

NORTHWEST EMC

Microsoft Corporation

1713 USB Radio Device

FCC 15.207:2015

FCC 15.247:2015

Report # MCSO1731.1 Rev 01



NVLAP Lab Code: 200629-0

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

CERTIFICATE OF TEST

Last Date of Test: May 08, 2015
Microsoft Corporation
Model: 1713 USB Radio Device

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2015	ANSI C63.10:2009
FCC 15.247:2015	ANSI C63.10:2009

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Band Edge Compliance	Yes	Pass	
6.7	Spurious Conducted Emissions	Yes	Pass	
6.9.1	Occupied Bandwidth	Yes	Pass	
6.10.2	Output Power	Yes	Pass	
6.11.2	Power Spectral Density	Yes	Pass	
7.5	Duty Cycle	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Rod Munro, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

REVISION HISTORY

Revision Number	Description	Date	Page Number
01	Correct references to channel number and transmit frequency for high channel	7/17/15	Various

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

<http://www.nwemc.com/accreditations/>
<http://gsi.nist.gov/global/docs/cabs/designations.html>

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

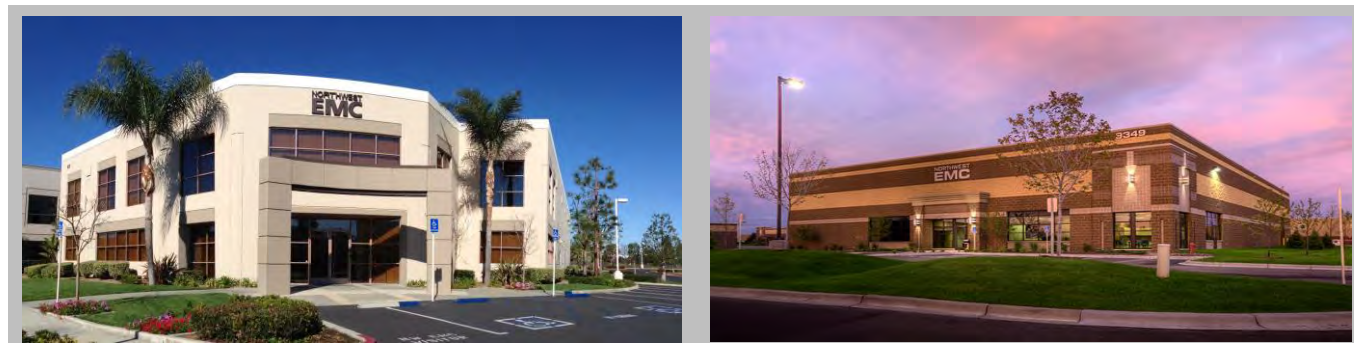
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement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

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

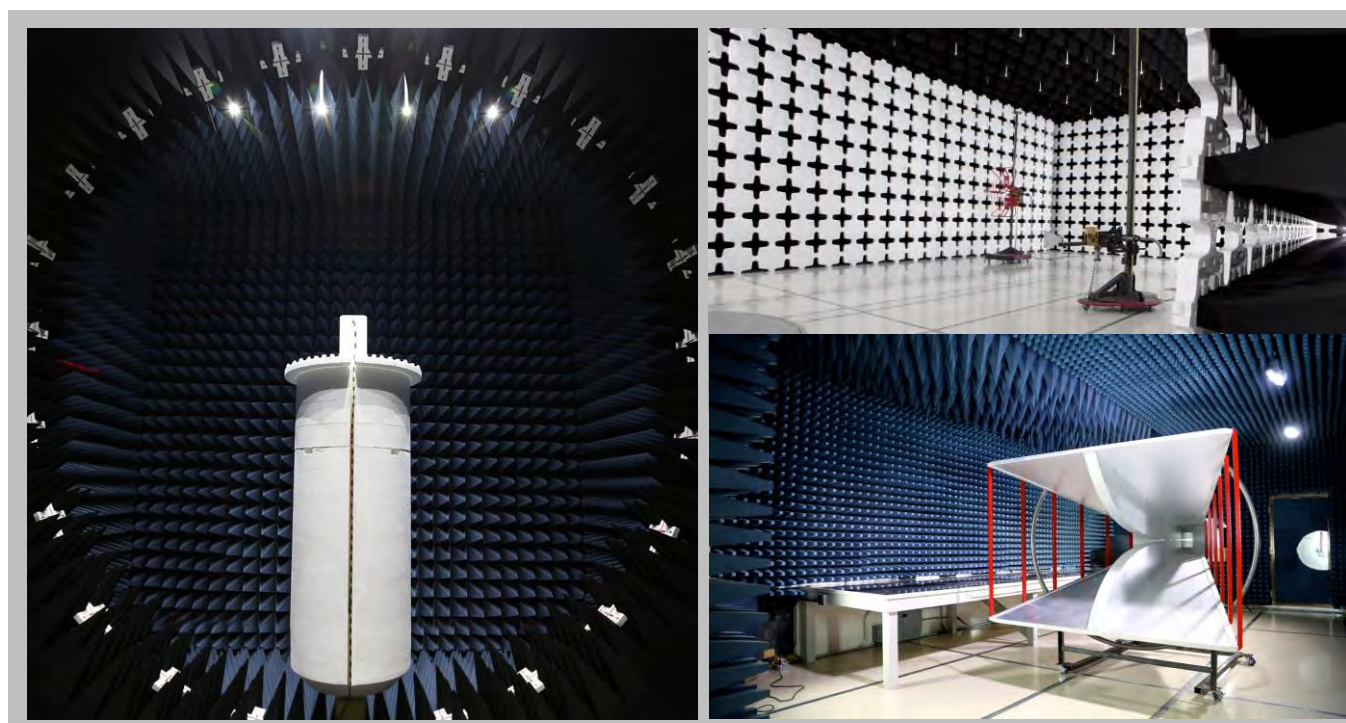
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.5 dB	-4.5 dB
AC Powerline Conducted Emissions (dB)	2.9 dB	-2.9 dB

FACILITIES



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052
Test Requested By:	Kitty Tam
Model:	1713 USB Radio Device
First Date of Test:	May 07, 2015
Last Date of Test:	May 08, 2015
Receipt Date of Samples:	May 07, 2015
Equipment Design Stage:	Pre-production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
USB radio device
Testing Objective:
To demonstrate compliance of the 802.11 radio under FCC 15.247 for operation in the 2.4 GHz band.

CONFIGURATIONS

Configuration MCSO1731- 1

Software/Firmware Running during test	
Description	Version
MT7662 QA	V1.03.13 (v1.8)

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
USB Radio Device	Microsoft Corporation	1713	EV1-3-000299

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop Computer	Lenovo	ThinkPad T440S	R-86-2
AC Adapter	Lenovo	ADLX45NDC2A	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	No	1m	Yes	USB Radio Device	Laptop Computer
AC Power	No	0.9m	No	AC Mains	AC Adapter
DC Power	No	1.65m	Yes	AC Adapter	Laptop Computer

Configuration MCSO1731- 2

Software/Firmware Running during test	
Description	Version
MT7662 QA	V1.03.13 (v1.8)

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
USB Radio Device	Microsoft Corporation	1713	EV1-3-000297

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop Computer	Lenovo	ThinkPad T440S	R-86-2
AC Adapter	Lenovo	ADLX45NDC2A	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	No	1m	Yes	USB Radio Device	Laptop Computer
AC Power	No	0.9m	No	AC Mains	AC Adapter
DC Power	No	1.65m	Yes	AC Adapter	Laptop Computer

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/7/2015	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.
2	5/7/2015	Output Power	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	5/7/2015	Occupied 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.
4	5/7/2015	Spurious 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.
5	5/7/2015	Duty Cycle	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	5/7/2015	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.
7	5/8/2015	Spurious Radiated 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.
8	5/8/2015	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable, Standard LISN	N/A	Conducted / NF Probe Cable	NC4	2/11/2015	02/11/2016
High Pass Filter	TTE	H97-100K-50-720B	HHF	12/8/2014	12/08/2015
Attenuator	Fairview Microwave	SA03B-20	RKD	10/14/2014	10/14/2015
LISN	Solar Electronics	9252-50-R-24-BNC	LIM	12/9/2014	12/09/2015
Receiver	Rohde & Schwarz	ESCI	ARE	6/6/2014	06/06/2015

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

MCSO1731-2

MODES INVESTIGATED

Transmitting Low Channel 1, 2412 MHz, 6 Mbps.
Transmitting Mid Channel 6, 2437 MHz, 6 Mbps.
Transmitting High Channel 11, 2462 MHz, 6 Mbps.

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	1	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

EUT powered by USB through laptop

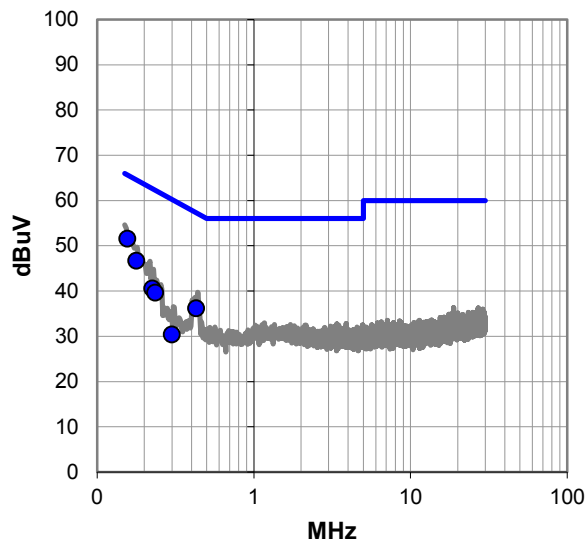
EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting Low Channel 1, 2412 MHz, 6 Mbps.

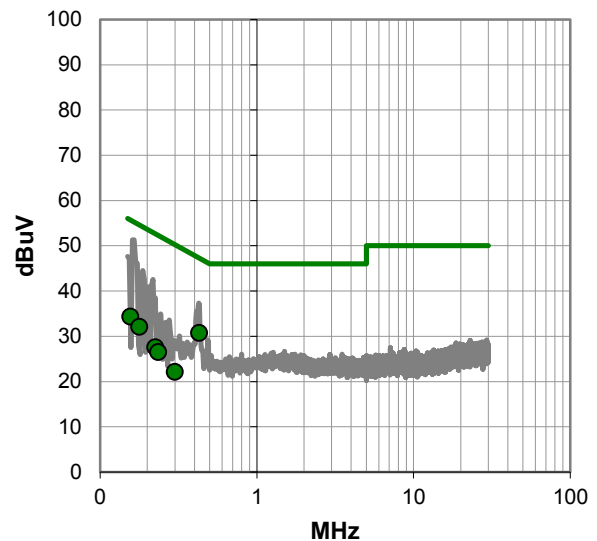
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	31.0	20.5	51.5	65.7	-14.1
0.178	26.2	20.5	46.7	64.6	-17.9
0.429	15.9	20.2	36.1	57.3	-21.1
0.225	20.2	20.3	40.5	62.6	-22.1
0.235	19.3	20.3	39.6	62.3	-22.7
0.300	10.0	20.4	30.4	60.3	-29.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.429	10.5	20.2	30.7	47.3	-16.5
0.156	13.8	20.5	34.3	55.7	-21.3
0.178	11.6	20.5	32.1	54.6	-22.5
0.225	7.2	20.3	27.5	52.6	-25.1
0.235	6.2	20.3	26.5	52.3	-25.8
0.300	1.7	20.4	22.1	50.3	-28.2

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	2	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

EUT powered by USB through laptop

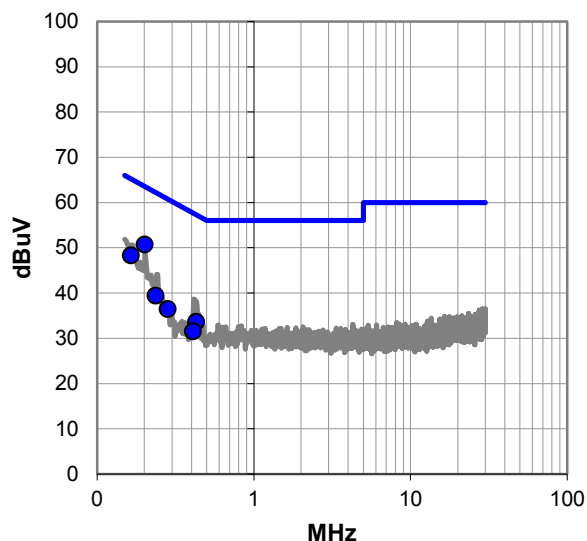
EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting Low Channel 1, 2412 MHz, 6 Mbps.

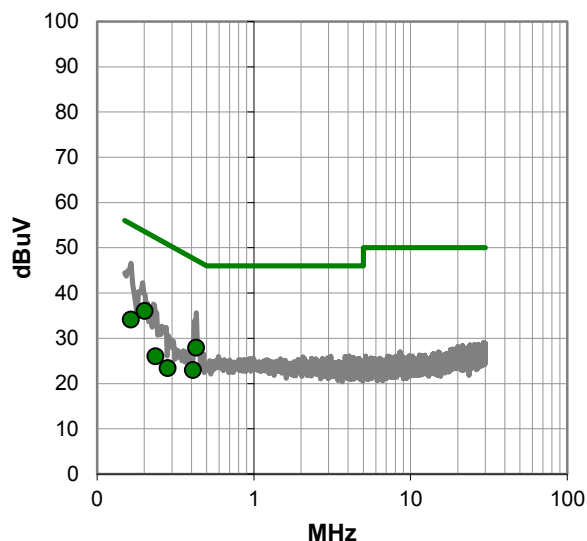
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.201	30.3	20.4	50.7	63.6	-12.9
0.164	27.8	20.5	48.3	65.2	-16.9
0.236	19.1	20.3	39.4	62.2	-22.8
0.429	13.4	20.2	33.6	57.3	-23.6
0.282	16.0	20.4	36.4	60.8	-24.3
0.408	11.3	20.2	31.5	57.7	-26.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.201	15.6	20.4	36.0	53.6	-17.6
0.429	7.7	20.2	27.9	47.3	-19.3
0.164	13.6	20.5	34.1	55.2	-21.1
0.408	2.7	20.2	22.9	47.7	-24.7
0.236	5.7	20.3	26.0	52.2	-26.2
0.282	3.0	20.4	23.4	50.8	-27.3

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	3	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

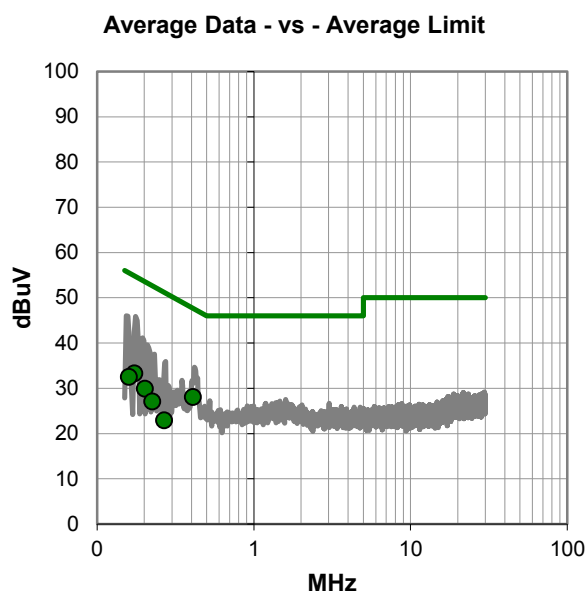
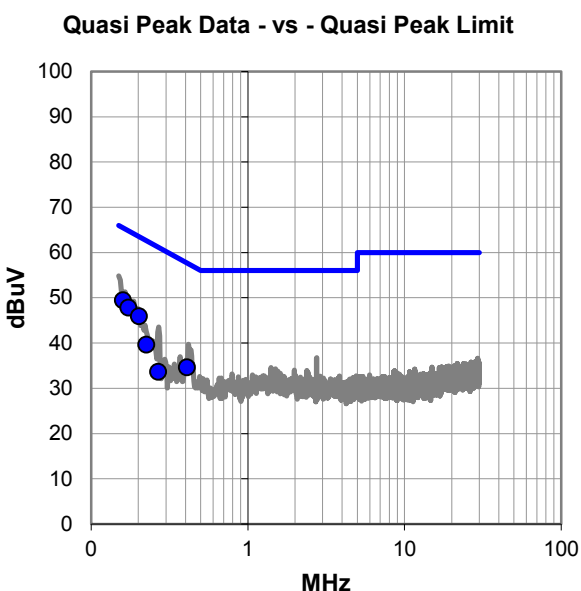
EUT powered by USB through laptop

EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting Mid Channel 6, 2437 MHz, 6 Mbps.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.160	28.9	20.5	49.4	65.5	-16.1
0.173	27.3	20.5	47.8	64.8	-17.0
0.202	25.5	20.4	45.9	63.5	-17.6
0.225	19.3	20.3	39.6	62.6	-23.0
0.409	14.4	20.2	34.6	57.7	-23.0
0.269	13.3	20.3	33.6	61.2	-27.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.409	7.8	20.2	28.0	47.7	-19.6
0.173	12.8	20.5	33.3	54.8	-21.5
0.160	12.0	20.5	32.5	55.5	-23.0
0.202	9.5	20.4	29.9	53.5	-23.6
0.225	6.7	20.3	27.0	52.6	-25.6
0.269	2.6	20.3	22.9	51.2	-28.3

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	4	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

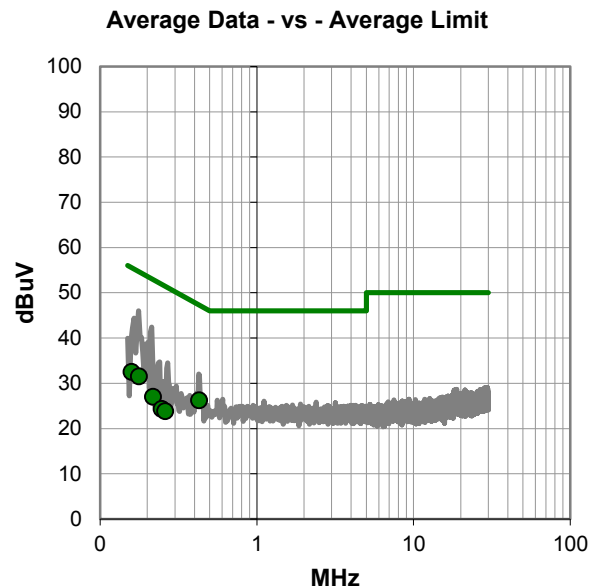
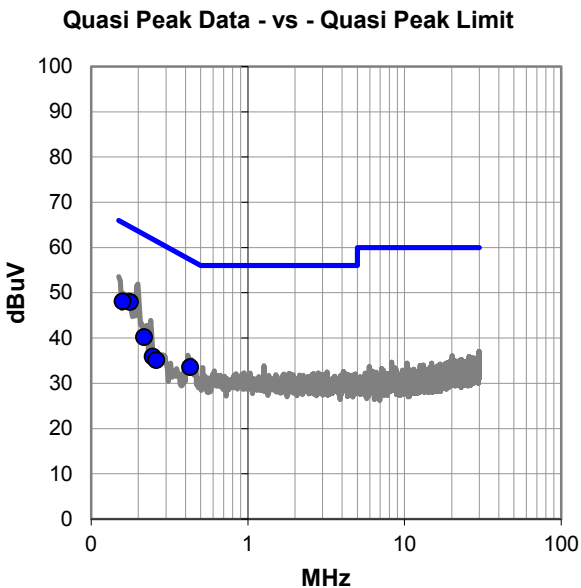
EUT powered by USB through laptop

EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting Mid Channel 6, 2437 MHz, 6 Mbps.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.177	27.5	20.5	48.0	64.6	-16.6
0.159	27.6	20.5	48.1	65.5	-17.4
0.218	19.8	20.4	40.2	62.9	-22.7
0.429	13.3	20.2	33.5	57.3	-23.7
0.247	15.6	20.3	35.9	61.8	-25.9
0.260	14.8	20.3	35.1	61.4	-26.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.429	6.0	20.2	26.2	47.3	-21.0
0.159	12.0	20.5	32.5	55.5	-23.0
0.177	11.0	20.5	31.5	54.6	-23.1
0.218	6.6	20.4	27.0	52.9	-25.9
0.247	4.0	20.3	24.3	51.8	-27.5
0.260	3.5	20.3	23.8	51.4	-27.6

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	5	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

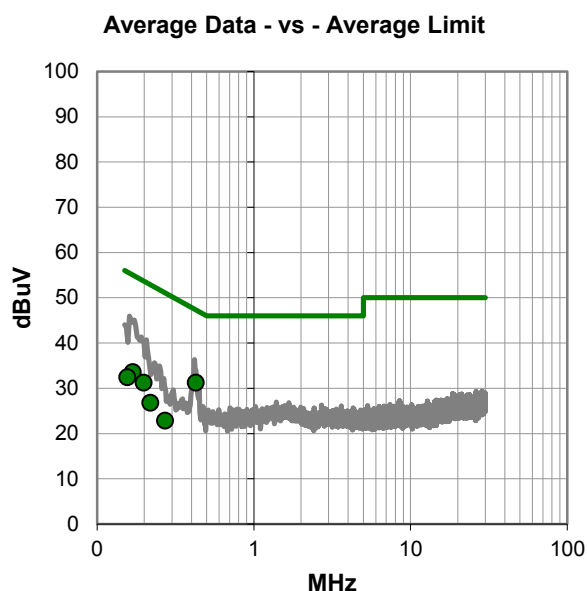
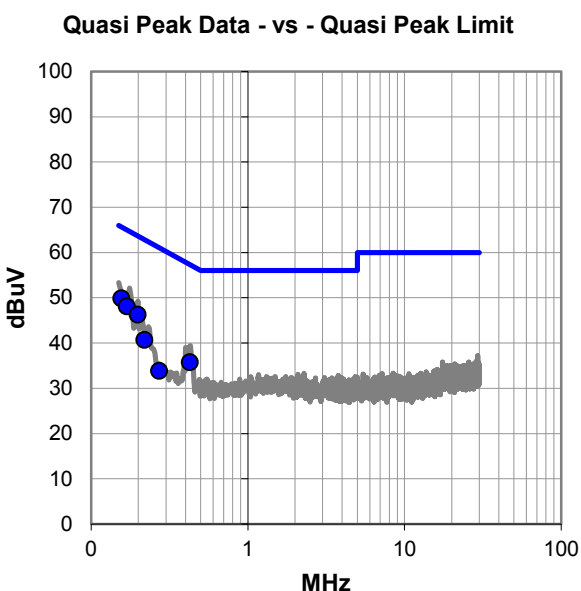
EUT powered by USB through laptop

EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting High Channel 11, 2462 MHz, 6 Mbps.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.156	29.3	20.5	49.8	65.7	-15.8
0.169	27.6	20.5	48.1	65.0	-16.9
0.198	25.8	20.4	46.2	63.7	-17.5
0.427	15.5	20.2	35.7	57.3	-21.6
0.219	20.3	20.4	40.7	62.9	-22.2
0.271	13.5	20.3	33.8	61.1	-27.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.427	11.0	20.2	31.2	47.3	-16.1
0.169	13.1	20.5	33.6	55.0	-21.4
0.198	10.8	20.4	31.2	53.7	-22.5
0.156	11.9	20.5	32.4	55.7	-23.2
0.219	6.4	20.4	26.8	52.9	-26.1
0.271	2.5	20.3	22.8	51.1	-28.3

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1713 USB Radio Device	Work Order:	MCSO1731
Serial Number:	EV1-3-000297	Date:	05/08/2015
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Relative Humidity:	39%
Customer Project:	None	Bar. Pressure:	1018 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	USB via 110VAC/60Hz	Configuration:	MCSO1731-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	6	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

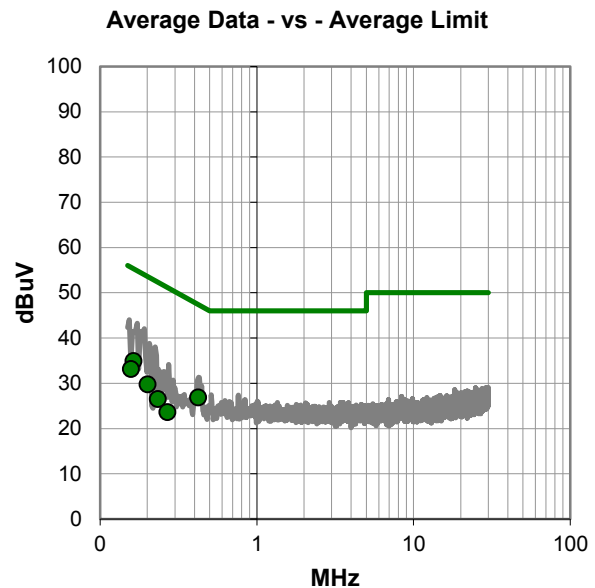
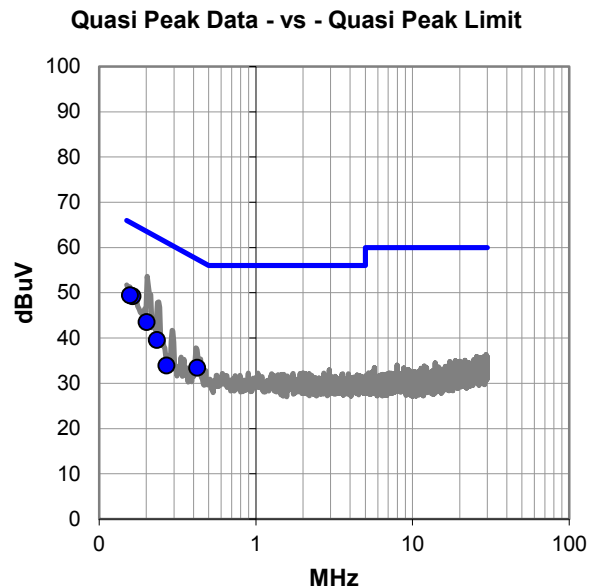
EUT powered by USB through laptop

EUT OPERATING MODES

Continuous Tx Enabled, EUT power settings at Default. Transmitting High Channel 11, 2462 MHz, 6 Mbps.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.164	28.7	20.5	49.2	65.3	-16.1
0.157	28.9	20.5	49.4	65.6	-16.2
0.201	23.1	20.4	43.5	63.6	-20.0
0.233	19.2	20.3	39.5	62.3	-22.8
0.422	13.2	20.2	33.4	57.4	-24.0
0.270	13.6	20.3	33.9	61.1	-27.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.164	14.4	20.5	34.9	55.3	-20.4
0.422	6.6	20.2	26.8	47.4	-20.6
0.157	12.6	20.5	33.1	55.6	-22.5
0.201	9.3	20.4	29.7	53.6	-23.8
0.233	6.2	20.3	26.5	52.3	-25.8
0.270	3.3	20.3	23.6	51.1	-27.5

CONCLUSION

Pass



Tested By

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.

CHANNELS TESTED

Low Channel 1, 2412 MHz

Mid Channel 6, 2437 MHz

High Channel 11, 2462 MHz

POWER SETTINGS INVESTIGATED

USB

CONFIGURATIONS INVESTIGATED

MCSO1731 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 26000 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFE	10/28/2014	12 mo
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	LFF	3/6/2015	12 mo
NC01 Cables	N/A	Bilog Cables	NC1	9/8/2014	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAB	9/8/2014	12 mo
Antenna, Bilog	Teseq	CBL 6144	AYG	3/5/2015	24 mo
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HHI	12/9/2014	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	10/13/2014	12 mo
NC01 Cables	N/A	3115 Horn Cable	NC2	10/13/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	9/8/2014	12 mo
Antenna, Horn	EMCO	3115	AHM	6/3/2014	24 mo
NC01 Cables	N/A	Standard Gain Horn Cable	NC3	10/13/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	10/13/2014	12 mo
Antenna, Horn	EMCO	3160-08	AHO	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	10/13/2014	12 mo
Antenna, Horn	EMCO	3160-07	AHP	NCR	0 mo
18-26GHz Horn Antenna Cable	N/A	N/A	NC8	6/10/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	6/10/2014	12 mo
Antenna, Horn	ETS	3160-09	AIY	NCR	0 mo

MEASUREMENT BANDWIDTHS

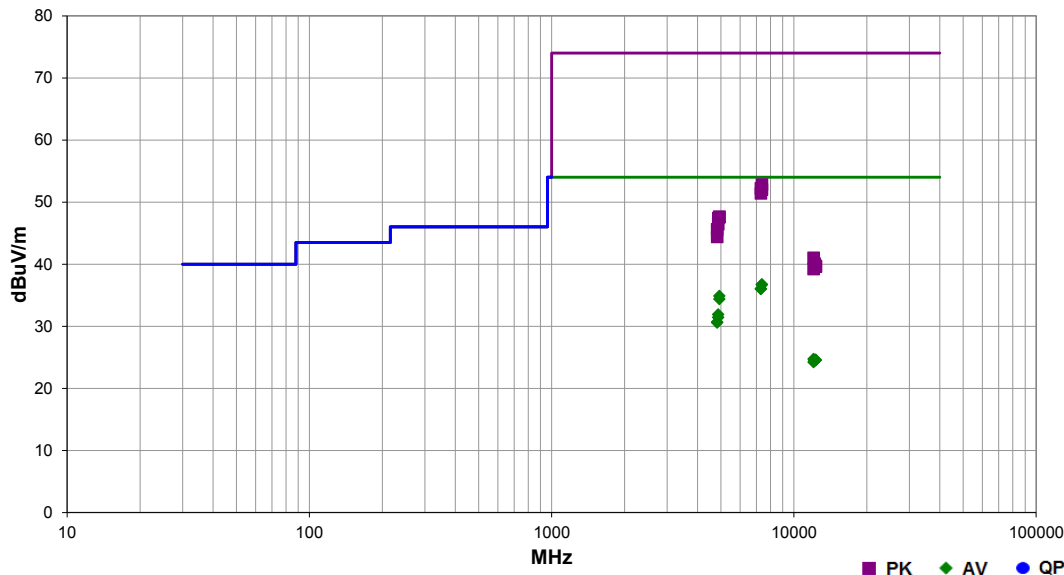
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The 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.

Work Order:	MCSO1731	Date:	05/08/15		
Project:	None	Temperature:	23 °C		
Job Site:	NC01	Humidity:	39% RH		
Serial Number:	EV1-3-000297	Barometric Pres.:	1018 mbar	Tested by:	Richard Mellroth
EUT:	1713 USB Radio Device				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	USB				
Operating Mode:	Continuous Tx enabled, EUT power settings at Default. See comments next to data points for EUT channel, data rate, and orientation.				
Deviations:	None				
Comments:	None				

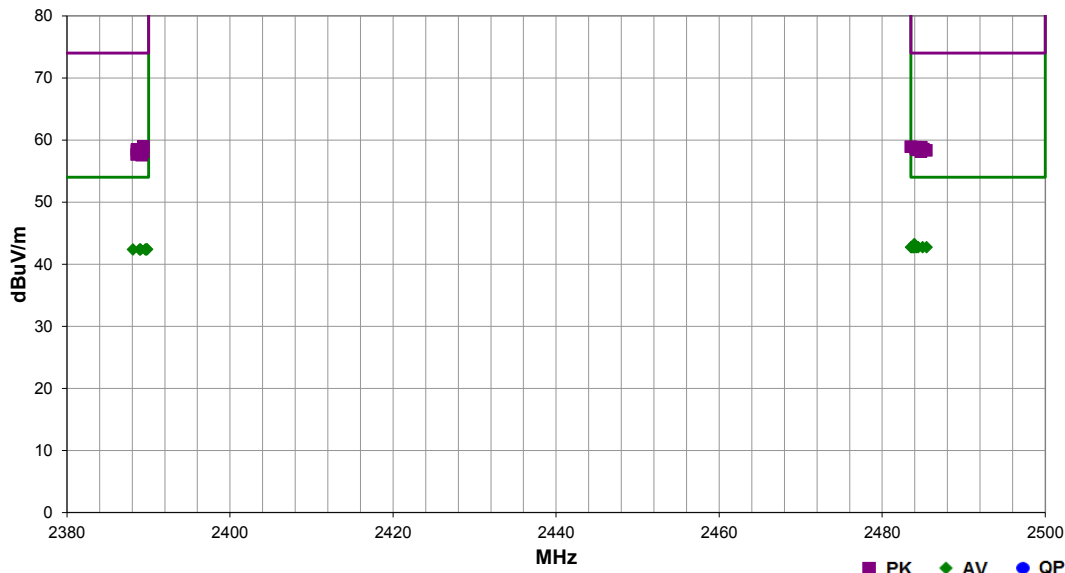
Test Specifications				Test Method			
FCC 15.247:2015				ANSI C63.10:2009			
Run #	16-17	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7384.635	22.8	13.9	1.2	8.0	3.0	0.0	Vert	AV	0.0	36.7	54.0	-17.3	High Ch 11, 6Mbps, EUT Flat
7384.595	22.8	13.9	1.2	259.0	3.0	0.0	Horz	AV	0.0	36.7	54.0	-17.3	High Ch 11, 6Mbps, EUT Flat
7310.740	22.8	13.2	1.2	63.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	Mid Ch 6, 6Mbps, EUT Flat
7309.615	22.8	13.2	1.2	137.0	3.0	0.0	Horz	AV	0.0	36.0	54.0	-18.0	Mid Ch 6, 6Mbps, EUT Flat
4924.000	26.1	8.8	1.0	116.0	3.0	0.0	Horz	AV	0.0	34.9	54.0	-19.1	High Ch 11, 6Mbps, EUT Flat
4923.990	25.6	8.8	1.2	314.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	High Ch 11, 6Mbps, EUT Flat
7385.730	38.9	13.9	1.2	259.0	3.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High Ch 11, 6Mbps, EUT Flat
7311.120	39.0	13.2	1.2	63.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Mid Ch 6, 6Mbps, EUT Flat
7385.610	38.1	13.9	1.2	8.0	3.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	High Ch 11, 6Mbps, EUT Flat
4873.970	23.3	8.6	1.2	310.0	3.0	0.0	Vert	AV	0.0	31.9	54.0	-22.1	Mid Ch 6, 6Mbps, EUT Flat
4873.980	22.8	8.6	1.2	321.0	3.0	0.0	Horz	AV	0.0	31.4	54.0	-22.6	Mid Ch 6, 6Mbps, EUT Flat
7309.935	38.2	13.2	1.2	137.0	3.0	0.0	Horz	PK	0.0	51.4	74.0	-22.6	Mid Ch 6, 6Mbps, EUT Flat
4822.740	22.4	8.3	1.2	358.0	3.0	0.0	Horz	AV	0.0	30.7	54.0	-23.3	Low Ch 1, 6Mbps, EUT Flat
4823.185	22.3	8.3	1.2	291.0	3.0	0.0	Vert	AV	0.0	30.6	54.0	-23.4	Low Ch 1, 6Mbps, EUT Flat
4924.315	38.9	8.8	1.0	116.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	High Ch 11, 6Mbps, EUT Flat
4923.445	38.8	8.8	1.2	314.0	3.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	High Ch 11, 6Mbps, EUT Flat
4875.410	38.8	8.6	1.2	310.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	Mid Ch 6, 6Mbps, EUT Flat
4874.395	37.8	8.6	1.2	321.0	3.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Mid Ch 6, 6Mbps, EUT Flat
4824.840	37.3	8.3	1.2	358.0	3.0	0.0	Horz	PK	0.0	45.6	74.0	-28.4	Low Ch 1, 6Mbps, EUT Flat
12059.940	26.4	-1.7	1.2	16.0	3.0	0.0	Vert	AV	0.0	24.7	54.0	-29.3	Low Ch 1, 6Mbps, EUT Flat
12308.540	26.3	-1.7	1.6	333.0	3.0	0.0	Vert	AV	0.0	24.6	54.0	-29.4	High Ch 11, 6Mbps, EUT Flat
12309.930	26.2	-1.7	1.2	242.0	3.0	0.0	Horz	AV	0.0	24.5	54.0	-29.5	High Ch 11, 6Mbps, EUT Flat
12183.560	26.1	-1.6	1.2	307.0	3.0	0.0	Horz	AV	0.0	24.5	54.0	-29.5	Mid Ch 6, 6Mbps, EUT Flat
12183.690	26.1	-1.6	1.2	312.0	3.0	0.0	Vert	AV	0.0	24.5	54.0	-29.5	Mid Ch 6, 6Mbps, EUT Flat
4824.645	36.1	8.3	1.2	291.0	3.0	0.0	Vert	PK	0.0	44.4	74.0	-29.6	Low Ch 1, 6Mbps, EUT Flat
12058.560	25.9	-1.7	1.2	23.0	3.0	0.0	Horz	AV	0.0	24.2	54.0	-29.8	Low Ch 1, 6Mbps, EUT Flat
12060.140	42.7	-1.7	1.2	16.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Low Ch 1, 6Mbps, EUT Flat
12183.600	41.7	-1.6	1.2	312.0	3.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	Mid Ch 6, 6Mbps, EUT Flat
12309.100	41.4	-1.7	1.6	333.0	3.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	High Ch 11, 6Mbps, EUT Flat
12184.160	41.3	-1.6	1.2	307.0	3.0	0.0	Horz	PK	0.0	39.7	74.0	-34.3	Mid Ch 6, 6Mbps, EUT Flat
12309.600	41.3	-1.7	1.2	242.0	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	High Ch 11, 6Mbps, EUT Flat
12058.950	40.9	-1.7	1.2	23.0	3.0	0.0	Horz	PK	0.0	39.2	74.0	-34.8	Low Ch 1, 6Mbps, EUT Flat

Work Order:	MCSO1731	Date:	05/08/15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	39% RH	
Serial Number:	EV1-3-000297	Barometric Pres.:	1018 mbar	
EUT:	1713 USB Radio Device			Tested by: Richard Mellroth
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	USB			
Operating Mode:	Continuous Tx enabled, EUT power settings at Default. See comments next to data points for EUT channel, data rate, and orientation.			
Deviations:	None			
Comments:	2.4 GHz Band Edge Measurements			

Test Specifications				Test Method		
FCC 15.247:2015				ANSI C63.10:2009		



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
2483.957	25.4	-2.2	2.9	128.0	3.0	20.0	Horz	AV	0.0	43.2	54.0	-10.8	High Ch 11, 6Mbps, EUT Flat
2483.837	25.0	-2.2	1.2	23.0	3.0	20.0	Horz	AV	0.0	42.8	54.0	-11.2	High Ch 11, MCS0, EUT Flat
2483.553	24.9	-2.2	1.2	302.0	3.0	20.0	Vert	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT Vert
2483.673	24.9	-2.2	1.2	331.0	3.0	20.0	Vert	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT Flat
2483.817	24.9	-2.2	1.2	182.0	3.0	20.0	Horz	AV	0.0	42.7	54.0	-11.3	High Ch 11, MCS7, EUT Flat
2483.943	24.9	-2.2	1.2	84.0	3.0	20.0	Horz	AV	0.0	42.7	54.0	-11.3	High Ch 11, 36Mbps, EUT Flat
2484.187	24.9	-2.2	1.2	230.0	3.0	20.0	Horz	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT Flat
2484.407	24.9	-2.2	3.9	259.0	3.0	20.0	Vert	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT on Side
2484.963	24.9	-2.2	1.2	263.0	3.0	20.0	Horz	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT on Side
2485.460	24.9	-2.2	1.2	224.0	3.0	20.0	Horz	AV	0.0	42.7	54.0	-11.3	High Ch 11, 6Mbps, EUT Vert
2389.847	24.7	-2.3	1.2	257.0	3.0	20.0	Vert	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT on Side
2389.747	24.7	-2.3	1.2	205.0	3.0	20.0	Horz	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT on Side
2389.630	24.7	-2.3	1.2	324.0	3.0	20.0	Horz	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT Vert
2389.023	24.7	-2.3	1.2	194.0	3.0	20.0	Vert	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT Flat
2388.933	24.7	-2.3	1.2	303.0	3.0	20.0	Vert	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT Vert
2388.097	24.7	-2.3	1.2	266.0	3.0	20.0	Horz	AV	0.0	42.4	54.0	-11.6	Low Ch 1, 6Mbps, EUT Flat
2389.367	41.3	-2.3	1.2	257.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch 1, 6Mbps, EUT on Side
2483.500	41.1	-2.2	1.2	182.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	High Ch 11, MCS7, EUT Flat
2484.133	41.0	-2.2	1.2	230.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High Ch 11, 54Mbps, EUT Flat
2484.793	41.0	-2.2	1.2	302.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	High Ch 11, 6Mbps, EUT Vert
2484.110	40.8	-2.2	1.2	23.0	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch 11, 6Mbps, EUT Flat
2484.733	40.7	-2.2	1.2	263.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	High Ch 11, 6Mbps, EUT on Side
2485.047	40.7	-2.2	1.2	331.0	3.0	20.0	Vert	PK	0.0	58.5	74.0	-15.5	High Ch 11, 6Mbps, EUT Flat
2388.577	40.8	-2.3	1.2	266.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	Low Ch 1, 6Mbps, EUT Flat
2484.223	40.6	-2.2	2.9	128.0	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	High Ch 11, 6Mbps, EUT Flat
2484.797	40.6	-2.2	1.2	224.0	3.0	20.0	Horz	PK	0.0	58.4	74.0	-15.6	High Ch 11, 6Mbps, EUT Vert
2485.417	40.5	-2.2	1.2	84.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	High Ch 11, 36Mbps, EUT Flat
2388.593	40.6	-2.3	1.2	205.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	Low Ch 1, 6Mbps, EUT on Side
2484.753	40.3	-2.2	3.9	259.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	High Ch 11, 6Mbps, EUT on Side
2389.357	40.4	-2.3	1.2	324.0	3.0	20.0	Horz	PK	0.0	58.1	74.0	-15.9	Low Ch 1, 6Mbps, EUT Vert
2388.543	40.0	-2.3	1.2	303.0	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	Low Ch 1, 6Mbps, EUT Vert
2389.163	39.9	-2.3	1.2	194.0	3.0	20.0	Vert	PK	0.0	57.6	74.0	-16.4	Low Ch 1, 6Mbps, EUT Flat

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 (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

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.

