

NORTHWEST EMC

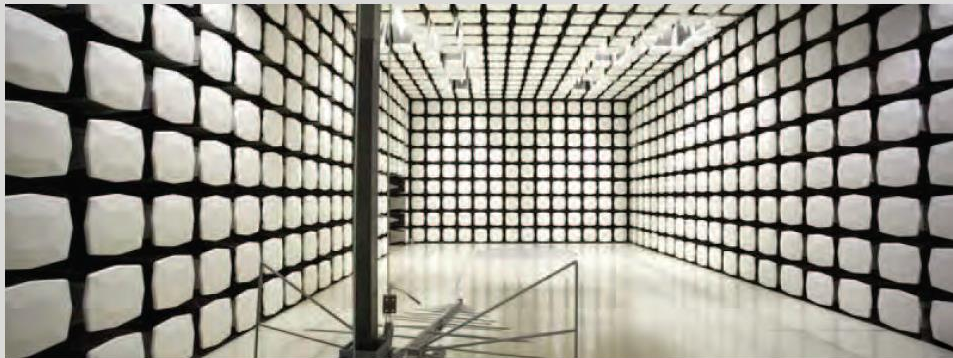
Microsoft Corporation

1721

FCC 15.207:2015

FCC 15.247:2015

Report # MCSO1732.1



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: July 09, 2015
Microsoft Corporation
Model: 1721

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	Spurious Conducted Emissions	Yes	Pass	
6.9.1	Occupied Bandwidth	Yes	Pass	
6.10.1	Output Power	Yes	Pass	
7.5	Duty Cycle	Yes	N/A	
7.7.2	Carrier Frequency Separation	Yes	Pass	
7.7.3	Number of Hopping Frequencies	Yes	Pass	
7.7.4	Dwell Time	Yes	Pass	
7.7.9	Band Edge Compliance	Yes	Pass	
7.7.9	Band Edge Compliance - Hopping Mode	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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

Revision Number		Description	Date	Page Number
00		None		

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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.

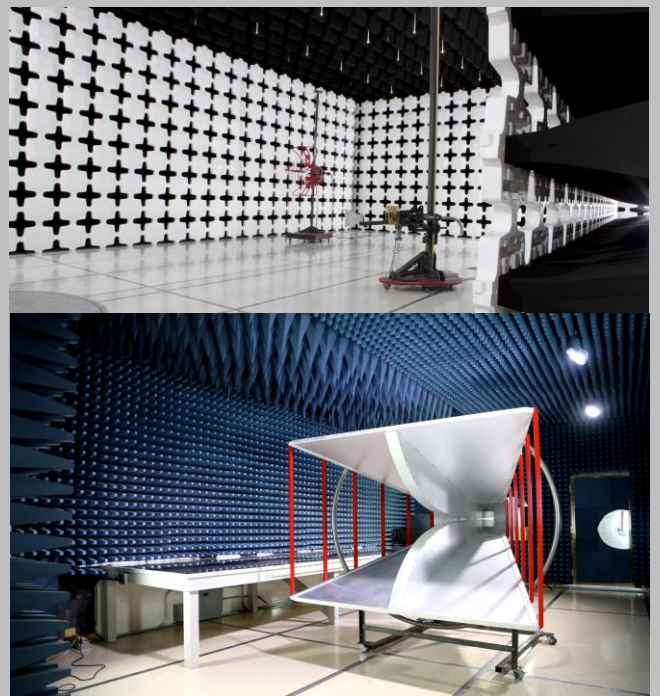
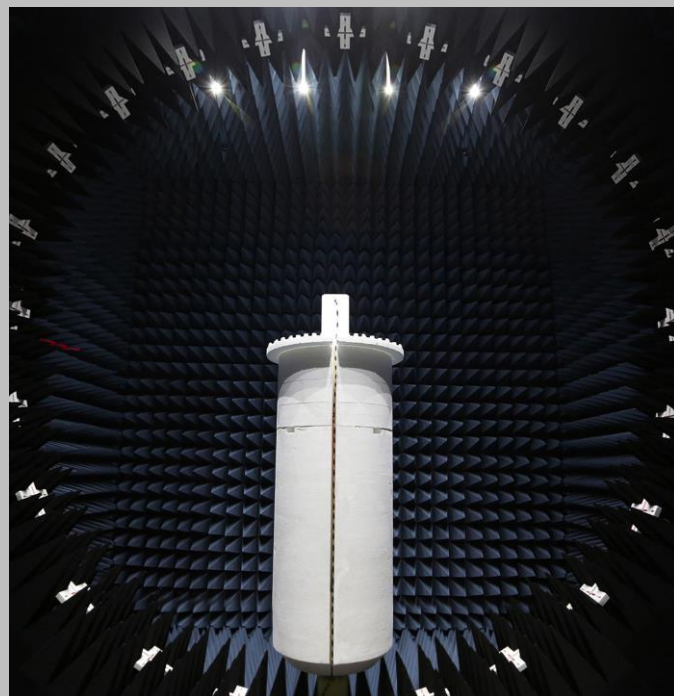
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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)	5.0 dB	-5.0 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 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:	Model 1721
First Date of Test:	June 26, 2015
Last Date of Test:	July 09, 2015
Receipt Date of Samples:	June 26, 2015
Equipment Design Stage:	Pre-Production EV2
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Bluetooth Radio Device
Testing Objective:
To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

CONFIGURATIONS

Configuration MCSO1732- 1

Software/Firmware Running during test	
Description	Version
N Bluetooth Compliance Tool	v2.13.1750.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio Device	Microsoft Corporation	1721	29 37901005079752549
USB Cable	Microsoft Corporation	PN: X914502	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Lenovo	ThinkPad E440	None
AC/DC Power Supply	Lenovo	ADLX65NLC2A	11SA45N0259Z1AS974CG6XA

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1m	No	Bluetooth Radio Device	Laptop PC
AC Power	No	0.9m	No	AC Mains	AC/DC Power Supply
DC Power	No	1.75m	Yes	AC/DC Power Supply	Laptop PC

Configuration MCSO1732- 2

Software/Firmware Running during test	
Description	Version
N Bluetooth Compliance Tool	v2.13.1750.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio Device (Hardware Configuration 2)	Microsoft Corporation	1721	2937901003818152549
USB Cable	Microsoft Corporation	PN: X914502	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/USB Power Supply	Microsoft Corporation	1623	0D130B0AKCE44

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1m	No	Bluetooth Radio Device	AC/USB Power Supply

CONFIGURATIONS

Configuration MCSO1732- 3

Software/Firmware Running during test					
Description				Version	
N Bluetooth Compliance Tool				v2.13.1750.0	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio Device (Hardware Configuration 1)	Microsoft Corporation	1721	2937902003021152649
USB Cable	Microsoft Corporation	PN: X914502	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Lenovo	ThinkPad E440	None
AC/DC Power Supply	Lenovo	ADLX65NLC2A	11SA45N0259Z1AS974CG6XA

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1m	No	Bluetooth Radio Device	Laptop PC
AC Power	No	0.9m	No	AC Mains	AC/DC Power Supply
DC Power	No	1.75m	Yes	AC/DC Power Supply	Laptop PC

Configuration MCSO1732- 4

Software/Firmware Running during test					
Description				Version	
N Bluetooth Compliance Tool				v2.13.1750.0	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio Device (Hardware Configuration 2)	Microsoft Corporation	1721	2937901003818152549
USB Cable	Microsoft Corporation	PN: X914502	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Lenovo	ThinkPad E440	None
AC/DC Power Supply	Lenovo	ADLX65NLC2A	11SA45N0259Z1AS974CG6XA

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1m	No	Bluetooth Radio Device	Laptop PC
AC Power	No	0.9m	No	AC Mains	AC/DC Power Supply
DC Power	No	1.75m	Yes	AC/DC Power Supply	Laptop PC

CONFIGURATIONS

Configuration MCSO1732- 5

Software/Firmware Running during test					
Description				Version	
N Bluetooth Compliance Tool				v2.13.1750.0	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio Device (Hardware Configuration 3)	Microsoft Corporation	1721	2937900007466552649
USB Cable	Microsoft Corporation	PN: X914502	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Lenovo	ThinkPad E440	None
AC/DC Power Supply	Lenovo	ADLX65NLC2A	11SA45N0259Z1AS974CG6XA

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1m	No	Bluetooth Radio Device	Laptop PC
AC Power	No	0.9m	No	AC Mains	AC/DC Power Supply
DC Power	No	1.75m	Yes	AC/DC Power Supply	Laptop PC

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/26/2015	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.
2	6/26/2015	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.
3	6/26/2015	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.
4	6/26/2015	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.
5	6/26/2015	Number of Hopping Frequencies	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	6/26/2015	Carrier Frequency Separation	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	6/26/2015	Dwell Time	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	6/26/2015	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.
9	6/26/2015	Band Edge Compliance-Hopping Mode	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.
10	7/9/2015	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.
11	7/15/2015	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
LISN	Solar Electronics	9252-50-R-24-BNC	LIM	12/9/2014	12/09/2015
Cable	Northwest EMC	Conducted / NF Probe Cable	NC4	2/11/2015	02/11/2016
Attenuator	Fairview Microwave	SA03B-20	RKD	10/14/2014	10/14/2015
High Pass Filter	TTE	H97-100K-50-720B	HHF	12/8/2014	12/08/2015
Receiver	Rohde & Schwarz	ESCI	ARE	6/6/2014	12/06/2015

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

MCSO1732-2

MODES INVESTIGATED

Transmitting BT EDR, Low Channel 0, 2402 MHz, DH5
Transmitting BT EDR, Mid Channel 39, 2441 MHz, DH5
Transmitting BT EDR, High Channel 78, 2480 MHz, DH5

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	7	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

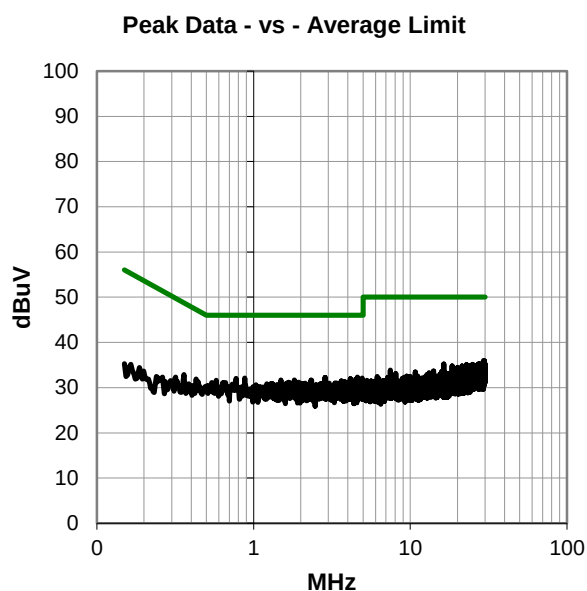
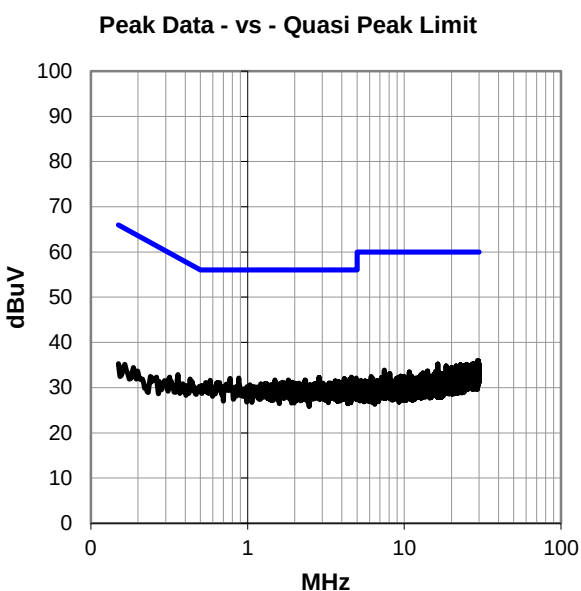
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, Low Channel 0, 2402 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #7

Peak Data - vs - Quasi Peak Limit

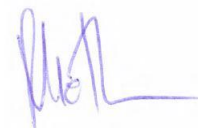
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.590	11.7	20.6	32.3	56.0	-23.7
2.859	11.8	20.4	32.2	56.0	-23.8
0.878	11.8	20.3	32.1	56.0	-23.9
4.631	11.5	20.6	32.1	56.0	-23.9
4.944	11.5	20.6	32.1	56.0	-23.9
0.773	11.7	20.3	32.0	56.0	-24.0
29.276	12.1	23.9	36.0	60.0	-24.0
4.146	11.4	20.6	32.0	56.0	-24.0
29.791	11.9	24.0	35.9	60.0	-24.1
4.716	11.3	20.6	31.9	56.0	-24.1
4.463	11.2	20.6	31.8	56.0	-24.2
2.321	11.3	20.4	31.7	56.0	-24.3
1.818	11.3	20.4	31.7	56.0	-24.3
1.493	11.3	20.4	31.7	56.0	-24.3
0.579	11.3	20.3	31.6	56.0	-24.4
2.344	11.2	20.4	31.6	56.0	-24.4
3.635	10.9	20.6	31.5	56.0	-24.5
1.836	11.0	20.4	31.4	56.0	-24.6
4.317	10.7	20.6	31.3	56.0	-24.7
3.825	10.7	20.6	31.3	56.0	-24.7
29.978	11.2	24.0	35.2	60.0	-24.8
27.183	11.8	23.4	35.2	60.0	-24.8
29.052	11.4	23.8	35.2	60.0	-24.8
27.687	11.7	23.5	35.2	60.0	-24.8
27.642	11.7	23.5	35.2	60.0	-24.8
16.342	13.3	21.9	35.2	60.0	-24.8

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.590	11.7	20.6	32.3	46.0	-13.7
2.859	11.8	20.4	32.2	46.0	-13.8
0.878	11.8	20.3	32.1	46.0	-13.9
4.631	11.5	20.6	32.1	46.0	-13.9
4.944	11.5	20.6	32.1	46.0	-13.9
0.773	11.7	20.3	32.0	46.0	-14.0
29.276	12.1	23.9	36.0	50.0	-14.0
4.146	11.4	20.6	32.0	46.0	-14.0
29.791	11.9	24.0	35.9	50.0	-14.1
4.716	11.3	20.6	31.9	46.0	-14.1
4.463	11.2	20.6	31.8	46.0	-14.2
2.321	11.3	20.4	31.7	46.0	-14.3
1.818	11.3	20.4	31.7	46.0	-14.3
1.493	11.3	20.4	31.7	46.0	-14.3
0.579	11.3	20.3	31.6	46.0	-14.4
2.344	11.2	20.4	31.6	46.0	-14.4
3.635	10.9	20.6	31.5	46.0	-14.5
1.836	11.0	20.4	31.4	46.0	-14.6
4.317	10.7	20.6	31.3	46.0	-14.7
3.825	10.7	20.6	31.3	46.0	-14.7
29.978	11.2	24.0	35.2	50.0	-14.8
27.183	11.8	23.4	35.2	50.0	-14.8
29.052	11.4	23.8	35.2	50.0	-14.8
27.687	11.7	23.5	35.2	50.0	-14.8
27.642	11.7	23.5	35.2	50.0	-14.8
16.342	13.3	21.9	35.2	50.0	-14.8

