3
0.162	27.1	20.4	47.5	65.4	-17.9
0.155	27.1	20.4	47.5	65.7	-18.2
2.760	16.5	20.5	37.0	56.0	-19.0
13.970	19.7	21.2	40.9	60.0	-19.1
0.317	20.4	20.3	40.7	59.8	-19.1
2.208	15.9	20.5	36.4	56.0	-19.6
0.179	24.4	20.3	44.7	64.5	-19.8
14.060	18.8	21.3	40.1	60.0	-19.9
13.770	18.7	21.2	39.9	60.0	-20.1
0.335	18.5	20.3	38.8	59.3	-20.5
14.150	18.1	21.3	39.4	60.0	-20.6
15.660	17.8	21.4	39.2	60.0	-20.8
14.200	17.9	21.3	39.2	60.0	-20.8
0.619	14.7	20.3	35.0	56.0	-21.0
0.454	15.5	20.3	35.8	56.8	-21.0
14.550	17.5	21.3	38.8	60.0	-21.2

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.262	27.4	20.3	47.7	51.4	-3.6
0.198	29.6	20.4	50.0	53.7	-3.8
0.274	25.3	20.3	45.6	51.0	-5.4
3.312	19.2	20.5	39.7	46.0	-6.3
0.162	27.1	20.4	47.5	55.4	-7.9
0.155	27.1	20.4	47.5	55.7	-8.2
2.760	16.5	20.5	37.0	46.0	-9.0
13.970	19.7	21.2	40.9	50.0	-9.1
0.317	20.4	20.3	40.7	49.8	-9.1
2.208	15.9	20.5	36.4	46.0	-9.6
0.179	24.4	20.3	44.7	54.5	-9.8
14.060	18.8	21.3	40.1	50.0	-9.9
13.770	18.7	21.2	39.9	50.0	-10.1
0.335	18.5	20.3	38.8	49.3	-10.5
14.150	18.1	21.3	39.4	50.0	-10.6
15.660	17.8	21.4	39.2	50.0	-10.8
14.200	17.9	21.3	39.2	50.0	-10.8
0.619	14.7	20.3	35.0	46.0	-11.0
0.454	15.5	20.3	35.8	46.8	-11.0
14.550	17.5	21.3	38.8	50.0	-11.2

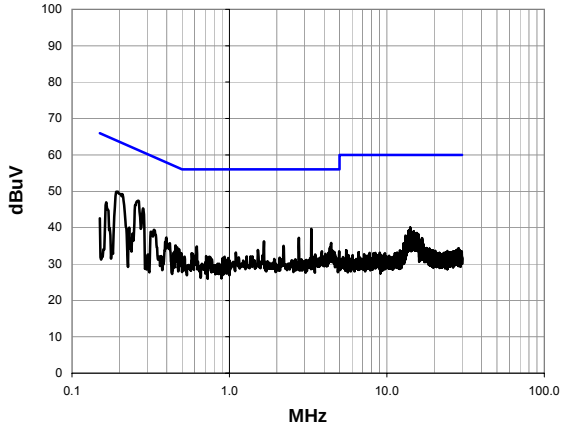
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5700Hz (H)				

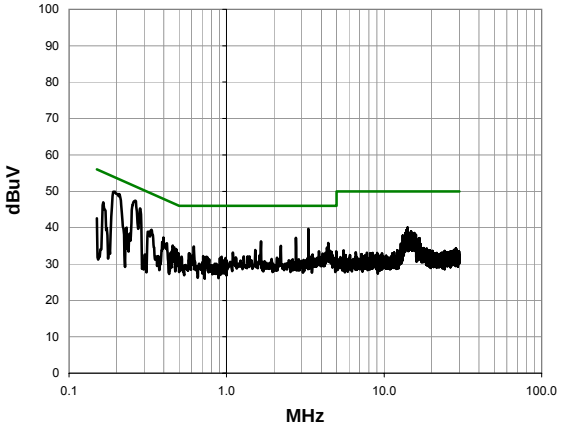
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	15	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	29.5	20.4	49.9	63.8	-13.9
0.262	27.1	20.3	47.4	61.4	-13.9
0.283	25.0	20.3	45.3	60.7	-15.4
3.312	19.1	20.5	39.6	56.0	-16.4
0.165	26.6	20.4	47.0	65.2	-18.2
2.760	16.7	20.5	37.2	56.0	-18.8
1.656	15.8	20.4	36.2	56.0	-19.8
14.090	18.8	21.3	40.1	60.0	-19.9
0.332	19.1	20.3	39.4	59.4	-20.0
4.424	15.1	20.7	35.8	56.0	-20.2
0.398	17.0	20.3	37.3	57.9	-20.6
13.810	18.0	21.2	39.2	60.0	-20.8
13.900	17.8	21.2	39.0	60.0	-21.0
2.208	14.5	20.5	35.0	56.0	-21.0
14.840	17.6	21.3	38.9	60.0	-21.1
0.619	14.5	20.3	34.8	56.0	-21.2
13.690	17.4	21.2	38.6	60.0	-21.4
4.384	13.9	20.7	34.6	56.0	-21.4
14.710	17.2	21.3	38.5	60.0	-21.5
4.344	13.8	20.7	34.5	56.0	-21.5