BAND EDGE COMPLIANCE

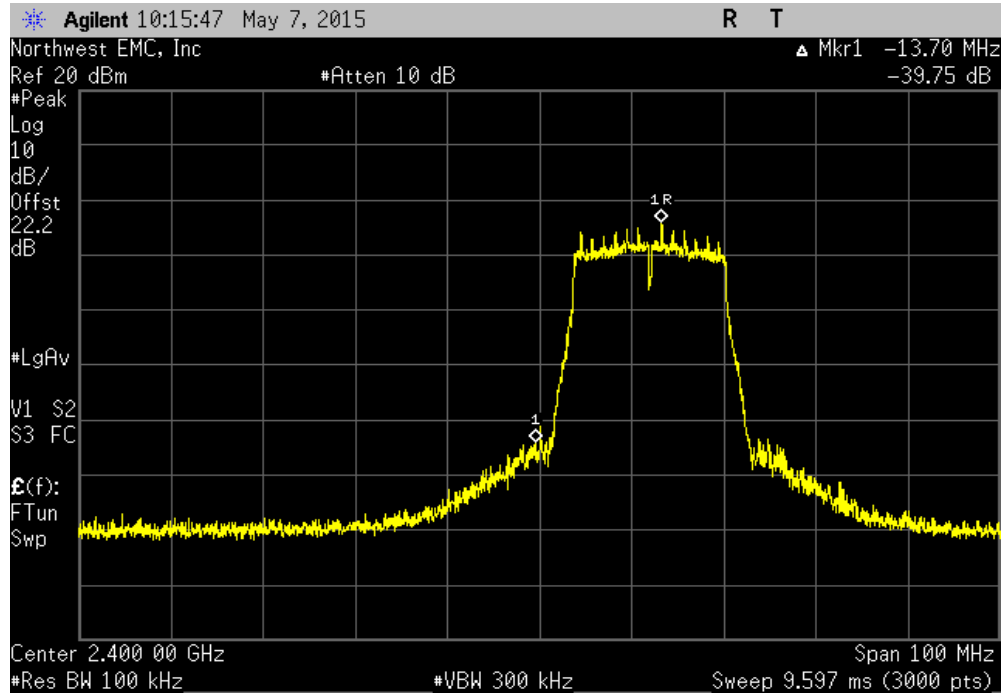


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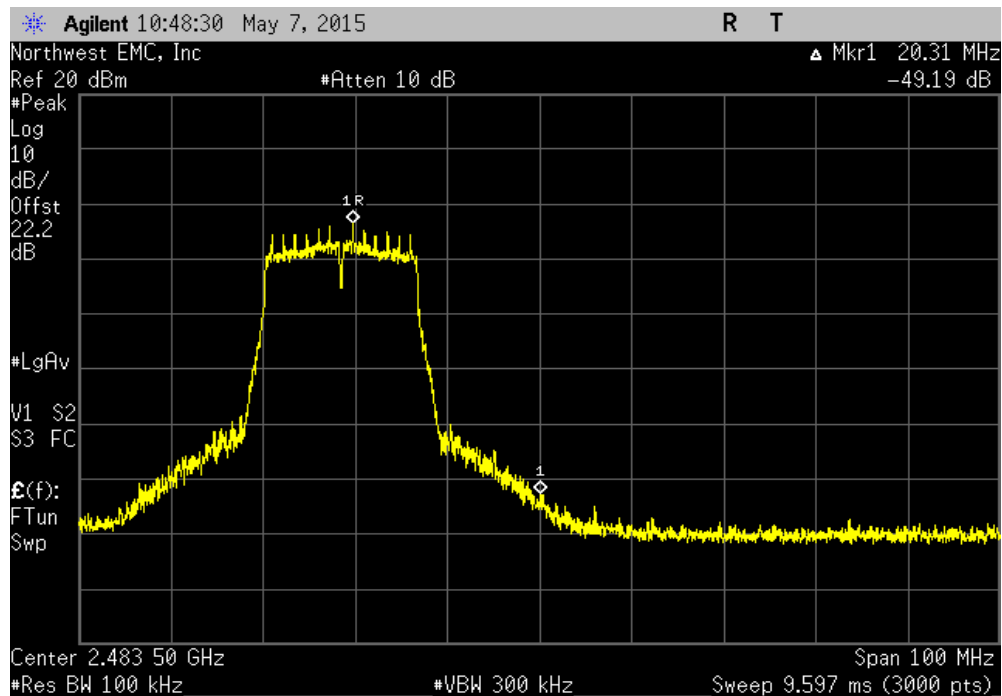
EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth	Power: USB	Job Site: NC02	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-39.75	-20 Pass
High Channel 11, 2462 MHz		-49.19	-20 Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-40.45	-20 Pass
High Channel 11, 2462 MHz		-49.38	-20 Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-38.81	-20 Pass
High Channel 11, 2462 MHz		-46.27	-20 Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz		-36.41	-20 Pass
High Channel 11, 2462 MHz		-47.52	-20 Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz		-38.95	-20 Pass
High Channel 11, 2462 MHz		-46.33	-20 Pass

BAND EDGE COMPLIANCE

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.75	-20	Pass

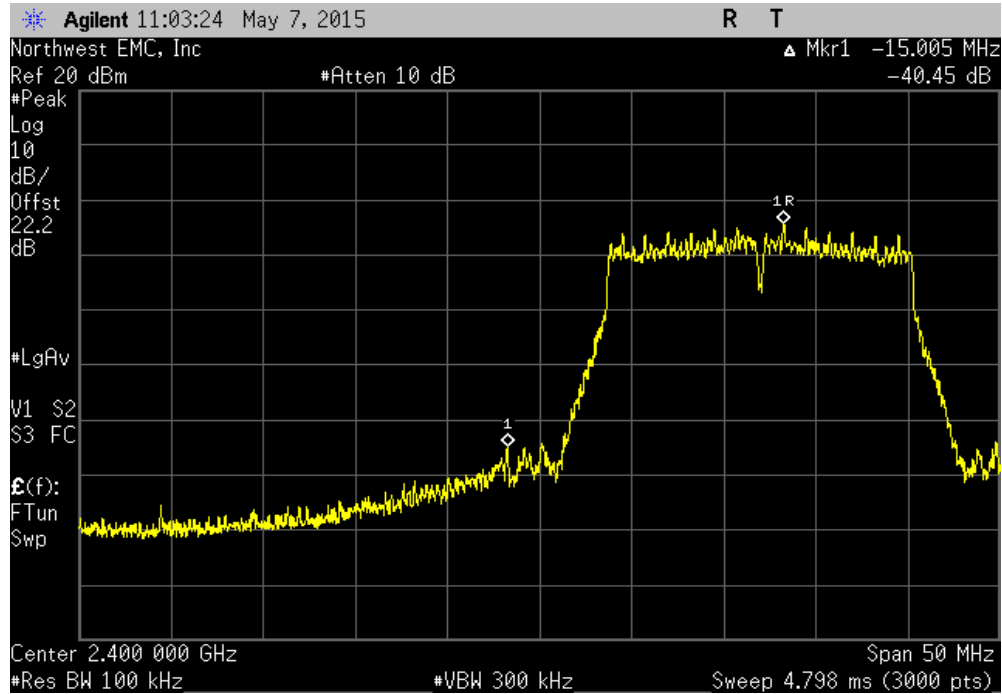


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.19	-20	Pass

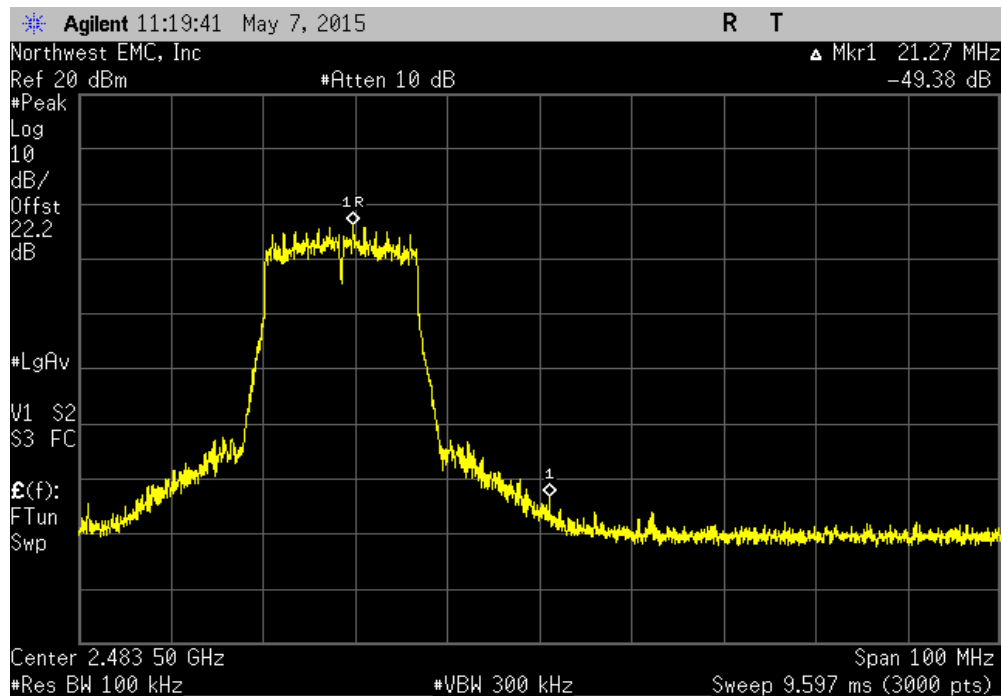


BAND EDGE COMPLIANCE

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-40.45	-20	Pass

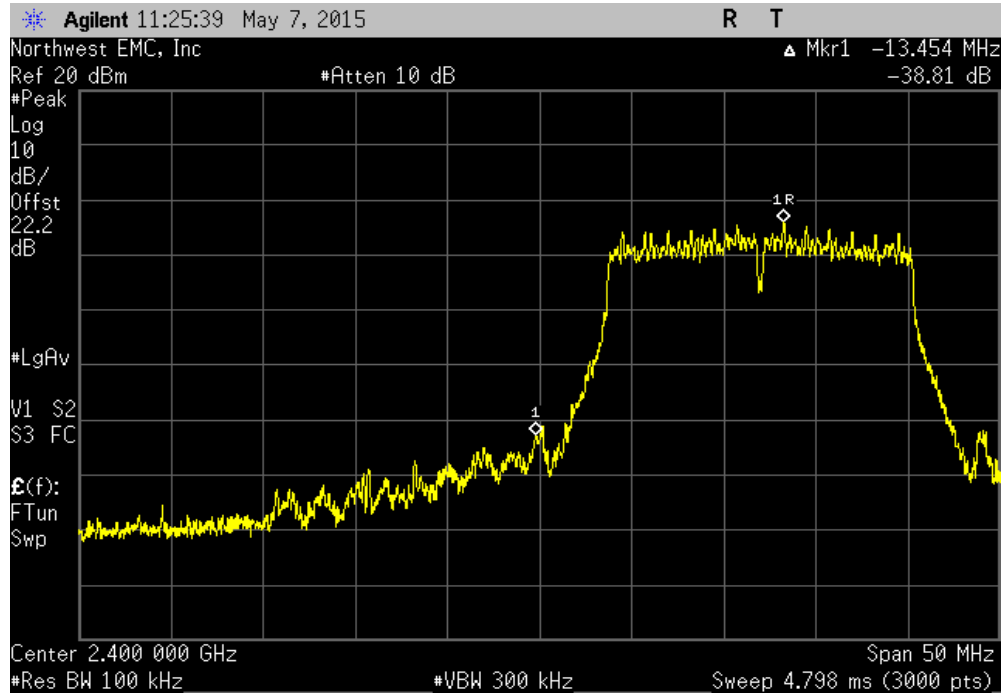


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.38	-20	Pass

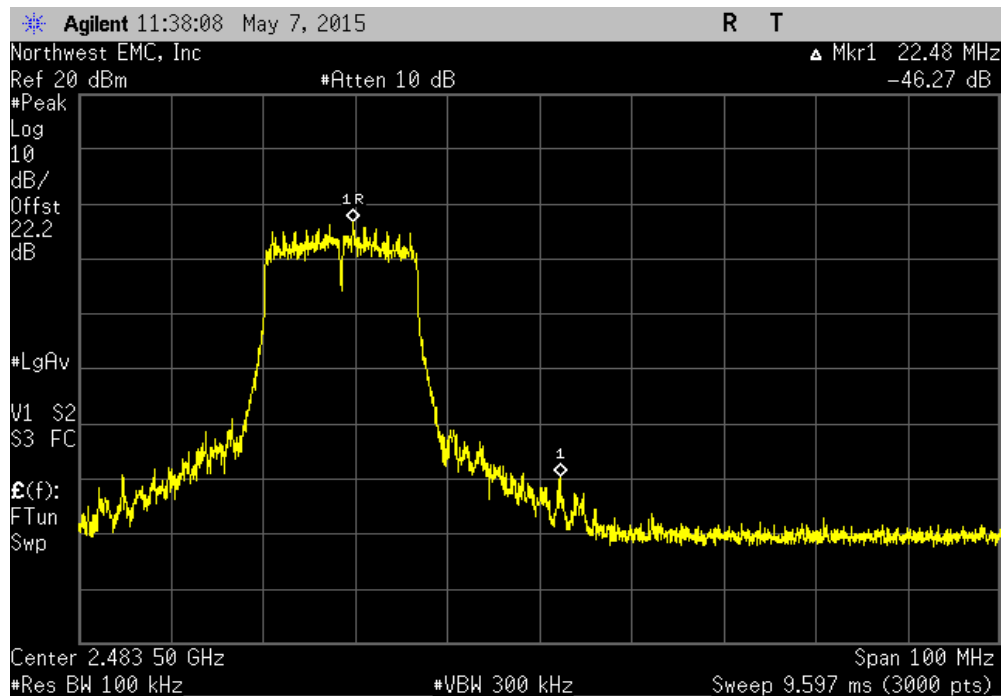


BAND EDGE COMPLIANCE

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-38.81	-20	Pass



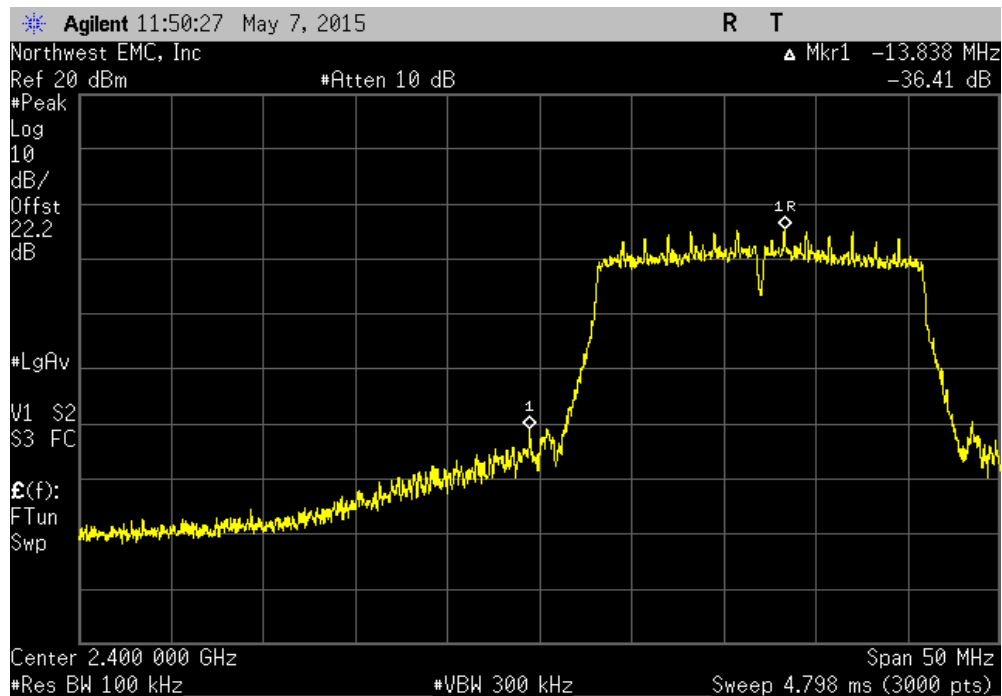
2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.27	-20	Pass



BAND EDGE COMPLIANCE

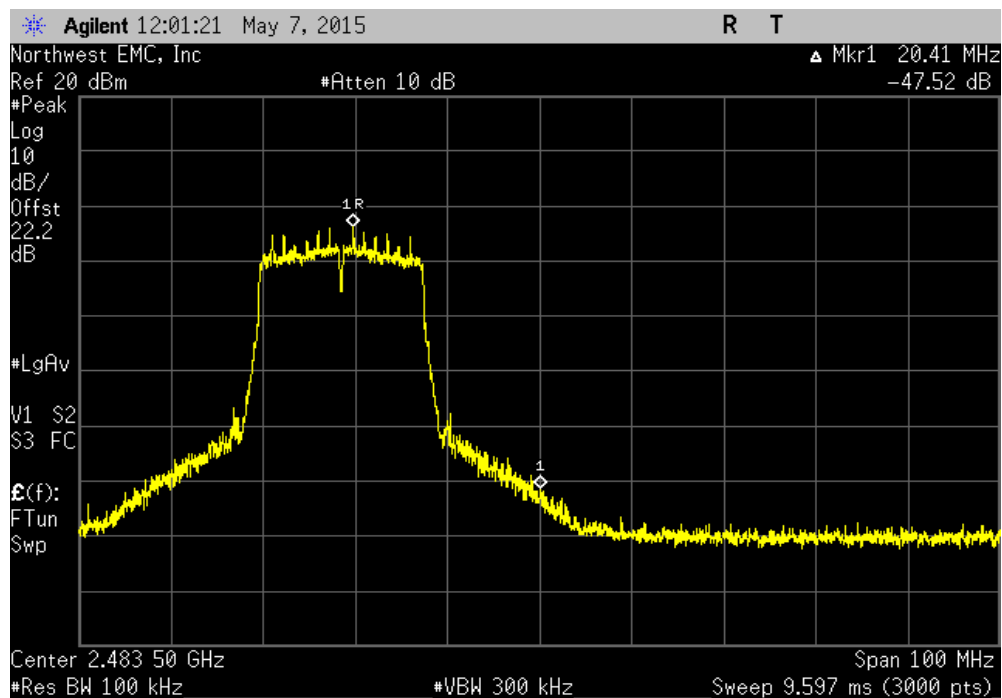
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz

				Value (dBc)	Limit ≤ (dBc)	Result
				-36.41	-20	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz

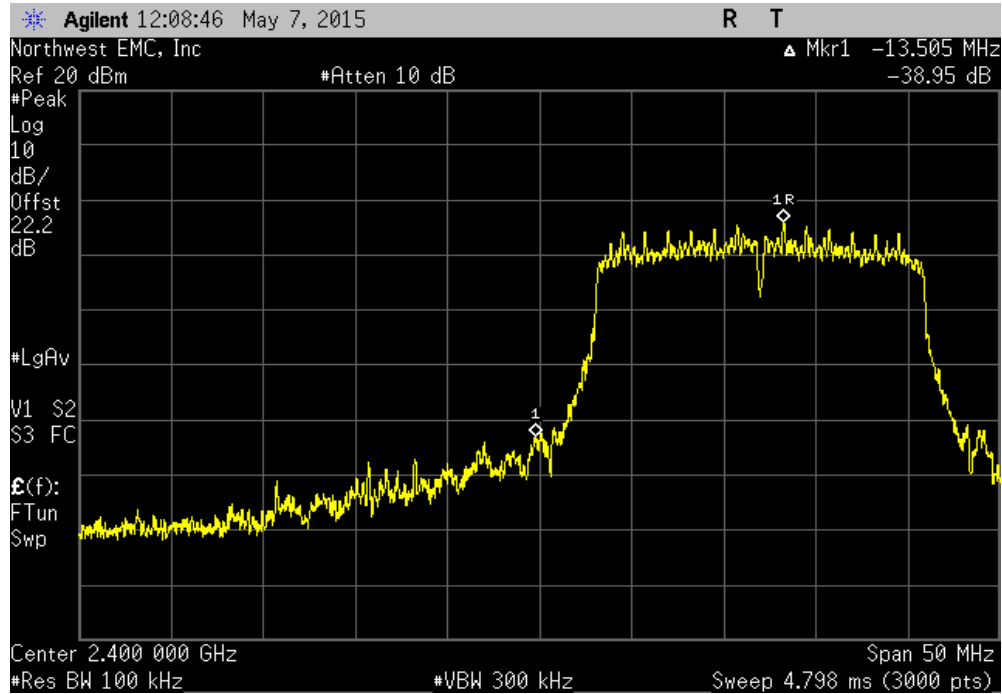
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.52	-20	Pass



BAND EDGE COMPLIANCE

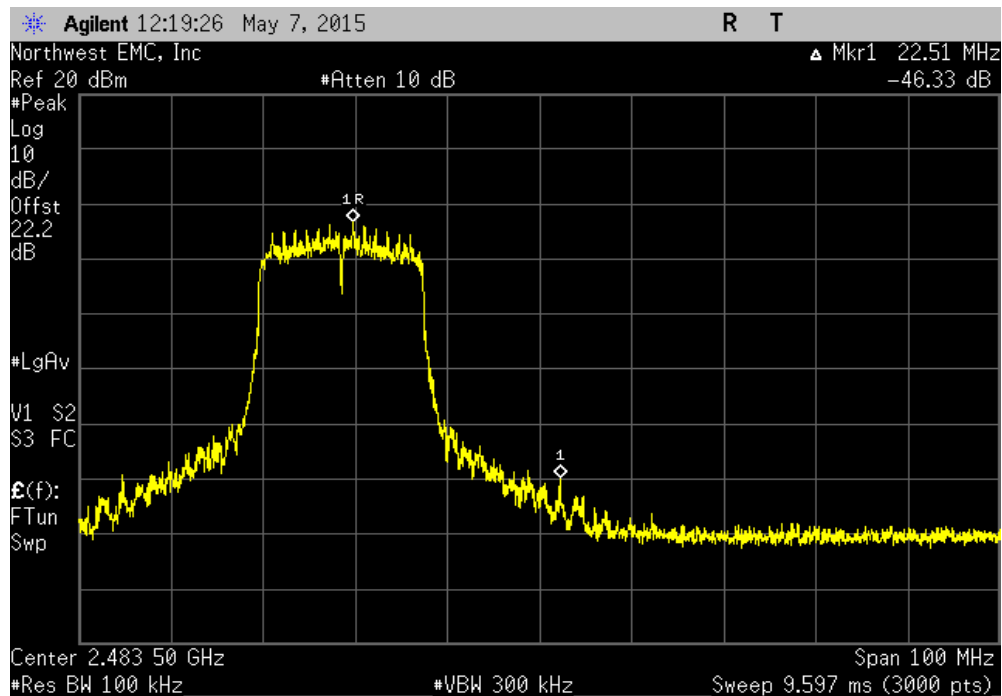
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

				Value (dBc)	Limit ≤ (dBc)	Result
				-38.95	-20	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz

				Value (dBc)	Limit ≤ (dBc)	Result
				-46.33	-20	Pass



SPURIOUS 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

TEST DESCRIPTION

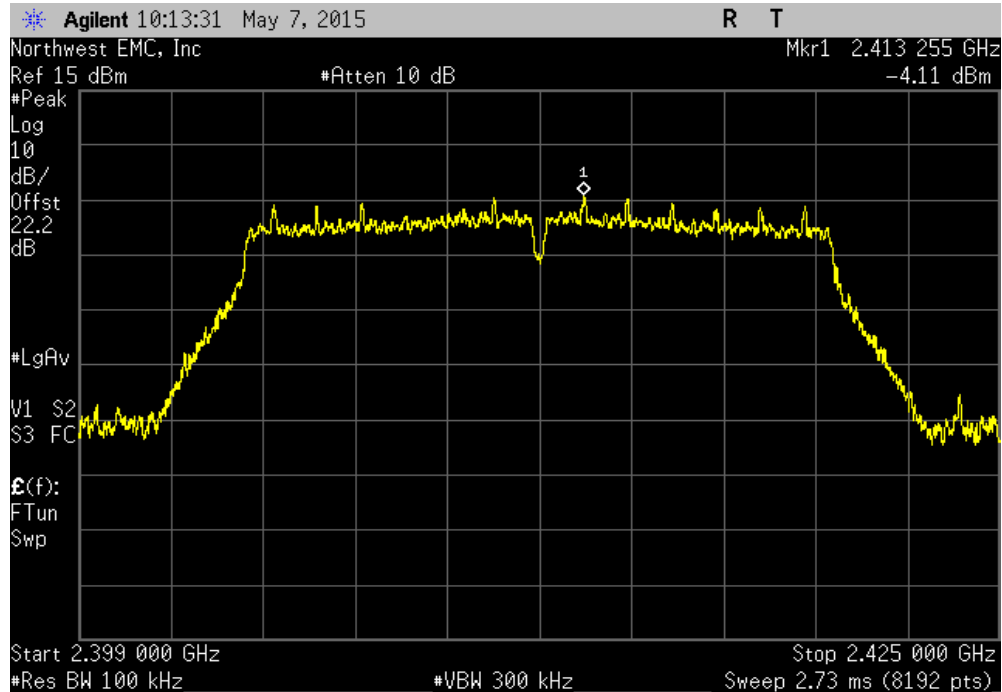
The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

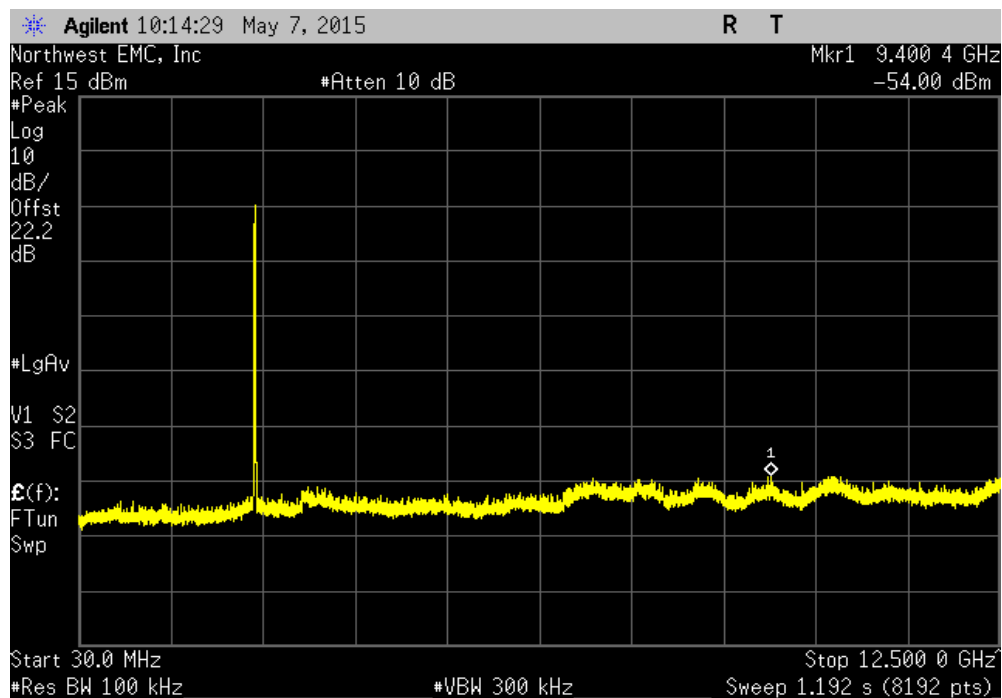
EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth		Power: USB	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Frequency Range	Value (dBc)
			Limit ≤ (dBc)
			Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	Fundamental	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-49.89
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-44.77
	Mid Channel 6, 2437 MHz	Fundamental	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-50.2
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-45.71
	High Channel 11, 2462 MHz	Fundamental	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-50.1
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-45.74
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	Fundamental	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-48.99
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-44.35
	Mid Channel 6, 2437 MHz	Fundamental	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-50.15
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-45.26
	High Channel 11, 2462 MHz	Fundamental	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.97
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-45.72
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	Fundamental	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-49.28
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-44.73
	Mid Channel 6, 2437 MHz	Fundamental	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-50.26
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-45.44
	High Channel 11, 2462 MHz	Fundamental	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-50.46
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-45.42
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	Fundamental	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-50.03
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-45.4
	Mid Channel 6, 2437 MHz	Fundamental	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-49.77
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-45.34
	High Channel 11, 2462 MHz	Fundamental	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.12
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-45.12
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	Fundamental	N/A
	Low Channel 1, 2412 MHz	30 MHz - 12.5 GHz	-49.48
	Low Channel 1, 2412 MHz	12.5 GHz - 25 GHz	-44.55
	Mid Channel 6, 2437 MHz	Fundamental	N/A
	Mid Channel 6, 2437 MHz	30 MHz - 12.5 GHz	-50.13
	Mid Channel 6, 2437 MHz	12.5 GHz - 25 GHz	-44.8
	High Channel 11, 2462 MHz	Fundamental	N/A
	High Channel 11, 2462 MHz	30 MHz - 12.5 GHz	-49.26
	High Channel 11, 2462 MHz	12.5 GHz - 25 GHz	-45.16

SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

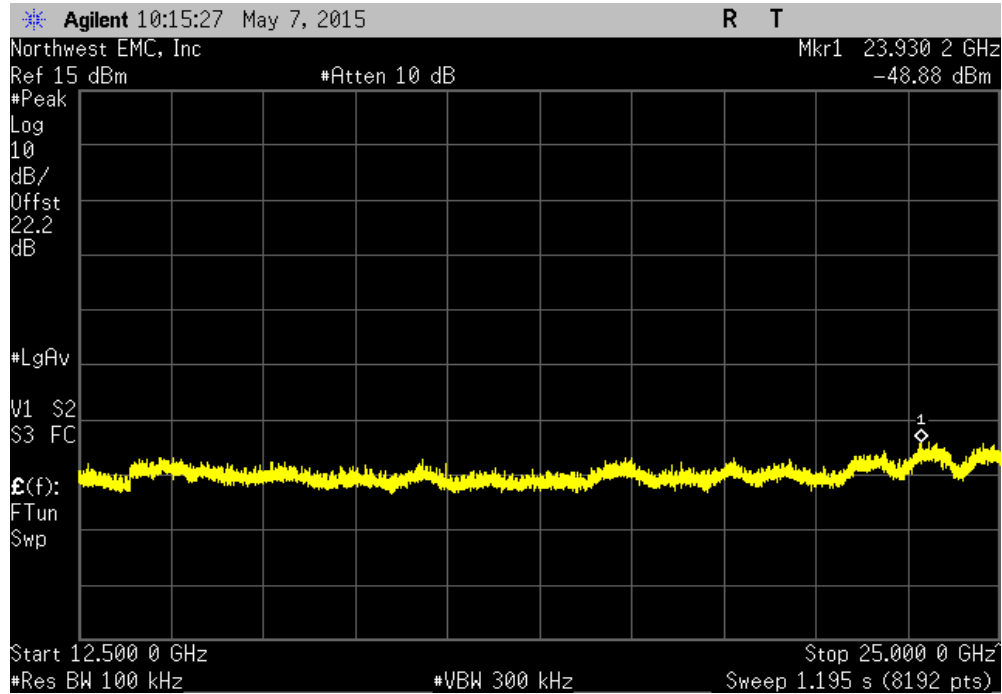


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-49.89	-20	Pass		

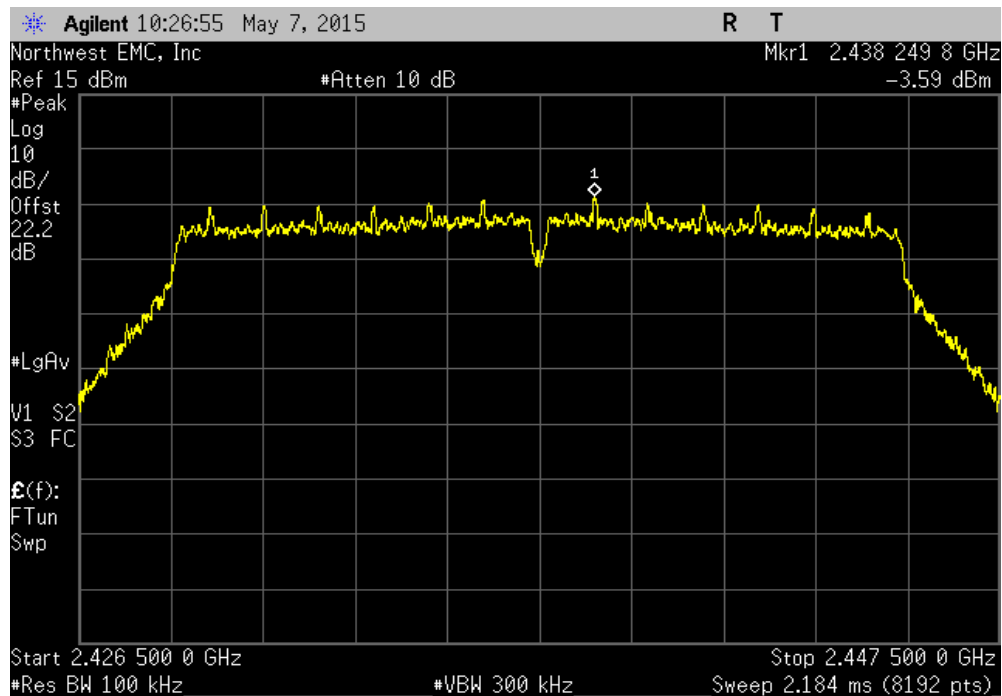


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-44.77	-20	Pass	

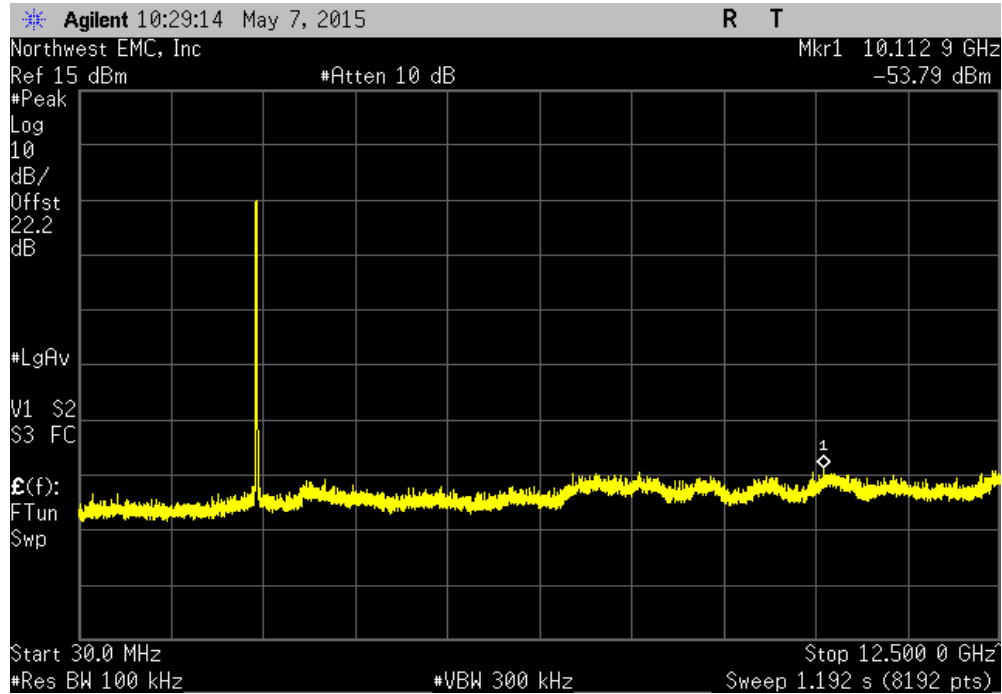


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

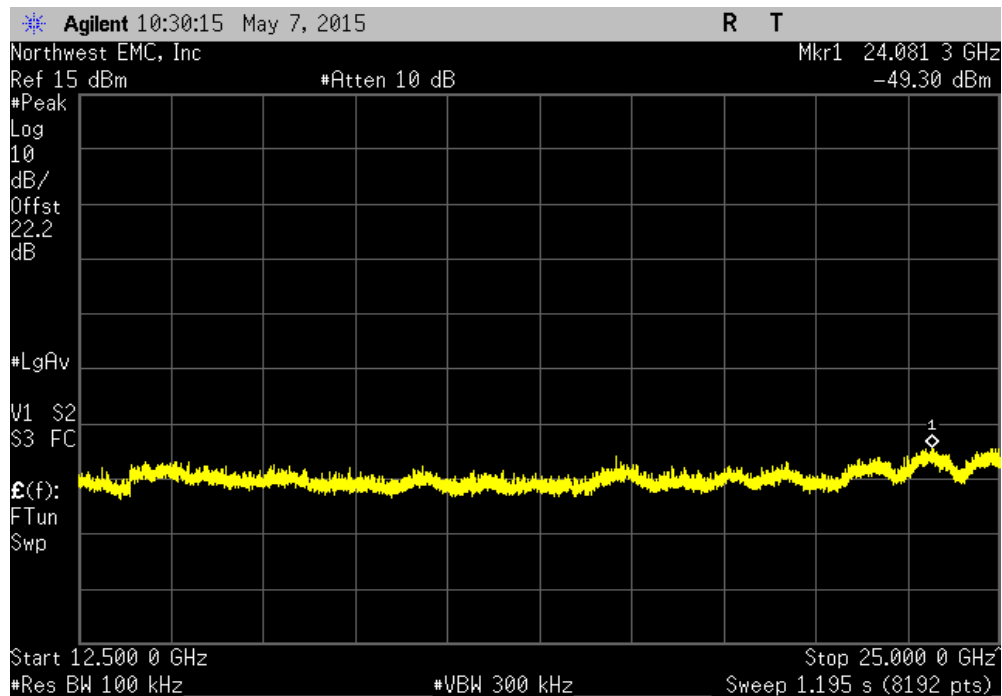


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-50.2	-20	Pass	

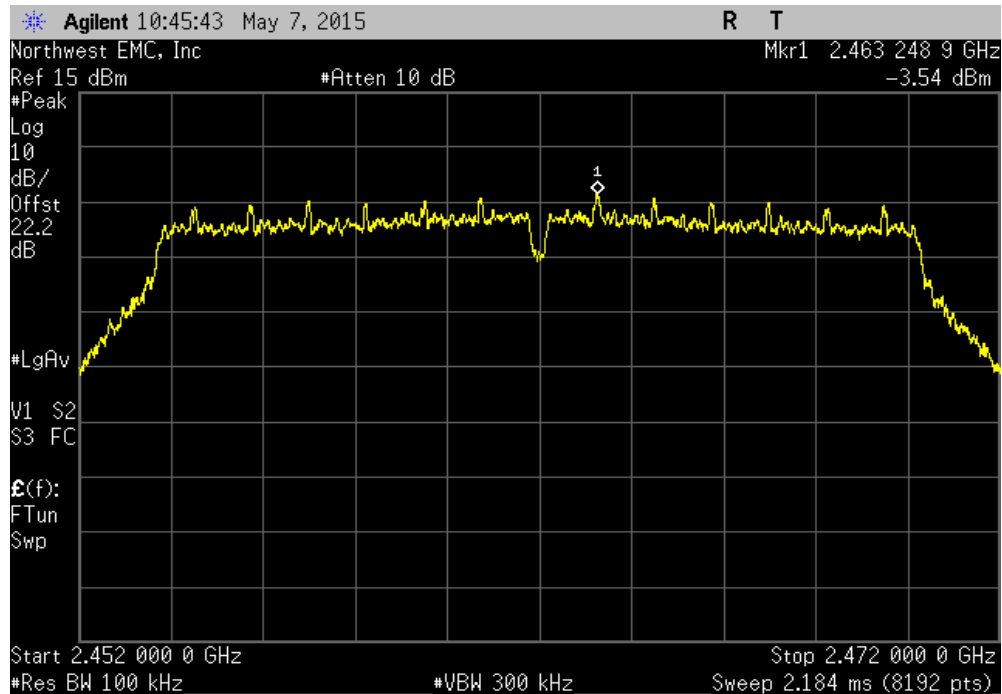


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.71	-20	Pass	

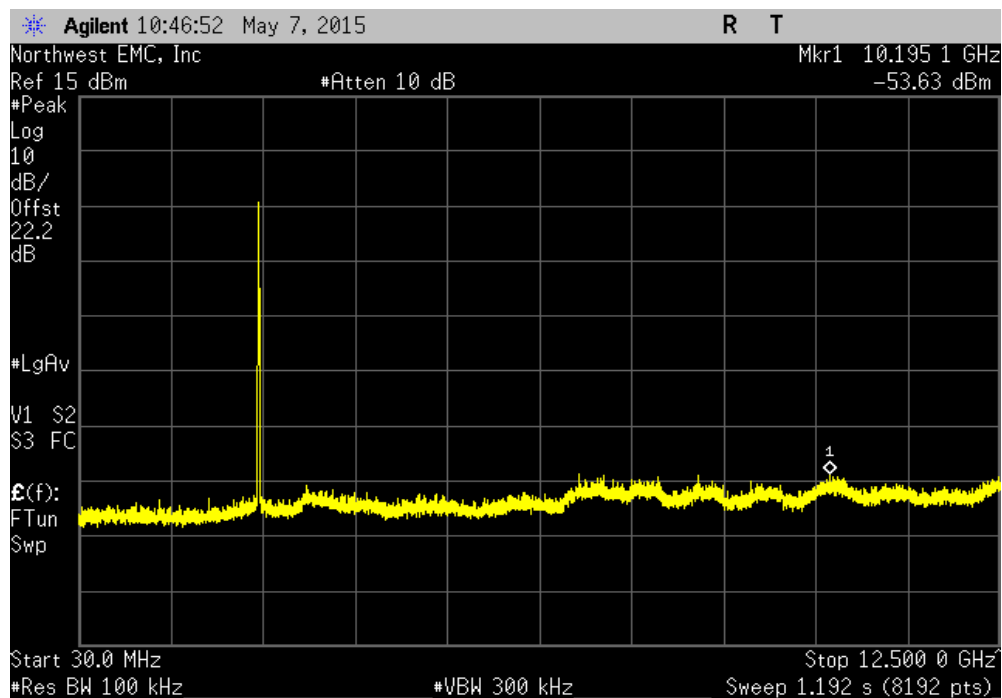


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

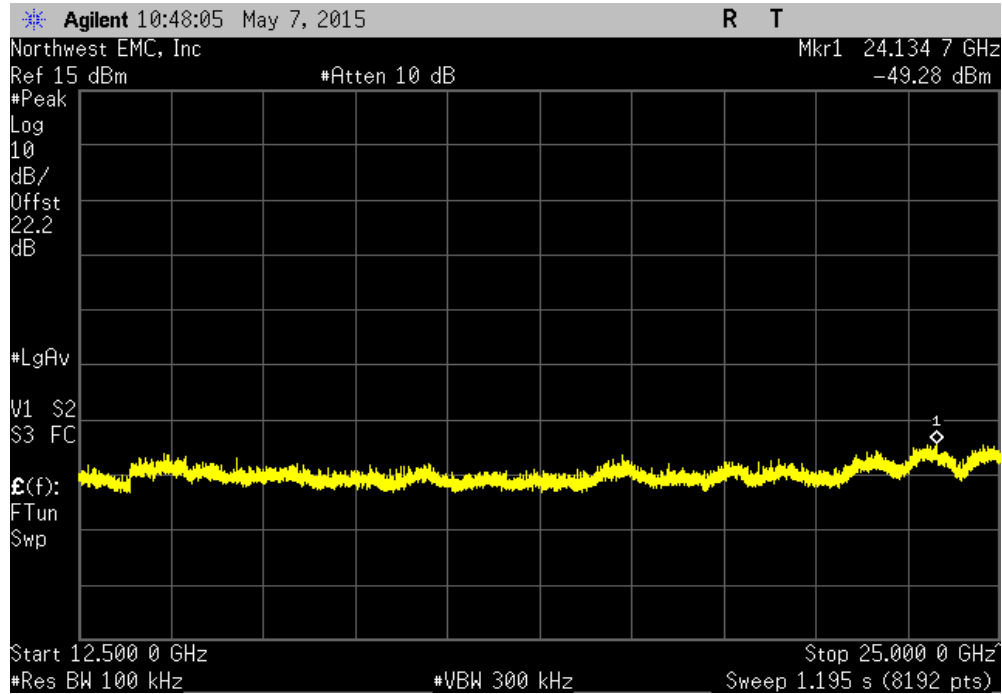


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-50.1	-20	Pass		

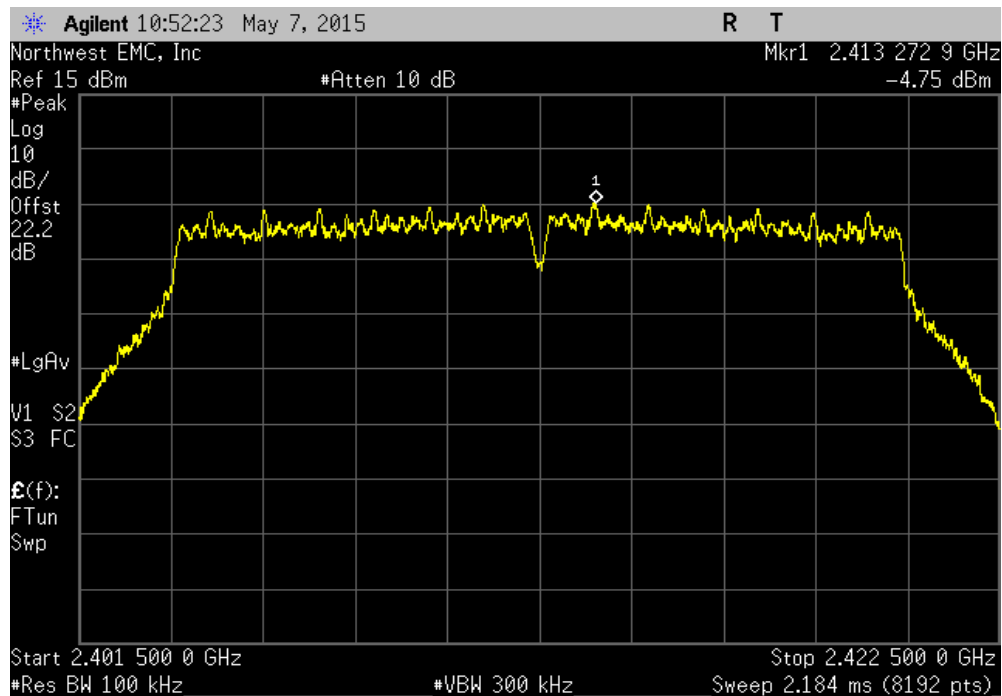


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.74	-20	Pass	

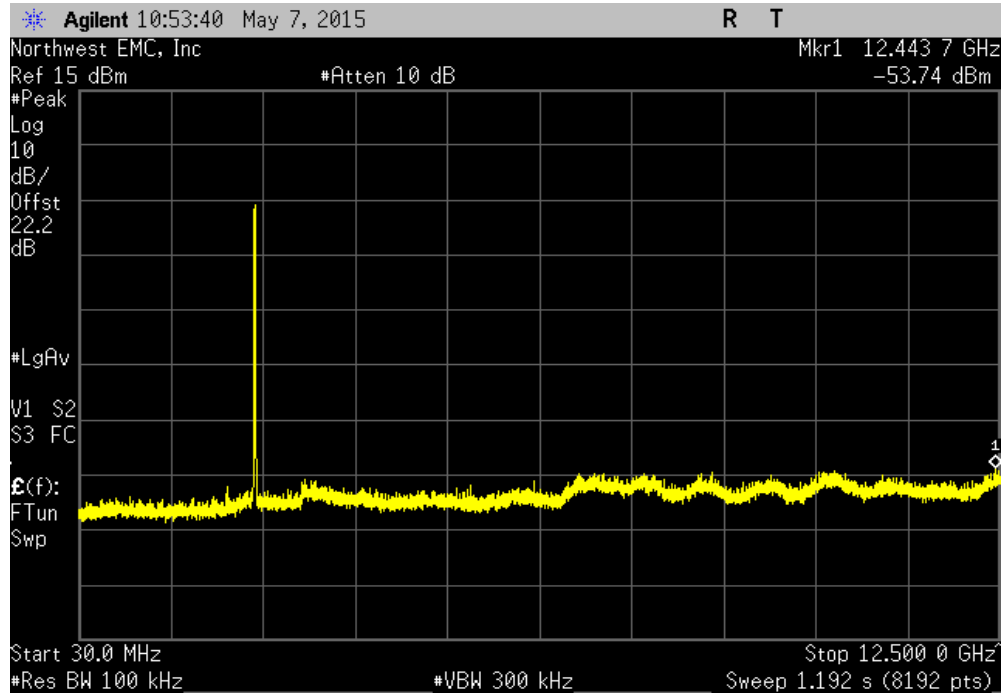


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

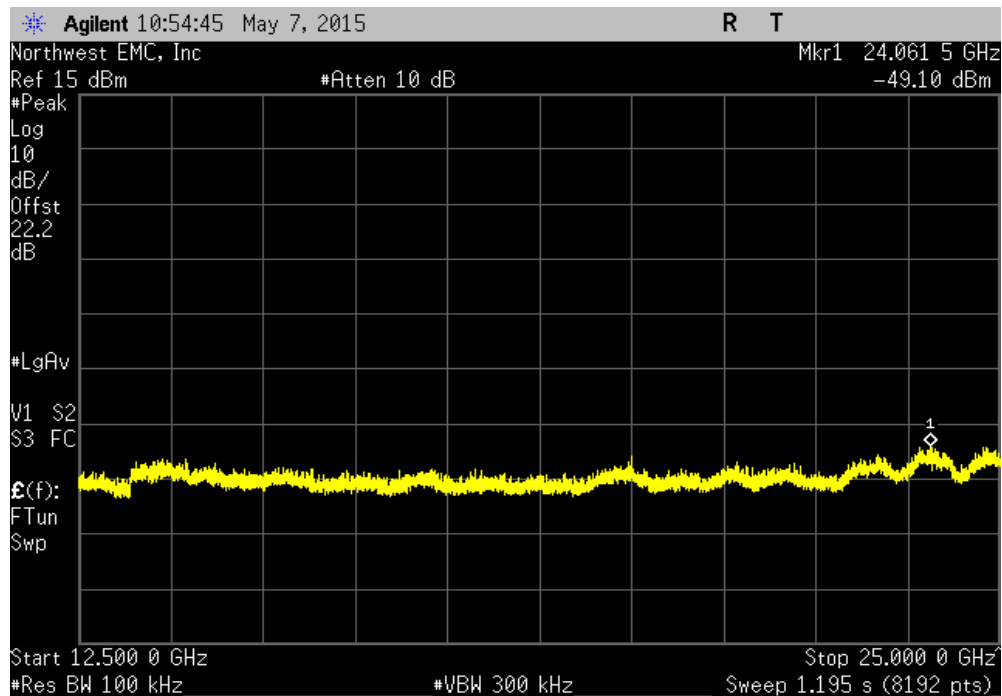


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-48.99	-20	Pass	

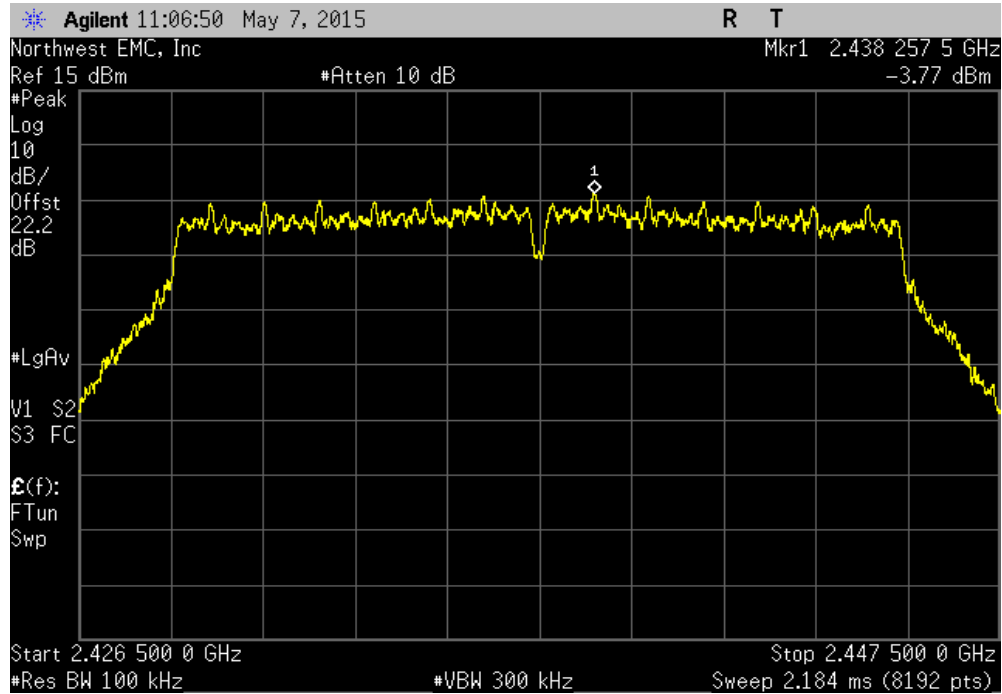


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-44.35	-20	Pass	

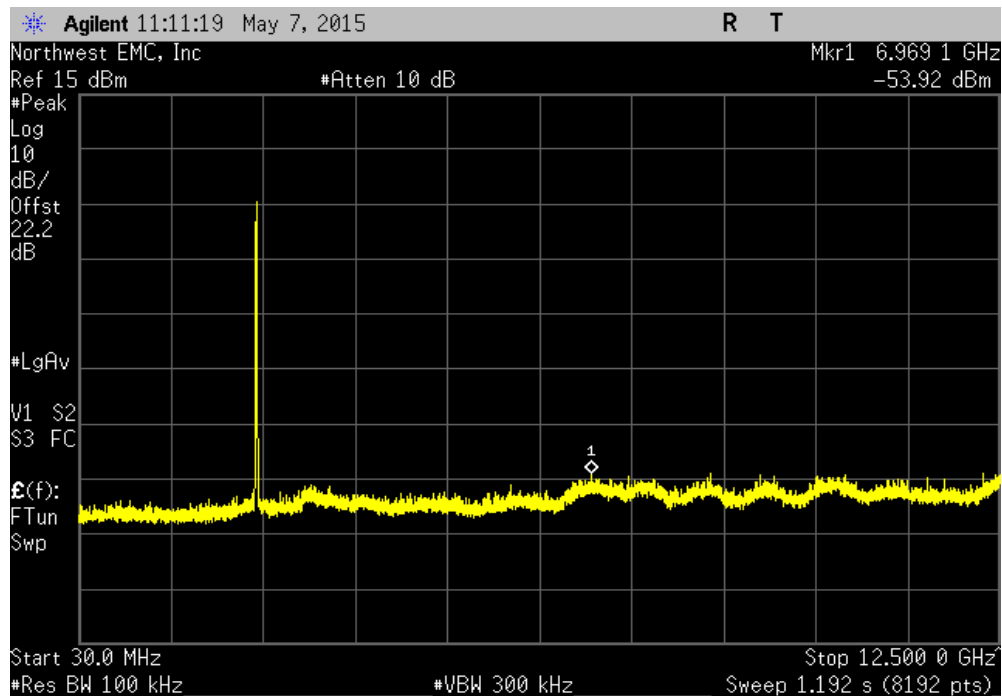


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

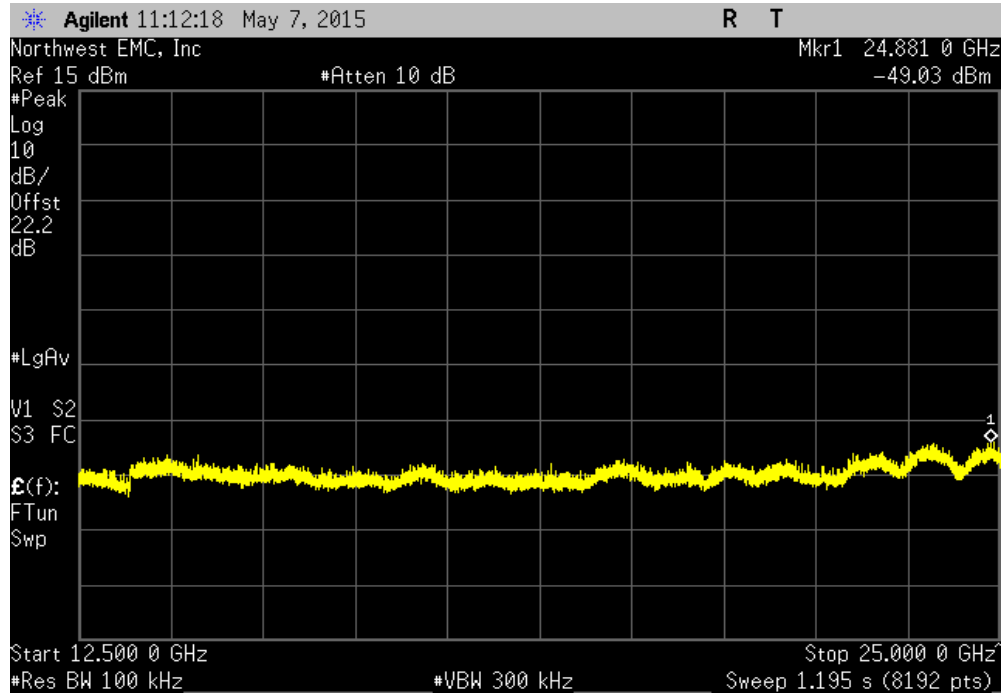


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-50.15	-20	Pass		

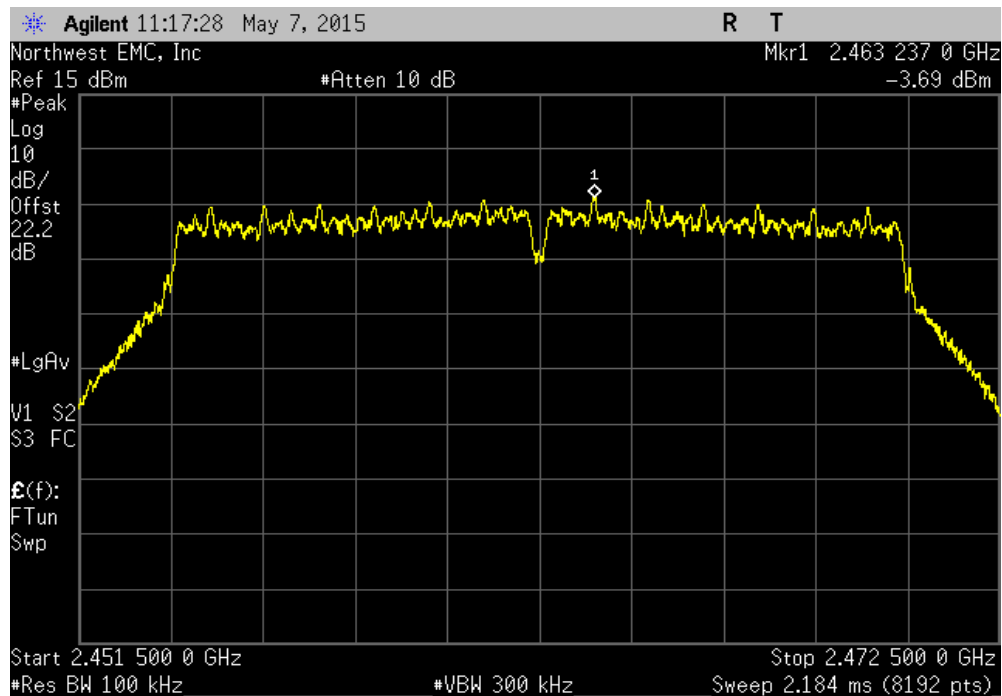


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.26	-20	Pass	

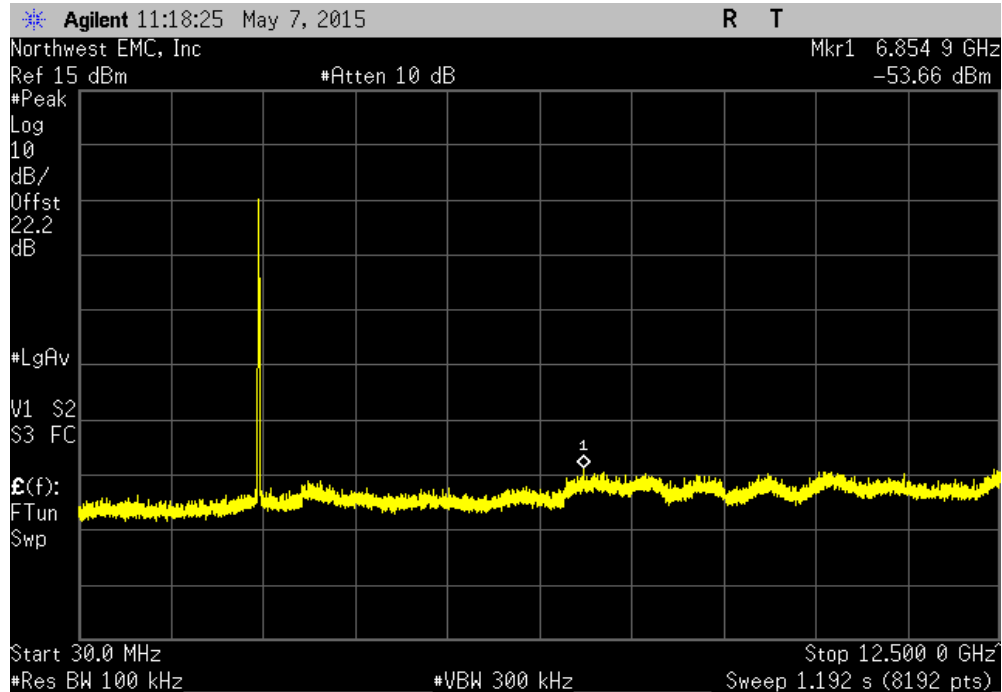


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

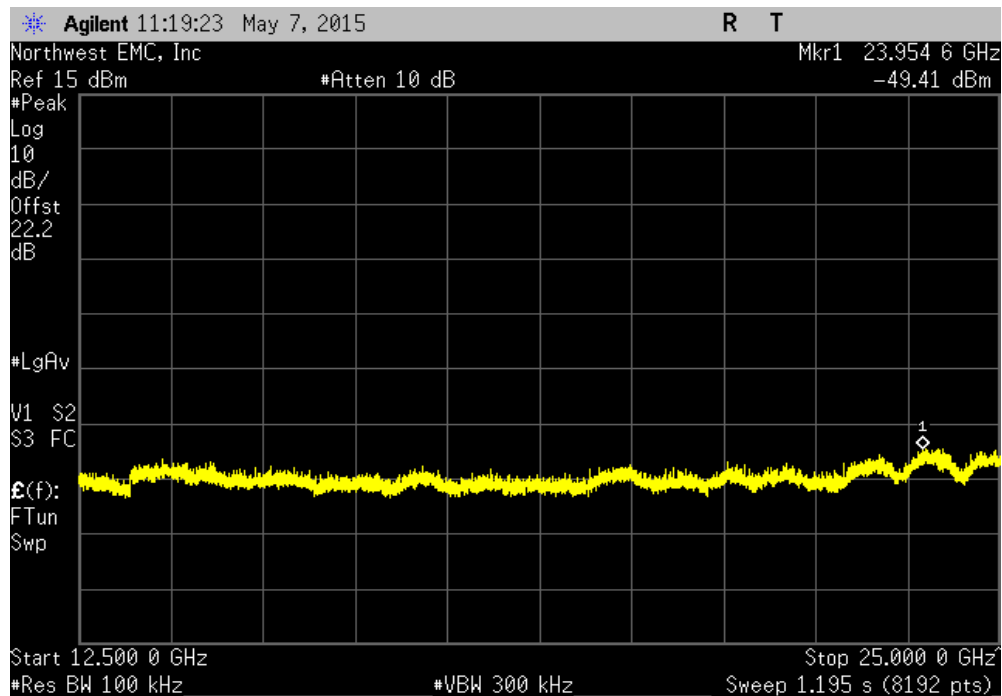


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-49.97	-20	Pass	

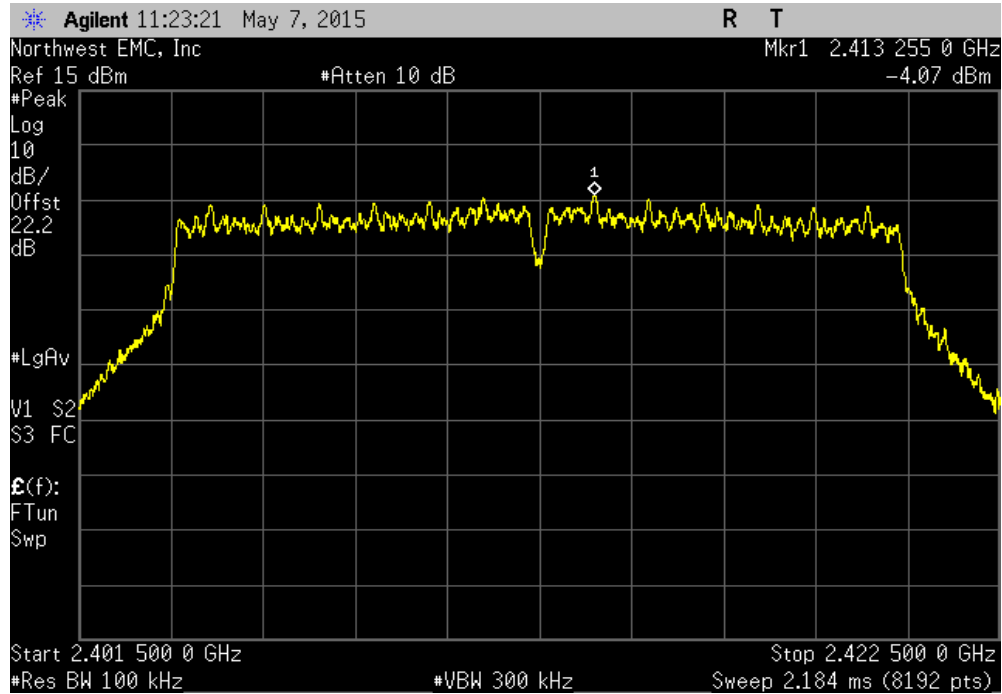


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.72	-20	Pass	

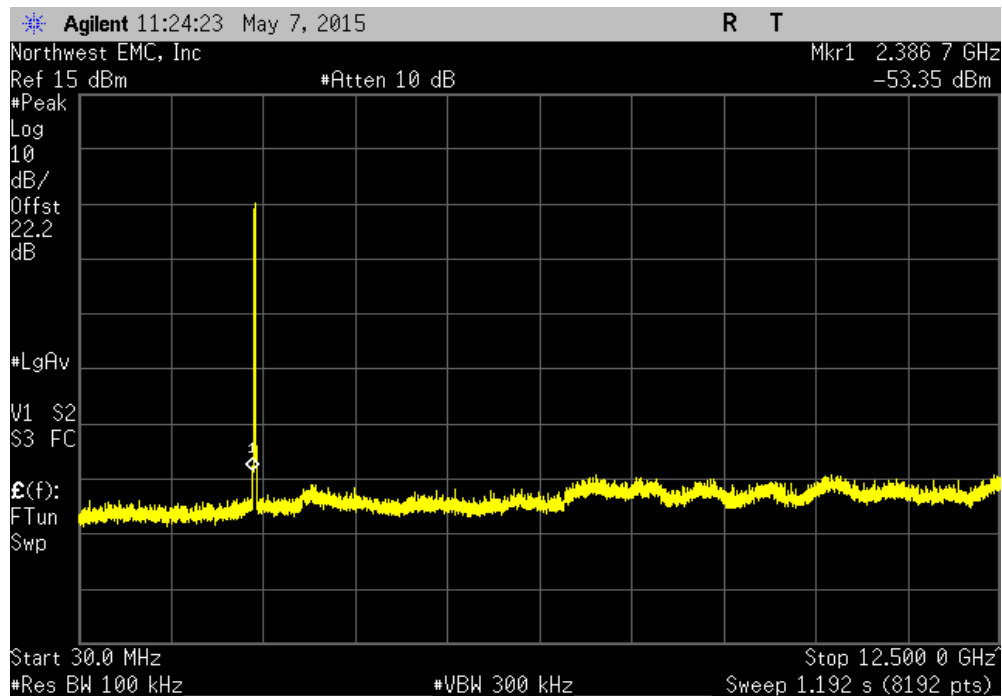


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

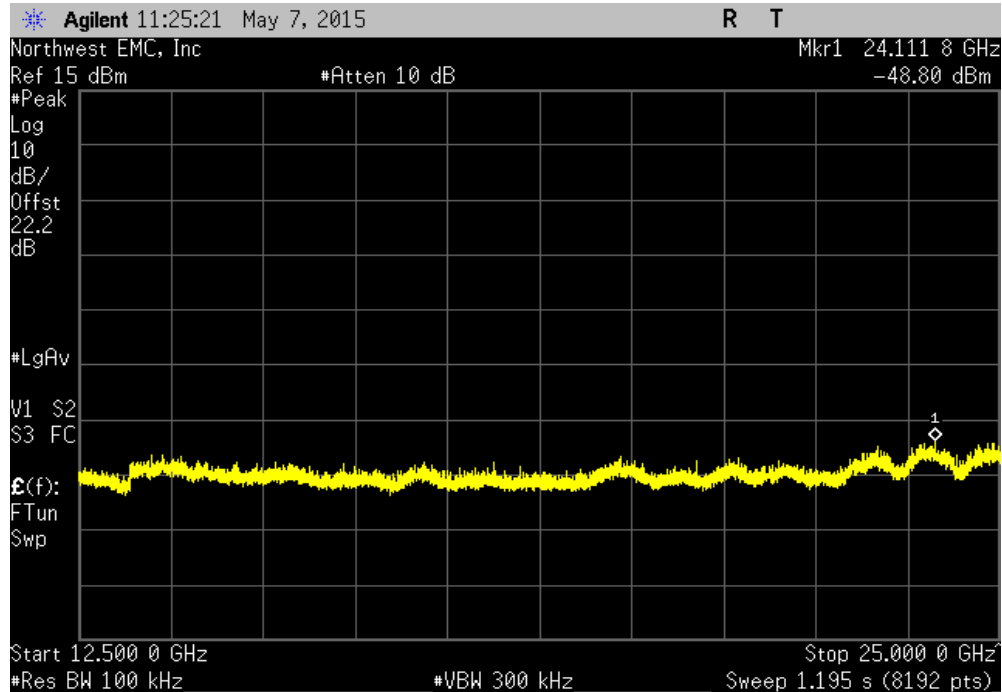


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-49.28	-20	Pass		

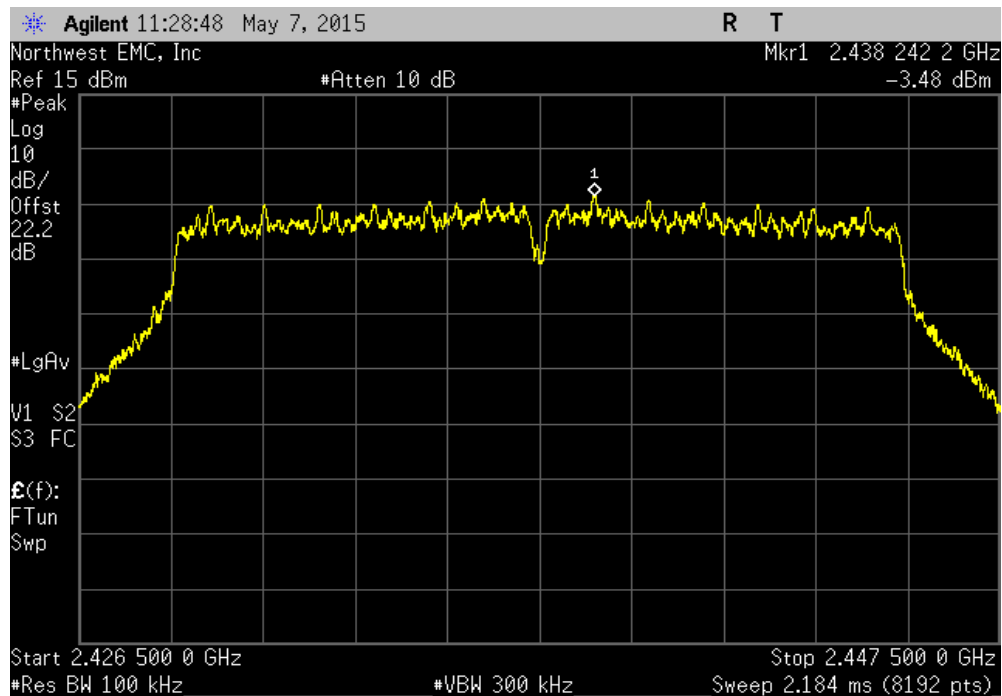


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-44.73	-20	Pass	

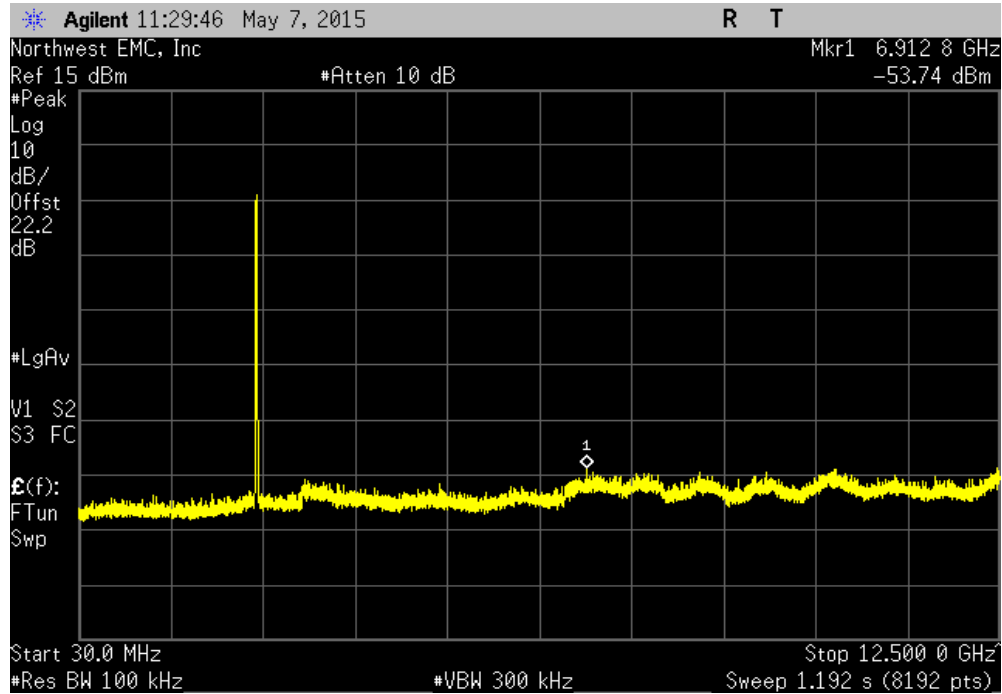


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

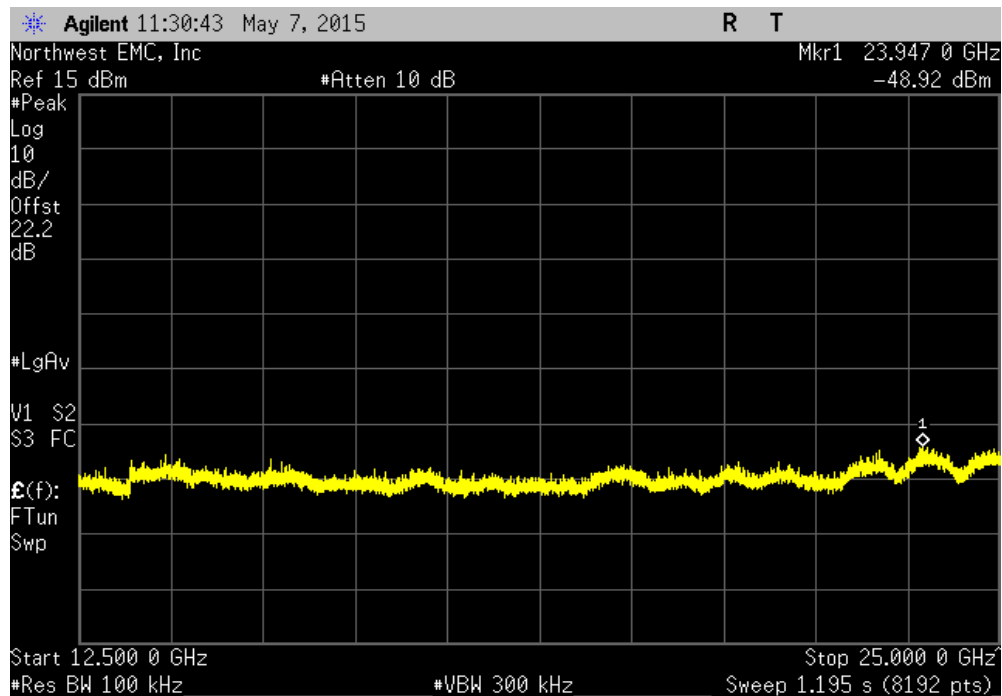


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-50.26	-20	Pass	

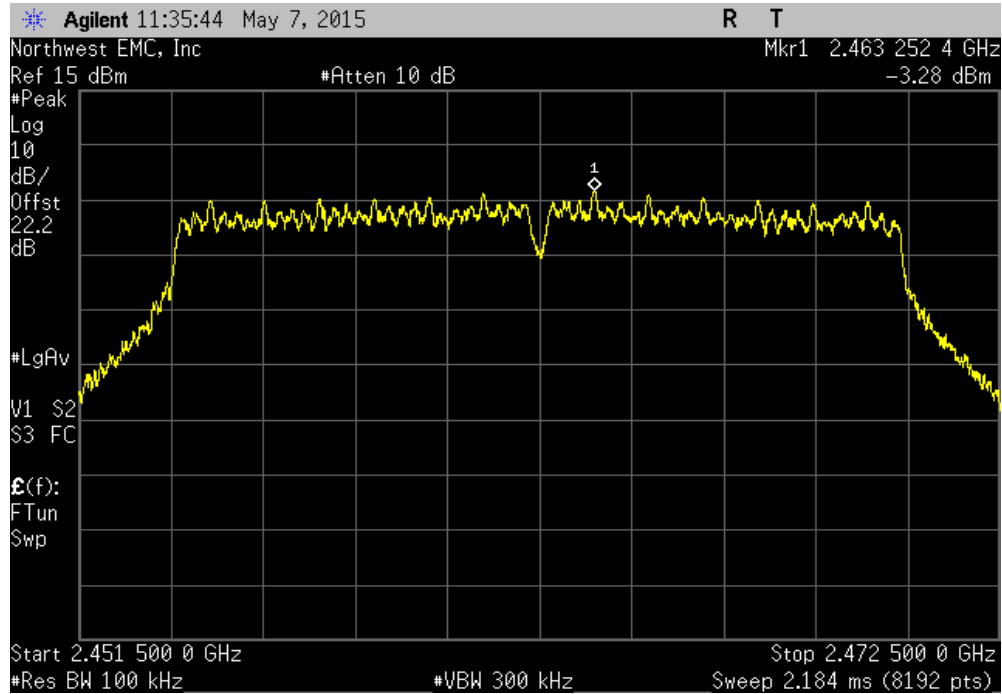


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.44	-20	Pass	

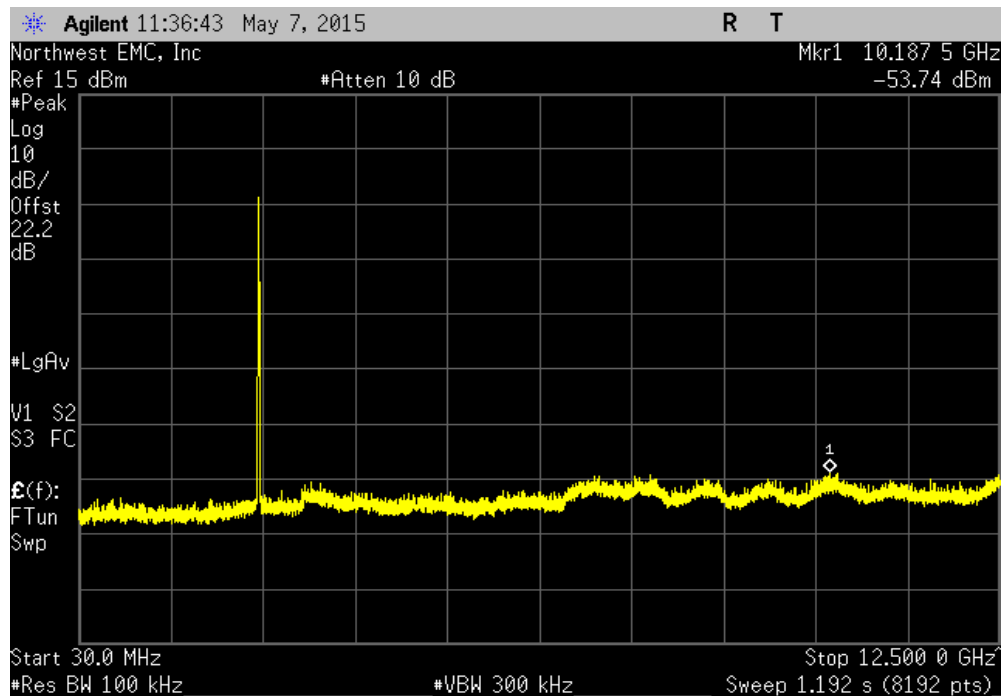