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	8	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

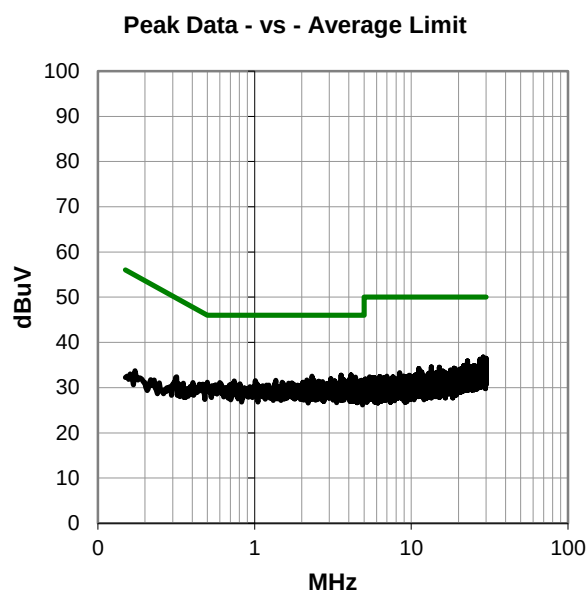
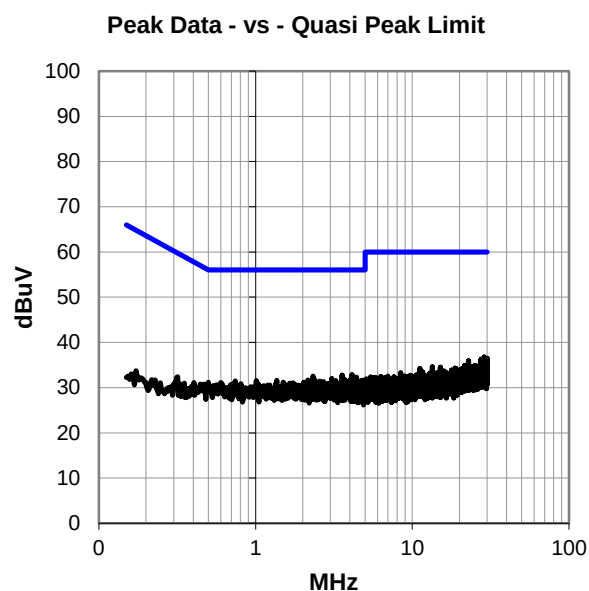
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, Low Channel 0, 2402 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #8

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.123	12.2	20.6	32.8	56.0	-23.2
28.784	13.0	23.8	36.8	60.0	-23.2
3.564	12.2	20.5	32.7	56.0	-23.3
2.329	12.1	20.4	32.5	56.0	-23.5
29.985	12.4	24.0	36.4	60.0	-23.6
4.399	11.7	20.6	32.3	56.0	-23.7
27.418	12.8	23.5	36.3	60.0	-23.7
3.071	11.5	20.5	32.0	56.0	-24.0
22.837	13.2	22.7	35.9	60.0	-24.1
4.019	11.2	20.6	31.8	56.0	-24.2
3.702	11.2	20.6	31.8	56.0	-24.2
2.153	11.3	20.4	31.7	56.0	-24.3
2.396	11.3	20.4	31.7	56.0	-24.3
1.366	11.3	20.3	31.6	56.0	-24.4
2.362	11.2	20.4	31.6	56.0	-24.4
4.821	11.0	20.6	31.6	56.0	-24.4
4.179	11.0	20.6	31.6	56.0	-24.4
1.012	11.2	20.3	31.5	56.0	-24.5
4.758	10.9	20.6	31.5	56.0	-24.5
3.247	11.0	20.5	31.5	56.0	-24.5
3.784	10.9	20.6	31.5	56.0	-24.5
0.743	11.1	20.3	31.4	56.0	-24.6
2.568	11.0	20.4	31.4	56.0	-24.6
4.649	10.8	20.6	31.4	56.0	-24.6
4.190	10.8	20.6	31.4	56.0	-24.6
29.228	11.5	23.9	35.4	60.0	-24.6

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.123	12.2	20.6	32.8	46.0	-13.2
28.784	13.0	23.8	36.8	50.0	-13.2
3.564	12.2	20.5	32.7	46.0	-13.3
2.329	12.1	20.4	32.5	46.0	-13.5
29.985	12.4	24.0	36.4	50.0	-13.6
4.399	11.7	20.6	32.3	46.0	-13.7
27.418	12.8	23.5	36.3	50.0	-13.7
3.071	11.5	20.5	32.0	46.0	-14.0
22.837	13.2	22.7	35.9	50.0	-14.1
4.019	11.2	20.6	31.8	46.0	-14.2
3.702	11.2	20.6	31.8	46.0	-14.2
2.153	11.3	20.4	31.7	46.0	-14.3
2.396	11.3	20.4	31.7	46.0	-14.3
1.366	11.3	20.3	31.6	46.0	-14.4
2.362	11.2	20.4	31.6	46.0	-14.4
4.821	11.0	20.6	31.6	46.0	-14.4
4.179	11.0	20.6	31.6	46.0	-14.4
1.012	11.2	20.3	31.5	46.0	-14.5
4.758	10.9	20.6	31.5	46.0	-14.5
3.247	11.0	20.5	31.5	46.0	-14.5
3.784	10.9	20.6	31.5	46.0	-14.5
0.743	11.1	20.3	31.4	46.0	-14.6
2.568	11.0	20.4	31.4	46.0	-14.6
4.649	10.8	20.6	31.4	46.0	-14.6
4.190	10.8	20.6	31.4	46.0	-14.6
29.228	11.5	23.9	35.4	50.0	-14.6

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	9	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

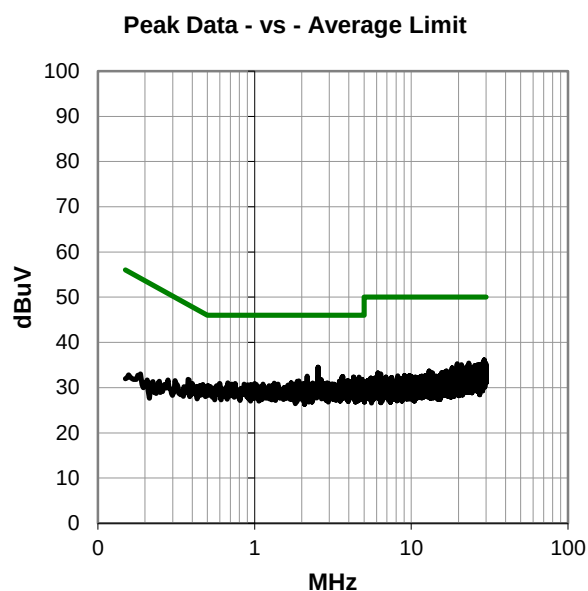
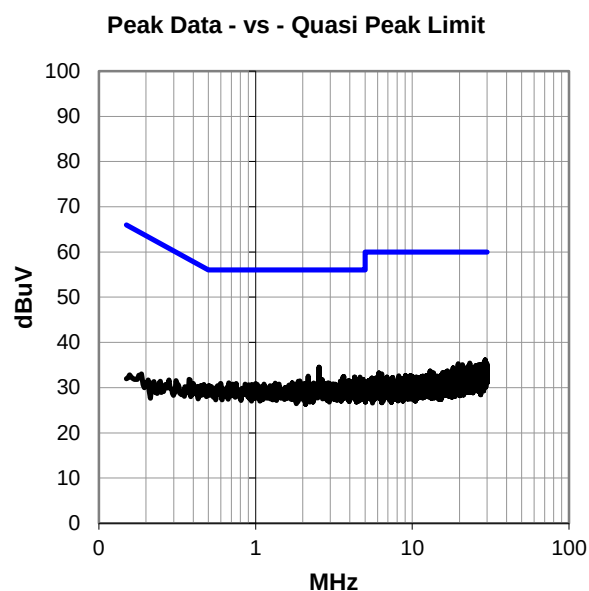
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, Mid Channel 39, 2441 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #9

Peak Data - vs - Quasi Peak Limit

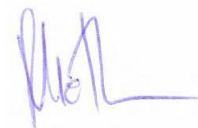
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
2.541	14.1	20.4	34.5	56.0	-21.5
2.165	12.1	20.4	32.5	56.0	-23.5
3.657	11.9	20.6	32.5	56.0	-23.5
4.634	11.7	20.6	32.3	56.0	-23.7
4.287	11.7	20.6	32.3	56.0	-23.7
3.608	11.7	20.6	32.3	56.0	-23.7
29.157	12.3	23.9	36.2	60.0	-23.8
4.840	11.2	20.6	31.8	56.0	-24.2
2.661	11.3	20.4	31.7	56.0	-24.3
28.974	11.8	23.8	35.6	60.0	-24.4
3.948	11.0	20.6	31.6	56.0	-24.4
1.915	11.1	20.4	31.5	56.0	-24.5
28.713	11.7	23.7	35.4	60.0	-24.6
3.485	10.9	20.5	31.4	56.0	-24.6
23.355	12.6	22.8	35.4	60.0	-24.6
4.903	10.8	20.6	31.4	56.0	-24.6
29.925	11.3	24.0	35.3	60.0	-24.7
4.590	10.7	20.6	31.3	56.0	-24.7
4.750	10.7	20.6	31.3	56.0	-24.7
19.628	13.0	22.3	35.3	60.0	-24.7
4.239	10.7	20.6	31.3	56.0	-24.7
4.149	10.7	20.6	31.3	56.0	-24.7
3.691	10.7	20.6	31.3	56.0	-24.7
29.485	11.3	23.9	35.2	60.0	-24.8
4.097	10.6	20.6	31.2	56.0	-24.8
3.866	10.6	20.6	31.2	56.0	-24.8

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
2.541	14.1	20.4	34.5	46.0	-11.5
2.165	12.1	20.4	32.5	46.0	-13.5
3.657	11.9	20.6	32.5	46.0	-13.5
4.634	11.7	20.6	32.3	46.0	-13.7
4.287	11.7	20.6	32.3	46.0	-13.7
3.608	11.7	20.6	32.3	46.0	-13.7
29.157	12.3	23.9	36.2	50.0	-13.8
4.840	11.2	20.6	31.8	46.0	-14.2
2.661	11.3	20.4	31.7	46.0	-14.3
28.974	11.8	23.8	35.6	50.0	-14.4
3.948	11.0	20.6	31.6	46.0	-14.4
1.915	11.1	20.4	31.5	46.0	-14.5
28.713	11.7	23.7	35.4	50.0	-14.6
3.485	10.9	20.5	31.4	46.0	-14.6
23.355	12.6	22.8	35.4	50.0	-14.6
4.903	10.8	20.6	31.4	46.0	-14.6
29.925	11.3	24.0	35.3	50.0	-14.7
4.590	10.7	20.6	31.3	46.0	-14.7
4.750	10.7	20.6	31.3	46.0	-14.7
19.628	13.0	22.3	35.3	50.0	-14.7
4.239	10.7	20.6	31.3	46.0	-14.7
4.149	10.7	20.6	31.3	46.0	-14.7
3.691	10.7	20.6	31.3	46.0	-14.7
29.485	11.3	23.9	35.2	50.0	-14.8
4.097	10.6	20.6	31.2	46.0	-14.8
3.866	10.6	20.6	31.2	46.0	-14.8

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	10	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

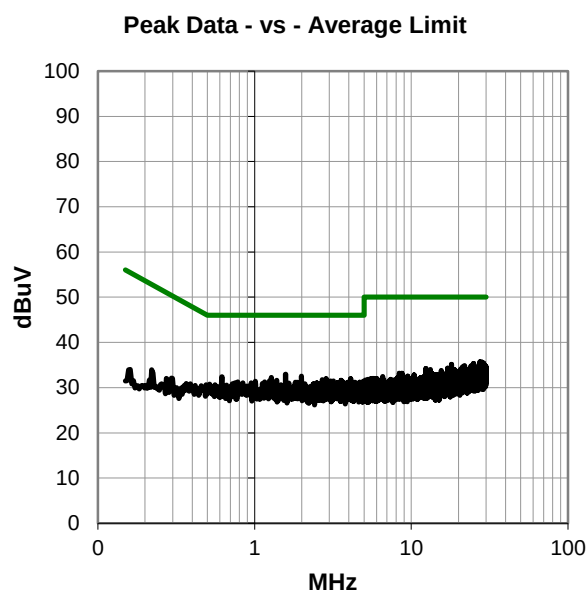
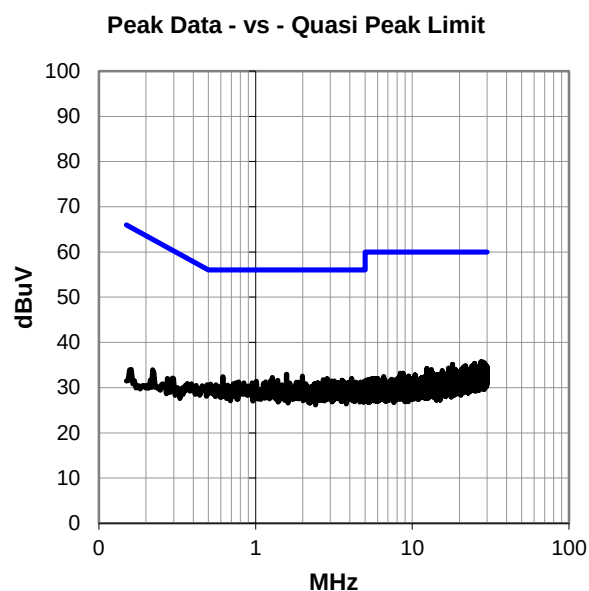
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, Mid Channel 39, 2441 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #10