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.196	29.5	20.4	49.9	53.8	-3.9
0.262	27.1	20.3	47.4	51.4	-3.9
0.283	25.0	20.3	45.3	50.7	-5.4
3.312	19.1	20.5	39.6	46.0	-6.4
0.165	26.6	20.4	47.0	55.2	-8.2
2.760	16.7	20.5	37.2	46.0	-8.8
1.656	15.8	20.4	36.2	46.0	-9.8
14.090	18.8	21.3	40.1	50.0	-9.9
0.332	19.1	20.3	39.4	49.4	-10.0
4.424	15.1	20.7	35.8	46.0	-10.2
0.398	17.0	20.3	37.3	47.9	-10.6
13.810	18.0	21.2	39.2	50.0	-10.8
13.900	17.8	21.2	39.0	50.0	-11.0
2.208	14.5	20.5	35.0	46.0	-11.0
14.840	17.6	21.3	38.9	50.0	-11.1
0.619	14.5	20.3	34.8	46.0	-11.2
13.690	17.4	21.2	38.6	50.0	-11.4
4.384	13.9	20.7	34.6	46.0	-11.4
14.710	17.2	21.3	38.5	50.0	-11.5
4.344	13.8	20.7	34.5	46.0	-11.5

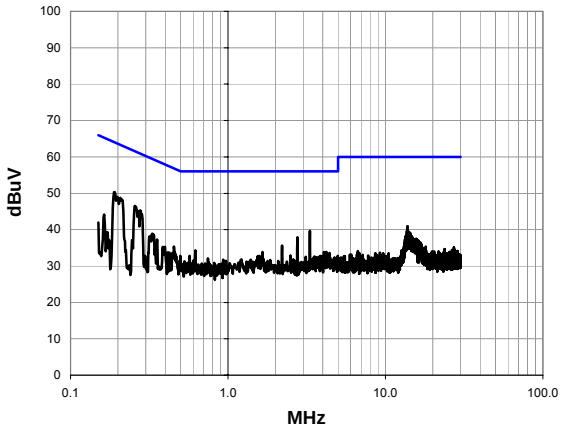
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MCSO1638	**Date:**	11/13/12		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	EV07	**Humidity:**	41.8% RH		
Serial Number:	6124053	**Barometric Pres.:**	1023 mbar	**Tested by:**	Brandon Hobbs / Sabrina Sanders
EUT:	1514				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting				
Deviations:	None				
Comments:	6Mbs - 5700Hz (L)				

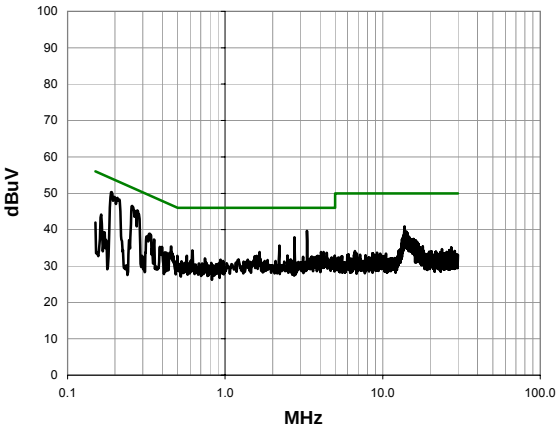
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	16	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	30.0	20.4	50.4	64.0	-13.7
0.257	26.2	20.3	46.5	61.5	-15.0
0.278	25.0	20.3	45.3	60.9	-15.6
3.312	19.1	20.5	39.6	56.0	-16.4
2.760	17.4	20.5	37.9	56.0	-18.1
13.790	19.7	21.2	40.9	60.0	-19.1
13.670	18.4	21.2	39.6	60.0	-20.4
2.208	15.1	20.5	35.6	56.0	-20.4
0.330	18.6	20.3	38.9	59.4	-20.5
14.170	18.1	21.3	39.4	60.0	-20.6
14.380	17.8	21.3	39.1	60.0	-20.9
13.910	17.7	21.2	38.9	60.0	-21.1
0.164	23.8	20.4	44.2	65.3	-21.1
0.453	15.1	20.3	35.4	56.8	-21.4
0.354	17.0	20.3	37.3	58.9	-21.6
0.621	14.0	20.3	34.3	56.0	-21.7
13.520	17.1	21.2	38.3	60.0	-21.7
14.730	16.8	21.3	38.1	60.0	-21.9
13.420	16.7	21.2	37.9	60.0	-22.1
4.208	13.2	20.7	33.9	56.0	-22.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.191	30.0	20.4	50.4	54.0	-3.7
0.257	26.2	20.3	46.5	51.5	-5.0
0.278	25.0	20.3	45.3	50.9	-5.6
3.312	19.1	20.5	39.6	46.0	-6.4
2.760	17.4	20.5	37.9	46.0	-8.1
13.790	19.7	21.2	40.9	50.0	-9.1
13.670	18.4	21.2	39.6	50.0	-10.4
2.208	15.1	20.5	35.6	46.0	-10.4
0.330	18.6	20.3	38.9	49.4	-10.5
14.170	18.1	21.3	39.4	50.0	-10.6
14.380	17.8	21.3	39.1	50.0	-10.9
13.910	17.7	21.2	38.9	50.0	-11.1
0.164	23.8	20.4	44.2	55.3	-11.1
0.453	15.1	20.3	35.4	46.8	-11.4
0.354	17.0	20.3	37.3	48.9	-11.6
0.621	14.0	20.3	34.3	46.0	-11.7
13.520	17.1	21.2	38.3	50.0	-11.7
14.730	16.8	21.3	38.1	50.0	-11.9
13.420	16.7	21.2	37.9	50.0	-12.1
4.208	13.2	20.7	33.9	46.0	-12.1