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

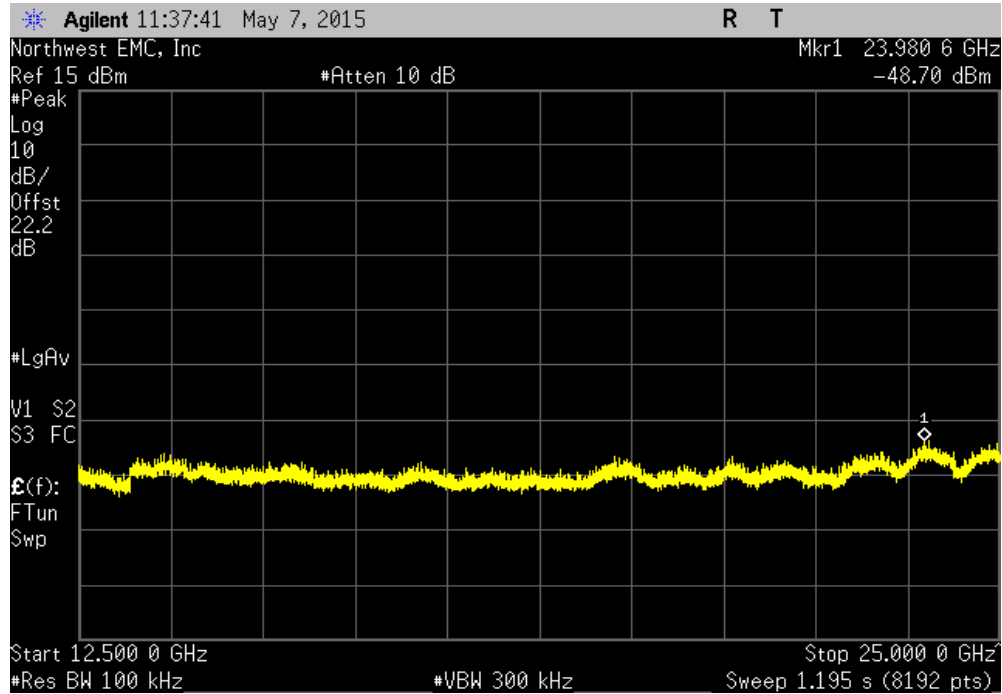


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-50.46	-20	Pass		

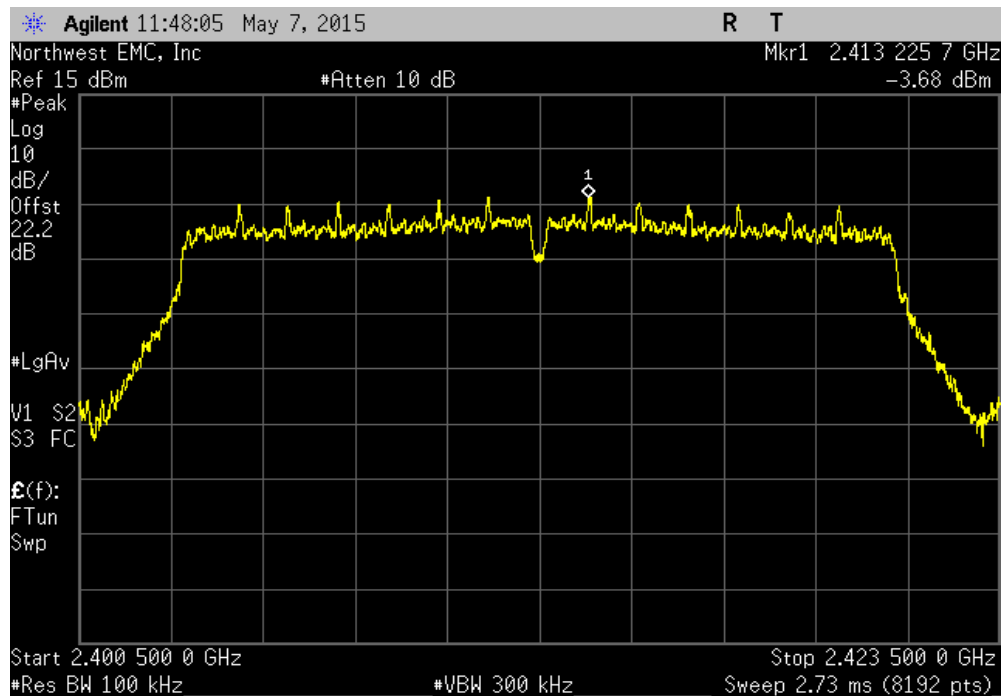


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.42	-20	Pass	

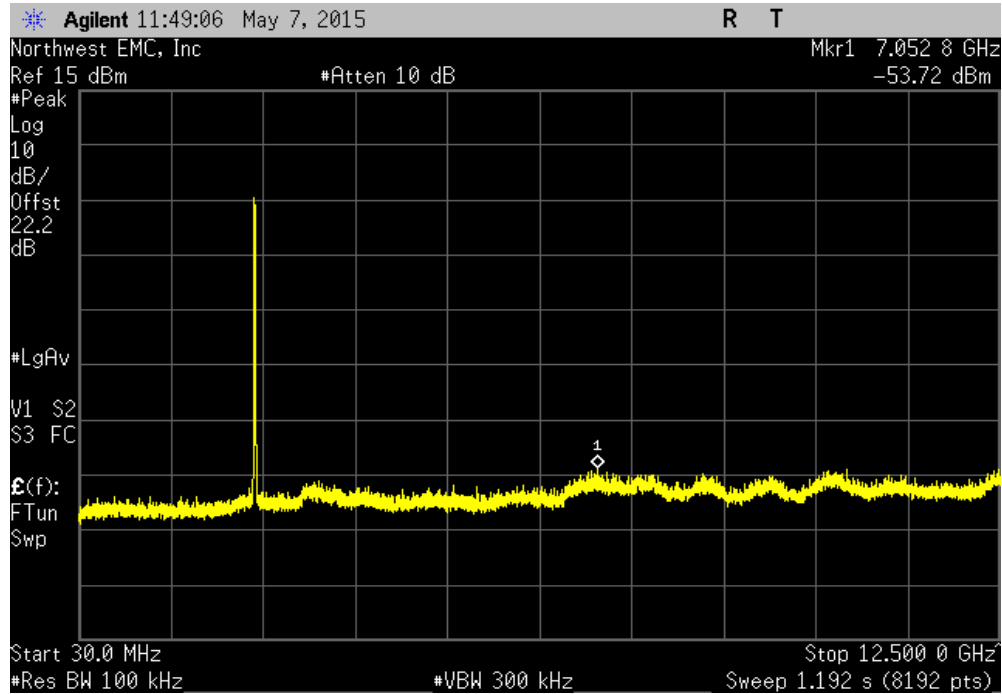


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

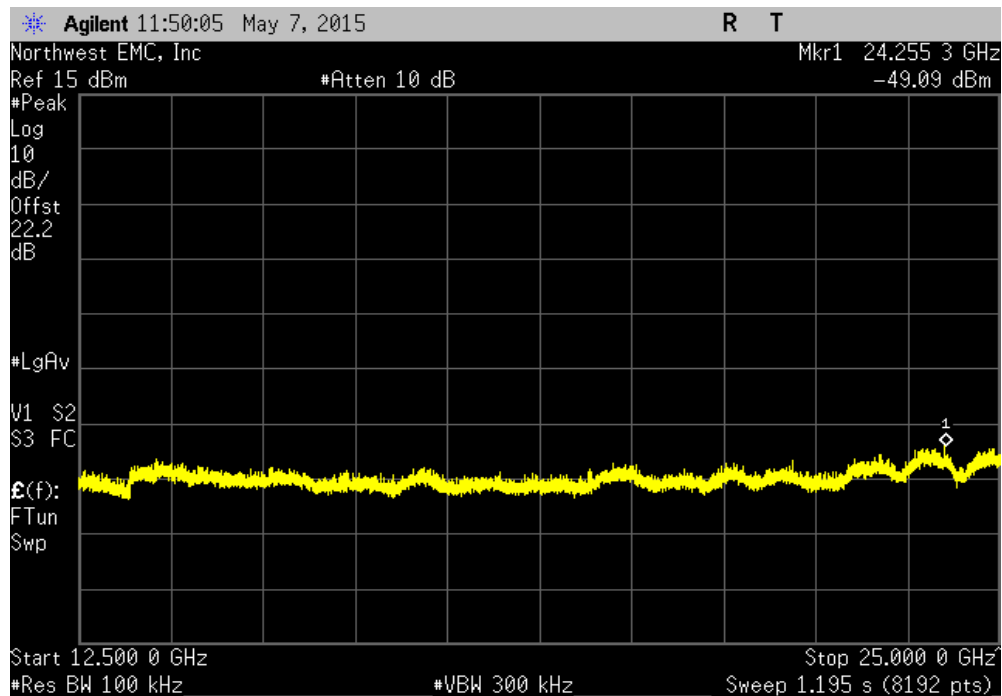


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-50.03	-20	Pass	

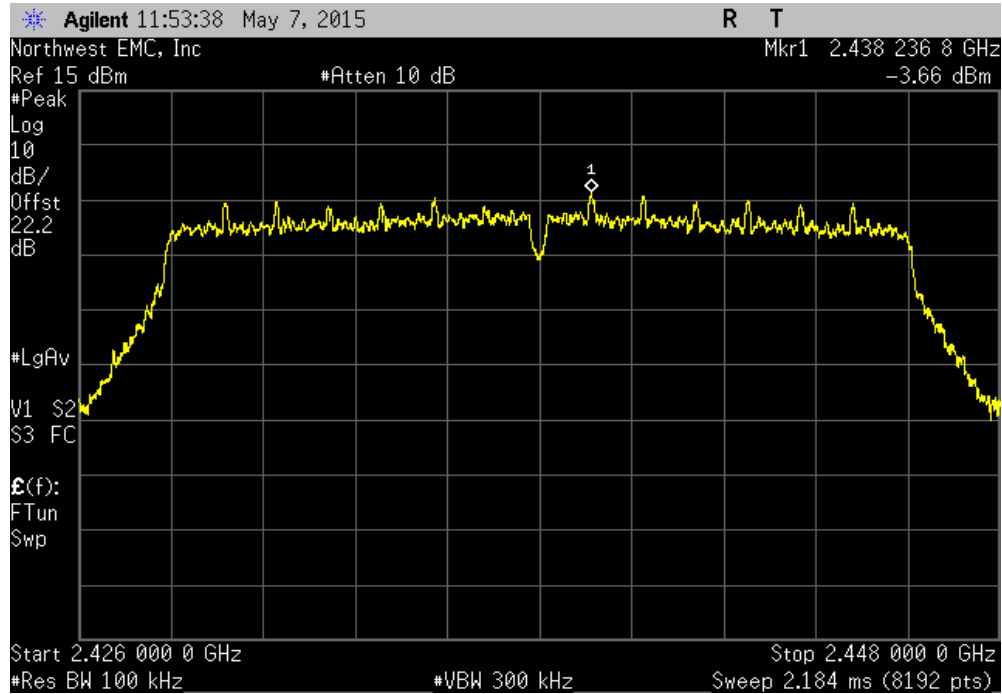


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.4	-20	Pass	

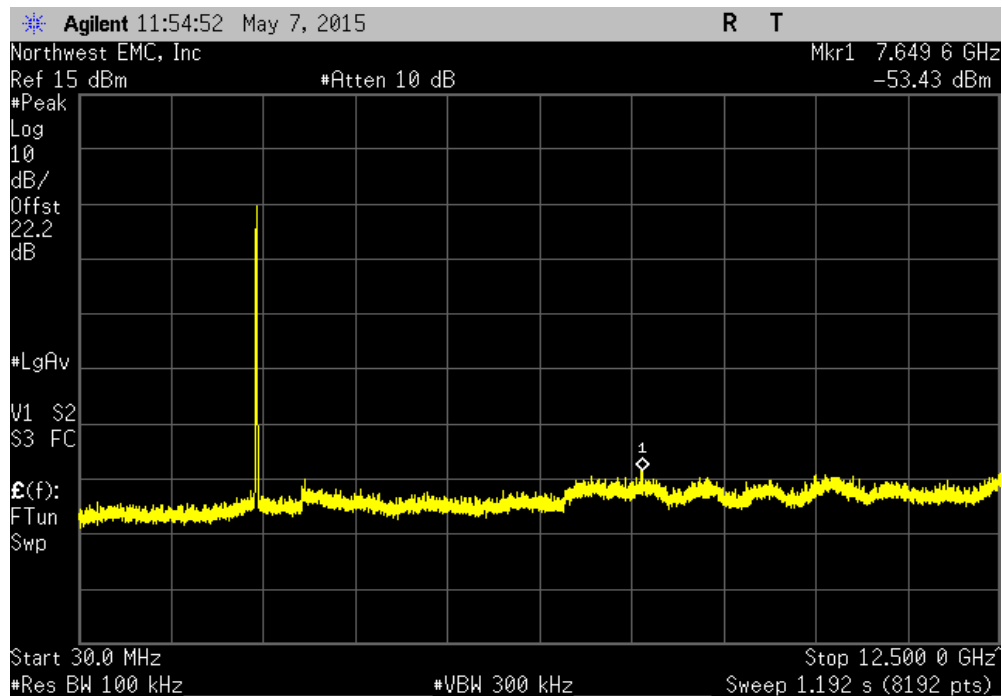


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

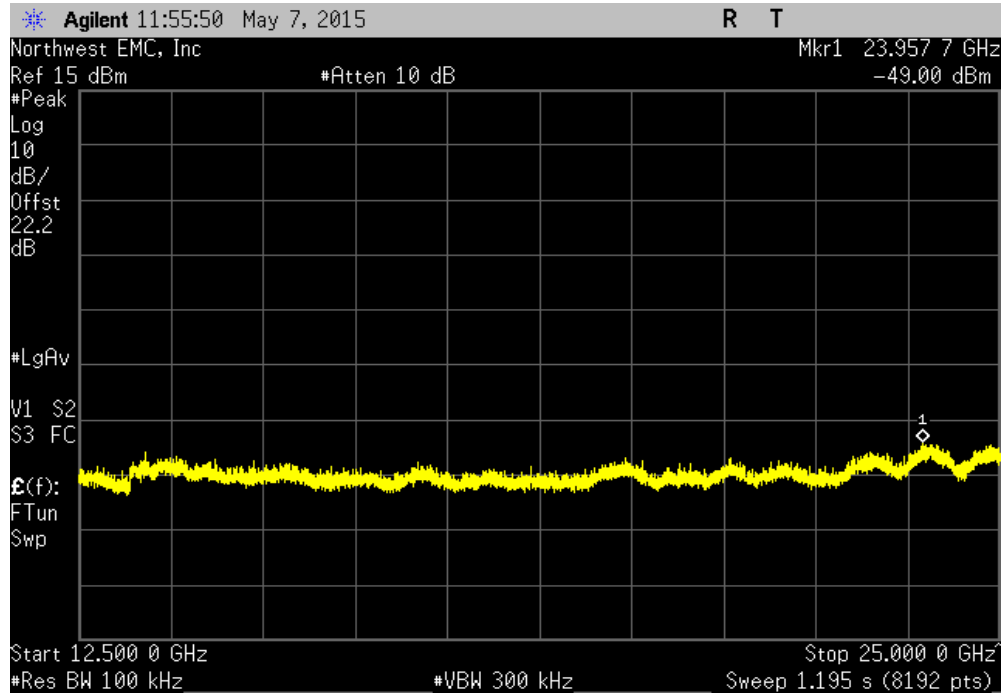


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-49.77	-20	Pass		

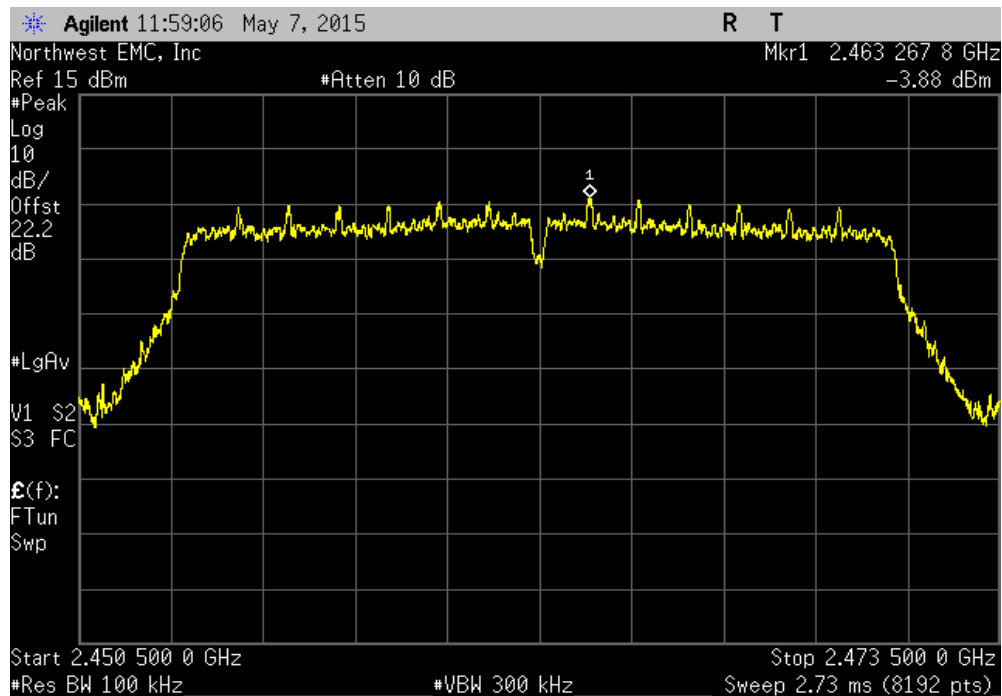


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.34	-20	Pass	

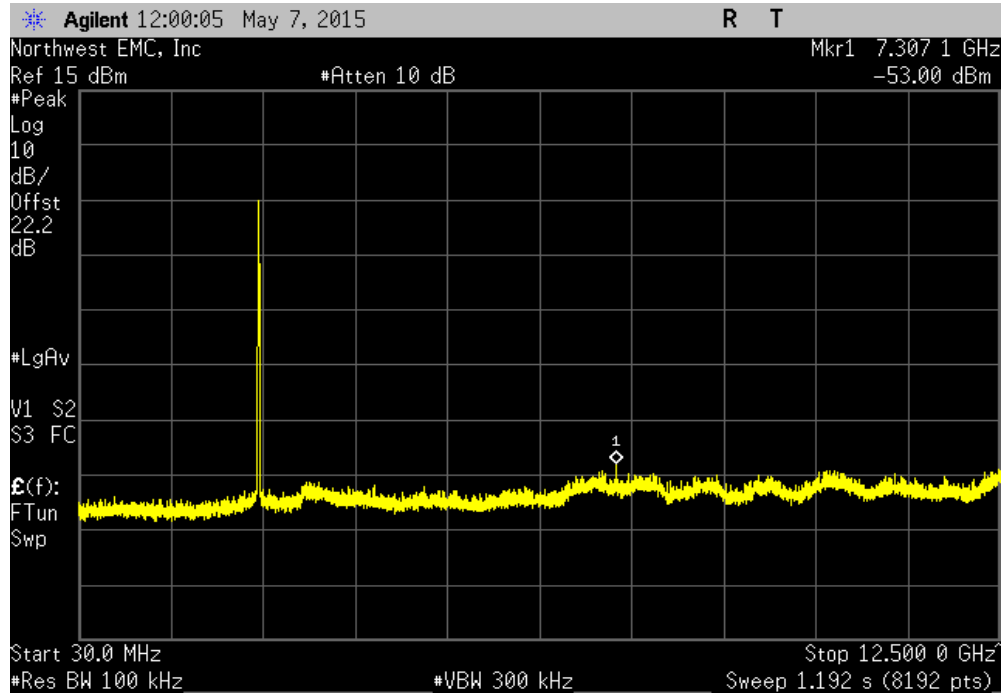


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

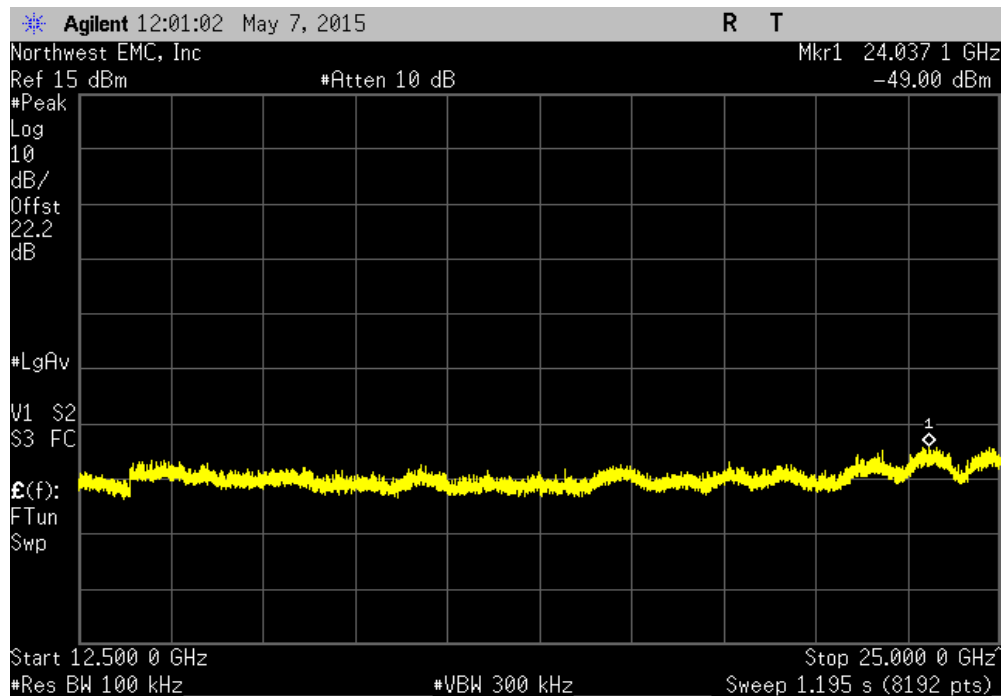


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-49.12	-20	Pass	

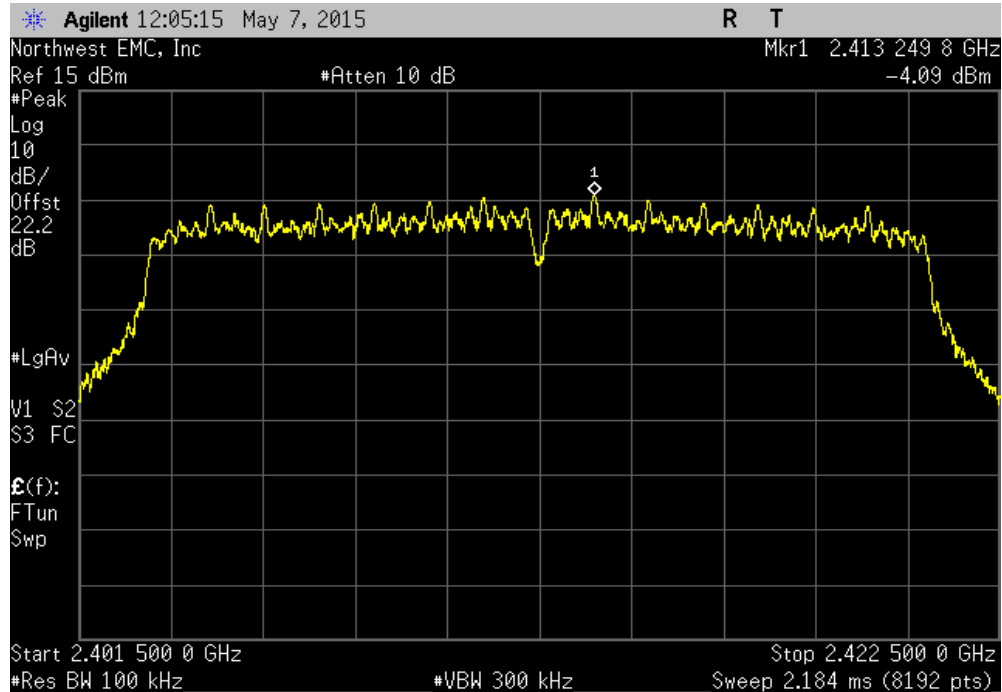


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.12	-20	Pass	

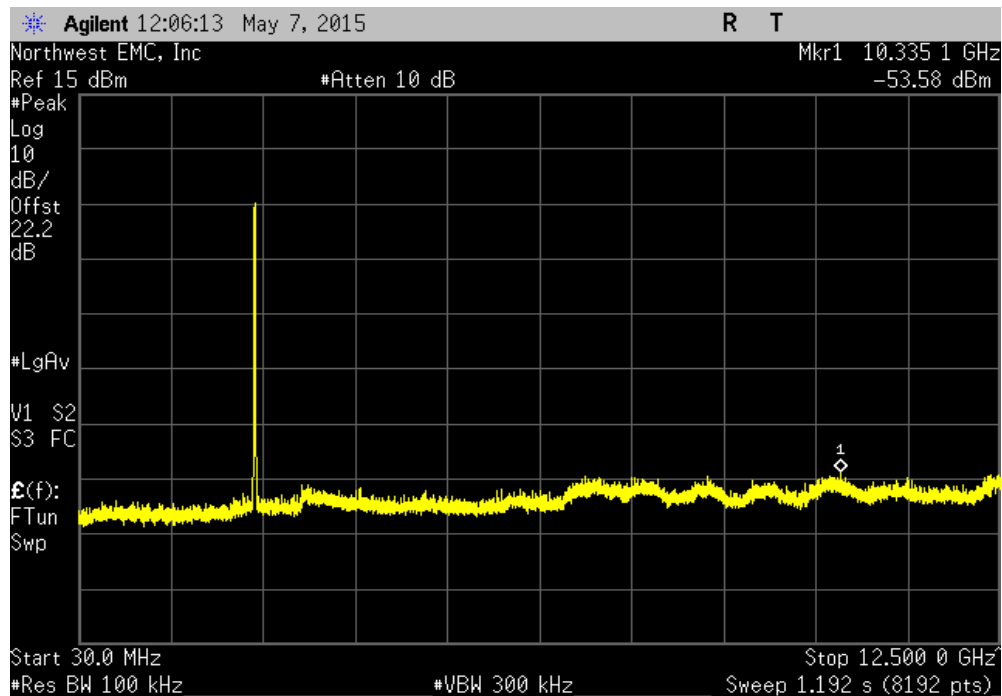


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

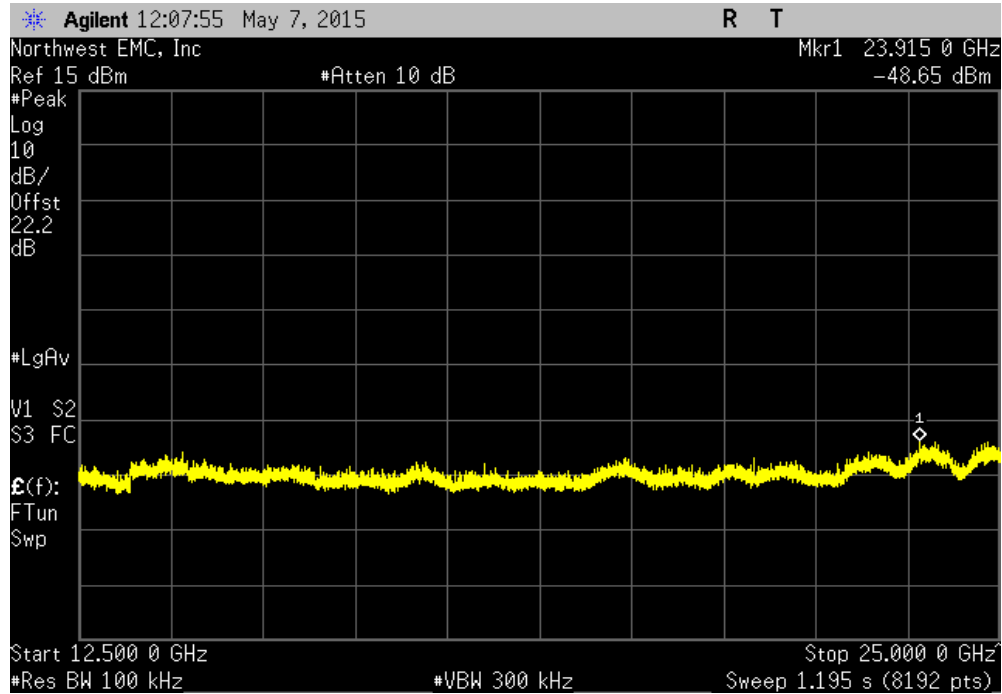


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-49.48	-20	Pass		

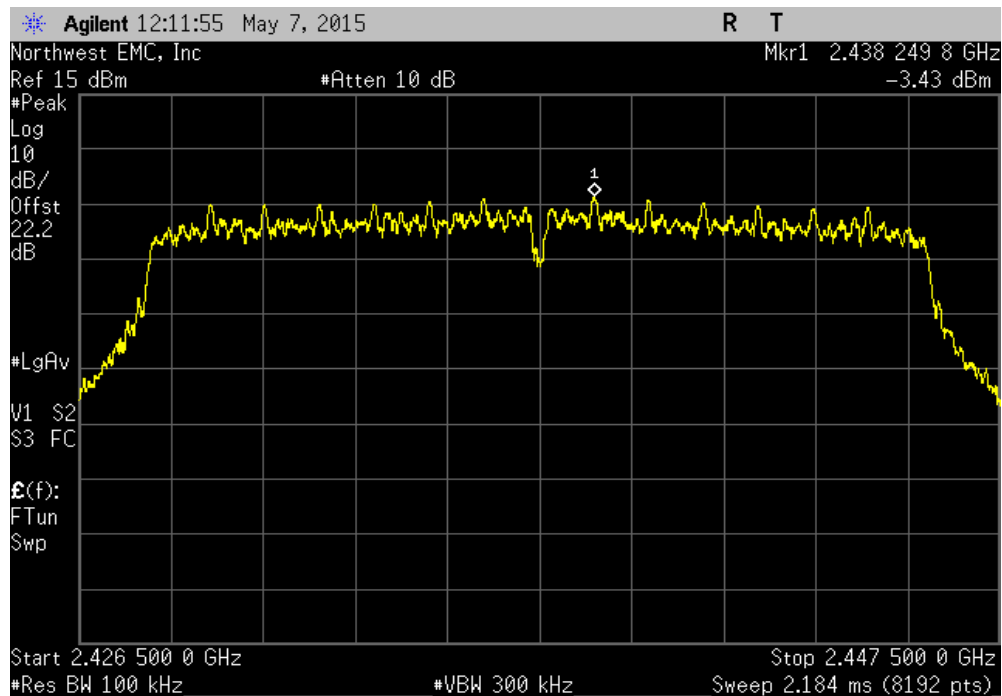


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-44.55	-20	Pass	

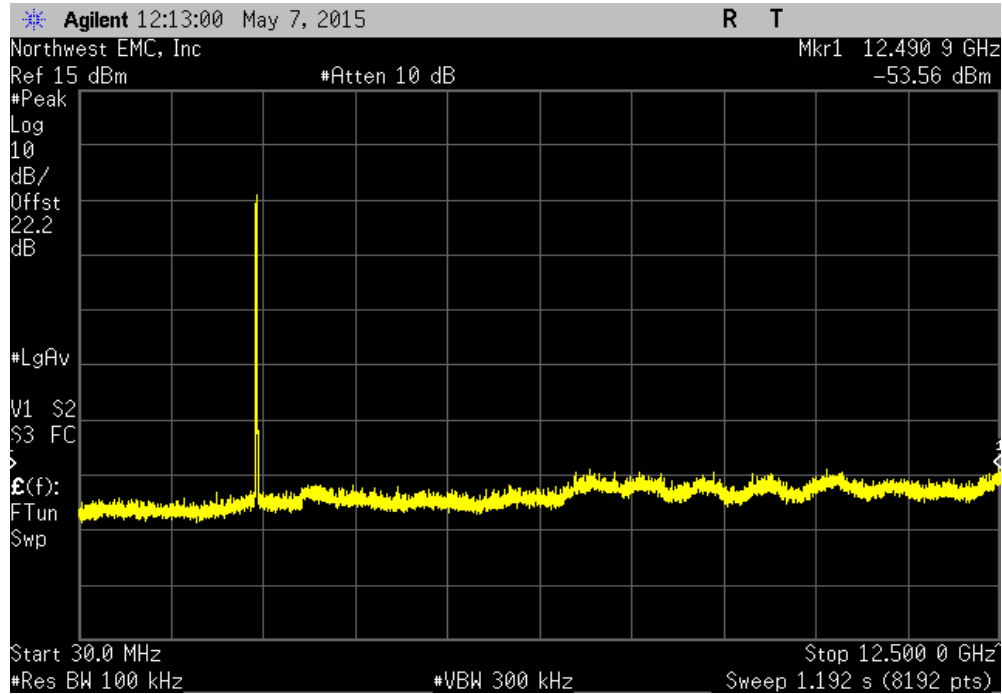


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	N/A	N/A	N/A	

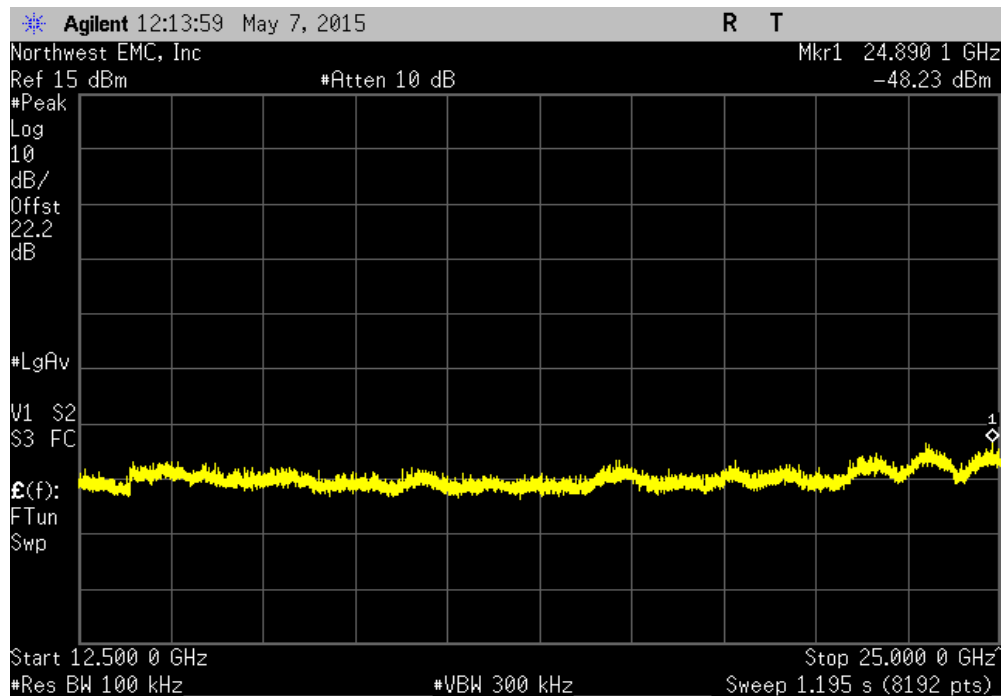


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-50.13	-20	Pass	

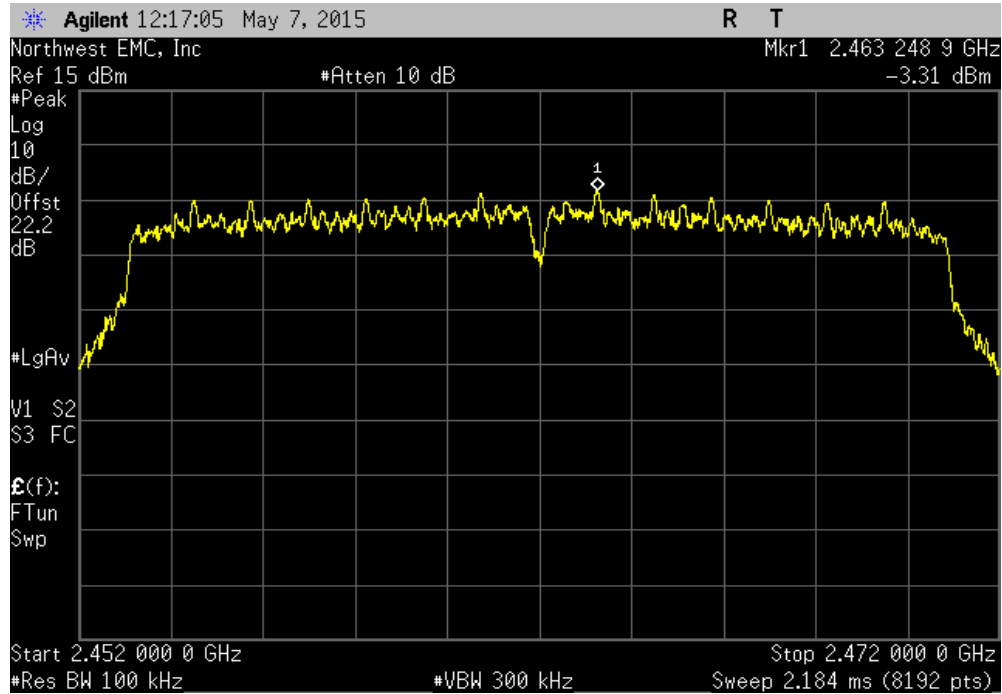


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-44.8	-20	Pass	

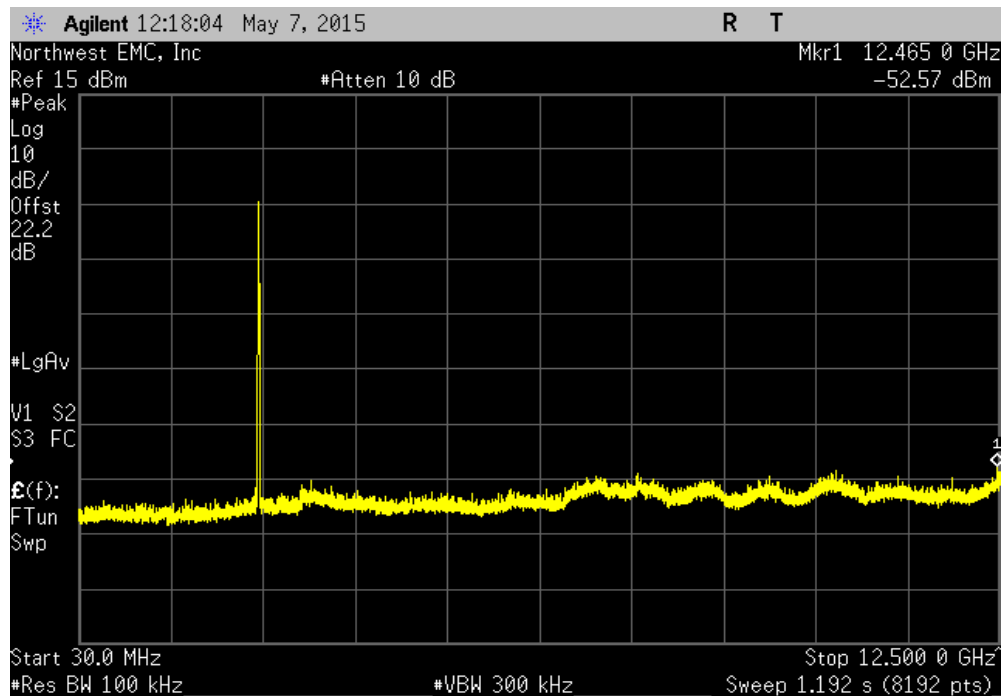


SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental		N/A	N/A	N/A		

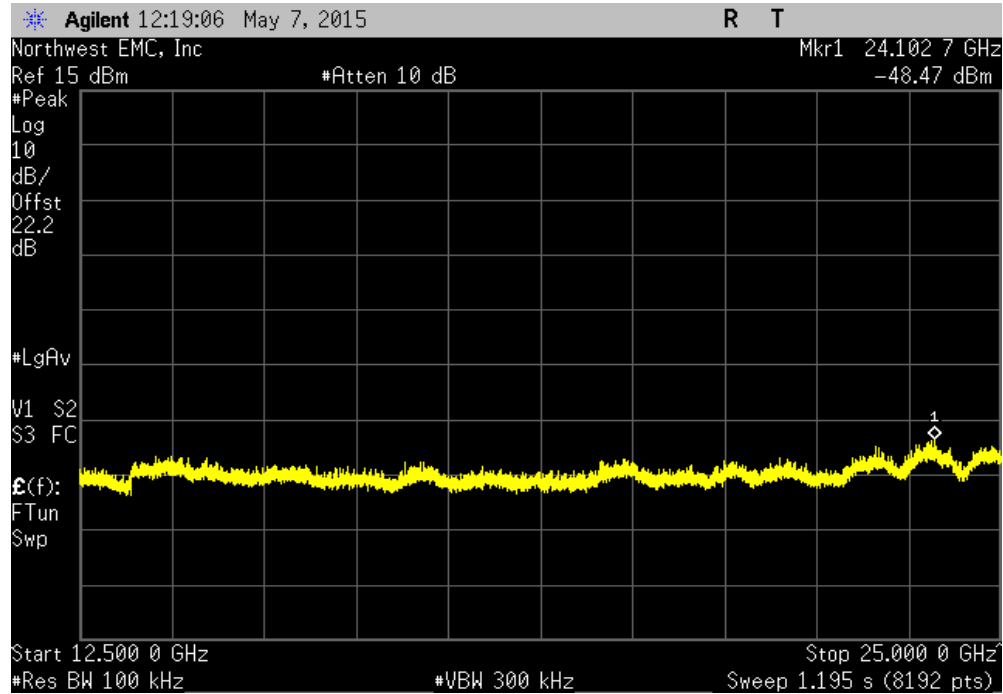


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz		-49.26	-20	Pass		



SPURIOUS CONDUCTED EMISSIONS

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz				
Frequency	Value	Limit		
Range	(dBc)	≤ (dBc)	Result	
12.5 GHz - 25 GHz	-45.16	-20	Pass	



OCCUPIED 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 (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

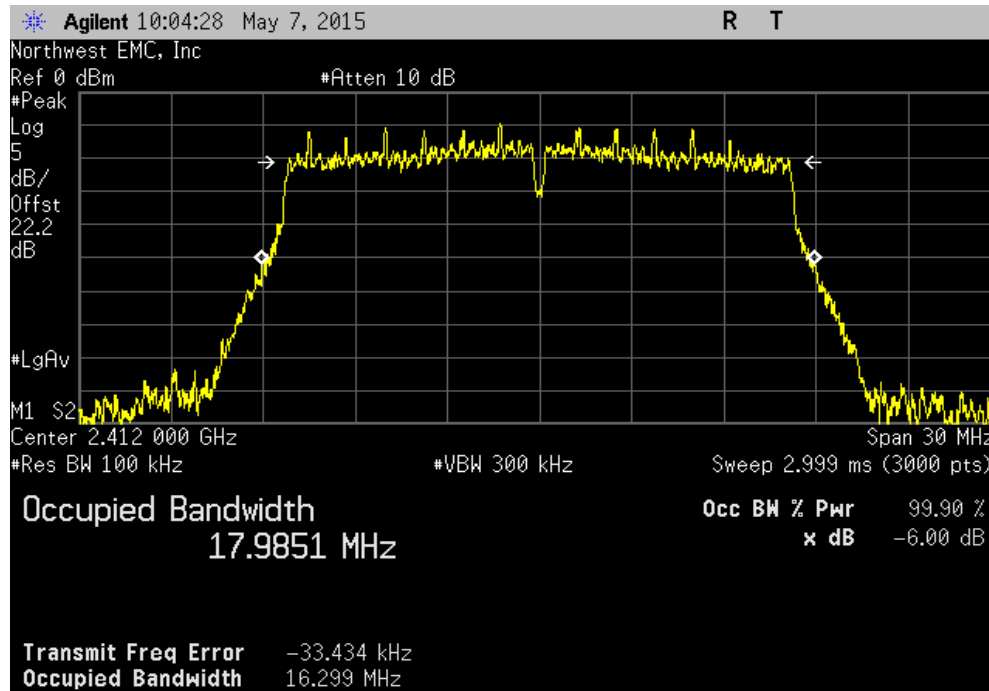
The EUT was set to the channels and modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer.