Peak Data - vs - Quasi Peak Limit

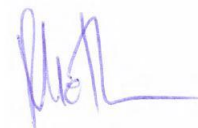
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.579	12.6	20.4	33.0	56.0	-23.0
1.993	12.1	20.4	32.5	56.0	-23.5
0.620	12.1	20.3	32.4	56.0	-23.6
1.280	11.9	20.3	32.2	56.0	-23.8
4.108	11.4	20.6	32.0	56.0	-24.0
2.859	11.5	20.4	31.9	56.0	-24.1
2.709	11.3	20.4	31.7	56.0	-24.3
27.474	12.2	23.5	35.7	60.0	-24.3
1.385	11.3	20.3	31.6	56.0	-24.4
3.564	11.1	20.5	31.6	56.0	-24.4
28.224	12.0	23.6	35.6	60.0	-24.4
2.829	11.2	20.4	31.6	56.0	-24.4
28.011	12.0	23.6	35.6	60.0	-24.4
3.183	11.0	20.5	31.5	56.0	-24.5
3.060	11.0	20.5	31.5	56.0	-24.5
1.012	11.1	20.3	31.4	56.0	-24.6
4.944	10.8	20.6	31.4	56.0	-24.6
28.881	11.6	23.8	35.4	60.0	-24.6
24.993	12.3	23.1	35.4	60.0	-24.6
3.012	10.9	20.4	31.3	56.0	-24.7
2.780	10.9	20.4	31.3	56.0	-24.7
3.676	10.7	20.6	31.3	56.0	-24.7
0.781	10.9	20.3	31.2	56.0	-24.8
1.161	10.9	20.3	31.2	56.0	-24.8
4.690	10.6	20.6	31.2	56.0	-24.8
4.358	10.6	20.6	31.2	56.0	-24.8

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.579	12.6	20.4	33.0	46.0	-13.0
1.993	12.1	20.4	32.5	46.0	-13.5
0.620	12.1	20.3	32.4	46.0	-13.6
1.280	11.9	20.3	32.2	46.0	-13.8
4.108	11.4	20.6	32.0	46.0	-14.0
2.859	11.5	20.4	31.9	46.0	-14.1
2.709	11.3	20.4	31.7	46.0	-14.3
27.474	12.2	23.5	35.7	50.0	-14.3
1.385	11.3	20.3	31.6	46.0	-14.4
3.564	11.1	20.5	31.6	46.0	-14.4
28.224	12.0	23.6	35.6	50.0	-14.4
2.829	11.2	20.4	31.6	46.0	-14.4
28.011	12.0	23.6	35.6	50.0	-14.4
3.183	11.0	20.5	31.5	46.0	-14.5
3.060	11.0	20.5	31.5	46.0	-14.5
1.012	11.1	20.3	31.4	46.0	-14.6
4.944	10.8	20.6	31.4	46.0	-14.6
28.881	11.6	23.8	35.4	50.0	-14.6
24.993	12.3	23.1	35.4	50.0	-14.6
3.012	10.9	20.4	31.3	46.0	-14.7
2.780	10.9	20.4	31.3	46.0	-14.7
3.676	10.7	20.6	31.3	46.0	-14.7
0.781	10.9	20.3	31.2	46.0	-14.8
1.161	10.9	20.3	31.2	46.0	-14.8
4.690	10.6	20.6	31.2	46.0	-14.8
4.358	10.6	20.6	31.2	46.0	-14.8

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	11	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

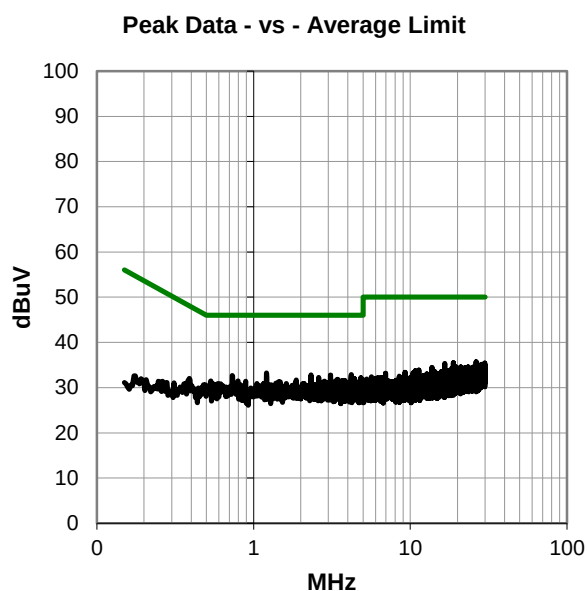
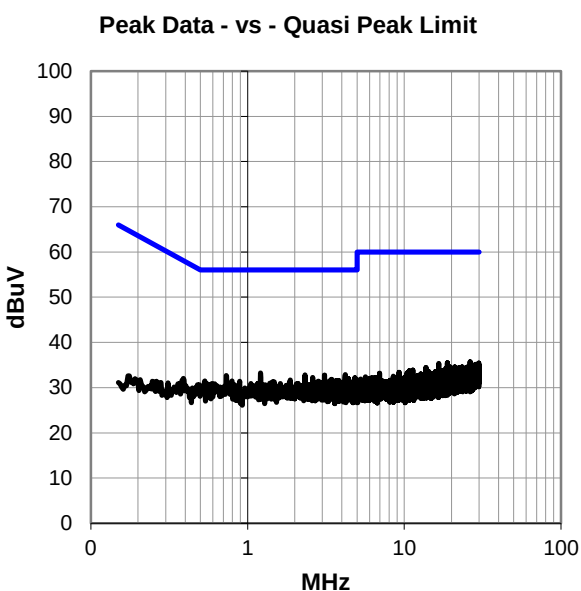
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, High Channel 78, 2480 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #11

Peak Data - vs - Quasi Peak Limit

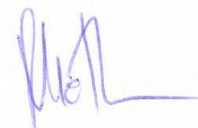
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.210	12.9	20.3	33.2	56.0	-22.8
4.198	12.3	20.6	32.9	56.0	-23.1
2.321	12.4	20.4	32.8	56.0	-23.2
3.097	12.3	20.5	32.8	56.0	-23.2
0.732	12.3	20.3	32.6	56.0	-23.4
2.609	11.8	20.4	32.2	56.0	-23.8
4.847	11.6	20.6	32.2	56.0	-23.8
4.411	11.4	20.6	32.0	56.0	-24.0
3.433	11.3	20.5	31.8	56.0	-24.2
3.112	11.3	20.5	31.8	56.0	-24.2
26.280	12.4	23.3	35.7	60.0	-24.3
1.874	11.3	20.4	31.7	56.0	-24.3
3.400	11.1	20.5	31.6	56.0	-24.4
4.922	11.0	20.6	31.6	56.0	-24.4
3.825	11.0	20.6	31.6	56.0	-24.4
3.672	11.0	20.6	31.6	56.0	-24.4
18.893	13.3	22.2	35.5	60.0	-24.5
0.534	11.2	20.3	31.5	56.0	-24.5
2.836	11.0	20.4	31.4	56.0	-24.6
0.892	11.1	20.3	31.4	56.0	-24.6
29.869	11.4	24.0	35.4	60.0	-24.6
4.325	10.8	20.6	31.4	56.0	-24.6
16.573	13.4	21.9	35.3	60.0	-24.7
4.134	10.7	20.6	31.3	56.0	-24.7
1.478	10.9	20.4	31.3	56.0	-24.7
1.463	10.9	20.4	31.3	56.0	-24.7

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.210	12.9	20.3	33.2	46.0	-12.8
4.198	12.3	20.6	32.9	46.0	-13.1
2.321	12.4	20.4	32.8	46.0	-13.2
3.097	12.3	20.5	32.8	46.0	-13.2
0.732	12.3	20.3	32.6	46.0	-13.4
2.609	11.8	20.4	32.2	46.0	-13.8
4.847	11.6	20.6	32.2	46.0	-13.8
4.411	11.4	20.6	32.0	46.0	-14.0
3.433	11.3	20.5	31.8	46.0	-14.2
3.112	11.3	20.5	31.8	46.0	-14.2
26.280	12.4	23.3	35.7	50.0	-14.3
1.874	11.3	20.4	31.7	46.0	-14.3
3.400	11.1	20.5	31.6	46.0	-14.4
4.922	11.0	20.6	31.6	46.0	-14.4
3.825	11.0	20.6	31.6	46.0	-14.4
3.672	11.0	20.6	31.6	46.0	-14.4
18.893	13.3	22.2	35.5	50.0	-14.5
0.534	11.2	20.3	31.5	46.0	-14.5
2.836	11.0	20.4	31.4	46.0	-14.6
0.892	11.1	20.3	31.4	46.0	-14.6
29.869	11.4	24.0	35.4	50.0	-14.6
4.325	10.8	20.6	31.4	46.0	-14.6
16.573	13.4	21.9	35.3	50.0	-14.7
4.134	10.7	20.6	31.3	46.0	-14.7
1.478	10.9	20.4	31.3	46.0	-14.7
1.463	10.9	20.4	31.3	46.0	-14.7

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	1721	Work Order:	MCSO1732
Serial Number:	2937901003818152549	Date:	06/29/2015
Customer:	Microsoft Corporation	Temperature:	24°C
Attendees:	None	Relative Humidity:	52%
Customer Project:	None	Bar. Pressure:	1016 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	MCSO1732-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	12	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

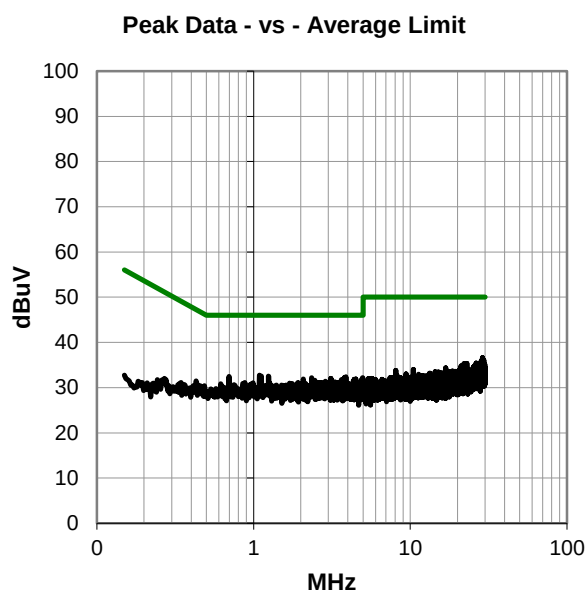
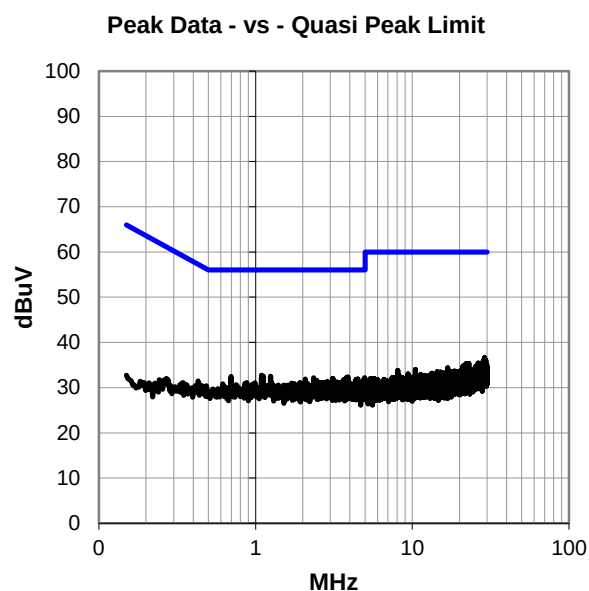
Power Setting at maximum.

EUT OPERATING MODES

Transmitting BT EDR, High Channel 78, 2480 MHz, DH5

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #12

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.090	12.4	20.3	32.7	56.0	-23.3
28.918	12.8	23.8	36.6	60.0	-23.4
1.247	12.2	20.3	32.5	56.0	-23.5
1.120	12.2	20.3	32.5	56.0	-23.5
0.698	12.1	20.3	32.4	56.0	-23.6
3.892	11.8	20.6	32.4	56.0	-23.6
2.351	11.8	20.4	32.2	56.0	-23.8
4.970	11.6	20.6	32.2	56.0	-23.8
3.791	11.6	20.6	32.2	56.0	-23.8
29.131	12.3	23.8	36.1	60.0	-23.9
3.116	11.6	20.5	32.1	56.0	-23.9
29.534	12.1	23.9	36.0	60.0	-24.0
28.530	12.3	23.7	36.0	60.0	-24.0
3.843	11.4	20.6	32.0	56.0	-24.0
2.079	11.5	20.4	31.9	56.0	-24.1
4.489	11.3	20.6	31.9	56.0	-24.1
4.907	11.2	20.6	31.8	56.0	-24.2
4.384	11.2	20.6	31.8	56.0	-24.2
3.638	11.2	20.6	31.8	56.0	-24.2
28.217	12.1	23.6	35.7	60.0	-24.3
2.463	11.2	20.4	31.6	56.0	-24.4
3.672	11.0	20.6	31.6	56.0	-24.4
3.161	11.1	20.5	31.6	56.0	-24.4
2.870	11.0	20.4	31.4	56.0	-24.6
26.329	12.1	23.3	35.4	60.0	-24.6
4.321	10.8	20.6	31.4	56.0	-24.6

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.090	12.4	20.3	32.7	46.0	-13.3
28.918	12.8	23.8	36.6	50.0	-13.4
1.247	12.2	20.3	32.5	46.0	-13.5
1.120	12.2	20.3	32.5	46.0	-13.5
0.698	12.1	20.3	32.4	46.0	-13.6
3.892	11.8	20.6	32.4	46.0	-13.6
2.351	11.8	20.4	32.2	46.0	-13.8
4.970	11.6	20.6	32.2	46.0	-13.8
3.791	11.6	20.6	32.2	46.0	-13.8
29.131	12.3	23.8	36.1	50.0	-13.9
3.116	11.6	20.5	32.1	46.0	-13.9
29.534	12.1	23.9	36.0	50.0	-14.0
28.530	12.3	23.7	36.0	50.0	-14.0
3.843	11.4	20.6	32.0	46.0	-14.0
2.079	11.5	20.4	31.9	46.0	-14.1
4.489	11.3	20.6	31.9	46.0	-14.1
4.907	11.2	20.6	31.8	46.0	-14.2
4.384	11.2	20.6	31.8	46.0	-14.2
3.638	11.2	20.6	31.8	46.0	-14.2
28.217	12.1	23.6	35.7	50.0	-14.3
2.463	11.2	20.4	31.6	46.0	-14.4
3.672	11.0	20.6	31.6	46.0	-14.4
3.161	11.1	20.5	31.6	46.0	-14.4
2.870	11.0	20.4	31.4	46.0	-14.6
26.329	12.1	23.3	35.4	50.0	-14.6
4.321	10.8	20.6	31.4	46.0	-14.6

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 0, 2402 MHz

Mid Channel 39, 2441 MHz

High Channel 78, 2480 MHz

MODES OF OPERATION

Transmitting Bluetooth EDR, Non-Hopping Mode, DH5

Transmitting Bluetooth EDR, Non-Hopping Mode, 2DH5

Transmitting Bluetooth EDR, Non-Hopping Mode, 3DH5

POWER SETTINGS INVESTIGATED

USB

CONFIGURATIONS INVESTIGATED

MCSO1732 - 3

MCSO1732 - 4

MCSO1732 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 26 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFE	6/22/2015	12 mo
Spectrum Analyzer	Agilent Technologies	N9010A	R104	4/15/2014	24 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	10/13/2014	12 mo
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HHI	12/9/2014	12 mo
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	LFF	3/6/2015	12 mo
Antenna, Bilog	Teseq	CBL 6144	AYG	3/5/2015	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAB	9/8/2014	12 mo
NC01 Cables	Northwest EMC	Bilog Cables	NC1	9/8/2014	12 mo
Antenna, Horn	EMCO	3115	AHM	6/3/2014	24 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	9/8/2014	12 mo
NC01 Cables	Northwest EMC	3115 Horn Cable	NC2	6/17/2015	12 mo
Antenna, Horn	EMCO	3160-07	AHP	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	10/13/2014	12 mo
Antenna, Horn	EMCO	3160-08	AHO	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	10/13/2014	12 mo
NC01 Cables	Northwest EMC	Standard Gain Horn Cable	NC3	6/17/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIY	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	6/6/2015	12 mo
18-26GHz Horn Antenna Cable	Northwest EMC	N/A	NC8	6/6/2015	12 mo

MEASUREMENT BANDWIDTHS

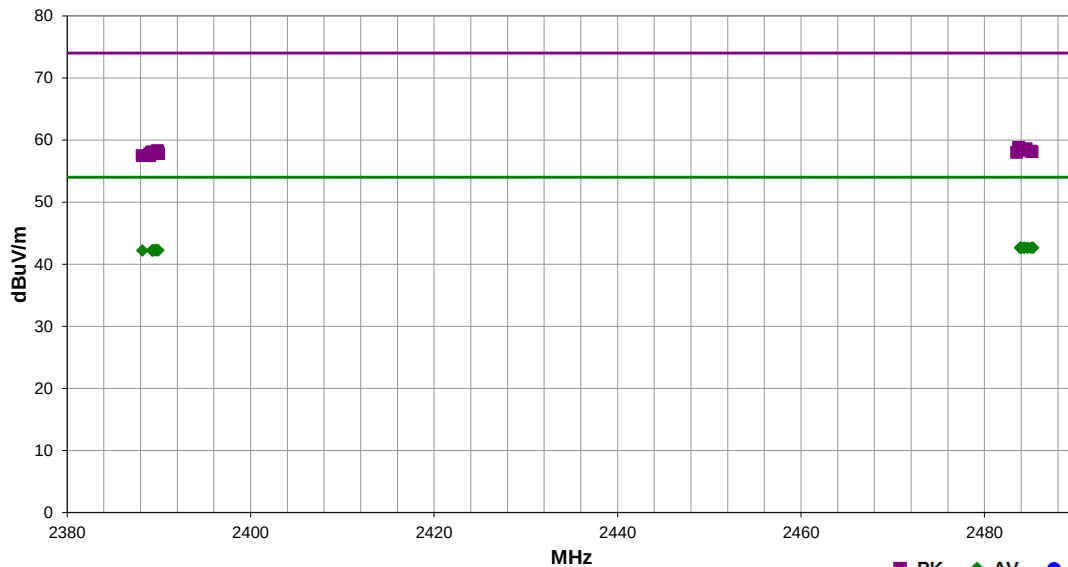
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

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:	MCSO1732	Date:	07/09/15		
Project:	None	Temperature:	23 °C		
Job Site:	NC01	Humidity:	50% RH		
Serial Number:	2937900007466552649	Barometric Pres.:	1008 mbar	Tested by:	Richard Mellroth
EUT:	1721				
Configuration:	5				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	USB				
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.				
Deviations:	None				
Comments:	Hardware Configuration 3. Power Settings at Maximum. 2.4 GHz Band Edge Measurements.				

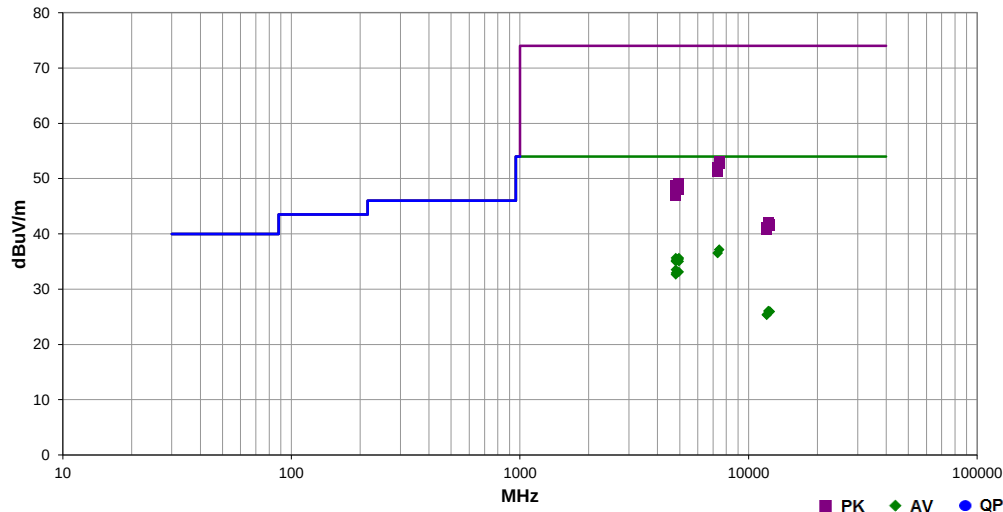
Test Specifications	FCC 15.247:2015		Test Method	ANSI C63.10:2009	
Run #	148	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)
Results	Pass				



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
2485.313	24.7	-2.1	1.6	88.0	3.0	20.0	Horz	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Disp. Up
2485.053	24.7	-2.1	1.3	86.0	3.0	20.0	Horz	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Flat
2484.677	24.7	-2.1	1.3	265.0	3.0	20.0	Vert	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Disp. Up
2484.290	24.7	-2.1	1.3	196.0	3.0	20.0	Horz	AV	0.0	42.6	54.0	-11.4	High Ch 78, 2DH5, EUT Disp. Up
2484.357	24.7	-2.1	2.9	73.0	3.0	20.0	Horz	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Vert
2484.013	24.7	-2.1	1.3	14.0	3.0	20.0	Vert	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Vert
2483.890	24.7	-2.1	1.3	241.0	3.0	20.0	Horz	AV	0.0	42.6	54.0	-11.4	High Ch 78, 3DH5, EUT Disp. Up
2483.920	24.7	-2.1	1.3	25.0	3.0	20.0	Vert	AV	0.0	42.6	54.0	-11.4	High Ch 78, DH5, EUT Flat
2389.707	24.6	-2.3	2.5	40.0	3.0	20.0	Vert	AV	0.0	42.3	54.0	-11.7	Low Ch 0, DH5, EUT Flat
2389.933	24.5	-2.3	1.3	351.0	3.0	20.0	Horz	AV	0.0	42.2	54.0	-11.8	Low Ch 0, DH5, EUT Flat
2389.893	24.5	-2.3	1.3	205.0	3.0	20.0	Vert	AV	0.0	42.2	54.0	-11.8	Low Ch 0, DH5, EUT Disp. Up
2389.600	24.5	-2.3	1.3	18.0	3.0	20.0	Vert	AV	0.0	42.2	54.0	-11.8	Low Ch 0, 3DH5, EUT Flat
2389.400	24.5	-2.3	1.3	219.0	3.0	20.0	Horz	AV	0.0	42.2	54.0	-11.8	Low Ch 0, DH5, EUT Vert
2389.330	24.5	-2.3	1.3	139.0	3.0	20.0	Horz	AV	0.0	42.2	54.0	-11.8	Low Ch 0, DH5, EUT Disp. Up
2389.257	24.5	-2.3	1.3	104.0	3.0	20.0	Vert	AV	0.0	42.2	54.0	-11.8	Low Ch 0, 2DH5, EUT Flat
2388.197	24.5	-2.3	1.3	129.0	3.0	20.0	Vert	AV	0.0	42.2	54.0	-11.8	Low Ch 0, DH5, EUT Vert
2483.710	40.9	-2.1	1.3	25.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	High Ch 78, DH5, EUT Flat
2484.543	40.7	-2.1	2.9	73.0	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch 78, DH5, EUT Vert
2484.070	40.6	-2.1	1.3	14.0	3.0	20.0	Vert	PK	0.0	58.5	74.0	-15.5	High Ch 78, DH5, EUT Vert
2484.130	40.4	-2.1	1.3	86.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	High Ch 78, DH5, EUT Flat
2389.837	40.6	-2.3	1.3	351.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	Low Ch 0, DH5, EUT Flat
2485.017	40.3	-2.1	1.6	88.0	3.0	20.0	Horz	PK	0.0	58.2	74.0	-15.8	High Ch 78, DH5, EUT Disp. Up
2485.203	40.2	-2.1	1.3	196.0	3.0	20.0	Horz	PK	0.0	58.1	74.0	-15.9	High Ch 78, 2DH5, EUT Disp. Up
2389.880	40.4	-2.3	1.3	205.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	Low Ch 0, DH5, EUT Disp. Up
2389.207	40.4	-2.3	1.3	104.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	Low Ch 0, 2DH5, EUT Flat
2483.510	40.1	-2.1	1.3	265.0	3.0	20.0	Vert	PK	0.0	58.0	74.0	-16.0	High Ch 78, DH5, EUT Disp. Up
2483.517	40.1	-2.1	1.3	241.0	3.0	20.0	Horz	PK	0.0	58.0	74.0	-16.0	High Ch 78, 3DH5, EUT Disp. Up
2389.747	40.3	-2.3	2.5	40.0	3.0	20.0	Vert	PK	0.0	58.0	74.0	-16.0	Low Ch 0, DH5, EUT Flat
2389.970	40.1	-2.3	1.3	139.0	3.0	20.0	Horz	PK	0.0	57.8	74.0	-16.2	Low Ch 0, DH5, EUT Disp. Up
2388.983	40.1	-2.3	1.3	18.0	3.0	20.0	Vert	PK	0.0	57.8	74.0	-16.2	Low Ch 0, 3DH5, EUT Flat
2389.030	39.8	-2.3	1.3	219.0	3.0	20.0	Horz	PK	0.0	57.5	74.0	-16.5	Low Ch 0, DH5, EUT Vert
2388.167	39.8	-2.3	1.3	129.0	3.0	20.0	Vert	PK	0.0	57.5	74.0	-16.5	Low Ch 0, DH5, EUT Vert

Work Order:	MCSO1732	Date:	07/09/15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	50% RH	
Serial Number:	2937900007466552649	Barometric Pres.:	1008 mbar	
EUT:	1721	Tested by: Richard Mellroth		
Configuration:	5			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	USB			
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.			
Deviations:	None			
Comments:	Hardware Configuration 3. Power Settings at Maximum.			
Test Specifications		Test Method		
FCC 15.247:2015		ANSI C63.10:2009		

Run #	149-150	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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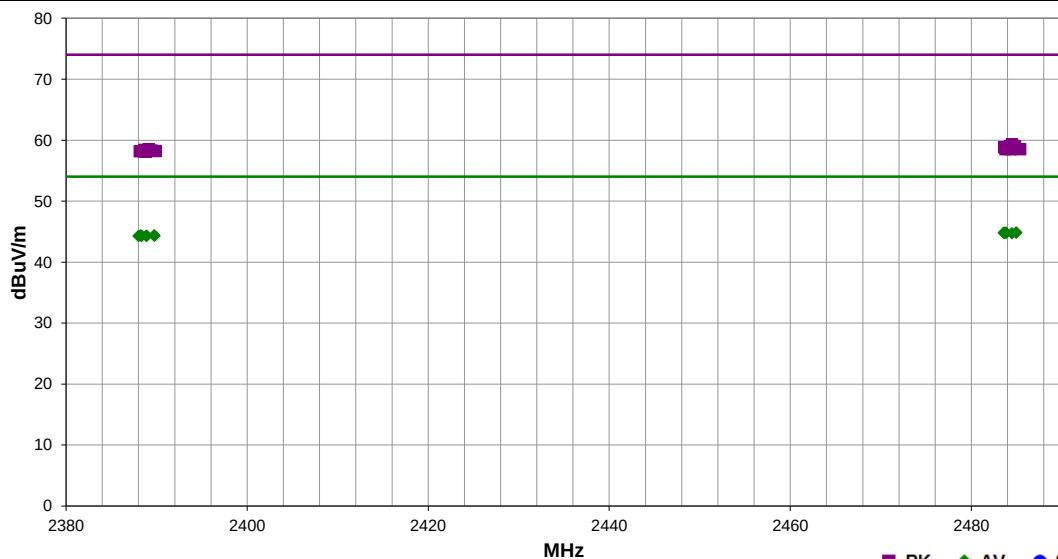