OCCUPIED BANDWIDTH

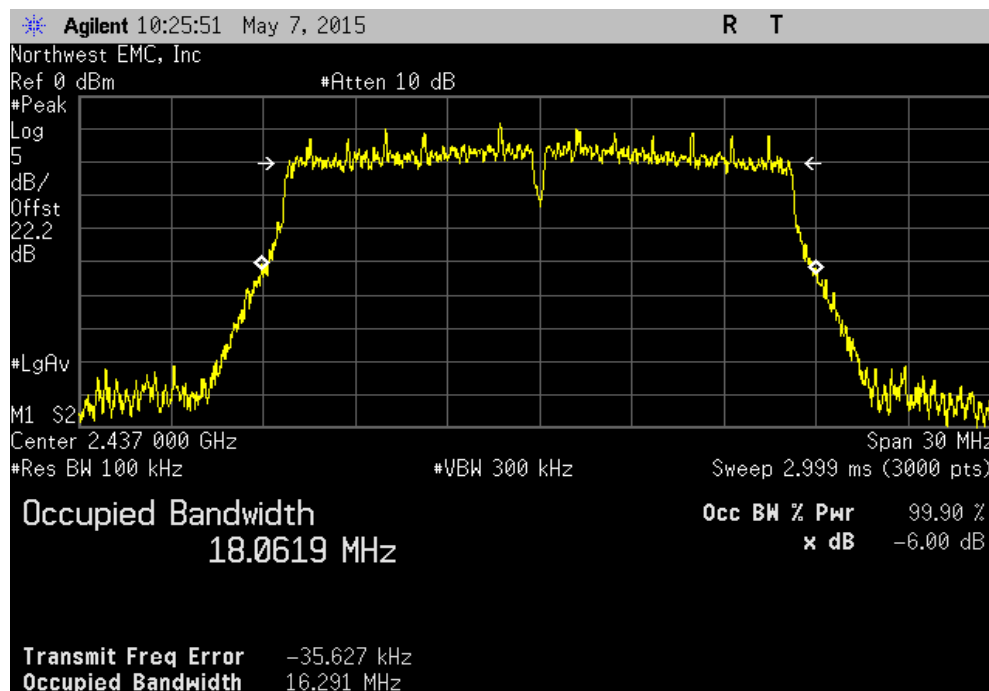
EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit (>) Result
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	16.299 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.291 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	15.712 MHz	500 kHz Pass
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	16.363 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.39 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	16.355 MHz	500 kHz Pass
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	16.196 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.213 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	16.047 MHz	500 kHz Pass
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	17.459 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	16.971 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.548 MHz	500 kHz Pass
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	15.877 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	15.933 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	15.681 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				16.299 MHz	500 kHz	Pass

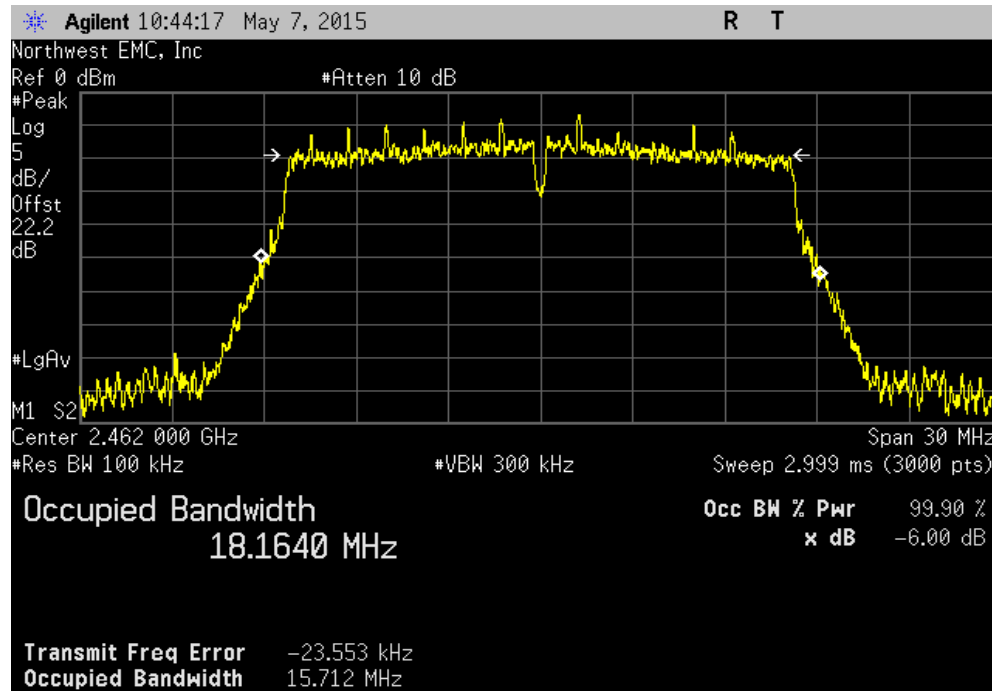


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				16.291 MHz	500 kHz	Pass

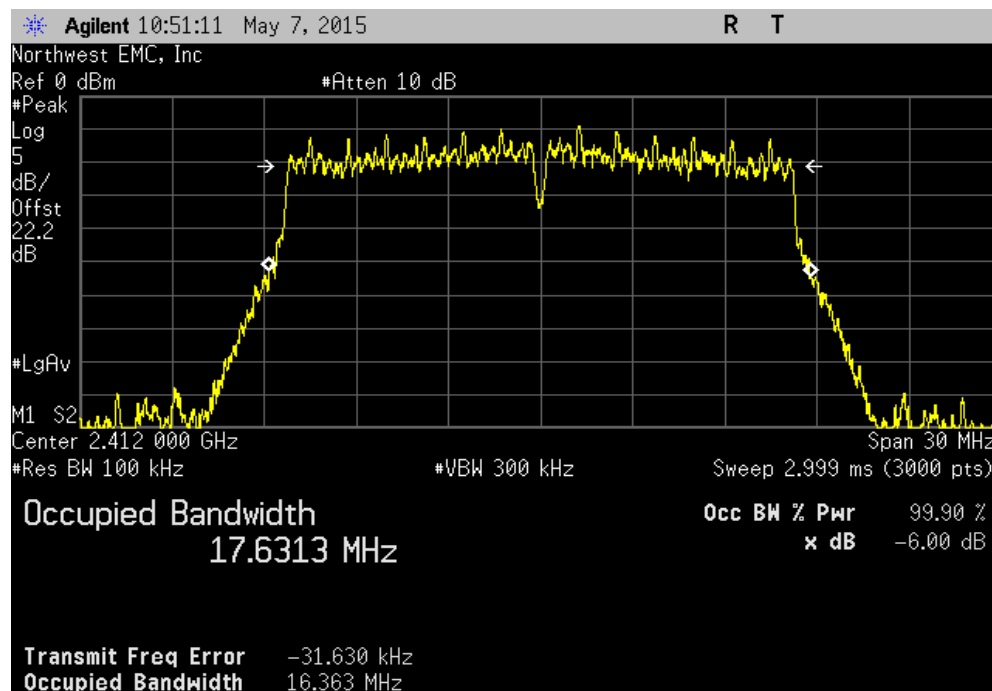


OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				15.712 MHz	500 kHz	Pass

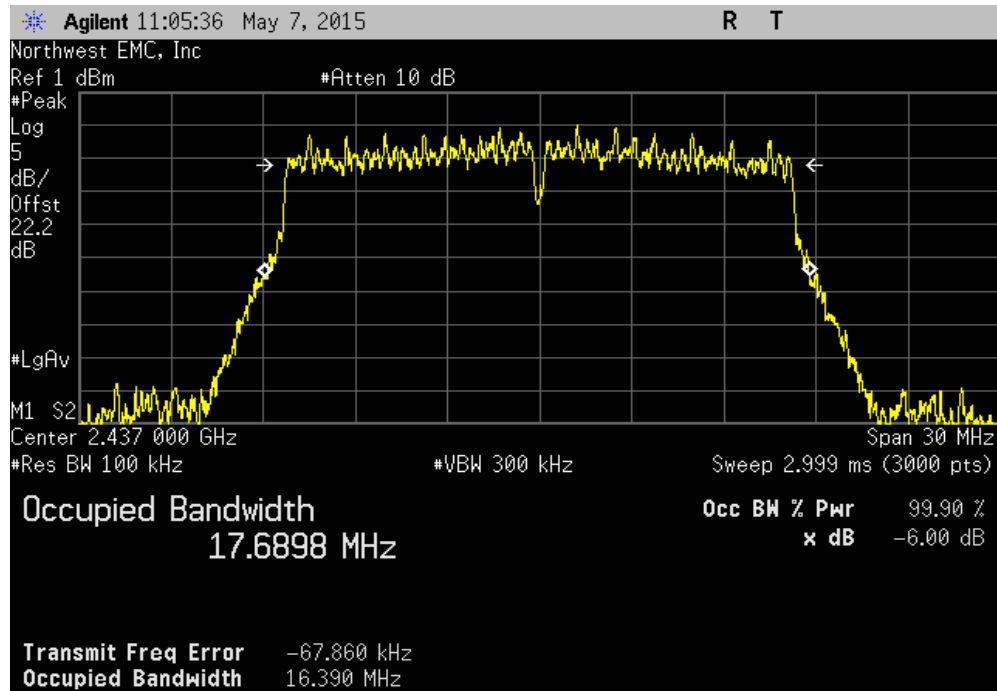


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				16.363 MHz	500 kHz	Pass

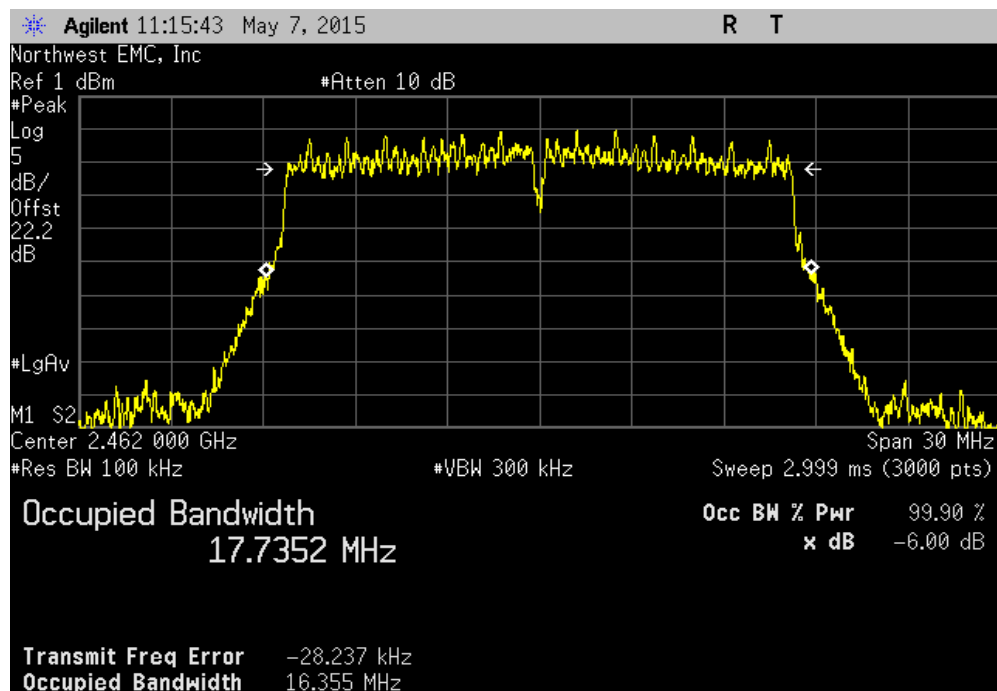


OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.39 MHz	500 kHz	Pass

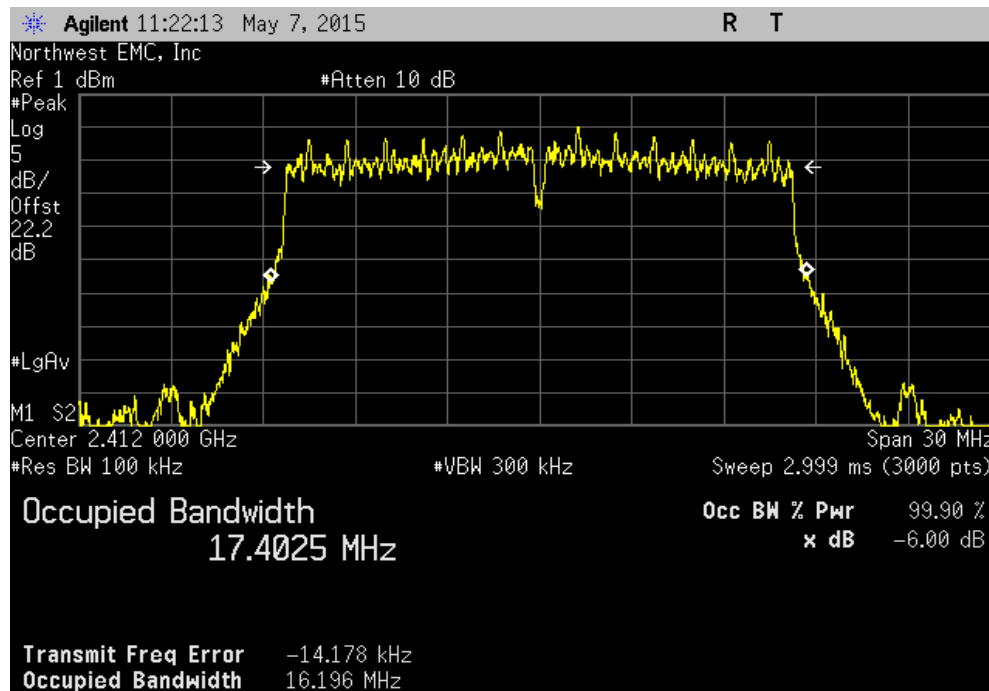


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				16.355 MHz	500 kHz	Pass

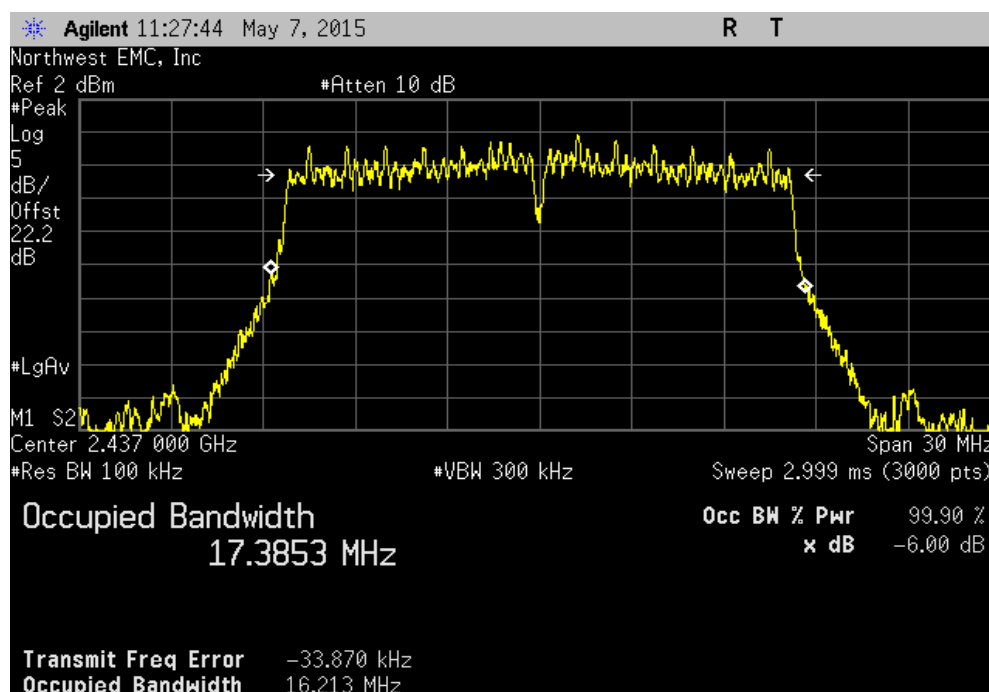


OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				16.196 MHz	500 kHz	Pass

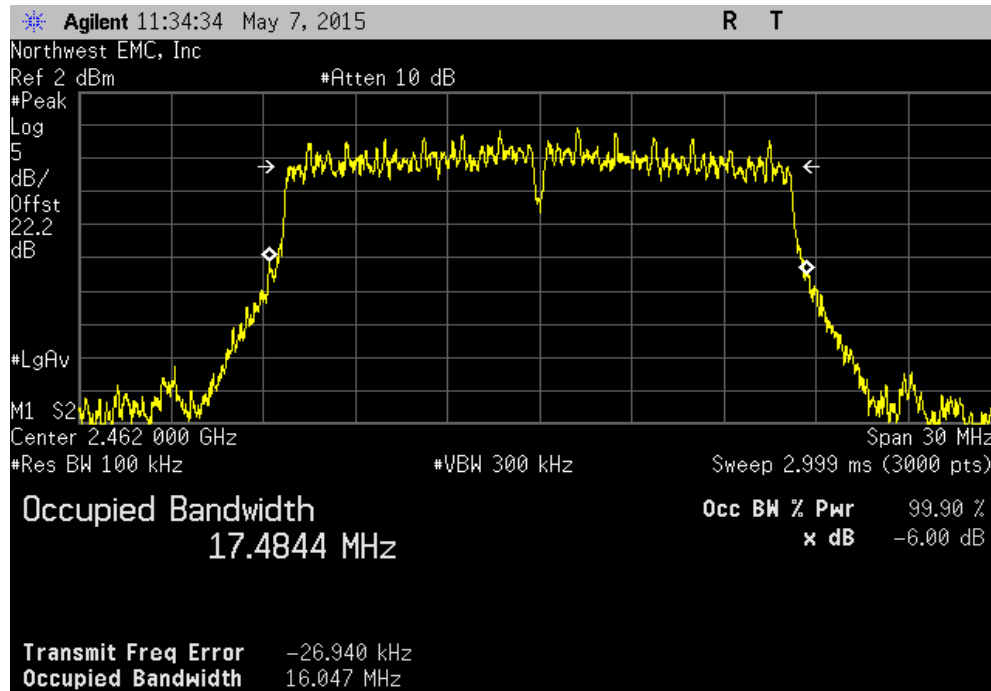


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				16.213 MHz	500 kHz	Pass

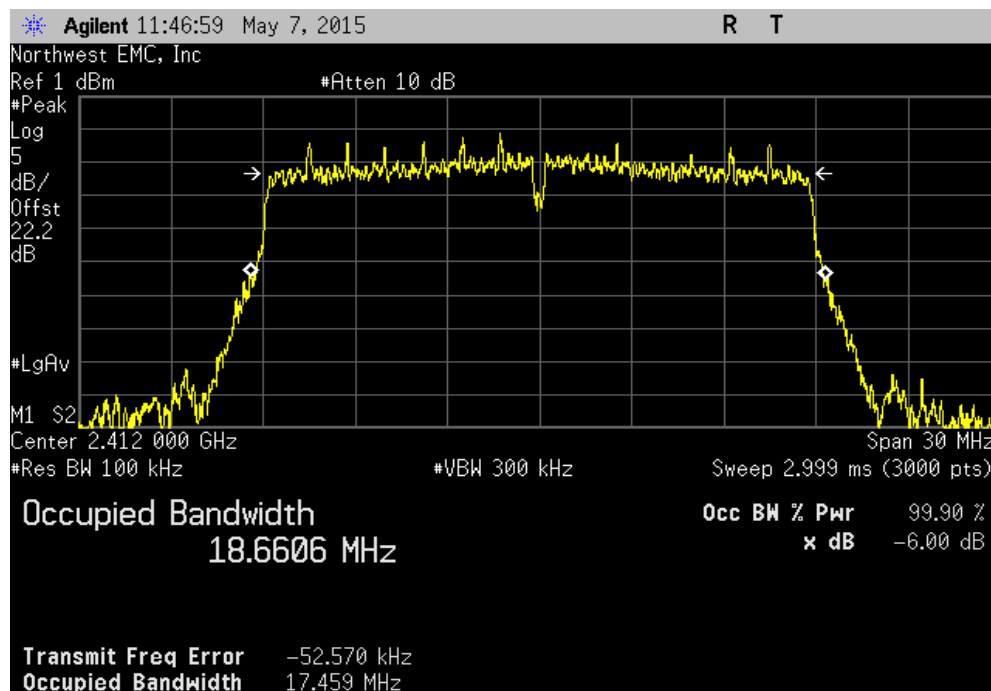


OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				16.047 MHz	500 kHz	Pass

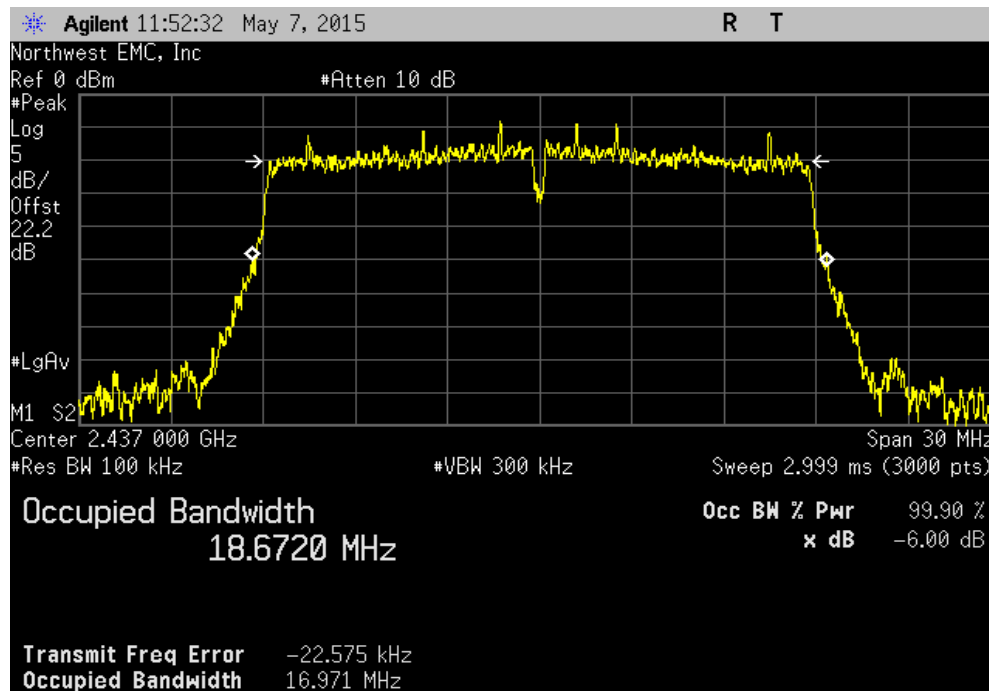


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				17.459 MHz	500 kHz	Pass

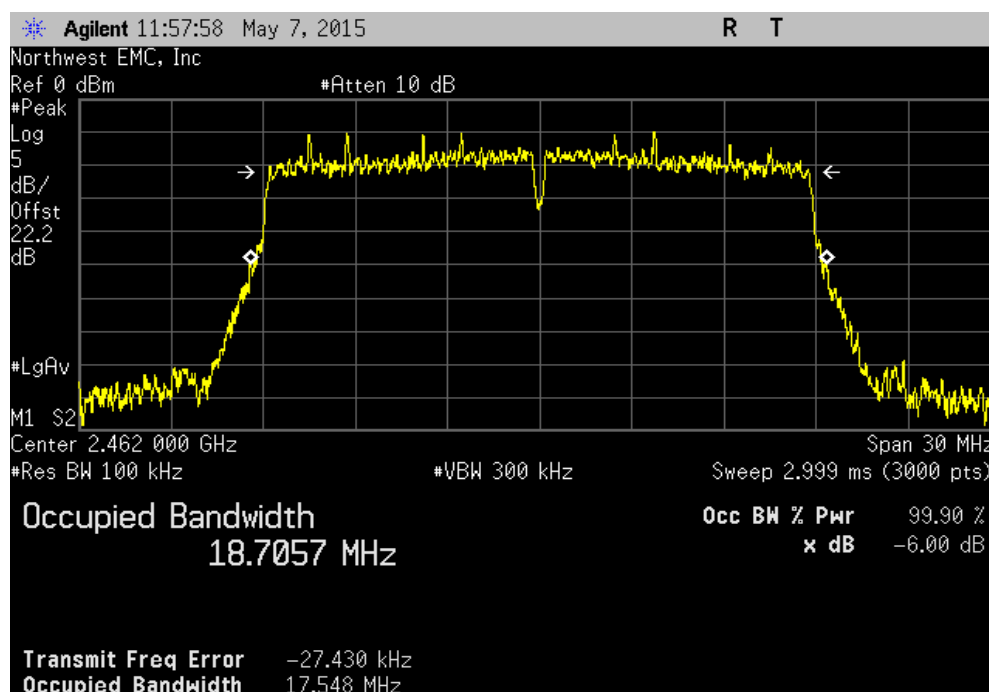


OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit (>)	Result
				16.971 MHz	500 kHz	Pass



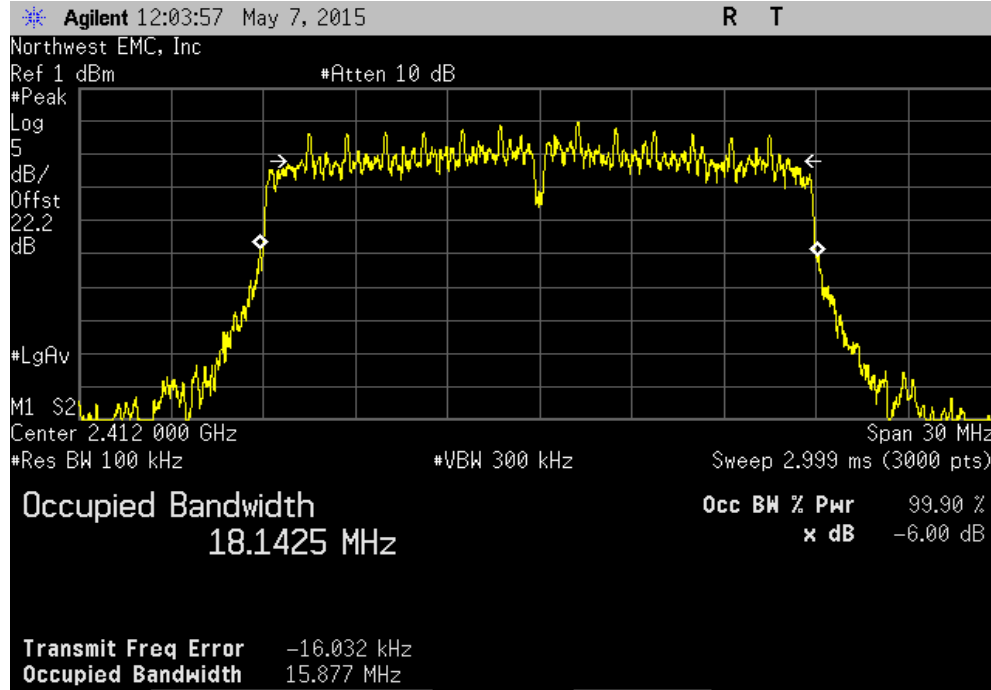
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit (>)	Result
				17.548 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

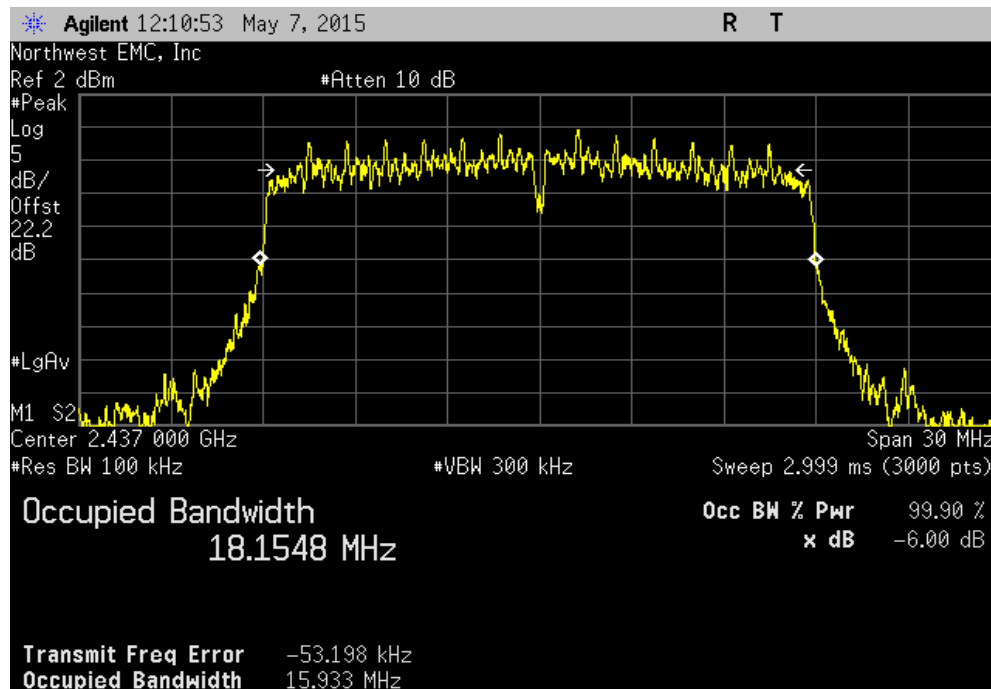
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

	Value	Limit (>)	Result
	15.877 MHz	500 kHz	Pass



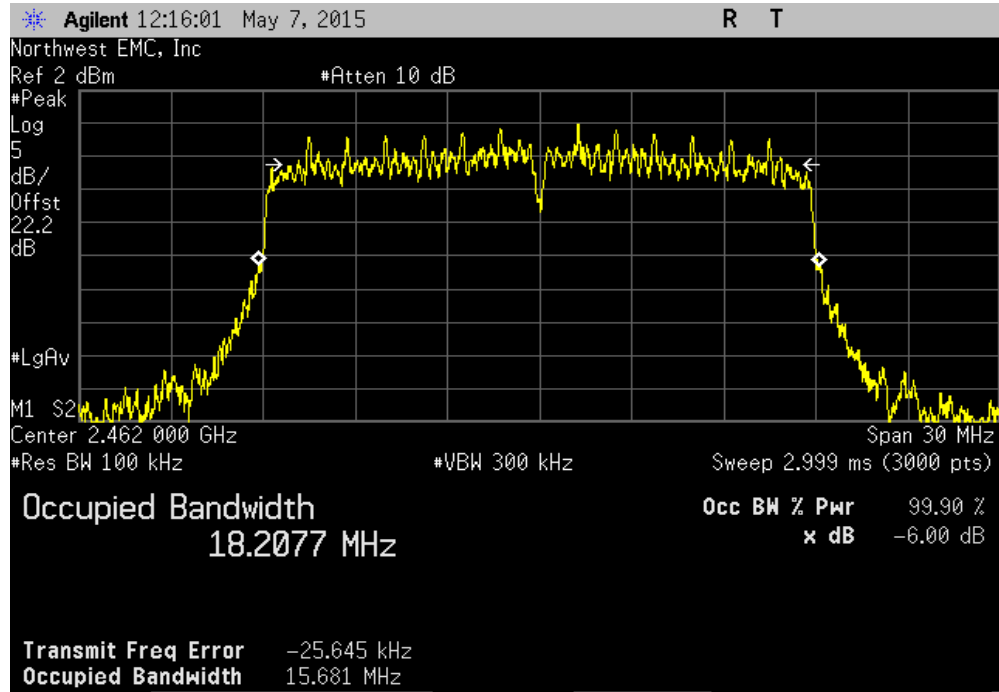
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz

	Value	Limit (>)	Result
	15.933 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value				Limit	Result	
				(>)		
15.681 MHz				500 kHz	Pass	



OUTPUT 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 (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

TEST DESCRIPTION

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. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The channel power integration method found in KDB 558074 DTS D01 Measurement Section 9.1.2 was used because the DTS Bandwidth of the radio was greater than the RBW on the analyzer.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

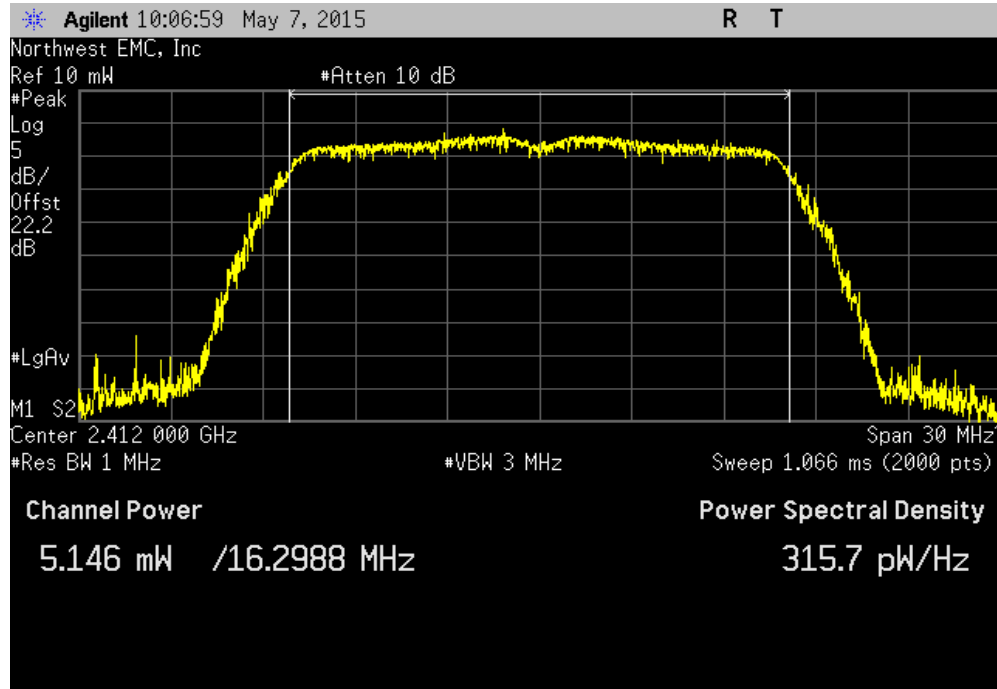
OUTPUT POWER

EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit (<)
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	5.146 mW	1 W
	Mid Channel 6, 2437 MHz	5.779 mW	1 W
	High Channel 11, 2462 MHz	6.428 mW	1 W
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	5.764 mW	1 W
	Mid Channel 6, 2437 MHz	6.893 mW	1 W
	High Channel 11, 2462 MHz	6.94 mW	1 W
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	6.201 mW	1 W
	Mid Channel 6, 2437 MHz	7.27 mW	1 W
	High Channel 11, 2462 MHz	7.161 mW	1 W
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	4.791 mW	1 W
	Mid Channel 6, 2437 MHz	5.739 mW	1 W
	High Channel 11, 2462 MHz	6.199 mW	1 W
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	5.535 mW	1 W
	Mid Channel 6, 2437 MHz	6.592 mW	1 W
	High Channel 11, 2462 MHz	6.565 mW	1 W

OUTPUT POWER

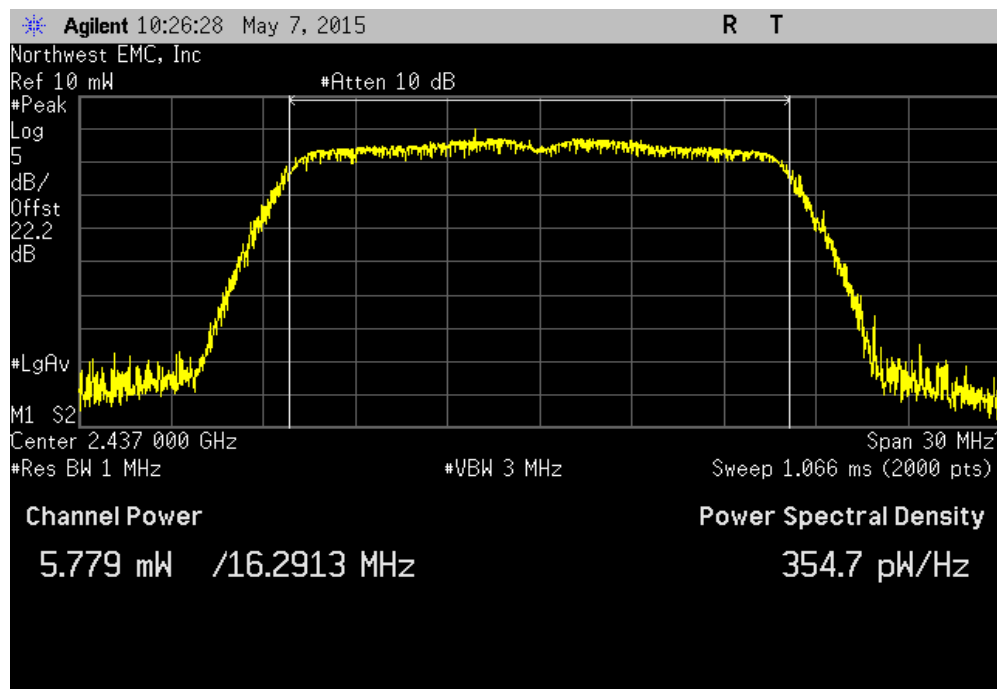
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz

	Value	Limit	Result
	5.146 mW	1 W	Pass



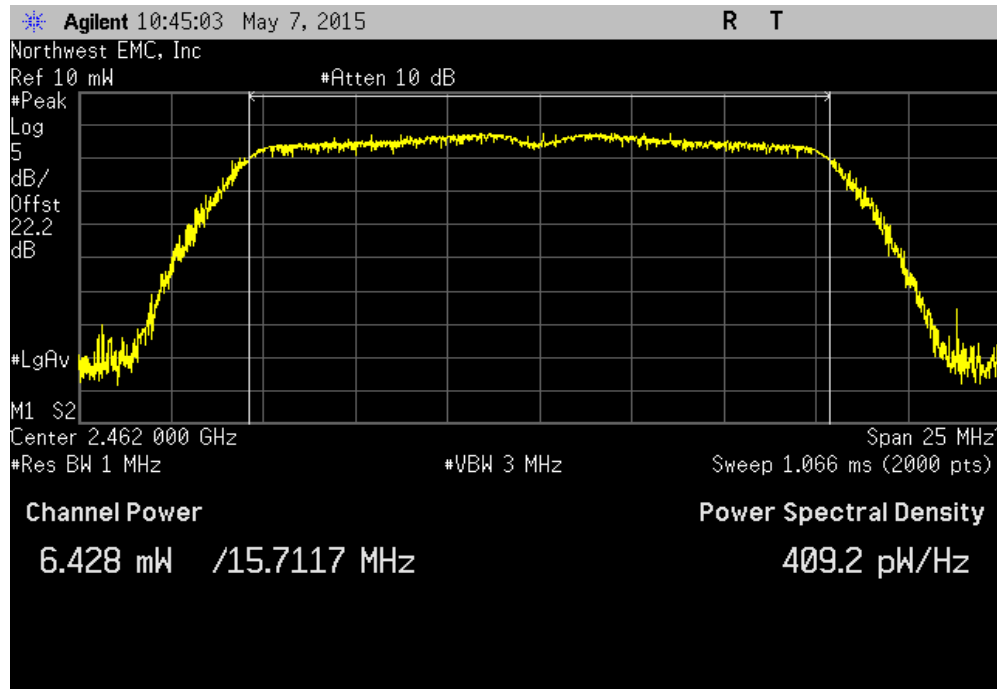
2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	5.779 mW	1 W	Pass