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7438.510	22.9	14.2	1.3	30.0	3.0	0.0	Horz	AV	0.0	37.1	54.0	-16.9	High Ch 78, DHS, EUT Vert
7438.765	22.9	14.2	2.1	110.0	3.0	0.0	Vert	AV	0.0	37.1	54.0	-16.9	High Ch 78, DHS, EUT Flat
7321.870	23.1	13.4	1.3	302.0	3.0	0.0	Horz	AV	0.0	36.5	54.0	-17.5	Mid Ch 39, DHS, EUT Vert
7321.510	23.1	13.4	3.7	60.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Mid Ch 39, DHS, EUT Flat
4960.070	27.1	8.5	1.7	345.0	3.0	0.0	Vert	AV	0.0	35.6	54.0	-18.4	High Ch 78, DHS, EUT Flat
4804.035	27.5	8.1	1.3	343.0	3.0	0.0	Horz	AV	0.0	35.6	54.0	-18.4	Low Ch 0, DHS, EUT Vert
4960.020	26.9	8.5	1.3	314.0	3.0	0.0	Horz	AV	0.0	35.4	54.0	-18.6	High Ch 78, DHS, EUT Vert
4882.035	26.8	8.6	1.5	349.0	3.0	0.0	Vert	AV	0.0	35.4	54.0	-18.6	Mid Ch 39, DHS, EUT Flat
4882.005	26.8	8.6	1.3	313.0	3.0	0.0	Horz	AV	0.0	35.4	54.0	-18.6	Mid Ch 39, DHS, EUT Vert
4804.040	27.1	8.1	3.4	315.0	3.0	0.0	Horz	AV	0.0	35.2	54.0	-18.8	Low Ch 0, DHS, EUT Disp. Up
4960.095	26.5	8.5	1.1	352.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	High Ch 78, 2DHS, EUT Flat
4804.035	26.9	8.1	1.8	0.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	Low Ch 0, DHS, EUT Flat
4804.050	25.4	8.1	1.3	185.0	3.0	0.0	Horz	AV	0.0	33.5	54.0	-20.5	Low Ch 0, DHS, EUT Flat
4960.065	24.6	8.5	1.3	334.0	3.0	0.0	Vert	AV	0.0	33.1	54.0	-20.9	High Ch 78, 3DHS, EUT Flat
7438.560	38.8	14.2	2.1	110.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	High Ch 78, DHS, EUT Flat
4804.090	24.8	8.1	1.3	338.0	3.0	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Low Ch 0, DHS, EUT Vert
7439.170	38.5	14.2	1.3	30.0	3.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	High Ch 78, DHS, EUT Vert
4804.020	24.5	8.1	3.3	273.0	3.0	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Low Ch 0, DHS, EUT Disp. Up
7323.540	38.5	13.4	1.3	302.0	3.0	0.0	Horz	PK	0.0	51.9	74.0	-22.1	Mid Ch 39, DHS, EUT Vert
7322.935	37.9	13.4	3.7	60.0	3.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	Mid Ch 39, DHS, EUT Flat
4959.970	40.5	8.5	1.7	345.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	High Ch 78, DHS, EUT Flat
4960.440	40.5	8.5	1.1	352.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	High Ch 78, 2DHS, EUT Flat
4959.995	40.3	8.5	1.3	314.0	3.0	0.0	Horz	PK	0.0	48.8	74.0	-25.2	High Ch 78, DHS, EUT Vert
4804.035	40.6	8.1	1.8	0.0	3.0	0.0	Vert	PK	0.0	48.7	74.0	-25.3	Low Ch 0, DHS, EUT Flat
4803.620	40.6	8.1	1.3	343.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch 0, DHS, EUT Vert
4881.885	39.9	8.6	1.5	349.0	3.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	Mid Ch 39, DHS, EUT Flat
4881.695	39.8	8.6	1.3	313.0	3.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	Mid Ch 39, DHS, EUT Vert
4959.675	39.5	8.5	1.3	334.0	3.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	High Ch 78, 3DHS, EUT Flat
4804.305	39.9	8.1	3.4	315.0	3.0	0.0	Horz	PK	0.0	48.0	74.0	-26.0	Low Ch 0, DHS, EUT Disp. Up
4804.085	39.9	8.1	3.3	273.0	3.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	Low Ch 0, DHS, EUT Disp. Up
4803.420	38.9	8.1	1.3	185.0	3.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	Low Ch 0, DHS, EUT Flat
4804.500	38.8	8.1	1.3	338.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch 0, DHS, EUT Flat
12211.140	26.8	-0.8	1.3	337.0	3.0	0.0	Horz	AV	0.0	26.0	54.0	-28.0	Mid Ch 39, DHS, EUT Vert
12210.550	26.8	-0.8	1.3	184.0	3.0	0.0	Vert	AV	0.0	26.0	54.0	-28.0	Mid Ch 39, DHS, EUT Flat
12399.950	26.8	-0.9	1.3	254.0	3.0	0.0	Horz	AV	0.0	25.9	54.0	-28.1	High Ch 78, DHS, EUT Vert
12399.990	26.8	-0.9	1.3	124.0	3.0	0.0	Vert	AV	0.0	25.9	54.0	-28.1	High Ch 78, DHS, EUT Flat
12011.110	27.1	-1.7	1.3	267.0	3.0	0.0	Vert	AV	0.0	25.4	54.0	-28.6	Low Ch 0, DHS, EUT Flat
12010.950	27.0	-1.7	1.3	83.0	3.0	0.0	Horz	AV	0.0	25.3	54.0	-28.7	Low Ch 0, DHS, EUT Vert
12210.640	42.9	-0.8	1.3	337.0	3.0	0.0	Horz	PK	0.0	42.1	74.0	-31.9	Mid Ch 39, DHS, EUT Vert
12209.440	42.5	-0.8	1.3	184.0	3.0	0.0	Vert	PK	0.0	41.7	74.0	-32.3	Mid Ch 39, DHS, EUT Flat
12399.900	42.5	-0.9	1.3	124.0	3.0	0.0	Vert	PK	0.0	41.6	74.0	-32.4	High Ch 78, DHS, EUT Flat
12398.970	42.4	-0.9	1.3	254.0	3.0	0.0	Horz	PK	0.0	41.5	74.0	-32.5	High Ch 78, DHS, EUT Vert
12009.910	42.9	-1.7	1.3	83.0	3.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	Low Ch 0, DHS, EUT Vert
12009.540	42.5	-1.7	1.3	267.0	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	Low Ch 0, DHS, EUT Flat

Work Order:	MCSO1732	Date:	07/02/15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	48% RH	
Serial Number:	2937901003818152549	Barometric Pres.:	1017 mbar	
EUT:	1721	Tested by:	Richard Mellroth	
Configuration:	4			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	USB			
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.			
Deviations:	None			
Comments:	Hardware Configuration 2. Power Settings at Maximum. 2.4 GHz Band Edge Measurements			

Test Specifications	FCC 15.247:2015	Test Method	ANSI C63.10:2009
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Run #	49	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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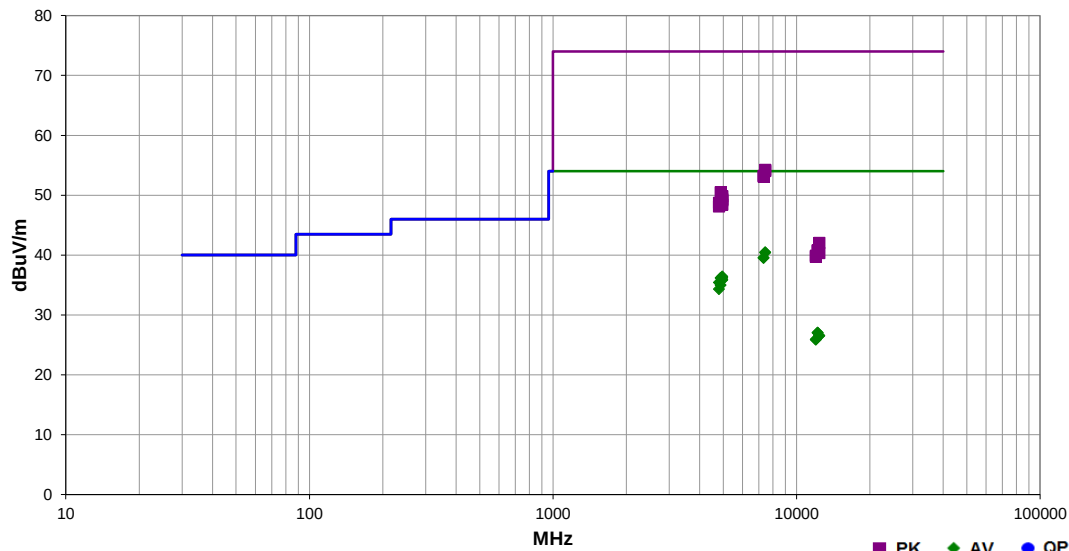


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.967	26.9	-2.1	1.3	215.0	3.0	20.0	Vert	AV	0.0	44.8	54.0	-9.2	High Ch 78, DH5, EUT Vert
2484.953	26.9	-2.1	4.0	5.0	3.0	20.0	Vert	AV	0.0	44.8	54.0	-9.2	High Ch 78, 3DH5, EUT Vert
2483.857	26.9	-2.1	1.3	11.0	3.0	20.0	Vert	AV	0.0	44.8	54.0	-9.2	High Ch 78, DH5, EUT Disp. Up
2483.810	26.9	-2.1	1.7	153.0	3.0	20.0	Vert	AV	0.0	44.8	54.0	-9.2	High Ch 78, 2DH5, EUT Vert
2483.723	26.9	-2.1	1.3	67.0	3.0	20.0	Vert	AV	0.0	44.8	54.0	-9.2	High Ch 78, DH5, EUT Flat
2483.727	26.9	-2.1	1.8	52.0	3.0	20.0	Horz	AV	0.0	44.8	54.0	-9.2	High Ch 78, DH5, EUT Flat
2483.567	26.9	-2.1	1.3	327.0	3.0	20.0	Horz	AV	0.0	44.8	54.0	-9.2	High Ch 78, DH5, EUT Disp. Up
2484.497	26.8	-2.1	1.3	360.0	3.0	20.0	Horz	AV	0.0	44.7	54.0	-9.3	High Ch 78, DH5, EUT Vert
2389.720	26.7	-2.3	3.0	118.0	3.0	20.0	Horz	AV	0.0	44.4	54.0	-9.6	Low Ch 0, DH5, EUT Vert
2388.207	26.7	-2.3	1.3	331.0	3.0	20.0	Vert	AV	0.0	44.4	54.0	-9.6	Low Ch 0, DH5, EUT Disp. Up
2389.783	26.6	-2.3	3.9	178.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	Low Ch 0, DH5, EUT Flat
2388.927	26.6	-2.3	1.4	87.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	Low Ch 0, 3DH5, EUT Vert
2388.850	26.6	-2.3	1.3	157.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	Low Ch 0, 2DH5, EUT Vert
2388.363	26.6	-2.3	2.0	244.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	Low Ch 0, DH5, EUT Vert
2388.303	26.6	-2.3	1.3	195.0	3.0	20.0	Horz	AV	0.0	44.3	54.0	-9.7	Low Ch 0, DH5, EUT Flat
2388.000	26.6	-2.3	1.3	168.0	3.0	20.0	Horz	AV	0.0	44.3	54.0	-9.7	Low Ch 0, DH5, EUT Disp. Up
2484.490	41.4	-2.1	1.3	67.0	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch 78, DH5, EUT Flat
2484.817	41.1	-2.1	1.3	360.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch 78, DH5, EUT Vert
2484.287	41.1	-2.1	4.0	5.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	High Ch 78, 3DH5, EUT Vert
2483.643	40.9	-2.1	1.3	11.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	High Ch 78, DH5, EUT Disp. Up
2484.180	40.8	-2.1	1.3	215.0	3.0	20.0	Vert	PK	0.0	58.7	74.0	-15.3	High Ch 78, DH5, EUT Vert
2485.383	40.6	-2.1	1.3	327.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	High Ch 78, DH5, EUT Disp. Up
2484.347	40.6	-2.1	1.8	52.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	High Ch 78, DH5, EUT Flat
2483.777	40.6	-2.1	1.7	153.0	3.0	20.0	Vert	PK	0.0	58.5	74.0	-15.5	High Ch 78, 2DH5, EUT Vert
2389.117	40.8	-2.3	1.3	168.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	Low Ch 0, DH5, EUT Disp. Up
2388.640	40.7	-2.3	2.0	244.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	Low Ch 0, DH5, EUT Vert
2389.430	40.6	-2.3	1.4	87.0	3.0	20.0	Vert	PK	0.0	58.3	74.0	-15.7	Low Ch 0, 3DH5, EUT Vert
2388.833	40.6	-2.3	3.0	118.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	Low Ch 0, DH5, EUT Flat
2389.873	40.5	-2.3	3.9	178.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	Low Ch 0, DH5, EUT Flat
2388.567	40.5	-2.3	1.3	157.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	Low Ch 0, 2DH5, EUT Vert
2388.140	40.5	-2.3	1.3	195.0	3.0	20.0	Horz	PK	0.0	58.2	74.0	-15.8	Low Ch 0, DH5, EUT Flat
2388.803	40.4	-2.3	1.3	331.0	3.0	20.0	Vert	PK	0.0	58.1	74.0	-15.9	Low Ch 0, DH5, EUT Disp. Up

Work Order:	MCSO1732	Date:	07/02/15		
Project:	None	Temperature:	23 °C		
Job Site:	NC01	Humidity:	48% RH		
Serial Number:	2937901003818152549	Barometric Pres.:	1017 mbar	Tested by:	Richard Mellroth
EUT:	1721				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	USB				
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.				
Deviations:	None				
Comments:	Hardware Configuration 2. Power Settings at Maximum.				

Test Specifications	FCC 15.247:2015	Test Method	ANSI C63.10:2009
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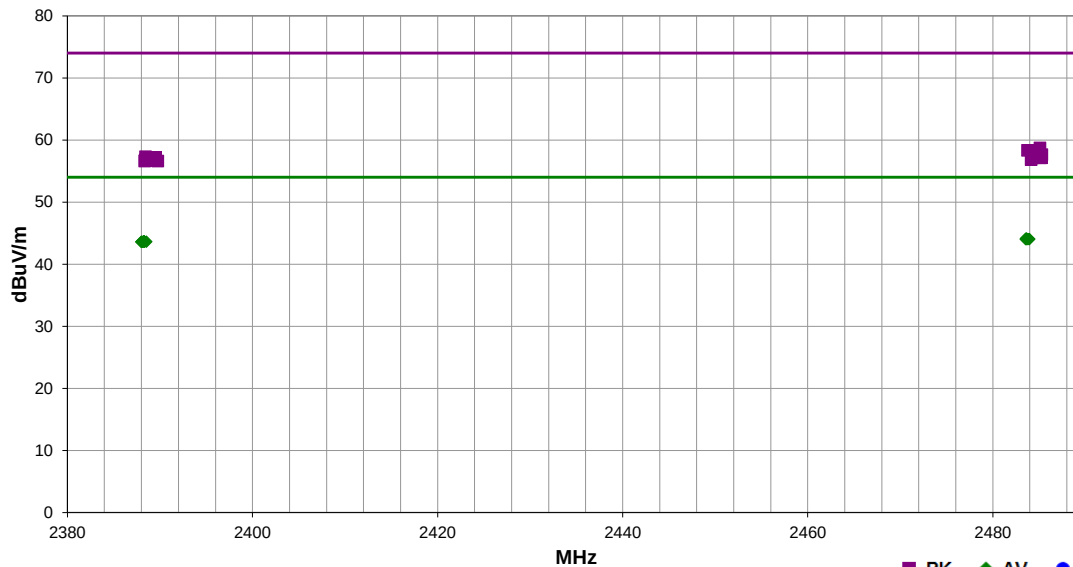
Run #	50-51	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.455	26.2	14.2	1.3	286.0	3.0	0.0	Vert	AV	0.0	40.4	54.0	-13.6	High Ch 78, DH5, EUT Vert
7441.300	26.2	14.2	1.3	193.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	High Ch 78, DH5, EUT Flat
7324.465	26.1	13.4	1.3	238.0	3.0	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch 39, DH5, EUT Flat
7324.195	26.1	13.4	1.3	205.0	3.0	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch 39, DH5, EUT Vert
4960.035	27.9	8.5	1.3	36.0	3.0	0.0	Horz	AV	0.0	36.4	54.0	-17.6	High Ch 78, 3DH5, EUT Flat
4960.030	27.7	8.5	1.3	43.0	3.0	0.0	Horz	AV	0.0	36.2	54.0	-17.8	High Ch 78, DH5, EUT Flat
4882.080	27.6	8.6	1.5	31.0	3.0	0.0	Horz	AV	0.0	36.2	54.0	-17.8	Mid Ch 39, DH5, EUT Flat
4960.045	27.4	8.5	1.3	315.0	3.0	0.0	Horz	AV	0.0	35.9	54.0	-18.1	High Ch 78, 2DH5, EUT Flat
4959.925	27.3	8.5	4.0	334.0	3.0	0.0	Vert	AV	0.0	35.8	54.0	-18.2	High Ch 78, DH5, EUT Vert
4804.050	27.3	8.1	1.3	27.0	3.0	0.0	Horz	AV	0.0	35.4	54.0	-18.6	Low Ch 0, DH5, EUT Flat
4882.015	26.4	8.6	1.3	1.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	Mid Ch 39, DH5, EUT Vert
4803.090	26.2	8.1	1.3	190.0	3.0	0.0	Vert	AV	0.0	34.3	54.0	-19.7	Low Ch 0, DH5, EUT Vert
7441.290	40.0	14.2	1.3	193.0	3.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	High Ch 78, DH5, EUT Flat
7440.630	39.8	14.2	1.3	286.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	High Ch 78, DH5, EUT Vert
7322.750	39.8	13.4	1.3	238.0	3.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	Mid Ch 39, DH5, EUT Flat
7322.210	39.7	13.4	1.3	205.0	3.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Mid Ch 39, DH5, EUT Vert
4882.705	41.9	8.6	1.5	31.0	3.0	0.0	Horz	PK	0.0	50.5	74.0	-23.5	Mid Ch 39, DH5, EUT Flat
4959.635	41.3	8.5	1.3	36.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	High Ch 78, 3DH5, EUT Flat
4959.745	40.8	8.5	1.3	43.0	3.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	High Ch 78, DH5, EUT Flat
4960.660	40.6	8.5	1.3	315.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	High Ch 78, 2DH5, EUT Flat
4804.490	40.6	8.1	1.3	27.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch 0, DH5, EUT Vert
4959.735	39.9	8.5	4.0	334.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	High Ch 78, DH5, EUT Vert
4881.810	39.8	8.6	1.3	1.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	Mid Ch 39, DH5, EUT Vert
4802.530	40.0	8.1	1.3	190.0	3.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	Low Ch 0, DH5, EUT Vert
12206.410	27.8	-0.8	1.3	138.0	3.0	0.0	Horz	AV	0.0	27.0	54.0	-27.0	Mid Ch 39, DH5, EUT Flat
12205.230	27.8	-0.8	1.3	287.0	3.0	0.0	Vert	AV	0.0	27.0	54.0	-27.0	Mid Ch 39, DH5, EUT Vert
12399.790	27.4	-0.9	1.3	26.0	3.0	0.0	Horz	AV	0.0	26.5	54.0	-27.5	High Ch 78, DH5, EUT Flat
12399.880	27.4	-0.9	1.3	88.0	3.0	0.0	Vert	AV	0.0	26.5	54.0	-27.5	High Ch 78, DH5, EUT Vert
12009.310	27.6	-1.7	1.3	171.0	3.0	0.0	Vert	AV	0.0	25.9	54.0	-28.1	Low Ch 0, DH5, EUT Vert
12008.620	27.6	-1.7	1.3	59.0	3.0	0.0	Horz	AV	0.0	25.9	54.0	-28.1	Low Ch 0, DH5, EUT Flat
12398.740	42.9	-0.9	1.3	26.0	3.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	High Ch 78, DH5, EUT Flat
12206.410	41.6	-0.8	1.3	287.0	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	Mid Ch 39, DH5, EUT Vert
12204.290	41.5	-0.8	1.3	138.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Mid Ch 39, DH5, EUT Flat
12399.900	41.2	-0.9	1.3	88.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	High Ch 78, DH5, EUT Vert
12009.610	41.6	-1.7	1.3	171.0	3.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	Low Ch 0, DH5, EUT Vert
12009.490	41.4	-1.7	1.3	59.0	3.0	0.0	Horz	PK	0.0	39.7	74.0	-34.3	Low Ch 0, DH5, EUT Flat

Work Order:	MCSO1732	Date:	07/01/15		
Project:	None	Temperature:	23 °C		
Job Site:	NC01	Humidity:	48% RH		
Serial Number:	2937902003021152649	Barometric Pres.:	1018 mbar	Tested by:	Richard Mellroth
EUT:	1721				
Configuration:	3				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	USB				
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.				
Deviations:	None				
Comments:	Hardware Configuration 1. Power Settings at Maximum. 2.4 GHz Band Edge Measurements.				

Test Specifications				Test Method			
FCC 15.247:2015				ANSI C63.10:2009			
Run #	15	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass

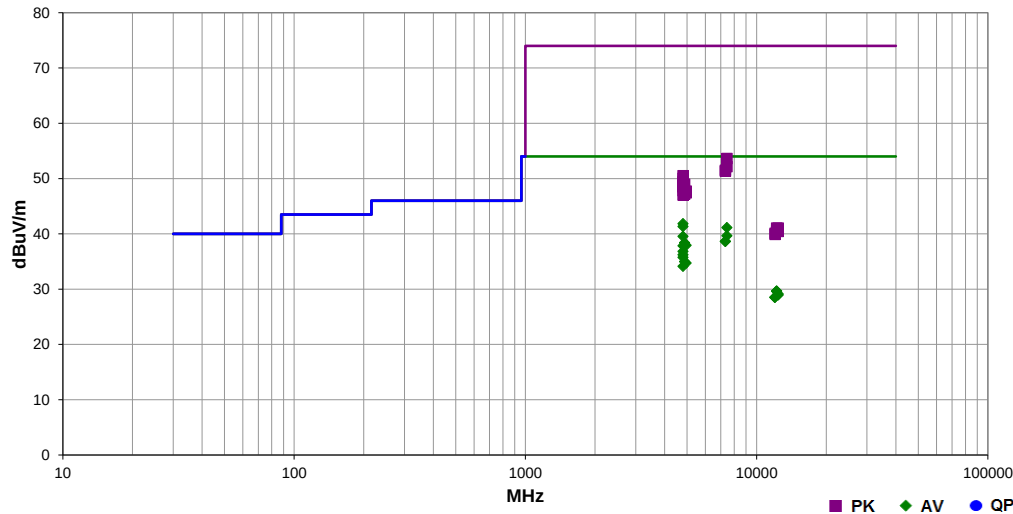


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.587	26.2	-2.1	3.8	325.0	3.0	20.0	Horz	AV	0.0	44.1	54.0	-9.9	High Ch 78, DH5, EUT Flat
2483.650	26.2	-2.1	4.0	142.0	3.0	20.0	Horz	AV	0.0	44.1	54.0	-9.9	High Ch 78, 2DH5, EUT Flat
2483.933	26.1	-2.1	1.3	359.0	3.0	20.0	Vert	AV	0.0	44.0	54.0	-10.0	High Ch 78, DH5, EUT Flat
2483.763	26.1	-2.1	1.3	344.0	3.0	20.0	Vert	AV	0.0	44.0	54.0	-10.0	High Ch 78, DH5, EUT Vert
2483.923	26.1	-2.1	1.3	234.0	3.0	20.0	Horz	AV	0.0	44.0	54.0	-10.0	High Ch 78, DH5, EUT Disp. Up
2483.590	26.1	-2.1	1.3	143.0	3.0	20.0	Horz	AV	0.0	44.0	54.0	-10.0	High Ch 78, DH5, EUT Vert
2483.627	26.1	-2.1	1.3	314.0	3.0	20.0	Horz	AV	0.0	44.0	54.0	-10.0	High Ch 78, 3DH5, EUT Flat
2483.567	26.1	-2.1	1.7	144.0	3.0	20.0	Vert	AV	0.0	44.0	54.0	-10.0	High Ch 78, DH5, EUT Disp. Up
2388.267	26.0	-2.3	1.3	11.0	3.0	20.0	Horz	AV	0.0	43.7	54.0	-10.3	Low Ch 0, DH5, EUT Disp. Up
2388.543	25.9	-2.3	1.3	69.0	3.0	20.0	Vert	AV	0.0	43.6	54.0	-10.4	Low Ch 0, DH5, EUT Vert
2388.337	25.9	-2.3	1.3	38.0	3.0	20.0	Horz	AV	0.0	43.6	54.0	-10.4	Low Ch 0, DH5, EUT Vert
2388.303	25.9	-2.3	3.8	258.0	3.0	20.0	Vert	AV	0.0	43.6	54.0	-10.4	Low Ch 0, DH5, EUT Flat
2388.217	25.9	-2.3	1.3	314.0	3.0	20.0	Horz	AV	0.0	43.6	54.0	-10.4	Low Ch 0, DH5, EUT Flat
2388.090	25.9	-2.3	1.3	153.0	3.0	20.0	Horz	AV	0.0	43.6	54.0	-10.4	Low Ch 0, 3DH5, EUT Disp. Up
2388.013	25.9	-2.3	1.3	143.0	3.0	20.0	Vert	AV	0.0	43.6	54.0	-10.4	Low Ch 0, DH5, EUT Disp. Up
2388.003	25.9	-2.3	1.3	178.0	3.0	20.0	Horz	AV	0.0	43.6	54.0	-10.4	Low Ch 0, 2DH5, EUT Disp. Up
2485.097	40.8	-2.1	3.8	325.0	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	High Ch 78, DH5, EUT Flat
2483.753	40.4	-2.1	1.3	359.0	3.0	20.0	Vert	PK	0.0	58.3	74.0	-15.7	High Ch 78, DH5, EUT Flat
2485.303	39.7	-2.1	1.3	143.0	3.0	20.0	Horz	PK	0.0	57.6	74.0	-16.4	High Ch 78, DH5, EUT Vert
2484.577	39.7	-2.1	1.3	344.0	3.0	20.0	Vert	PK	0.0	57.6	74.0	-16.4	High Ch 78, DH5, EUT Vert
2388.447	39.6	-2.3	3.8	258.0	3.0	20.0	Vert	PK	0.0	57.3	74.0	-16.7	Low Ch 0, DH5, EUT Flat
2389.527	39.5	-2.3	1.3	38.0	3.0	20.0	Horz	PK	0.0	57.2	74.0	-16.8	Low Ch 0, DH5, EUT Vert
2485.250	39.2	-2.1	1.7	144.0	3.0	20.0	Vert	PK	0.0	57.1	74.0	-16.9	High Ch 78, DH5, EUT Disp. Up
2485.163	39.2	-2.1	4.0	142.0	3.0	20.0	Horz	PK	0.0	57.1	74.0	-16.9	High Ch 78, 2DH5, EUT Flat
2484.417	39.2	-2.1	1.3	314.0	3.0	20.0	Horz	PK	0.0	57.1	74.0	-16.9	High Ch 78, 3DH5, EUT Flat
2389.450	39.2	-2.3	1.3	69.0	3.0	20.0	Vert	PK	0.0	56.9	74.0	-17.1	Low Ch 0, DH5, EUT Vert
2484.143	38.9	-2.1	1.3	234.0	3.0	20.0	Horz	PK	0.0	56.8	74.0	-17.2	High Ch 78, DH5, EUT Disp. Up
2388.590	39.1	-2.3	1.3	153.0	3.0	20.0	Horz	PK	0.0	56.8	74.0	-17.2	Low Ch 0, 3DH5, EUT Disp. Up
2388.413	39.1	-2.3	1.3	11.0	3.0	20.0	Horz	PK	0.0	56.8	74.0	-17.2	Low Ch 0, DH5, EUT Disp. Up
2388.990	39.0	-2.3	1.3	314.0	3.0	20.0	Horz	PK	0.0	56.7	74.0	-17.3	Low Ch 0, DH5, EUT Flat
2389.773	38.9	-2.3	1.3	178.0	3.0	20.0	Horz	PK	0.0	56.6	74.0	-17.4	Low Ch 0, 2DH5, EUT Disp. Up
2388.350	38.9	-2.3	1.3	143.0	3.0	20.0	Vert	PK	0.0	56.6	74.0	-17.4	Low Ch 0, DH5, EUT Disp. Up

Work Order:	MCSO1732	Date:	07/01/15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	48% RH	
Serial Number:	2937902003021152649	Barometric Pres.:	1018 mbar	
EUT:	1721			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	USB			
Operating Mode:	Transmitting BT EDR, See comments next to data points for EUT channel, data rate, and orientation.			
Deviations:	None			
Comments:	Hardware Configuration 1. Power Settings at Maximum.			