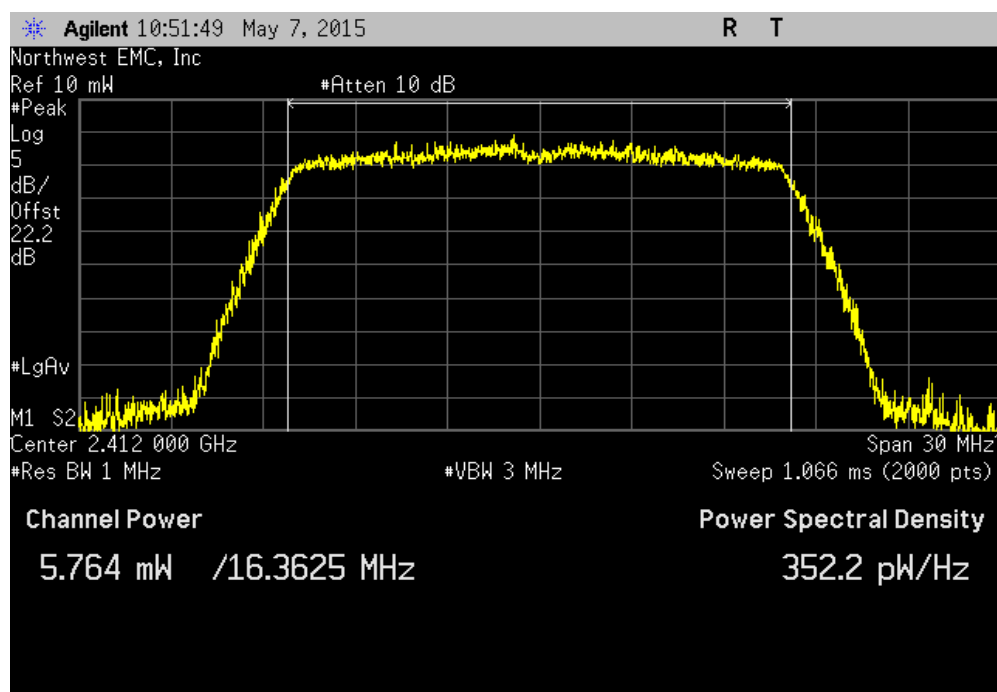


OUTPUT POWER

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				6.428 mW	1 W	Pass



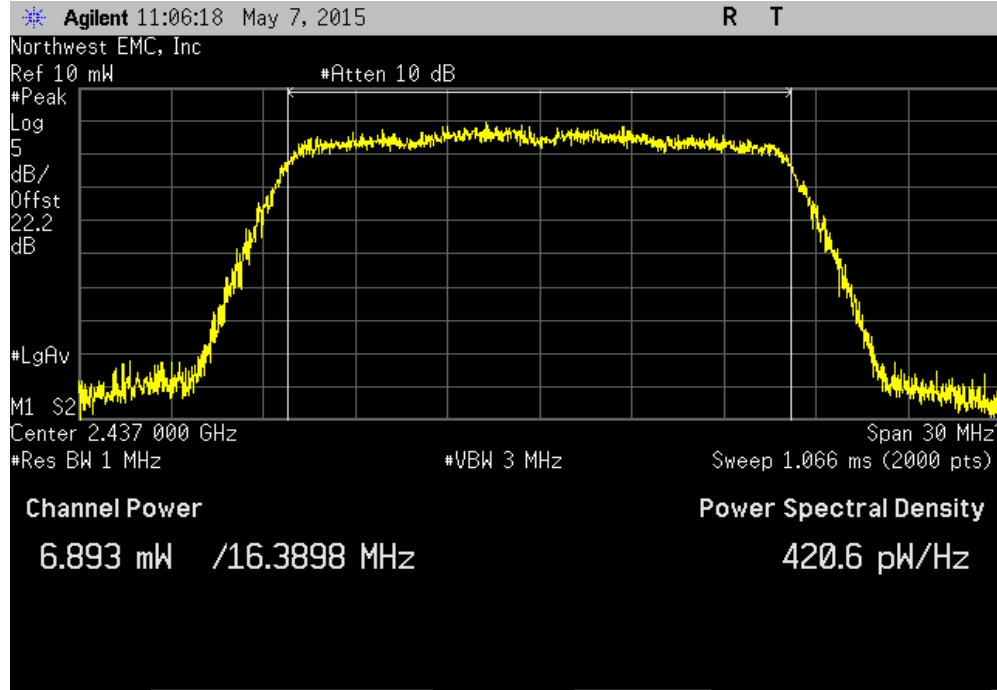
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				5.764 mW	1 W	Pass



OUTPUT POWER

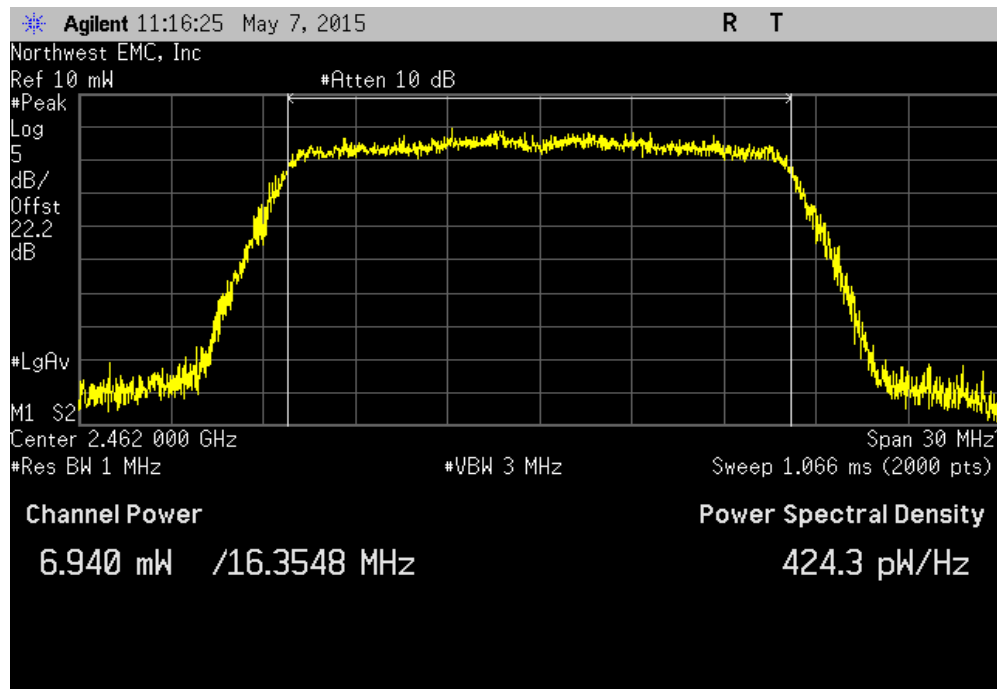
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	6.893 mW	1 W	Pass



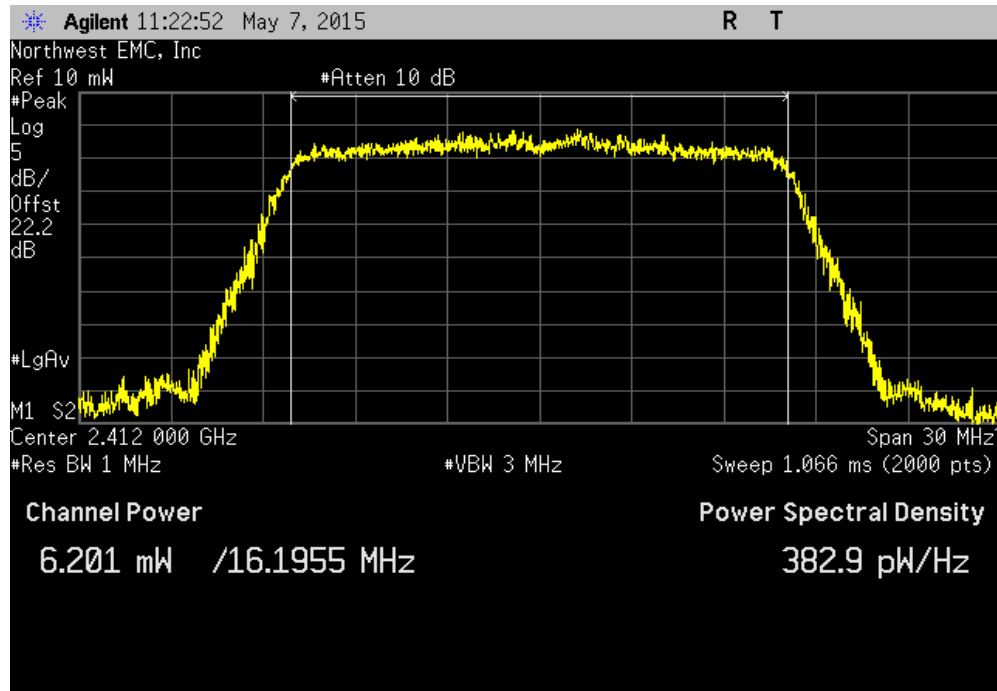
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Result
	6.94 mW	1 W	Pass

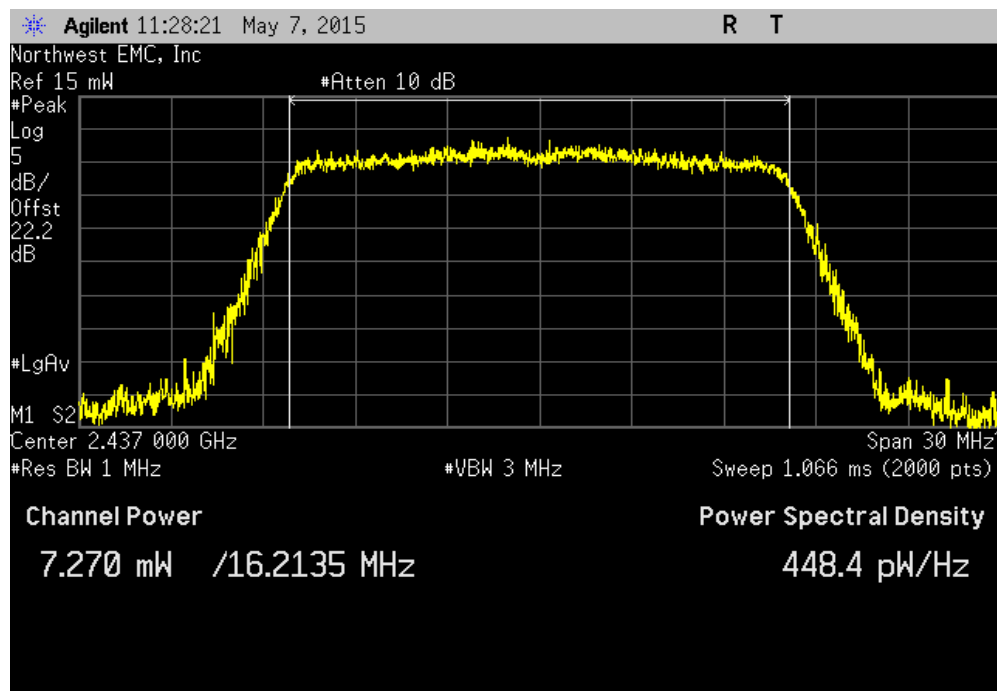


OUTPUT POWER

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				6.201 mW	1 W	Pass

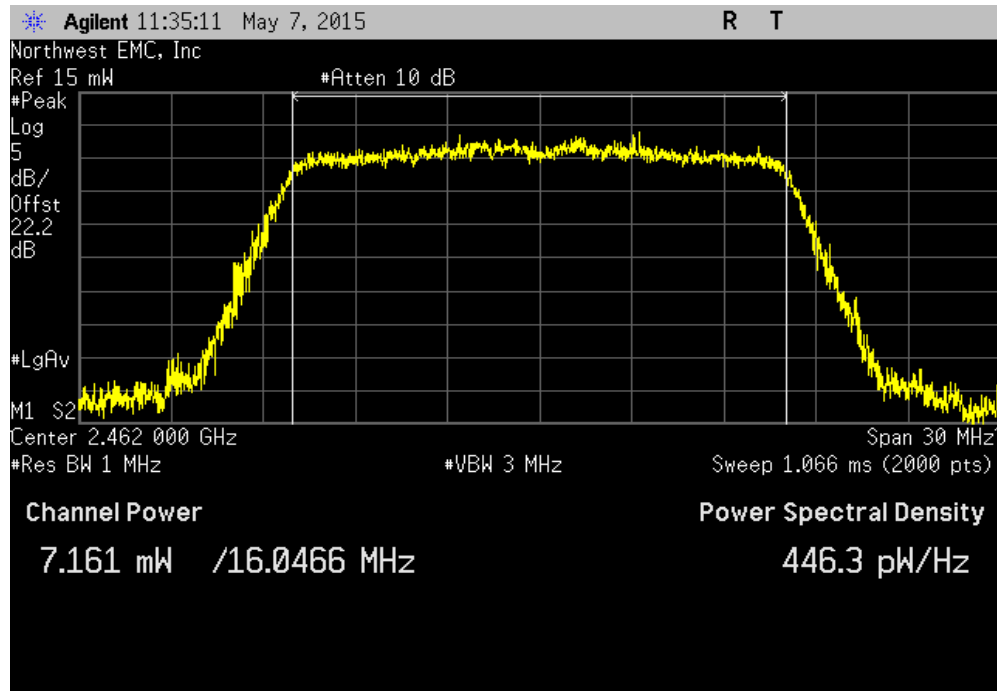


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				7.27 mW	1 W	Pass

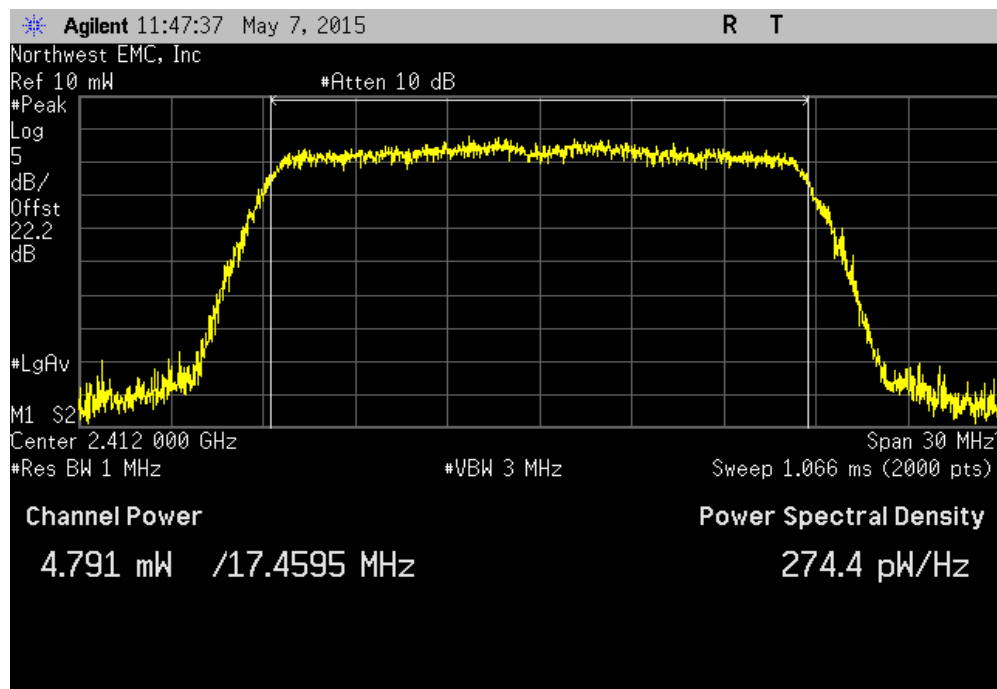


OUTPUT POWER

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				7.161 mW	1 W	Pass

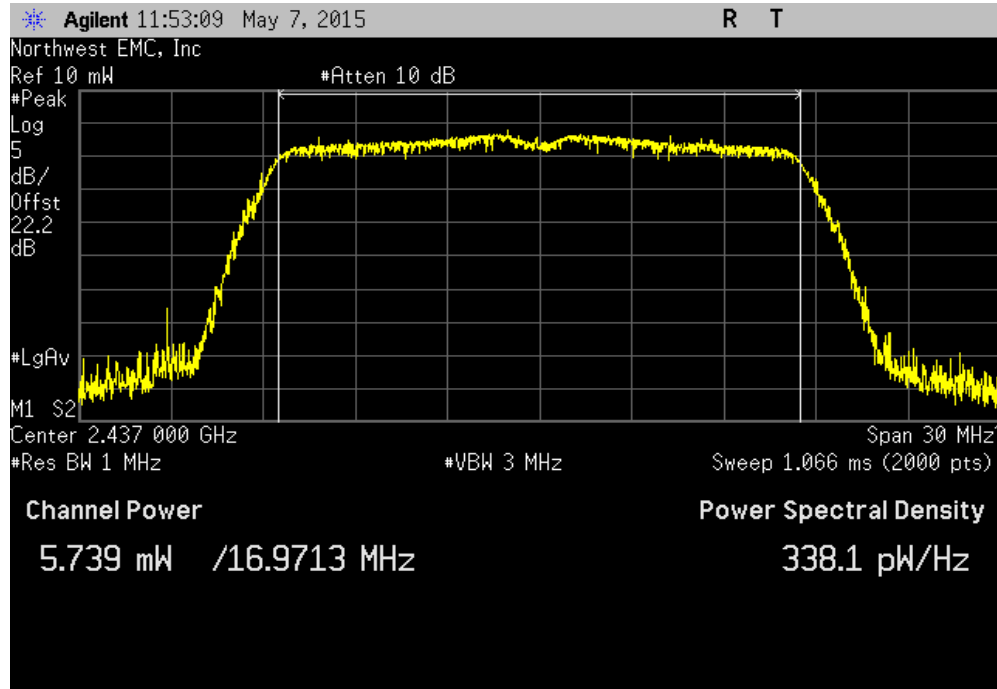


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				4.791 mW	1 W	Pass

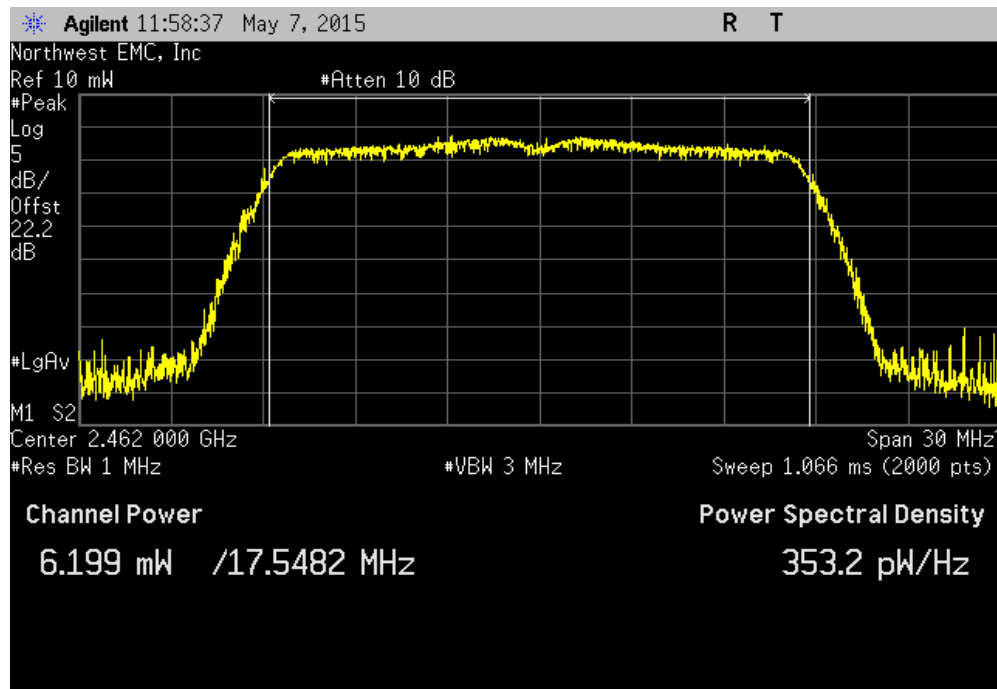


OUTPUT POWER

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				5.739 mW	1 W	Pass



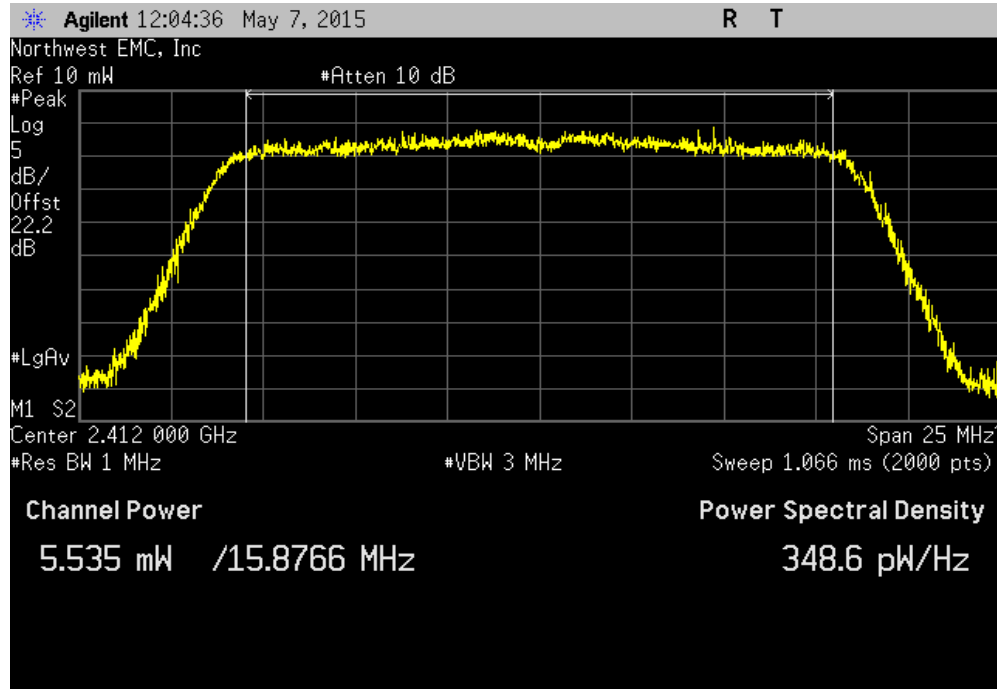
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Result
				6.199 mW	1 W	Pass



OUTPUT POWER

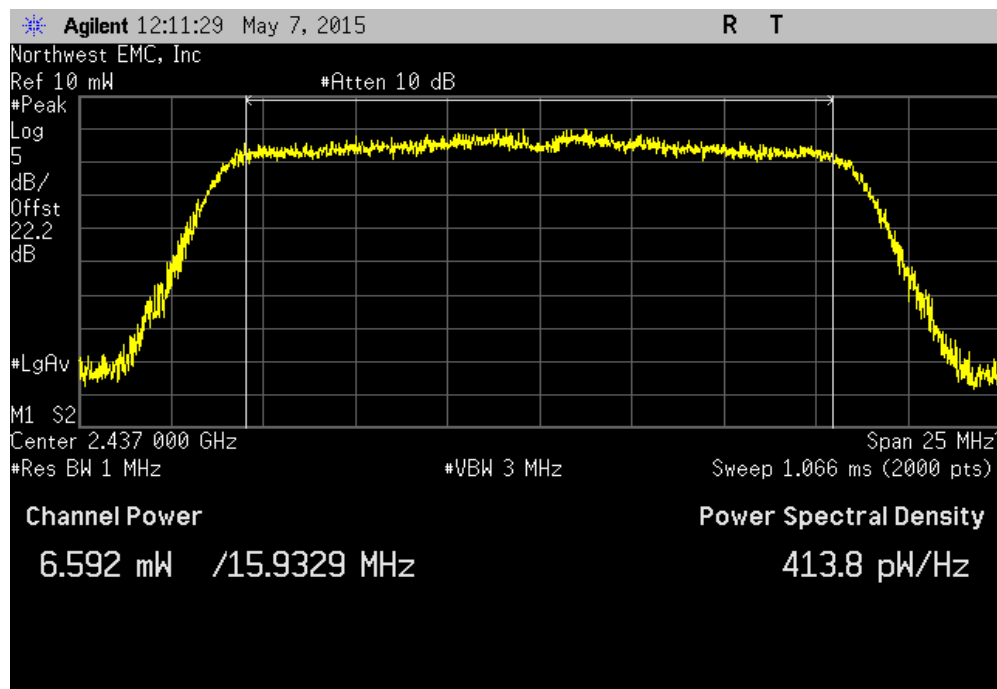
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

	Value	Limit	Result
	5.535 mW	1 W	Pass



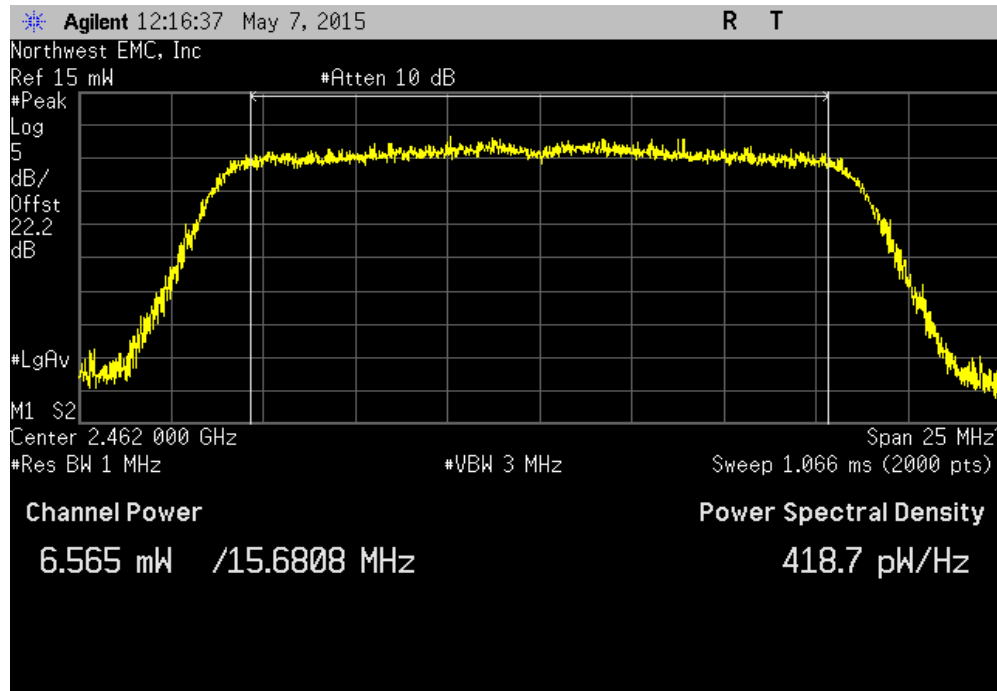
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	6.592 mW	1 W	Pass



OUTPUT POWER

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value	Limit	Result
				6.565 mW	1 W	Pass



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 (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

TEST DESCRIPTION

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. 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 lowest, middle, and maximum data rate for each modulation type available.

Per the procedure outlined in FCC KDB 558074 D01 DTS Measurement Section 5.3.1, the spectrum analyzer was used as follows:

- RBW = 100 kHz
- VBW = 300 kHz
- Detector = Peak (to match method used for power measurement)
- Trace = Max hold

The observed power level is then scaled to an equivalent value in 3 kHz by adding a Bandwidth Correction Factor (BWCF) where:

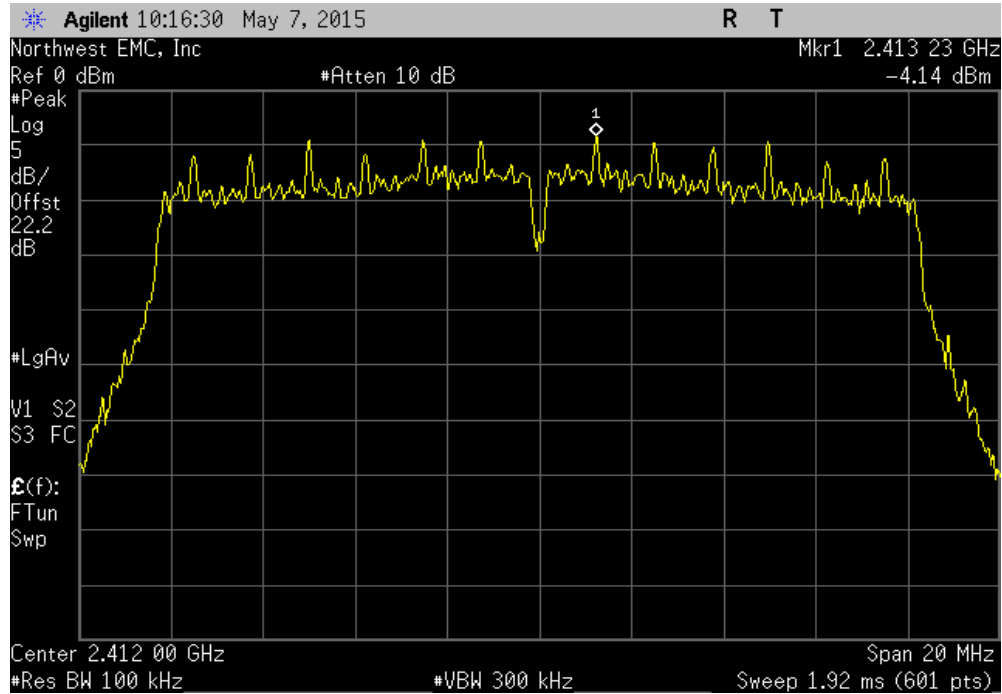
$$\text{BWCF} = 10 \cdot \log(3 \text{ kHz} / 100 \text{ kHz}) = -15.2 \text{ dB}$$

POWER SPECTRAL DENSITY

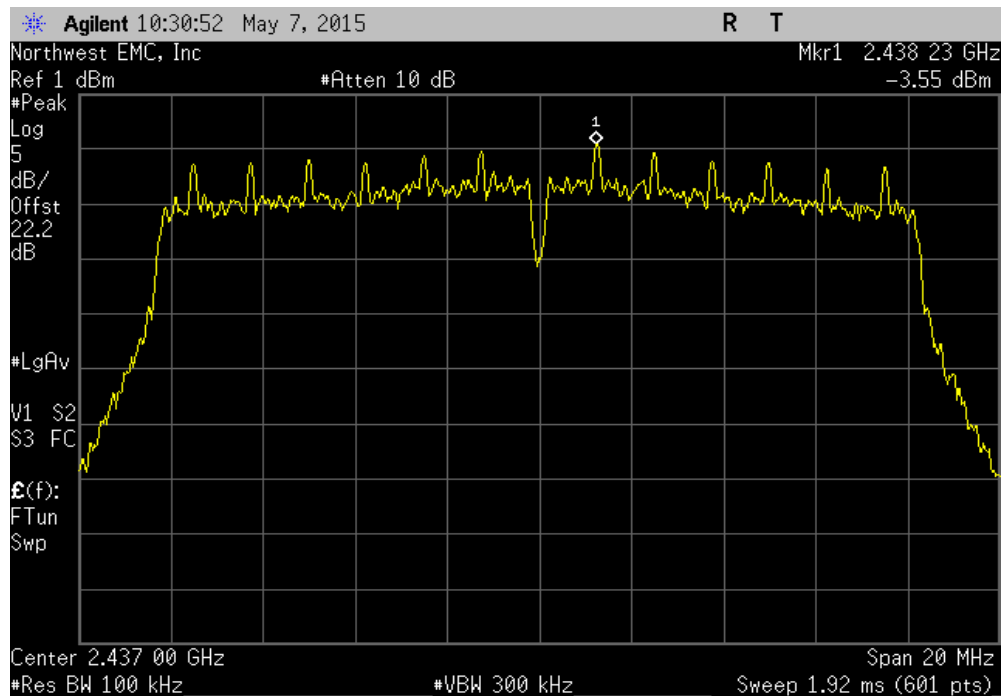
EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value dBm/100kHz	Limit dBm/3kHz
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	-4.14	8
	Mid Channel 6, 2437 MHz	-3.552	8
	High Channel 11, 2462 MHz	-3.43	8
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	-4.304	8
	Mid Channel 6, 2437 MHz	-3.644	8
	High Channel 11, 2462 MHz	-3.54	8
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	-4.009	8
	Mid Channel 6, 2437 MHz	-3.358	8
	High Channel 11, 2462 MHz	-3.203	8
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	-4.21	8
	Mid Channel 6, 2437 MHz	-3.55	8
	High Channel 11, 2462 MHz	-3.478	8
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	-3.973	8
	Mid Channel 6, 2437 MHz	-3.361	8
	High Channel 11, 2462 MHz	-3.225	8

POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
		To dBm/3kHz				
	-4.14	-15.2	-19.34	8	Pass	

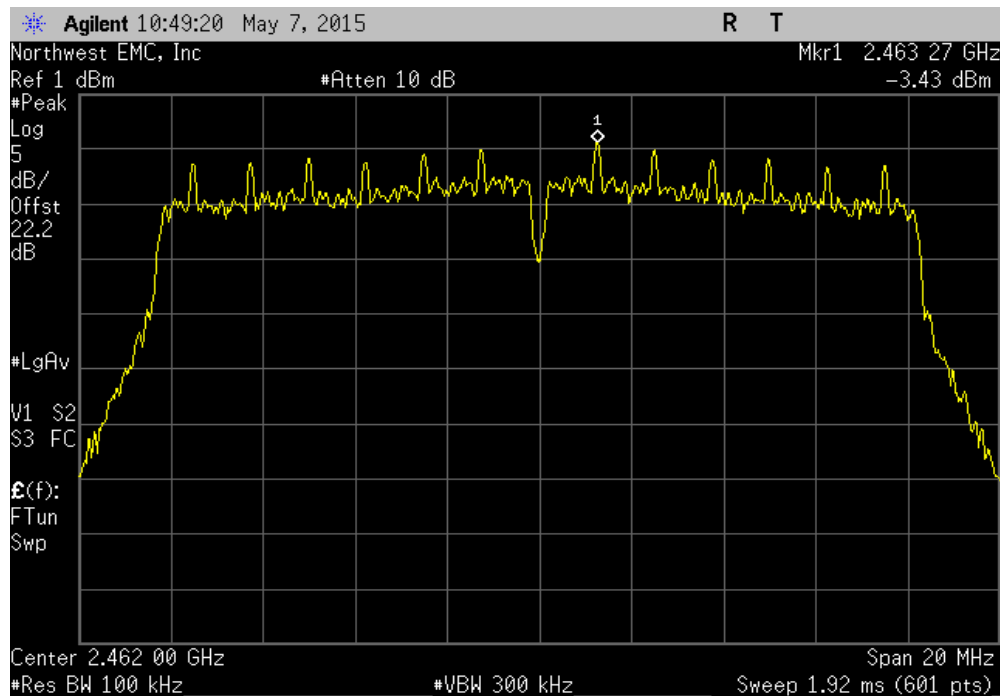


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
		To dBm/3kHz				
	-3.552	-15.2	-18.752	8	Pass	

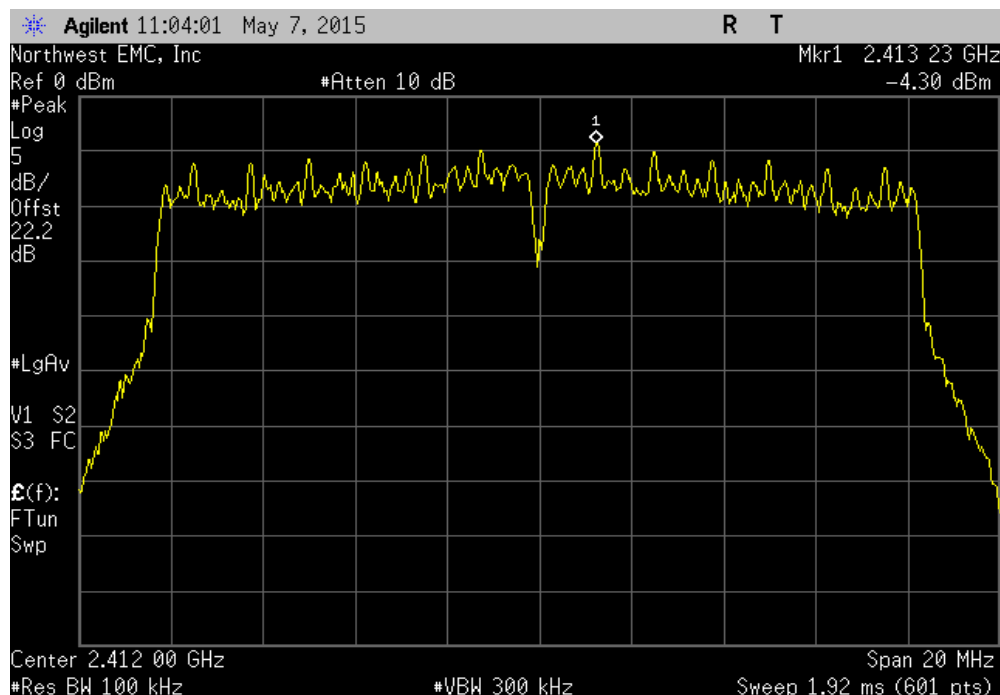


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Results
		-3.43	-15.2	-18.63	8	Pass

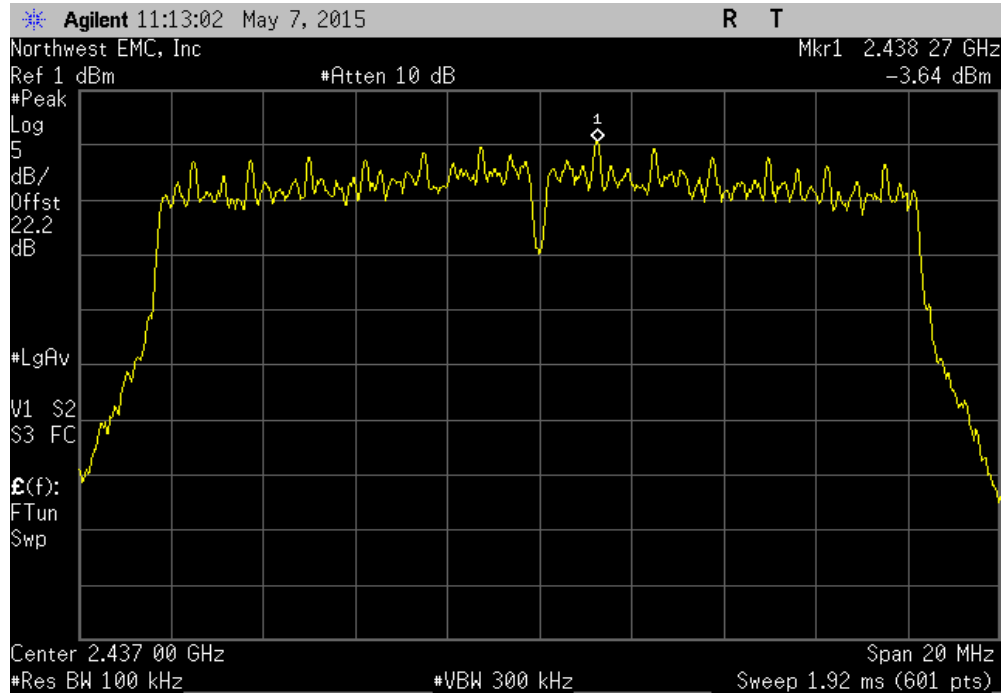


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Results
		-4.304	-15.2	-19.504	8	Pass

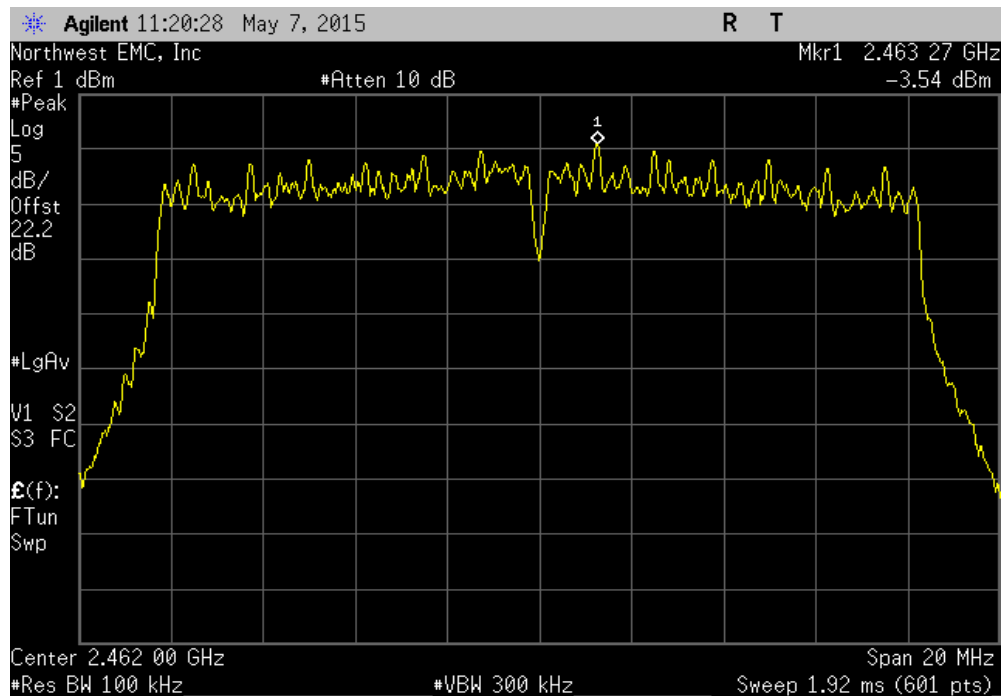


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz					
	Value	dBm/100kHz	Value	Limit	Results
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	-3.644	-15.2	-18.844	8	Pass

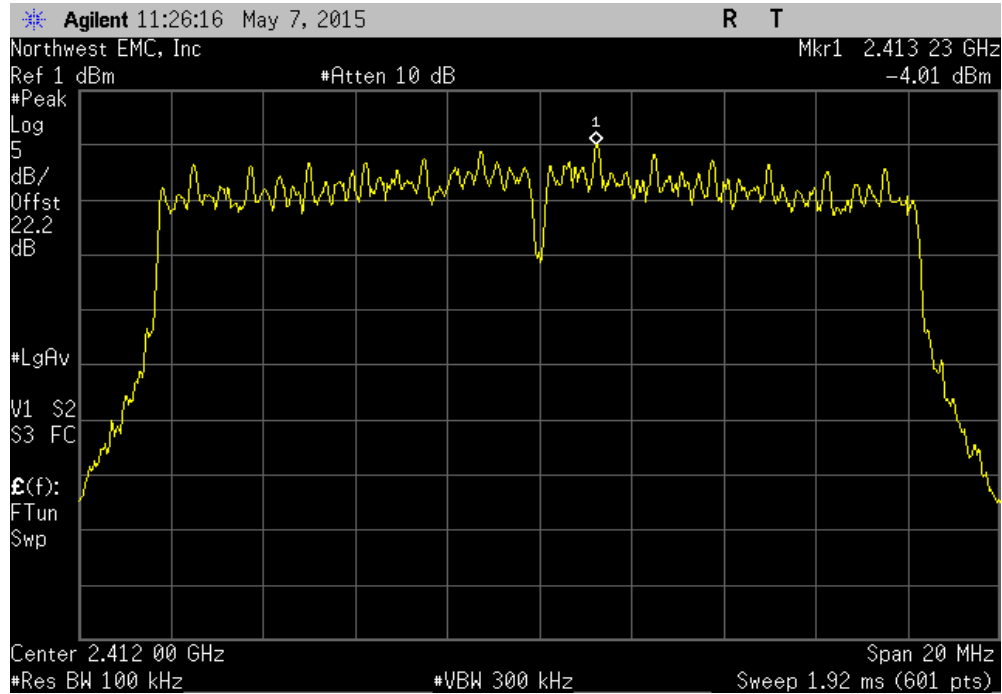


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz					
	Value	dBm/100kHz	Value	Limit	Results
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	-3.54	-15.2	-18.74	8	Pass

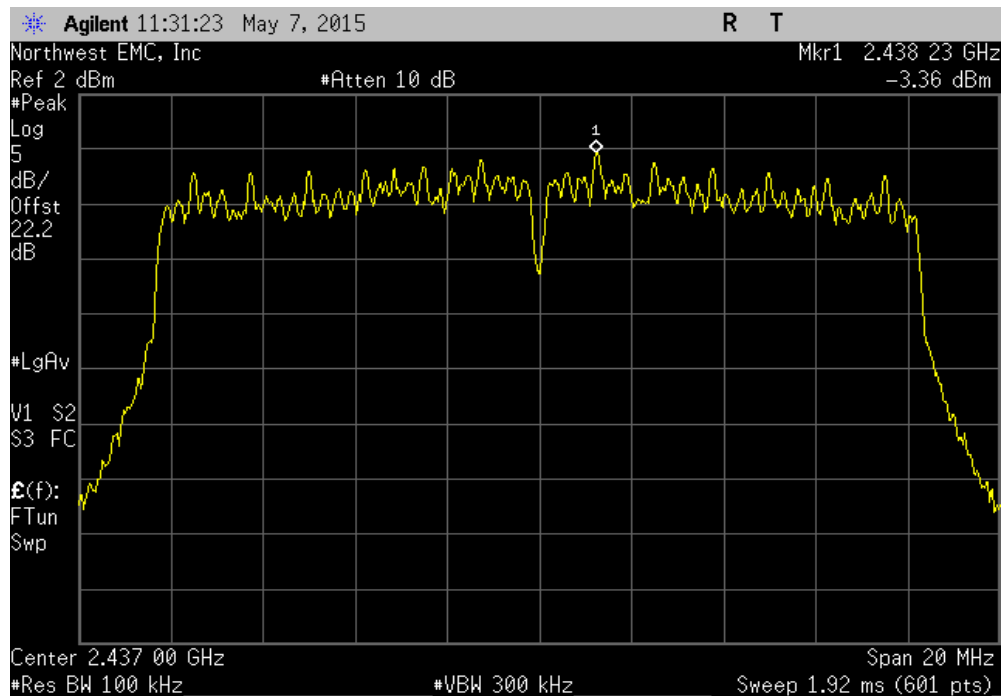


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-4.009	-15.2	-19.209	8	Pass	

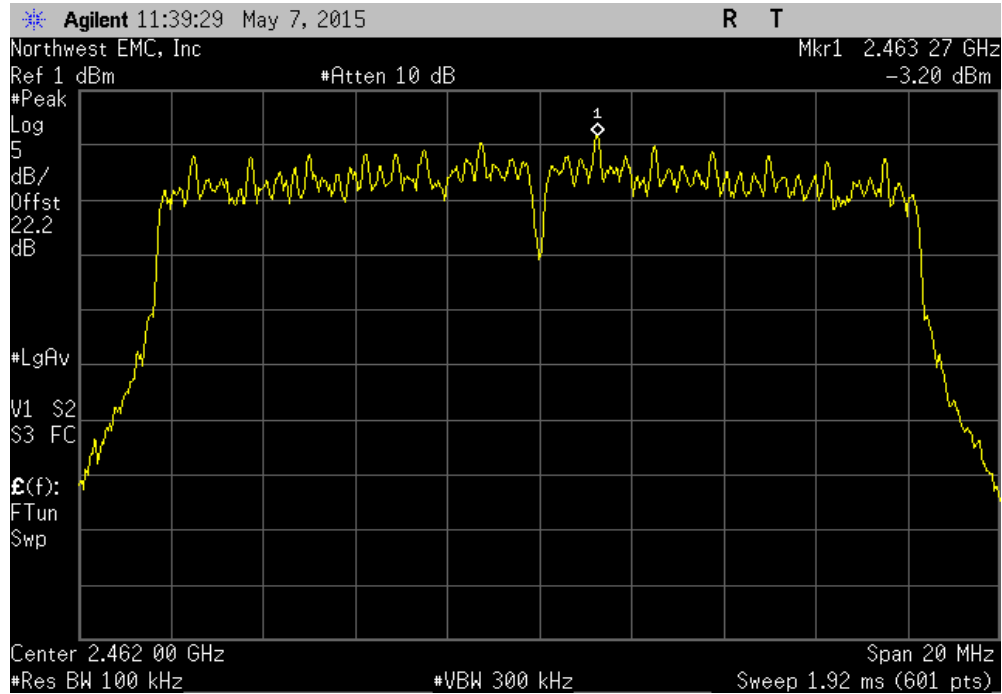


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-3.358	-15.2	-18.558	8	Pass	

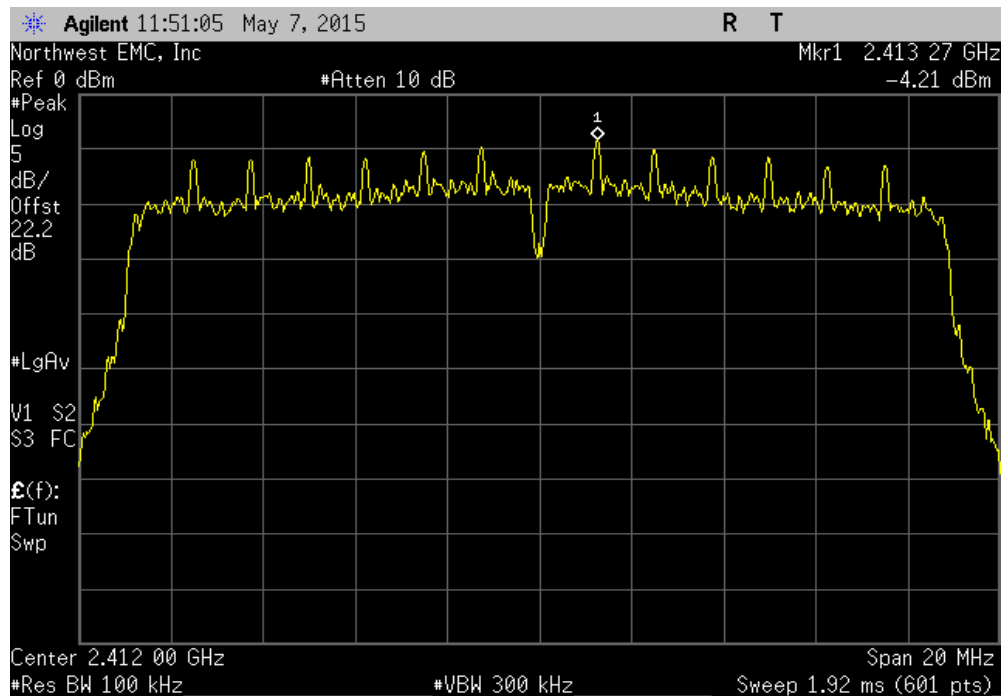


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Results
		-3.203	-15.2	-18.403	8	Pass

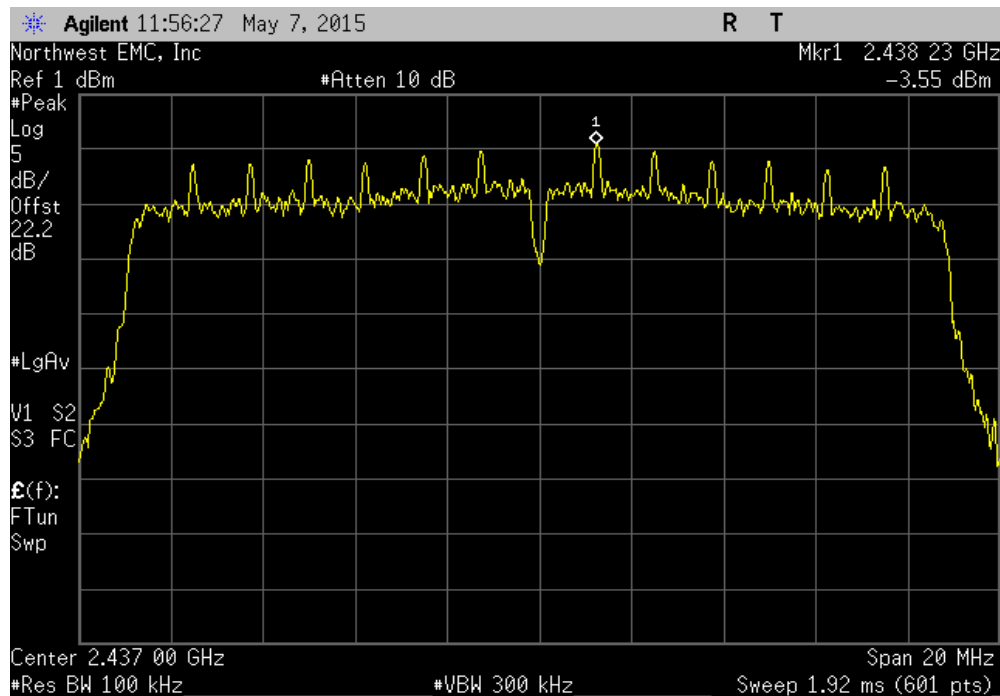


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Results
		-4.21	-15.2	-19.41	8	Pass

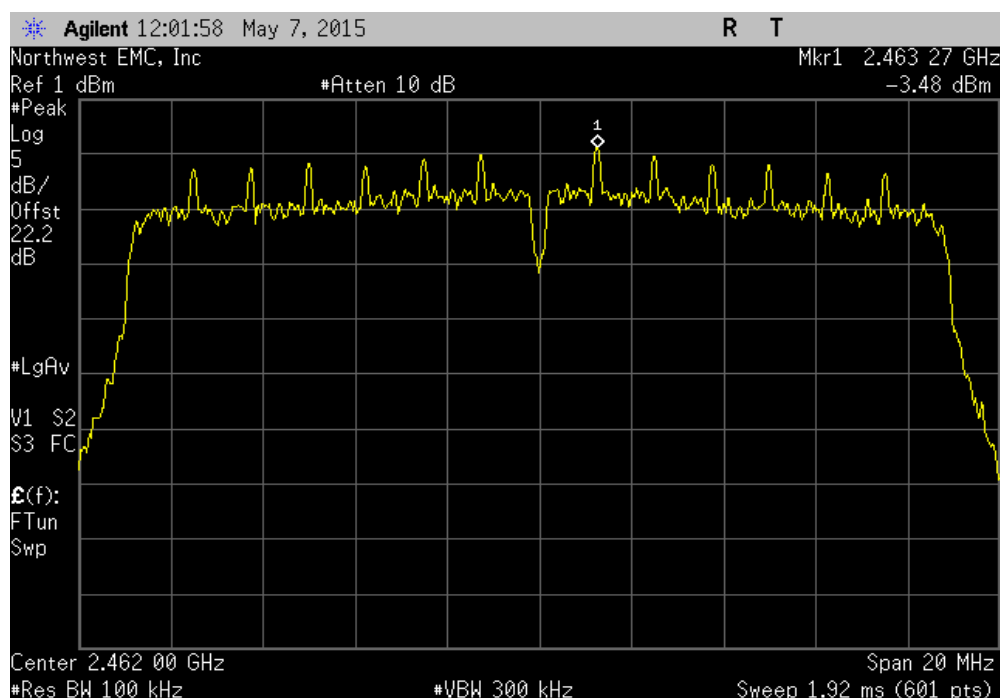


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-3.55	-15.2	-18.75	8	Pass	

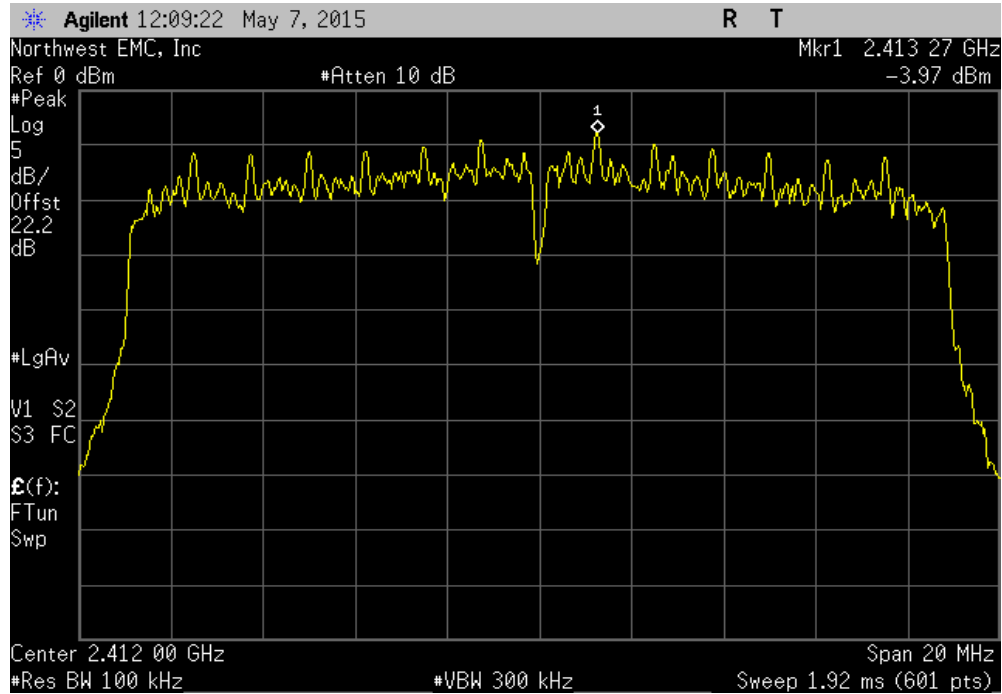


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-3.478	-15.2	-18.678	8	Pass	

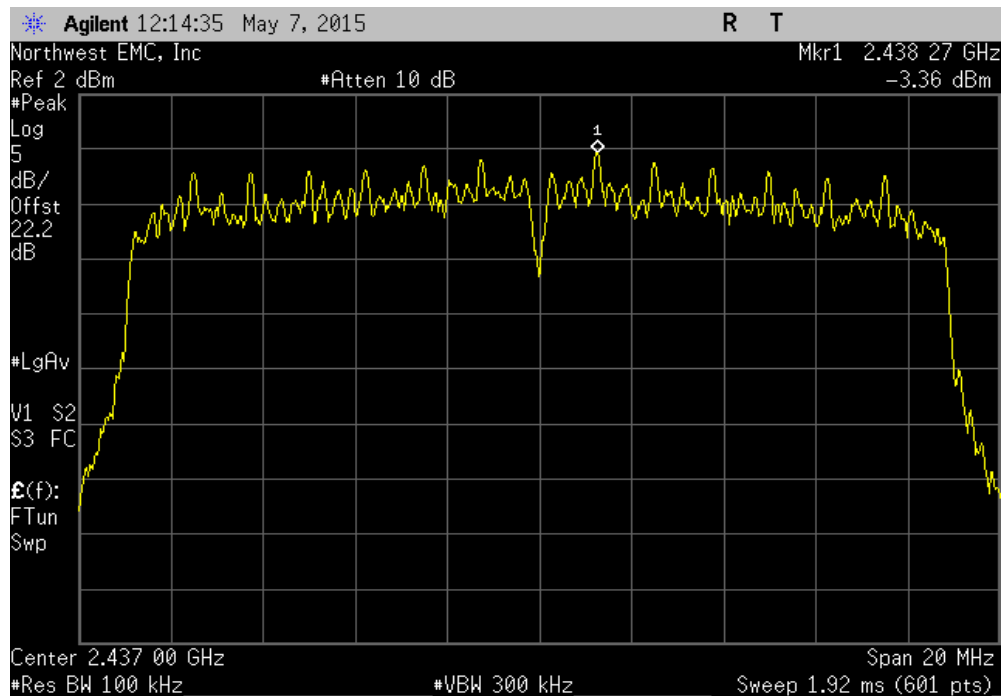


POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz					
	Value	dBm/100kHz	Value	Limit	Results
		To dBm/3kHz			
	-3.973	-15.2	-19.173	8	Pass

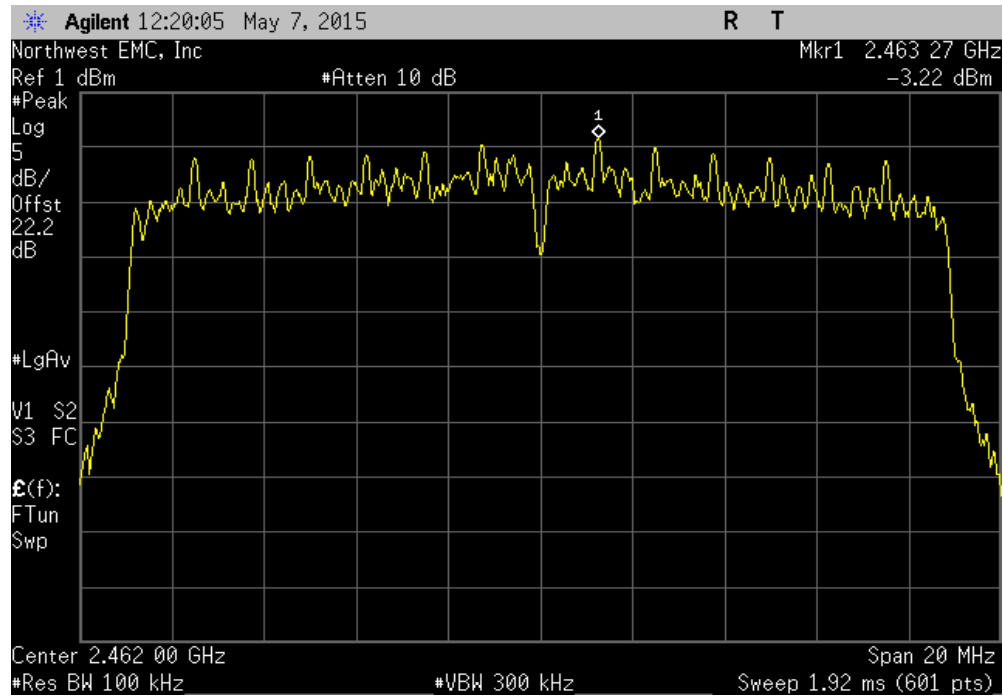


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz					
	Value	dBm/100kHz	Value	Limit	Results
		To dBm/3kHz			
	-3.361	-15.2	-18.561	8	Pass



POWER SPECTRAL DENSITY

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Value	dBm/100kHz	Value	Limit	Results	
		To dBm/3kHz				
	-3.225	-15.2	-18.425	8	Pass	



DUTY CYCLE

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4446A	AAT	6/27/2014	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/9/2014	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/9/2014	12

TEST DESCRIPTION

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

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.

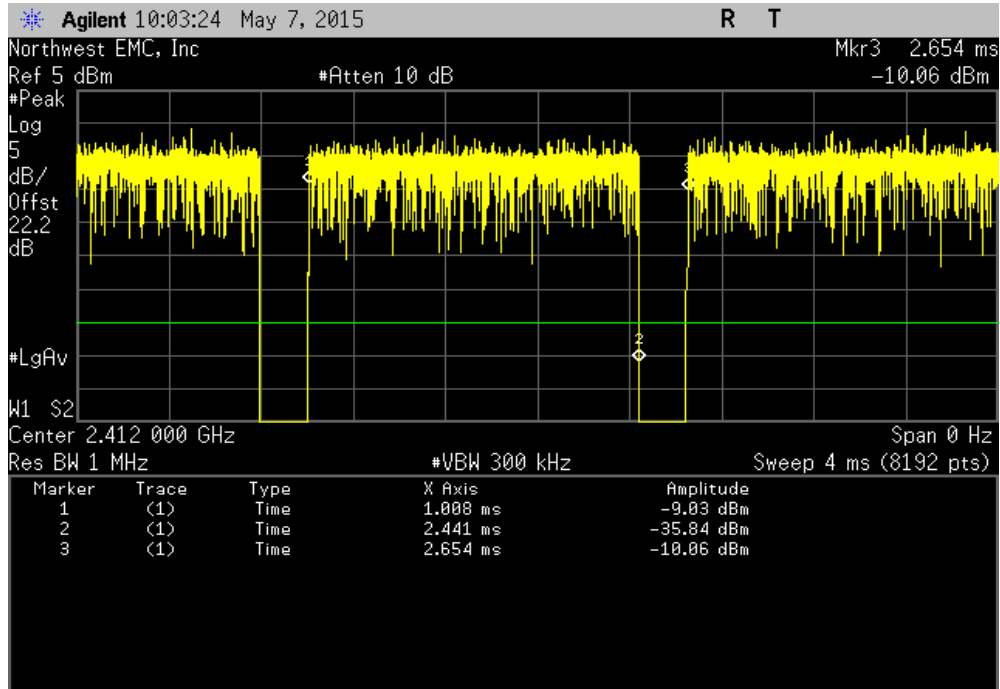
If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.

DUTY CYCLE

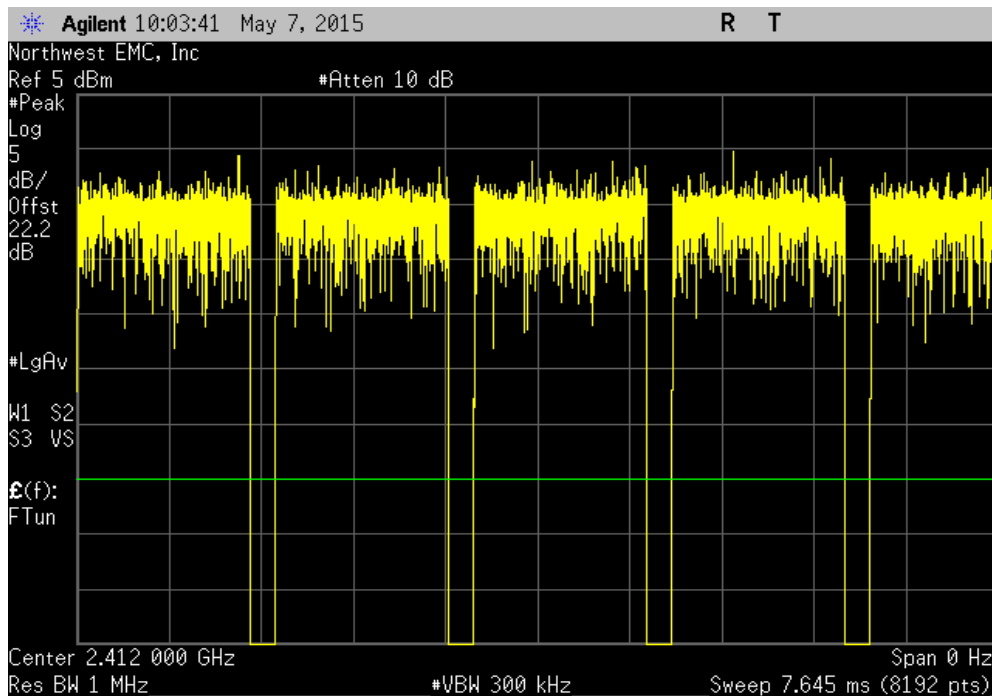
EUT: 1713 USB Radio Device		Work Order: MCSO1731	
Serial Number: EV1-3-00299		Date: 05/07/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: Kitty Tam		Humidity: 39%	
Project: None		Barometric Pres.: 1021 mb	
Tested by: Richard Mellroth		Power: USB	
Job Site: NC02			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
Power Settings set to Default. Client adapter cable loss of 0.75dB added to reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Pulse Width	Period
		Number of Pulses	Value (%)
		Limit (%)	Results
2400 MHz - 2483.5 MHz Band			
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	1.433 ms	1.645 ms
	Low Channel 1, 2412 MHz	N/A	N/A
	Mid Channel 6, 2437 MHz	1.433 ms	1.646 ms
	Mid Channel 6, 2437 MHz	N/A	N/A
	High Channel 11, 2462 MHz	1.432 ms	1.645 ms
	High Channel 11, 2462 MHz	N/A	N/A
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	252.9 us	465.6 us
	Low Channel 1, 2412 MHz	N/A	N/A
	Mid Channel 6, 2437 MHz	252.9 us	465.6 us
	Mid Channel 6, 2437 MHz	N/A	N/A
	High Channel 11, 2462 MHz	252 us	464.9 us
	High Channel 11, 2462 MHz	N/A	N/A
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	172.9 us	385.6 us
	Low Channel 1, 2412 MHz	N/A	N/A
	Mid Channel 6, 2437 MHz	172.9 us	385.5 us
	Mid Channel 6, 2437 MHz	N/A	N/A
	High Channel 11, 2462 MHz	172.9 us	385.5 us
	High Channel 11, 2462 MHz	N/A	N/A
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	1.329 ms	1.541 ms
	Low Channel 1, 2412 MHz	N/A	N/A
	Mid Channel 6, 2437 MHz	1.329 ms	1.542 ms
	Mid Channel 6, 2437 MHz	N/A	N/A
	High Channel 11, 2462 MHz	1.329 ms	1.542 ms
	High Channel 11, 2462 MHz	N/A	N/A
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	148.9 us	361.4 us
	Low Channel 1, 2412 MHz	N/A	N/A
	Mid Channel 6, 2437 MHz	148.9 us	361.4 us
	Mid Channel 6, 2437 MHz	N/A	N/A
	High Channel 11, 2462 MHz	148.9 us	361.6 us
	High Channel 11, 2462 MHz	N/A	N/A

DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.433 ms	1.645 ms	1	87.1	N/A	N/A

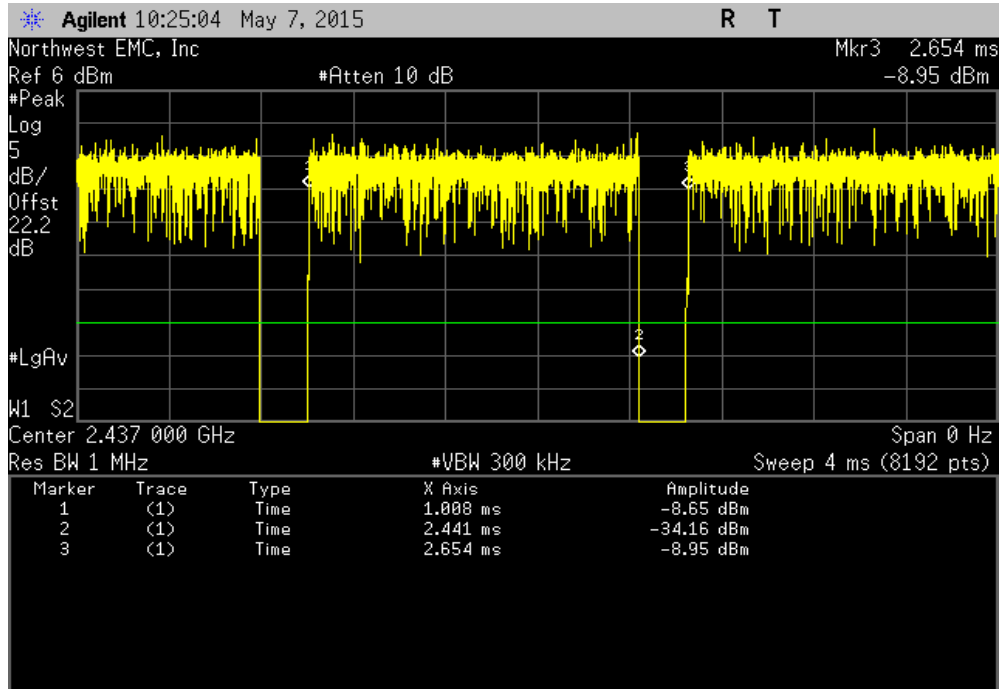


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

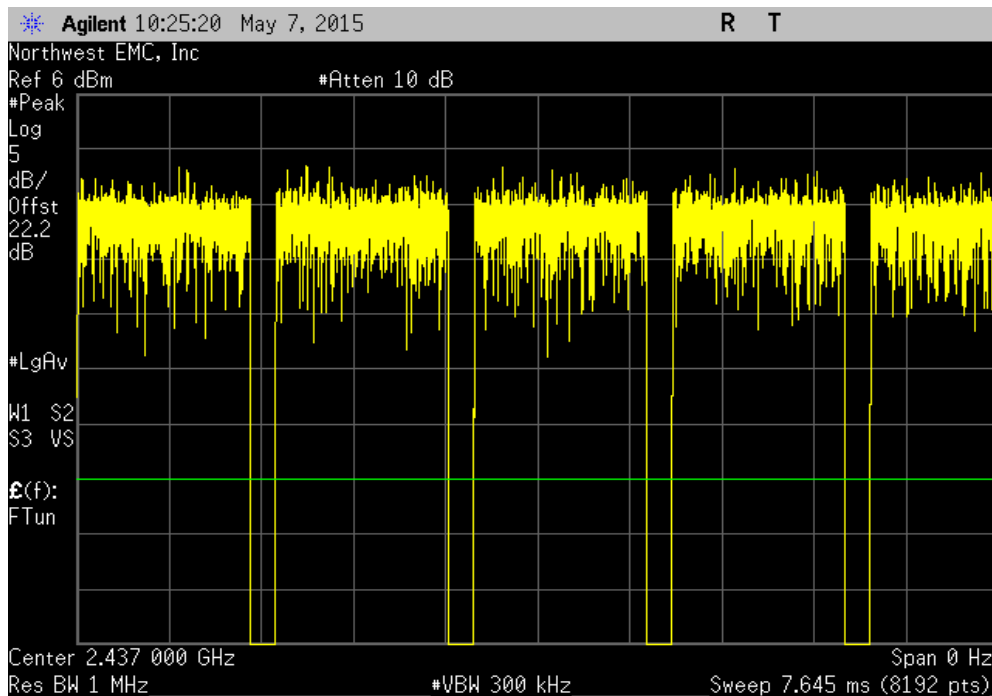


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.433 ms	1.646 ms	1	87.1	N/A	N/A

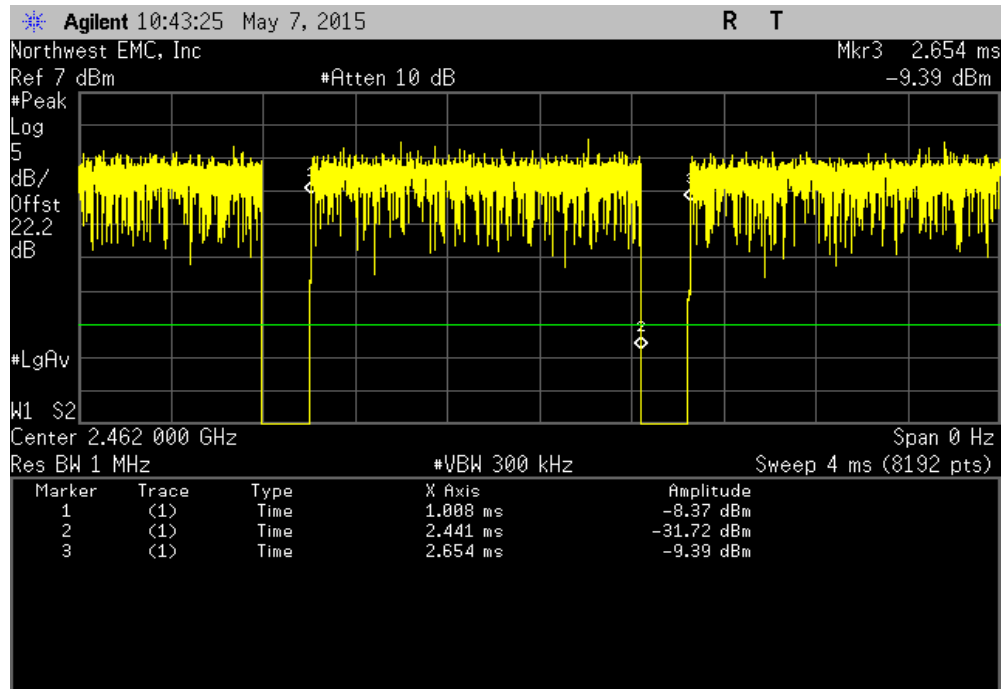


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.432 ms	1.645 ms	1	87.1	N/A	N/A

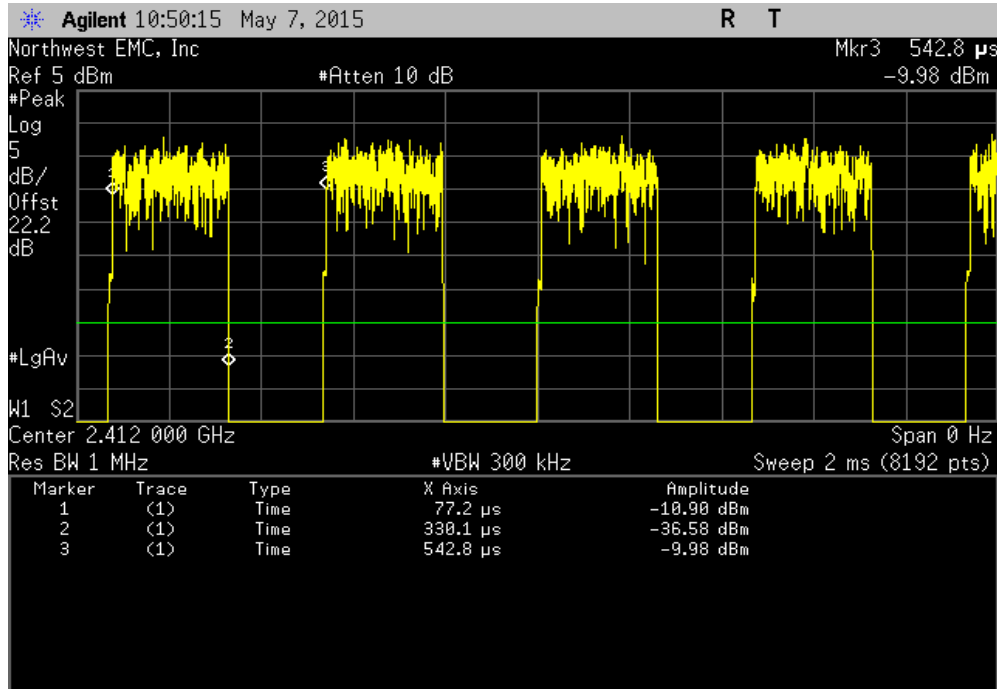


2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

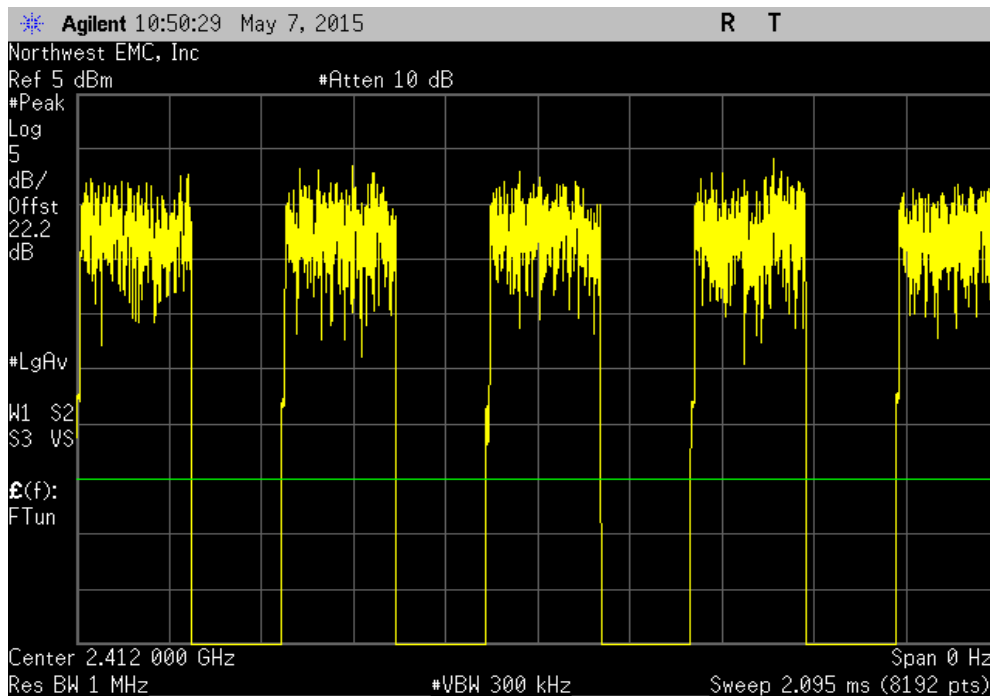


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
252.9 us	465.6 us	1	54.3	N/A	N/A	

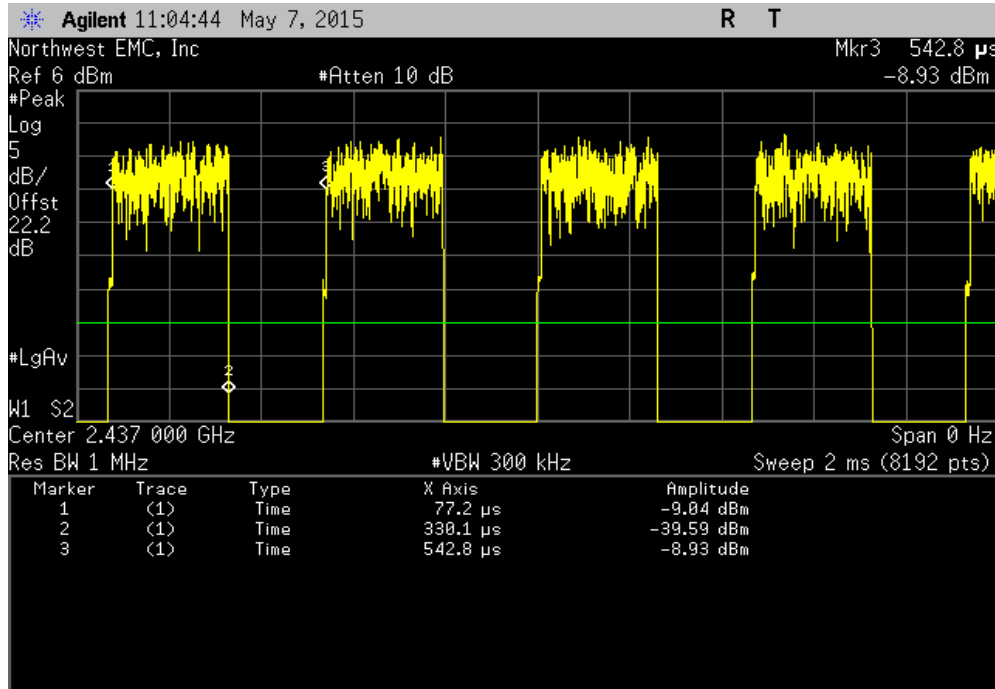


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

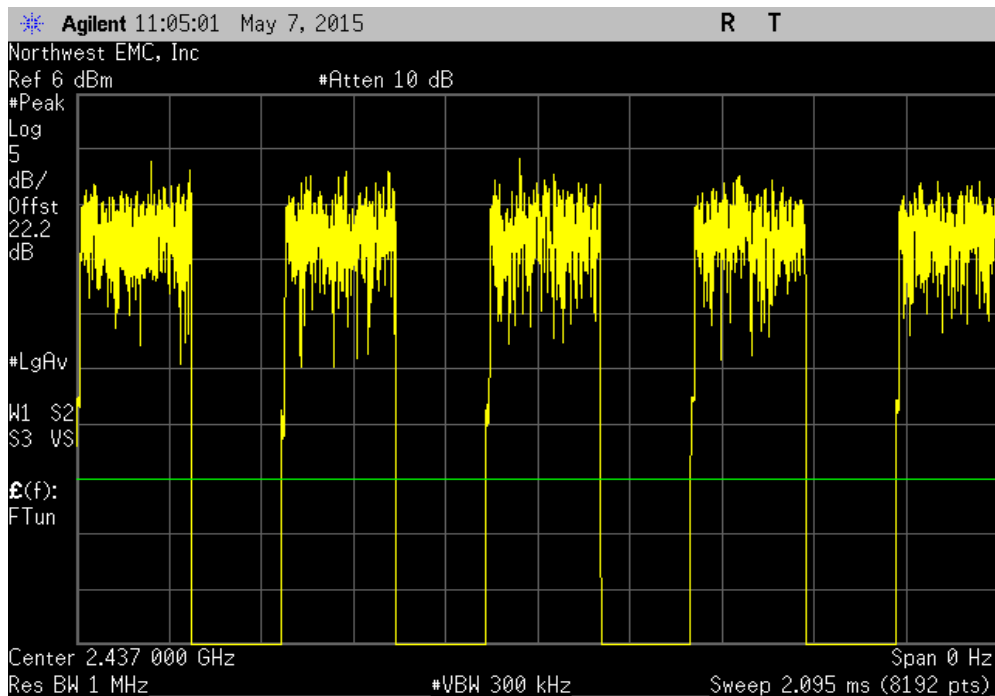


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
252.9 us	465.6 us	1	54.3	N/A	N/A	

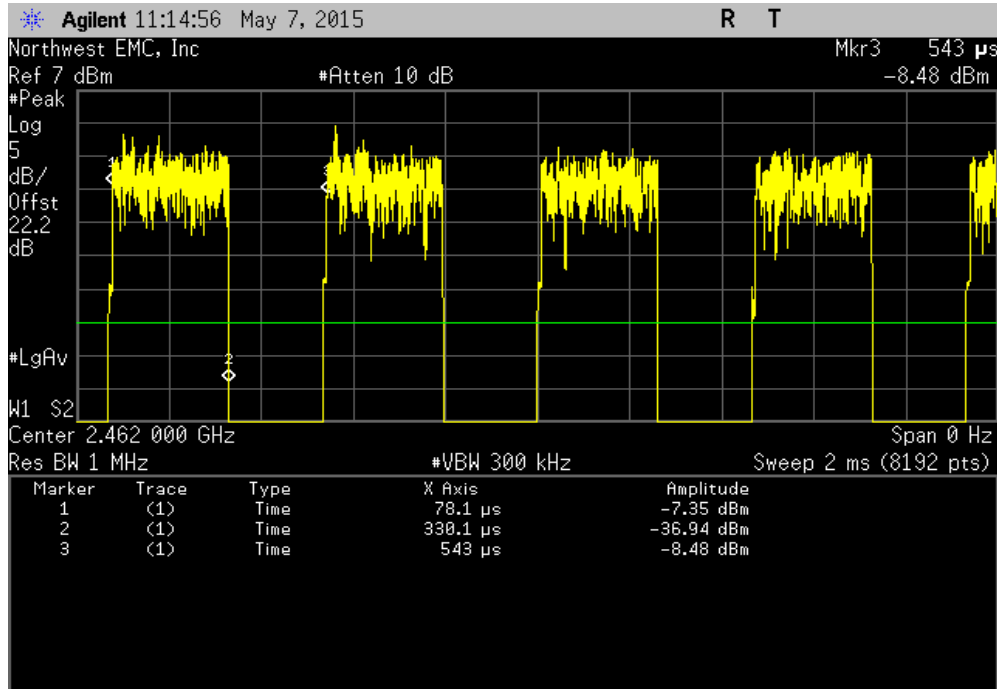


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

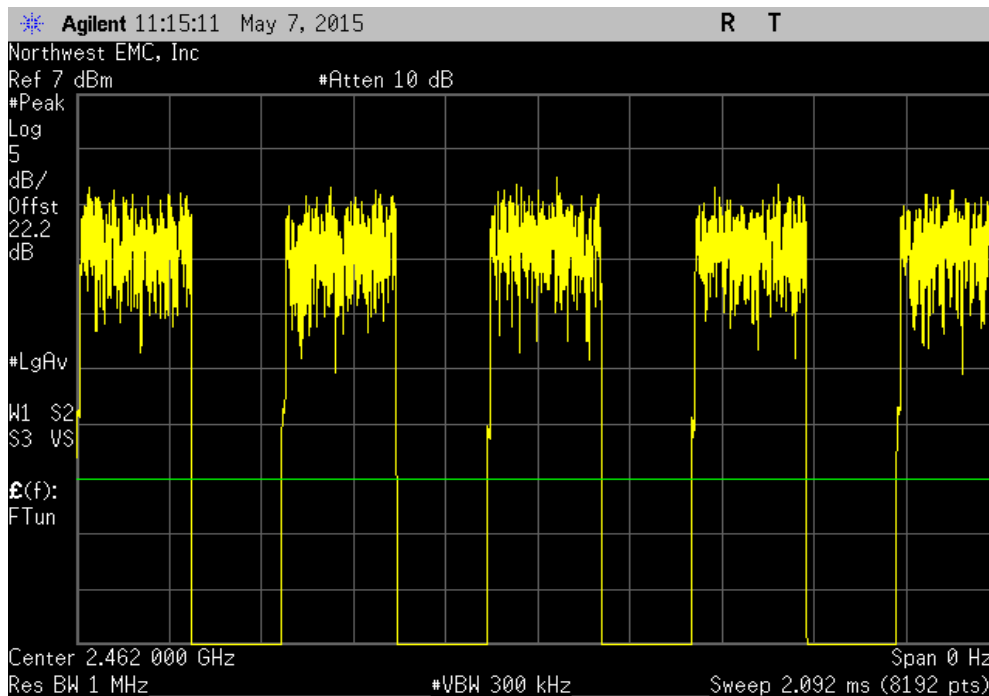


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	252 us	464.9 us	1	54.2	N/A	N/A

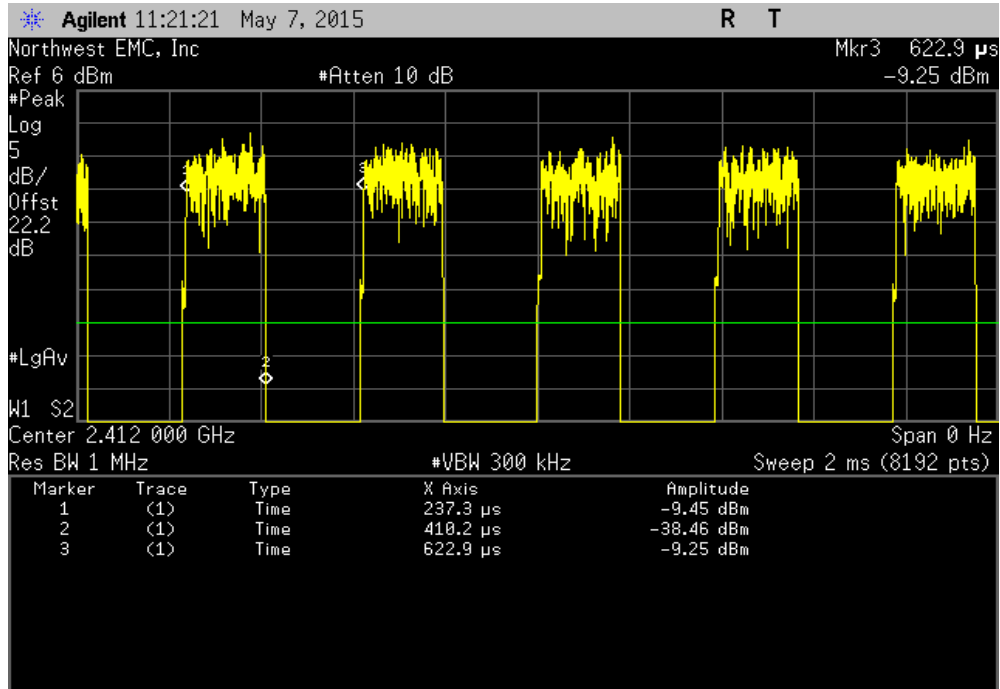


2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

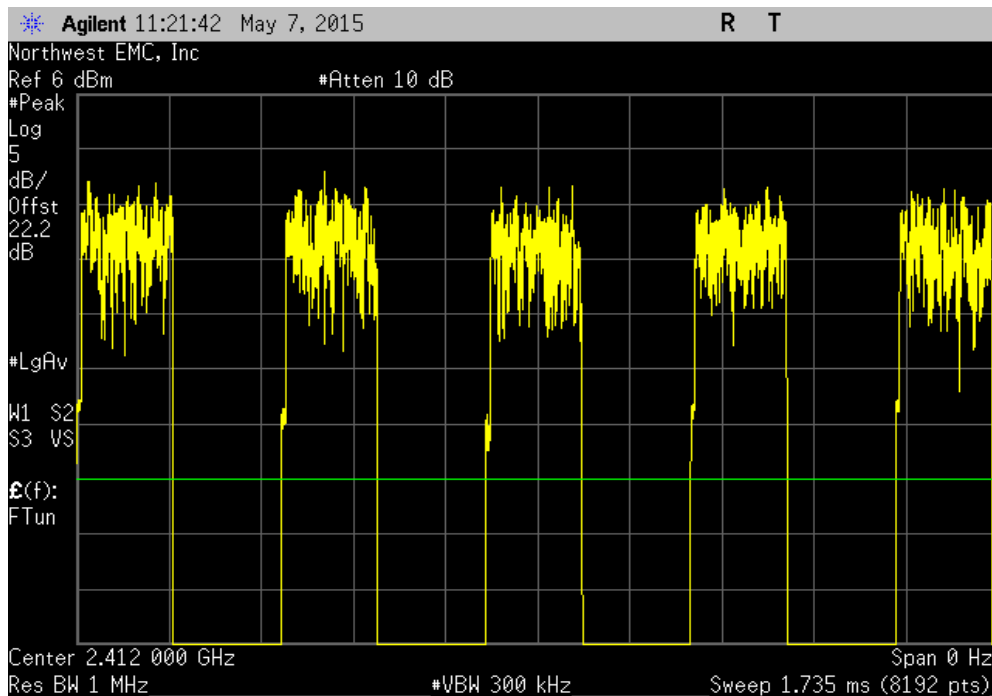


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
172.9 us	385.6 us	1	44.8	N/A	N/A	

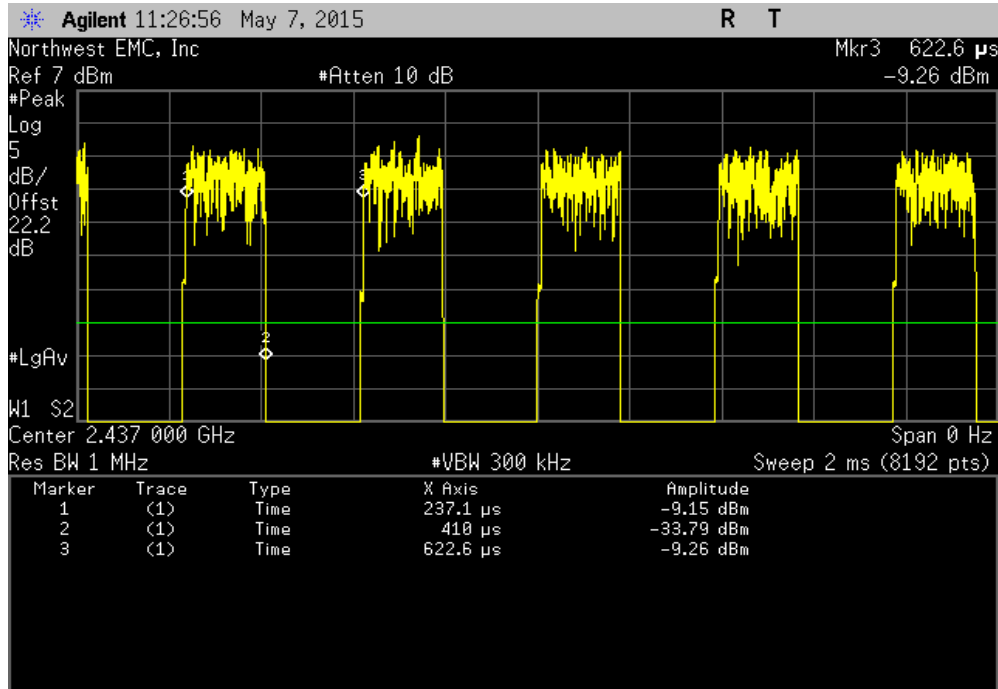


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

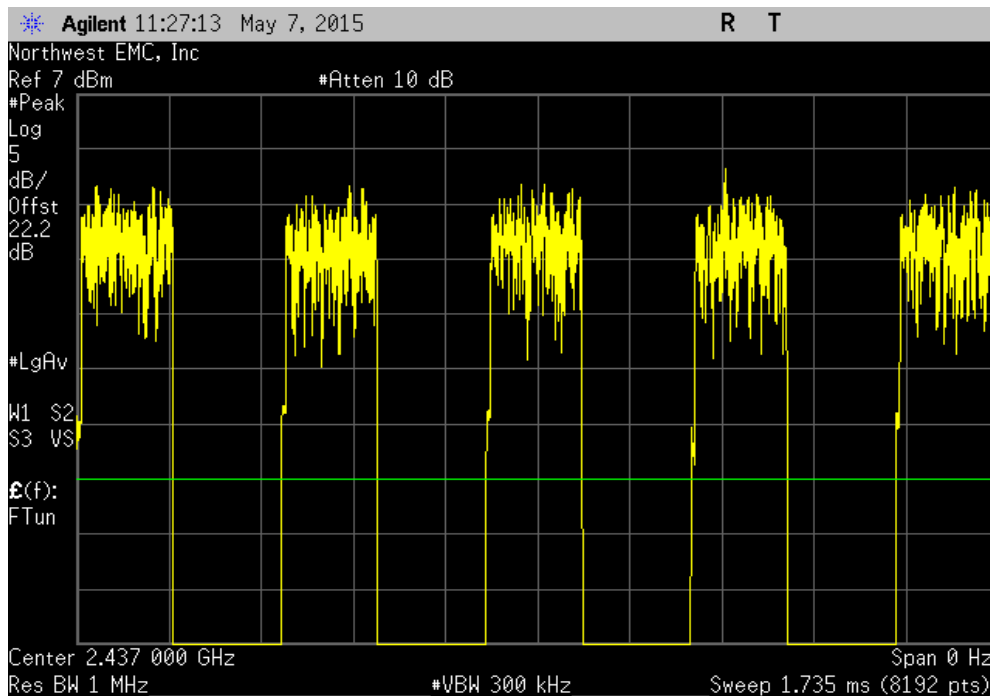


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
172.9 us	385.5 us	1	44.9	N/A	N/A	

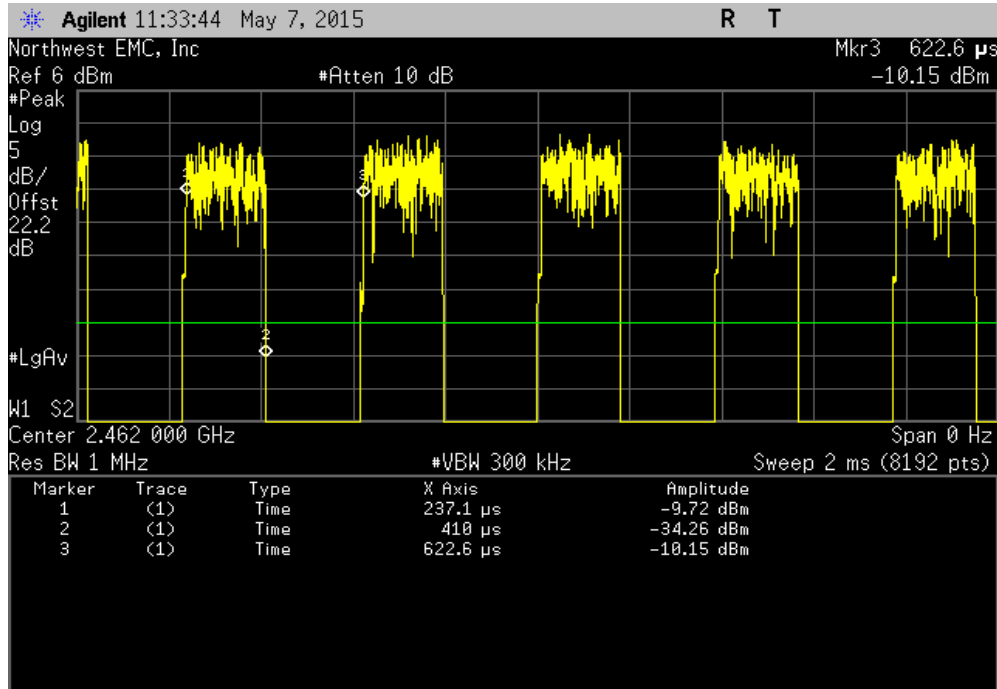


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

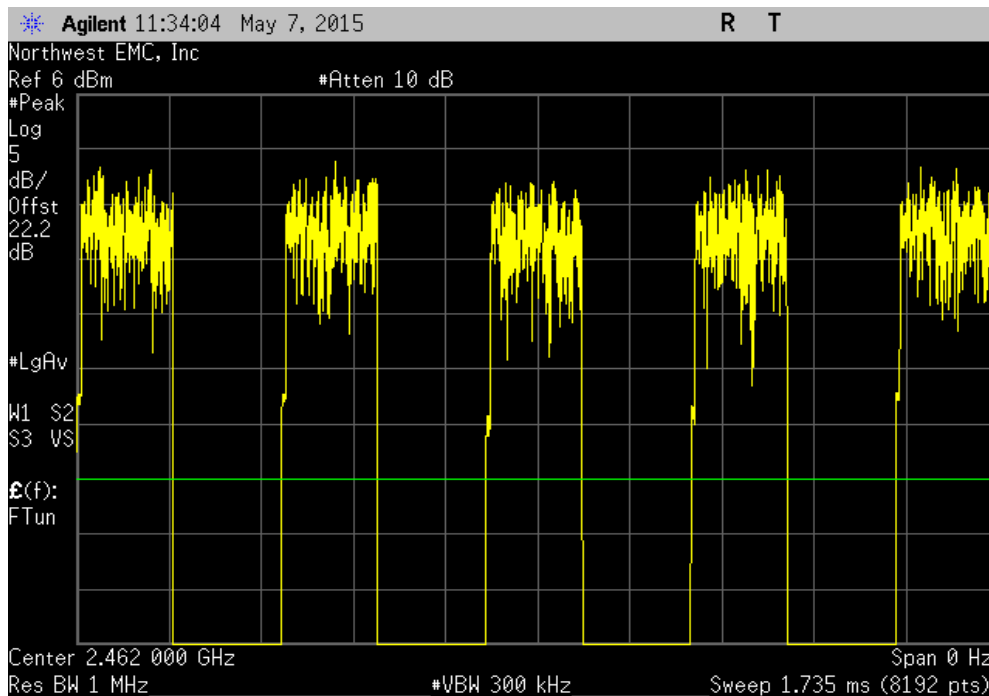


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
172.9 us	385.5 us	1	44.9	N/A	N/A	

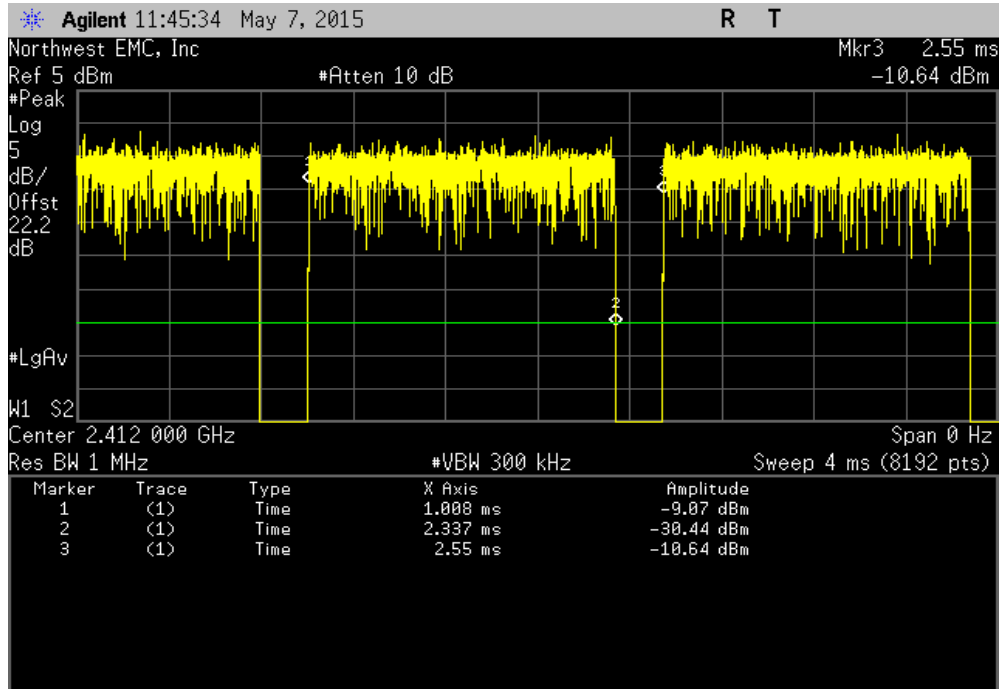


2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

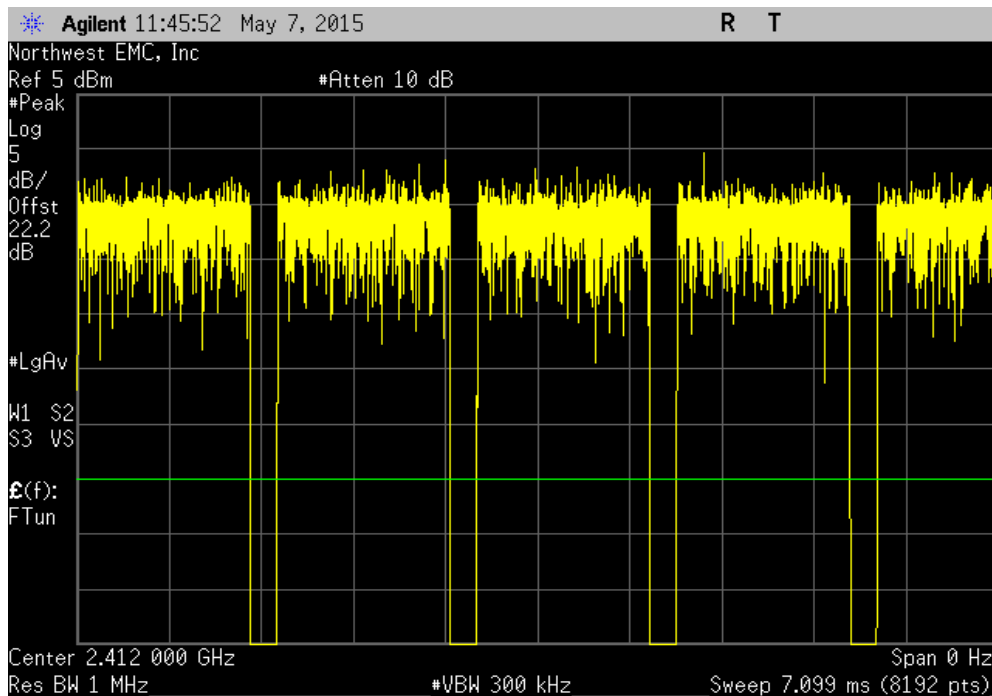


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.329 ms	1.541 ms	1	86.2	N/A	N/A

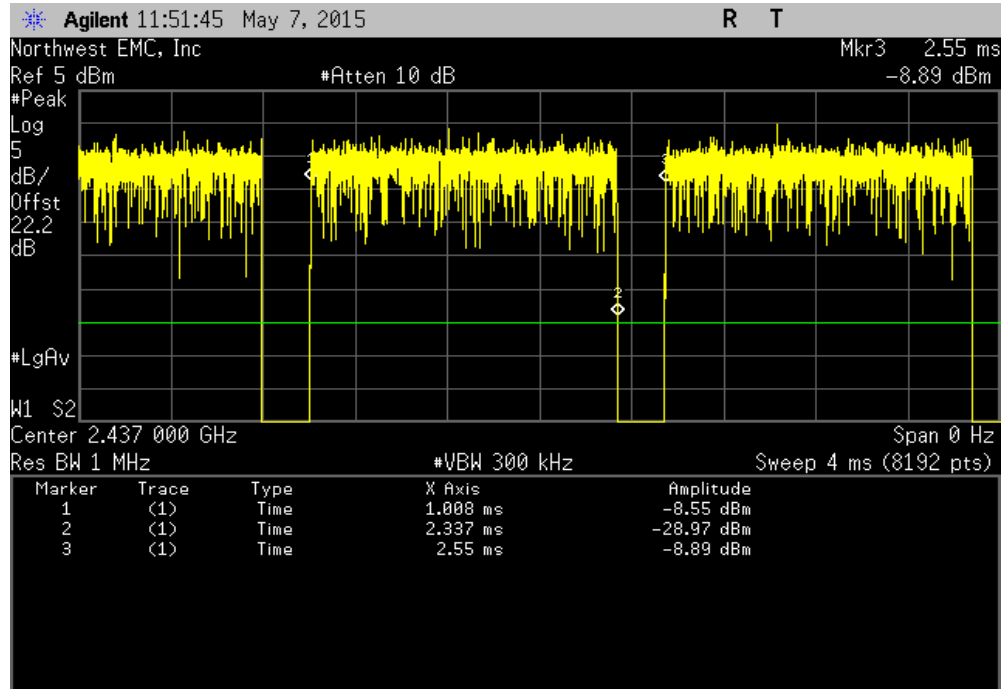


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

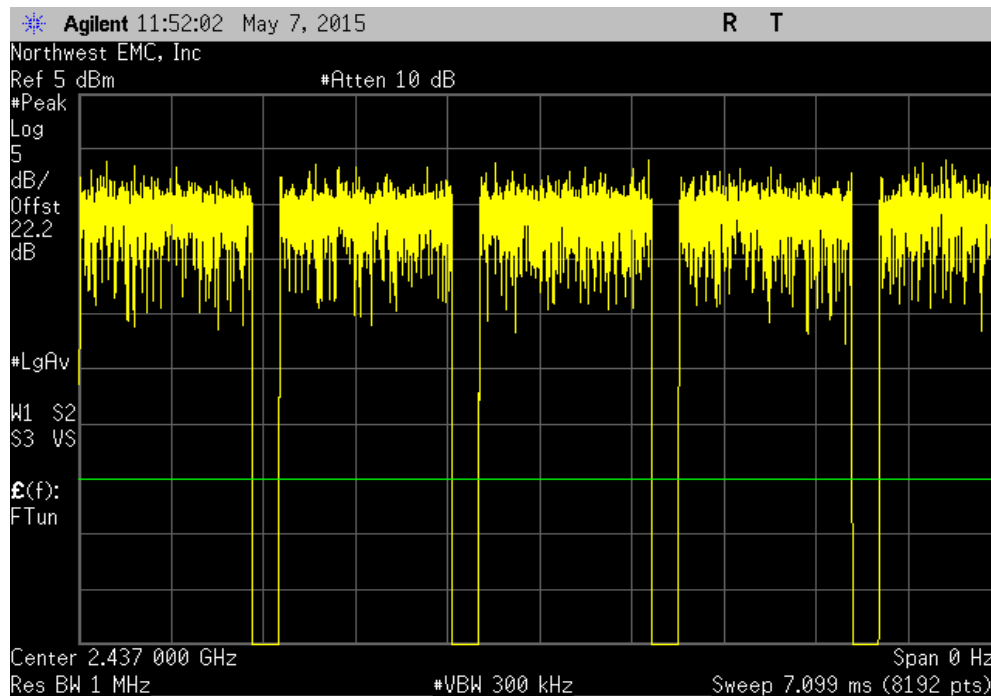


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.329 ms	1.542 ms	1	86.2	N/A	N/A

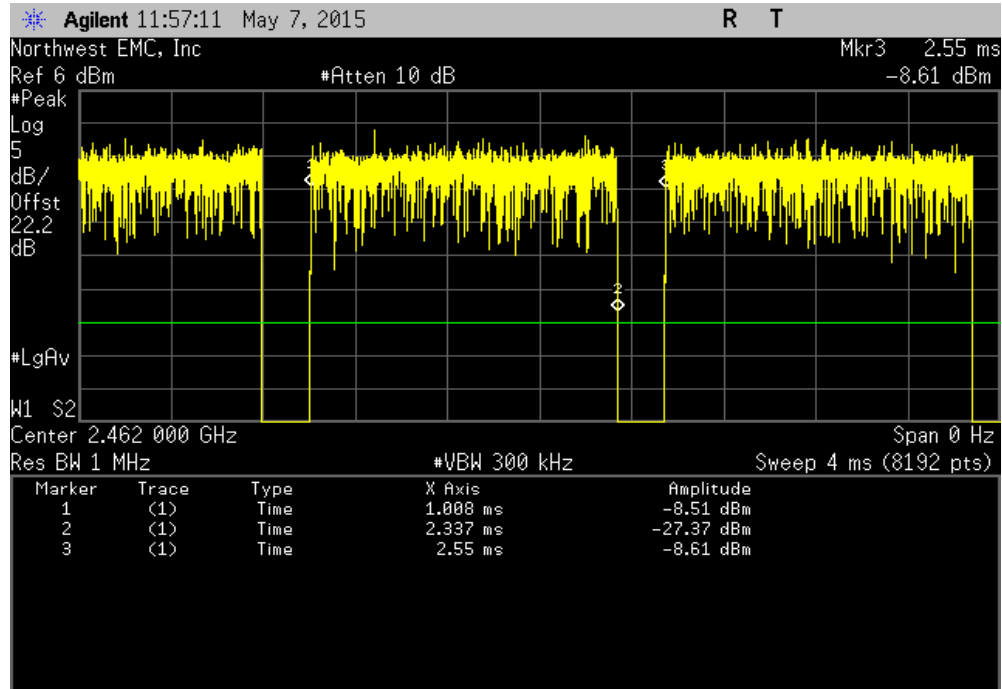


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

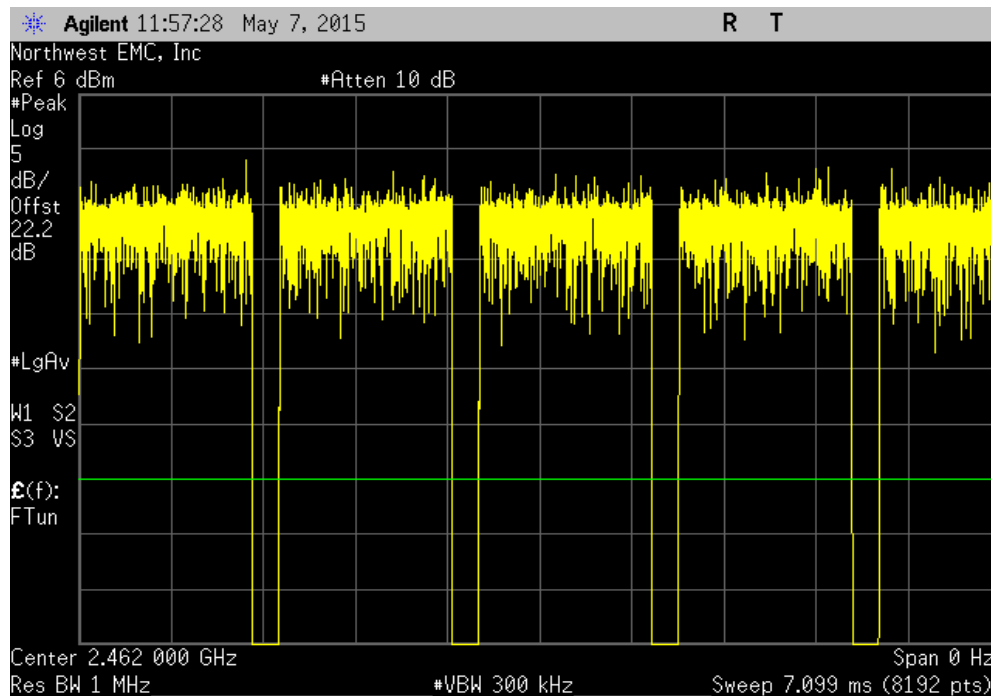


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.329 ms	1.542 ms	1	86.2	N/A	N/A

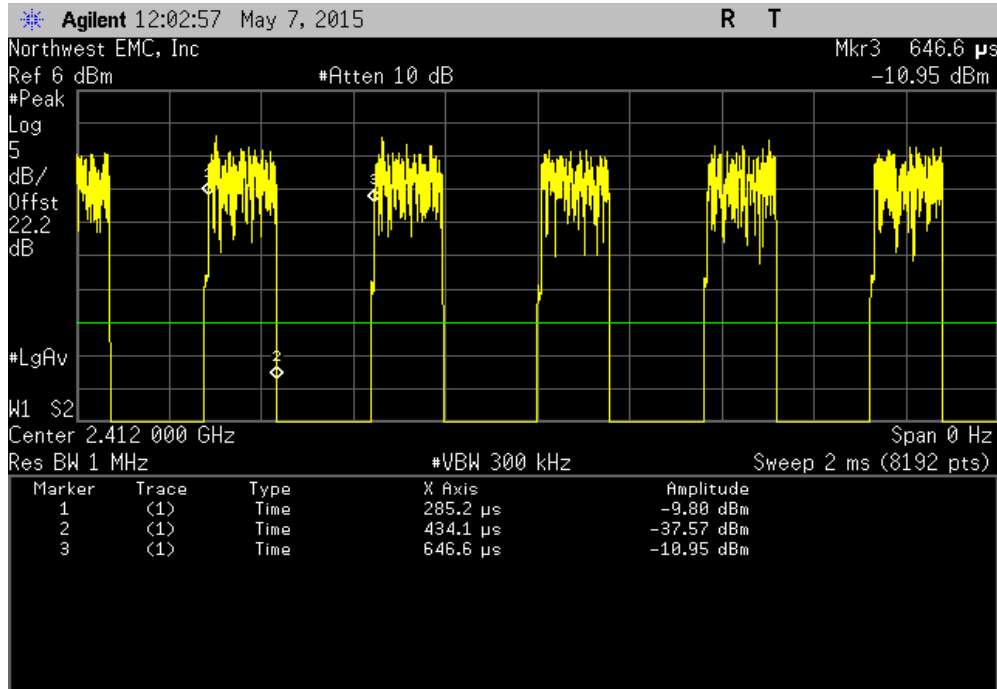


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

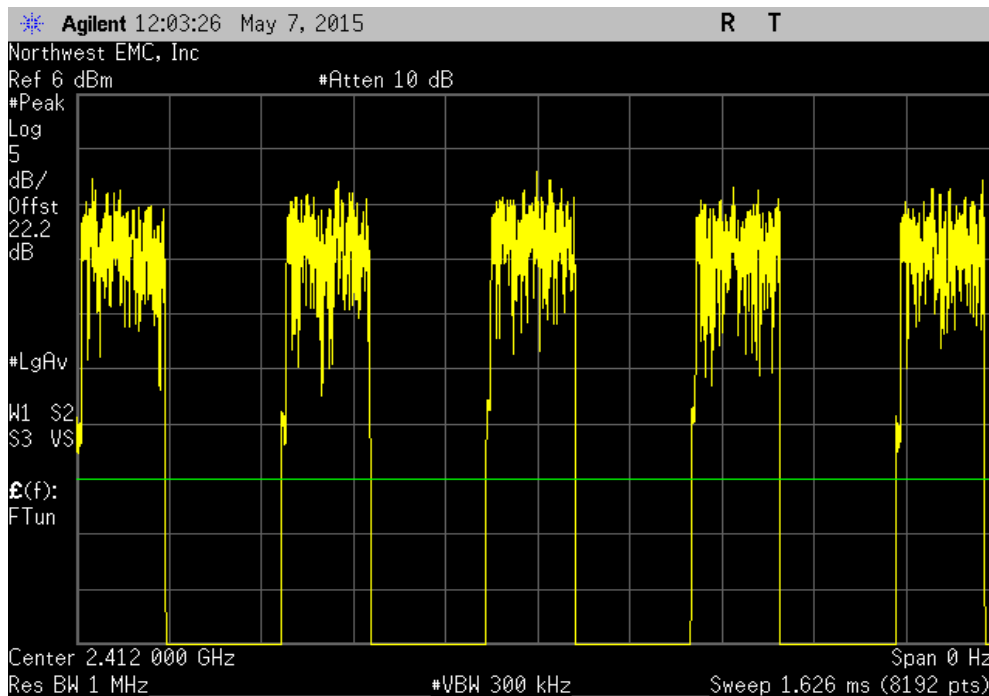


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
148.9 us	361.4 us	1	41.2	N/A	N/A	

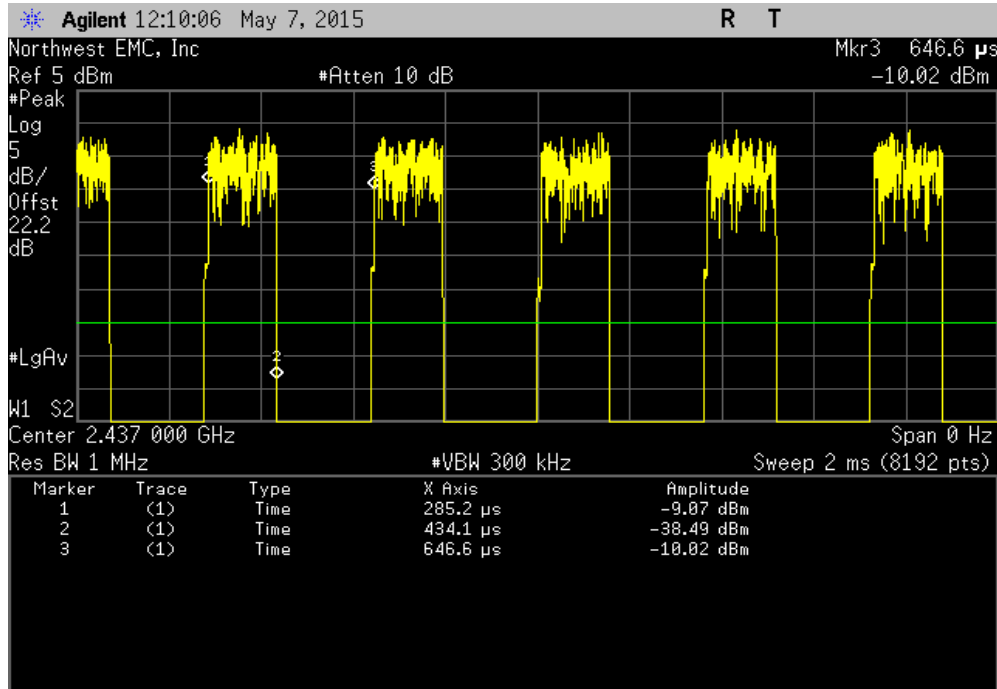


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	

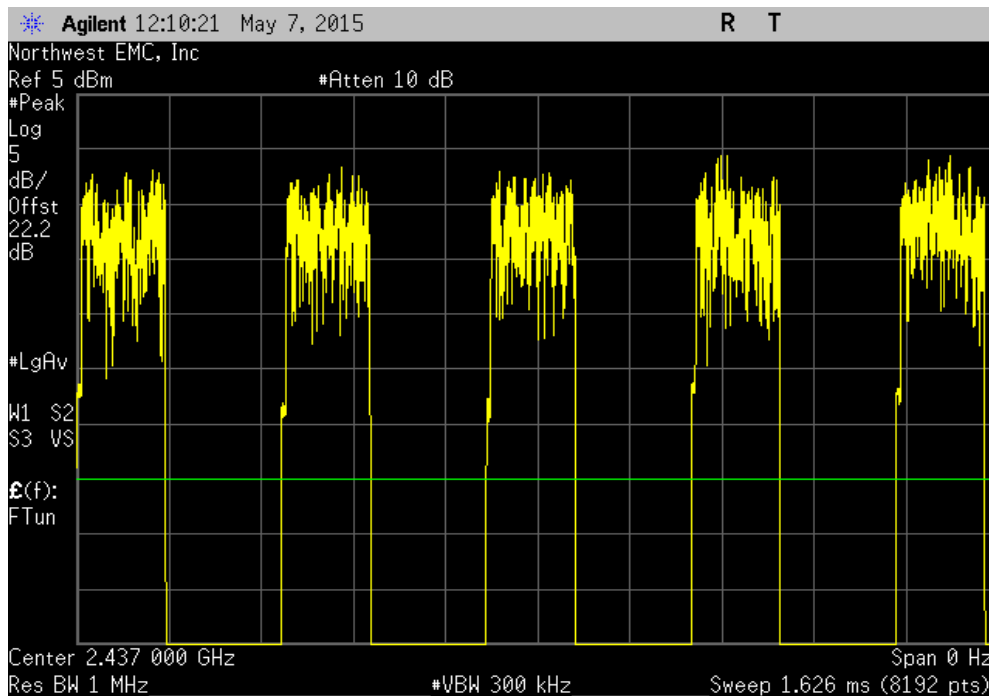


DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
148.9 us	361.4 us	1	41.2	N/A	N/A	

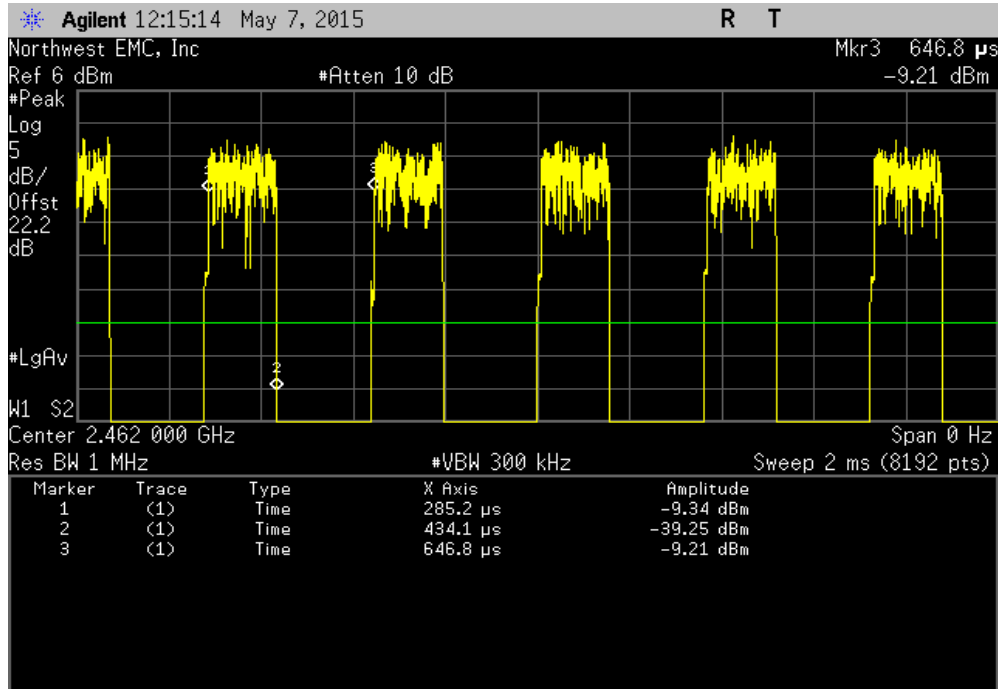


2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	



DUTY CYCLE

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	148.9 us	361.6 us	1	41.2	N/A	N/A



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