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
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4803.920	33.7	8.1	1.4	28.0	3.0	0.0	Horz	AV	0.0	41.8	54.0	-12.2	Low Ch 0, 2DH5, EUT Flat
4803.975	33.2	8.1	1.4	20.0	3.0	0.0	Horz	AV	0.0	41.3	54.0	-12.7	Low Ch 0, 3DH5, EUT Flat
7440.620	26.9	14.2	1.2	238.0	3.0	0.0	Horz	AV	0.0	41.1	54.0	-12.9	High Ch 78, DH5, EUT Flat
7439.685	25.4	14.2	1.3	358.0	3.0	0.0	Vert	AV	0.0	39.6	54.0	-14.4	High Ch 78, DH5, EUT Vert
4804.020	31.4	8.1	1.4	35.0	3.0	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Low Ch 0, DH5, EUT Flat
7322.910	25.2	13.4	1.3	182.0	3.0	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Mid Ch 39, DH5, EUT Vert
7322.845	25.2	13.4	1.3	47.0	3.0	0.0	Horz	AV	0.0	38.6	54.0	-15.4	Mid Ch 39, DH5, EUT Flat
4882.020	29.8	8.6	1.3	30.0	3.0	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Mid Ch 39, DH5, EUT Flat
4959.990	29.4	8.5	1.1	47.0	3.0	0.0	Horz	AV	0.0	37.9	54.0	-16.1	High Ch 78, DH5, EUT Flat
4804.000	29.7	8.1	1.3	302.0	3.0	0.0	Horz	AV	0.0	37.8	54.0	-16.2	Low Ch 0, DH5, EUT Vert
4804.010	28.7	8.1	4.0	315.0	3.0	0.0	Horz	AV	0.0	36.8	54.0	-17.2	Low Ch 0, DH5, EUT Disp. Up
4804.000	28.1	8.1	3.5	20.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	Low Ch 0, DH5, EUT Vert
4804.010	27.6	8.1	1.8	280.0	3.0	0.0	Vert	AV	0.0	35.7	54.0	-18.3	Low Ch 0, DH5, EUT Disp. Up
4881.975	26.4	8.6	1.3	331.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	Mid Ch 39, DH5, EUT Vert
4960.045	26.2	8.5	1.3	309.0	3.0	0.0	Vert	AV	0.0	34.7	54.0	-19.3	High Ch 78, DH5, EUT Vert
4803.875	26.0	8.1	1.3	296.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	Low Ch 0, DH5, EUT Flat
7440.615	39.4	14.2	1.3	358.0	3.0	0.0	Vert	PK	0.0	53.6	74.0	-20.4	High Ch 78, DH5, EUT Vert
7438.765	37.9	14.2	1.2	238.0	3.0	0.0	Horz	PK	0.0	52.1	74.0	-21.9	High Ch 78, DH5, EUT Flat
7322.160	38.1	13.4	1.3	47.0	3.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	Mid Ch 39, DH5, EUT Flat
7323.000	37.9	13.4	1.3	182.0	3.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	Mid Ch 39, DH5, EUT Vert
4803.560	42.4	8.1	1.4	28.0	3.0	0.0	Horz	PK	0.0	50.5	74.0	-23.5	Low Ch 0, 2DH5, EUT Flat
4803.780	41.9	8.1	1.4	20.0	3.0	0.0	Horz	PK	0.0	50.0	74.0	-24.0	Low Ch 0, 3DH5, EUT Flat
12211.330	30.4	-0.8	1.3	0.0	3.0	0.0	Horz	AV	0.0	29.6	54.0	-24.4	Mid Ch 39, DH5, EUT Flat
12211.080	30.4	-0.8	1.3	297.0	3.0	0.0	Vert	AV	0.0	29.6	54.0	-24.4	Mid Ch 39, DH5, EUT Vert
4803.865	41.3	8.1	1.4	35.0	3.0	0.0	Horz	PK	0.0	49.4	74.0	-24.6	Low Ch 0, DH5, EUT Flat
12399.720	30.0	-0.9	2.4	135.0	3.0	0.0	Horz	AV	0.0	29.1	54.0	-24.9	High Ch 78, DH5, EUT Flat
4881.675	40.4	8.6	1.3	30.0	3.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	Mid Ch 39, DH5, EUT Flat
12399.100	29.8	-0.9	1.3	87.0	3.0	0.0	Vert	AV	0.0	28.9	54.0	-25.1	High Ch 78, DH5, EUT Vert
4804.200	40.6	8.1	1.3	302.0	3.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch 0, DH5, EUT Vert
4804.375	40.4	8.1	3.5	20.0	3.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	Low Ch 0, DH5, EUT Vert
4804.145	40.4	8.1	4.0	315.0	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch 0, DH5, EUT Disp. Up
12008.960	30.2	-1.7	1.3	238.0	3.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	Low Ch 0, DH5, EUT Vert
12008.870	30.2	-1.7	1.3	226.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	Low Ch 0, DH5, EUT Flat
4803.795	39.7	8.1	1.8	280.0	3.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	Low Ch 0, DH5, EUT Disp. Up
4959.580	39.2	8.5	1.1	47.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	High Ch 78, DH5, EUT Flat
4960.585	38.9	8.5	1.3	309.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High Ch 78, DH5, EUT Vert
4881.800	38.6	8.6	1.3	331.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Mid Ch 39, DH5, EUT Vert
4803.725	38.9	8.1	1.3	296.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low Ch 0, DH5, EUT Flat
12399.220	41.9	-0.9	1.3	87.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	High Ch 78, DH5, EUT Vert
12209.330	41.8	-0.8	1.3	297.0	3.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Mid Ch 39, DH5, EUT Vert
12209.880	41.3	-0.8	1.3	0.0	3.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	Mid Ch 39, DH5, EUT Flat
12398.890	41.3	-0.9	2.4	135.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	High Ch 78, DH5, EUT Flat
12011.280	41.8	-1.7	1.3	226.0	3.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Low Ch 0, DH5, EUT Flat
12010.810	41.6	-1.7	1.3	238.0	3.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	Low Ch 0, DH5, EUT Vert

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

TEST DESCRIPTION

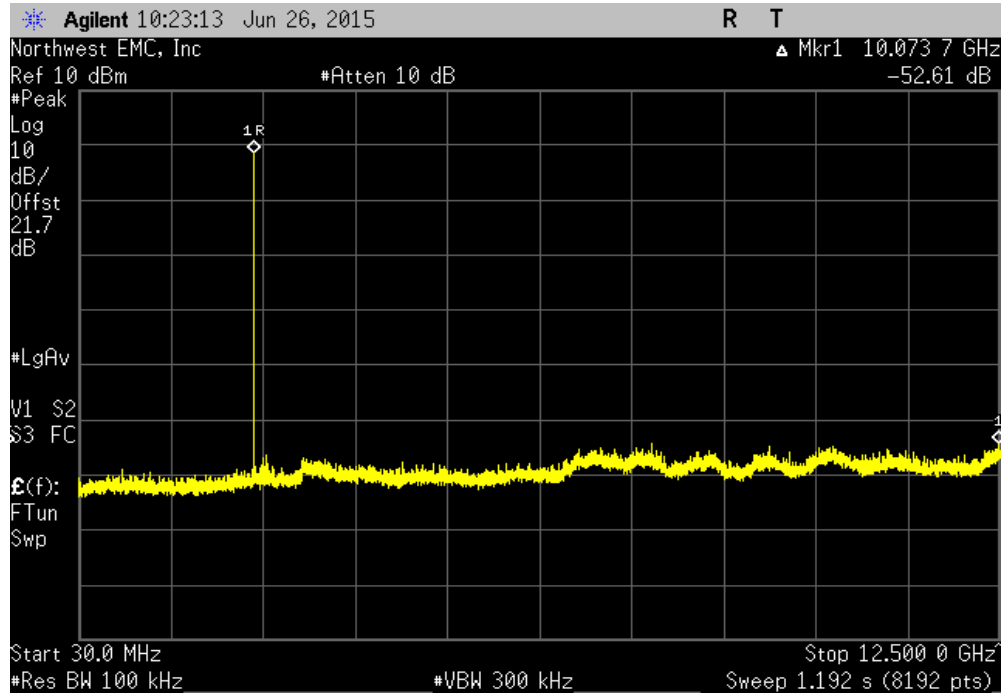
The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

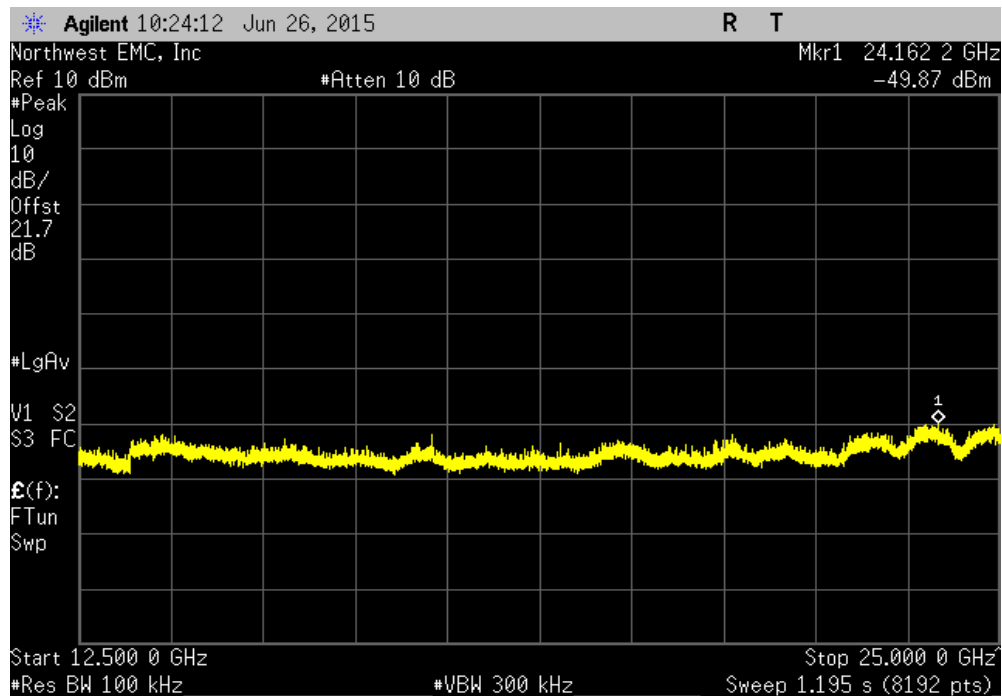
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Frequency Range	Value (dBc) Limit ≤ (dBc) Result
Non-Hopping Mode			
DH5			
	Low Channel 0, 2402 MHz	30 MHz - 12.5 GHz	-52.61 -20 Pass
	Low Channel 0, 2402 MHz	12.5 GHz - 25 GHz	-48.36 -20 Pass
	Mid Channel 39, 2441 MHz	30 MHz - 12.5 GHz	-53.32 -20 Pass
	Mid Channel 39, 2441 MHz	12.5 GHz - 25 GHz	-48.53 -20 Pass
	High Channel 78, 2480 MHz	30 MHz - 12.5 GHz	-54.84 -20 Pass
	High Channel 78, 2480 MHz	12.5 GHz - 25 GHz	-50.26 -20 Pass
2DH5			
	Low Channel 0, 2402 MHz	30 MHz - 12.5 GHz	-52.2 -20 Pass
	Low Channel 0, 2402 MHz	12.5 GHz - 25 GHz	-47.5 -20 Pass
	Mid Channel 39, 2441 MHz	30 MHz - 12.5 GHz	-52.97 -20 Pass
	Mid Channel 39, 2441 MHz	12.5 GHz - 25 GHz	-47.41 -20 Pass
	High Channel 78, 2480 MHz	30 MHz - 12.5 GHz	-54.42 -20 Pass
	High Channel 78, 2480 MHz	12.5 GHz - 25 GHz	-49.04 -20 Pass
3DH5			
	Low Channel 0, 2402 MHz	30 MHz - 12.5 GHz	-52.55 -20 Pass
	Low Channel 0, 2402 MHz	12.5 GHz - 25 GHz	-47.98 -20 Pass
	Mid Channel 39, 2441 MHz	30 MHz - 12.5 GHz	-52.11 -20 Pass
	Mid Channel 39, 2441 MHz	12.5 GHz - 25 GHz	-47.32 -20 Pass
	High Channel 78, 2480 MHz	30 MHz - 12.5 GHz	-52.34 -20 Pass
	High Channel 78, 2480 MHz	12.5 GHz - 25 GHz	-47.96 -20 Pass

SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.61	-20	Pass	

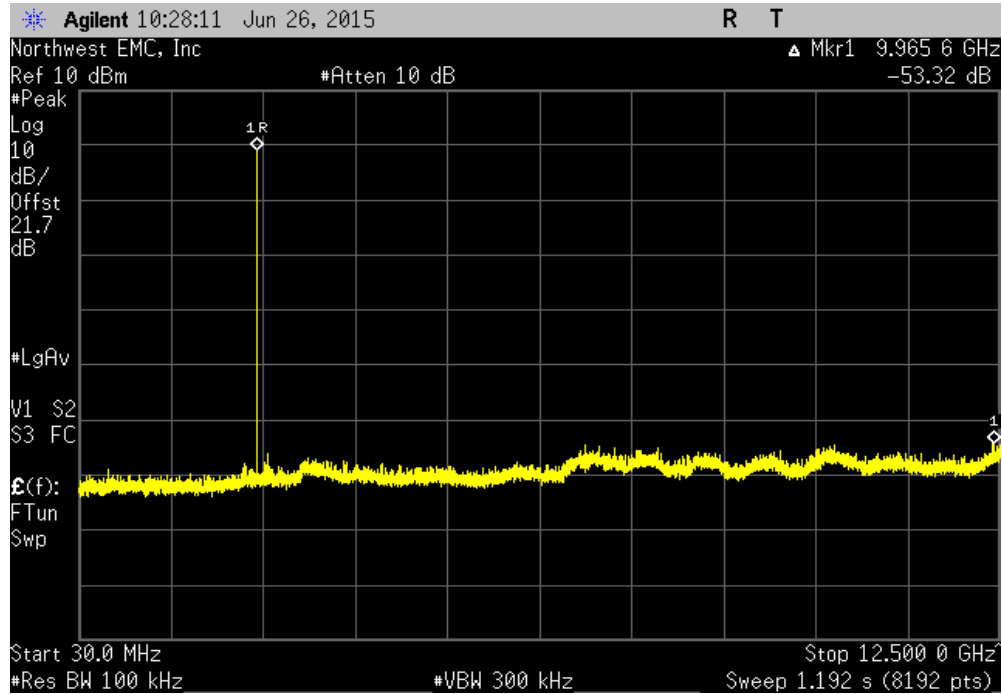


Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-48.36	-20	Pass	

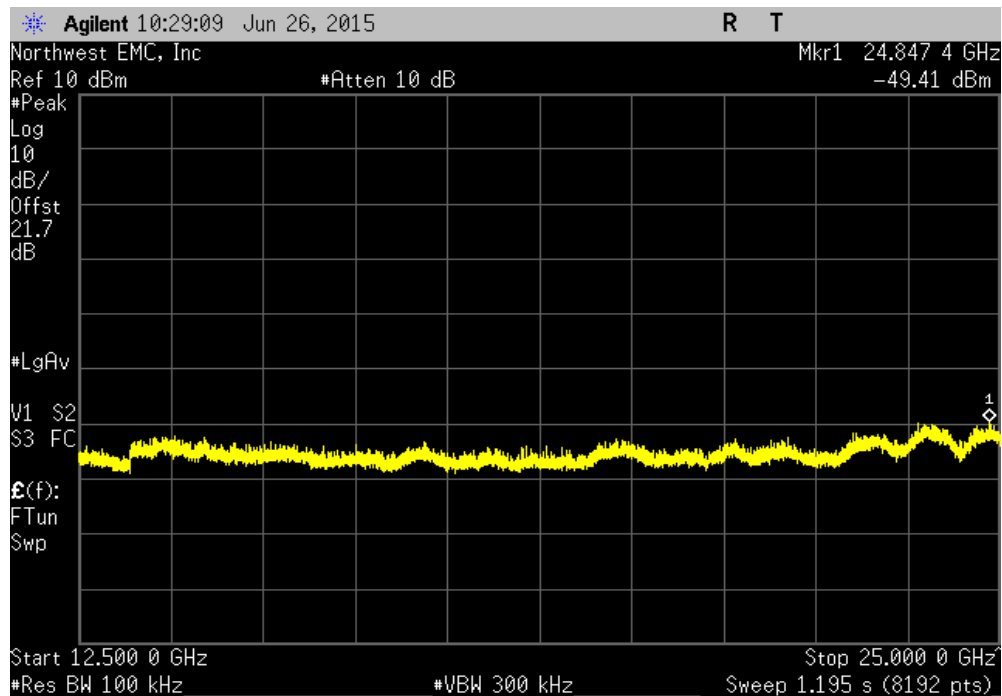


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-53.32	-20	Pass	

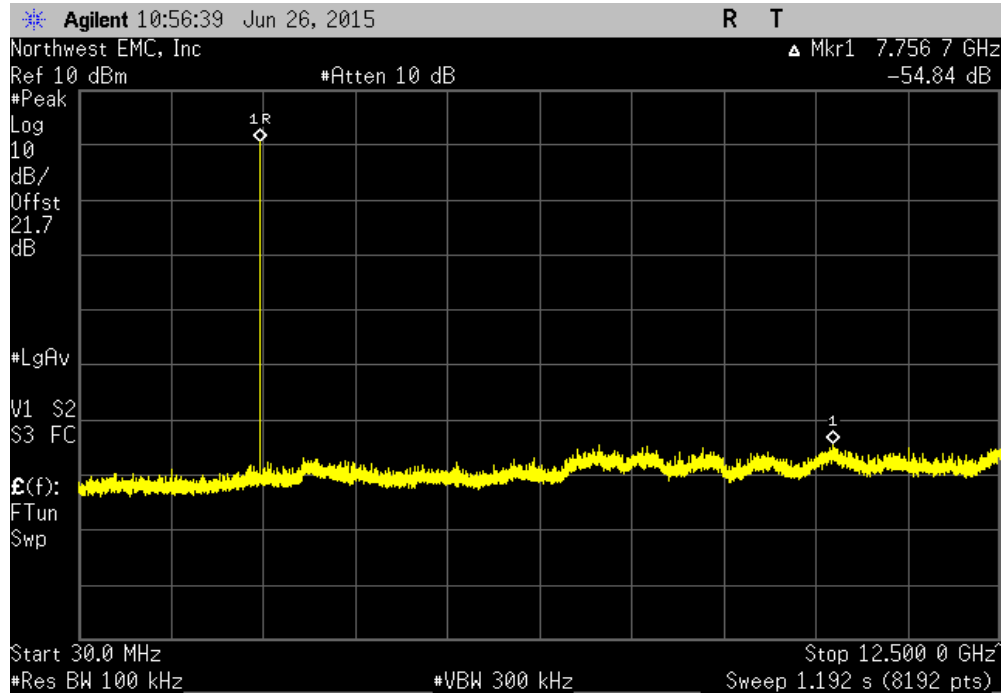


Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-48.53	-20	Pass	

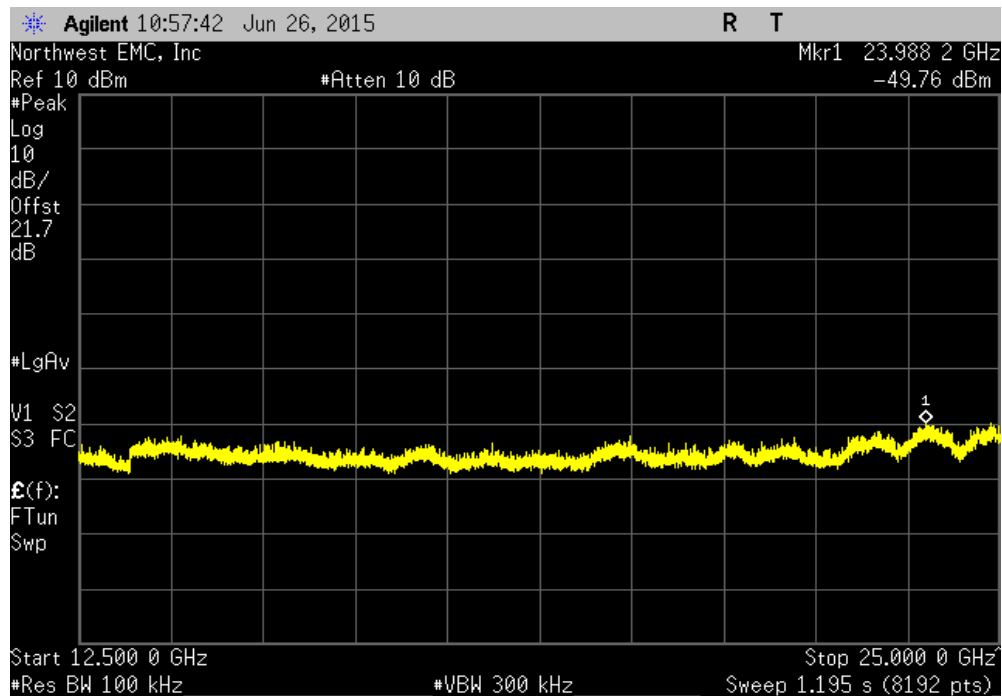


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-54.84	-20	Pass	

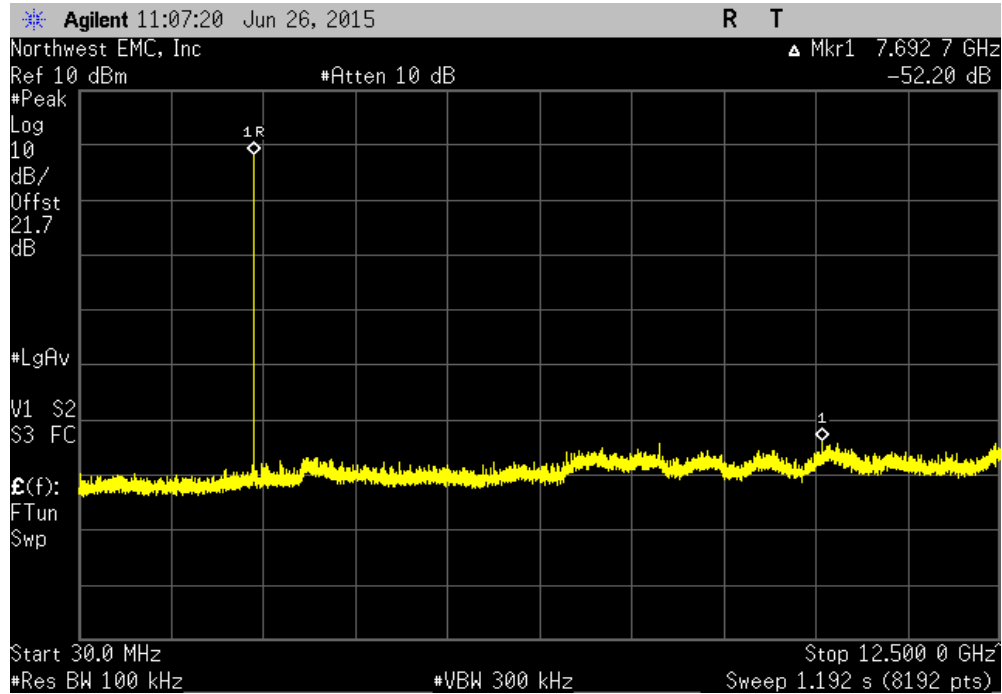


Non-Hopping Mode, DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-50.26	-20	Pass	

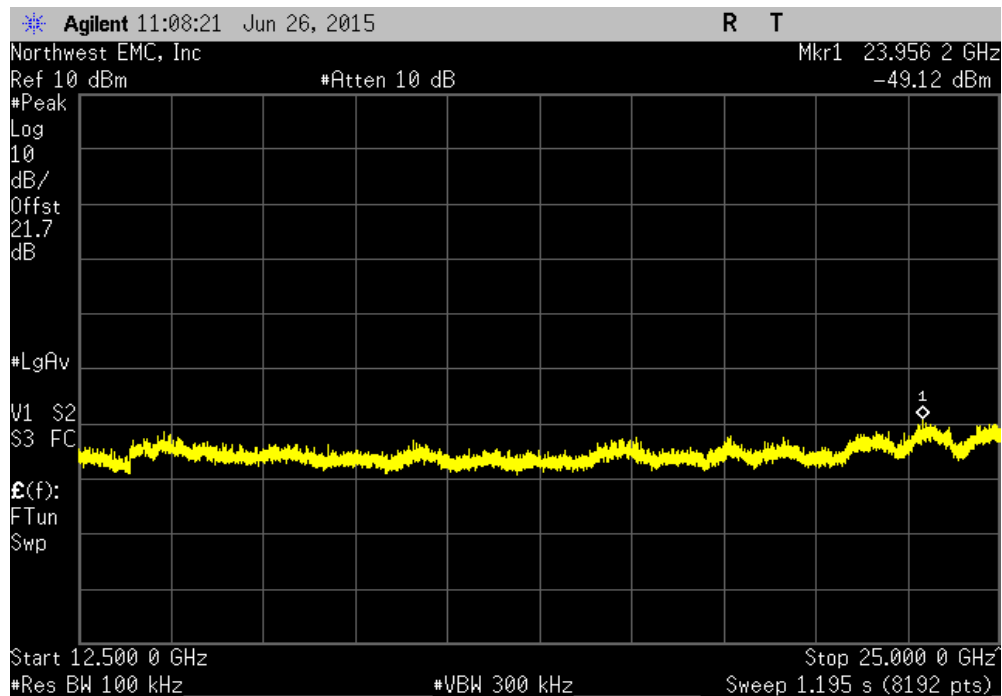


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.2	-20	Pass	

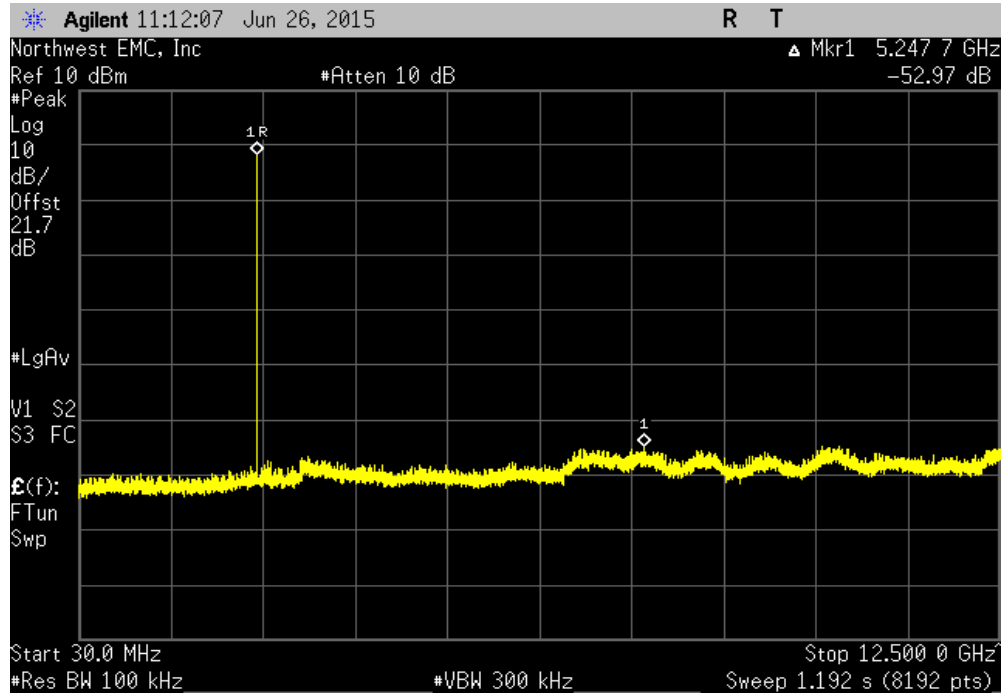


Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-47.5	-20	Pass	

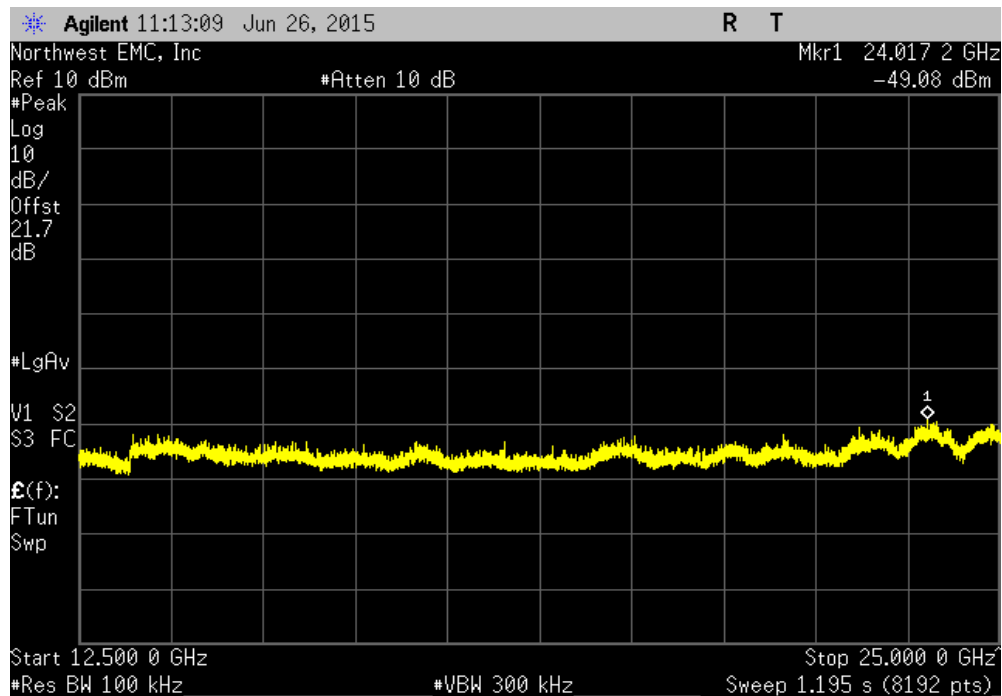


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.97	-20	Pass	

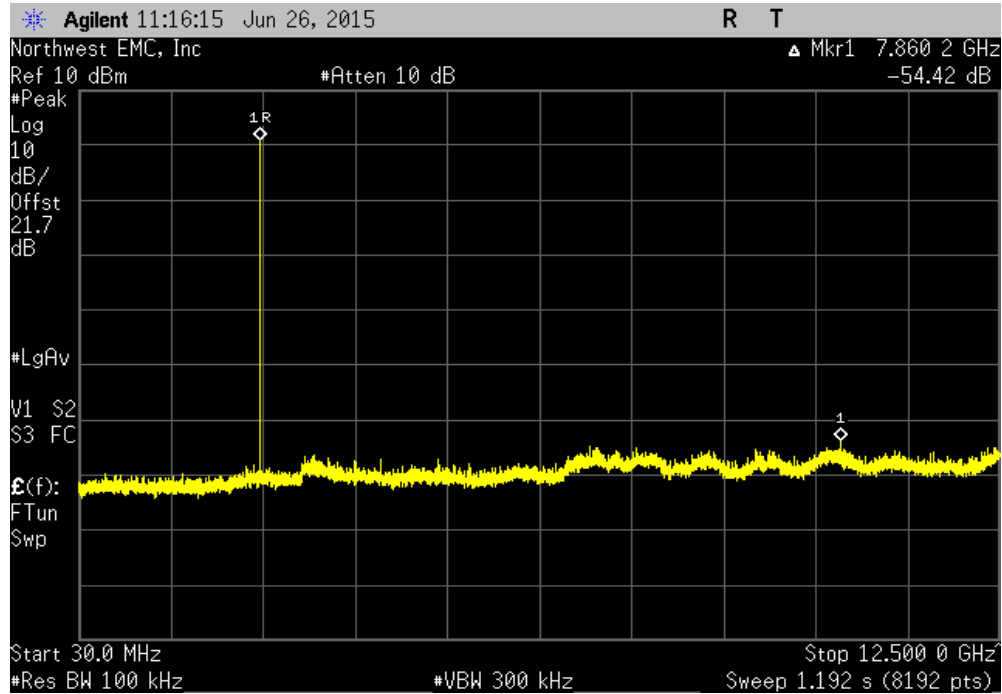


Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-47.41	-20	Pass	

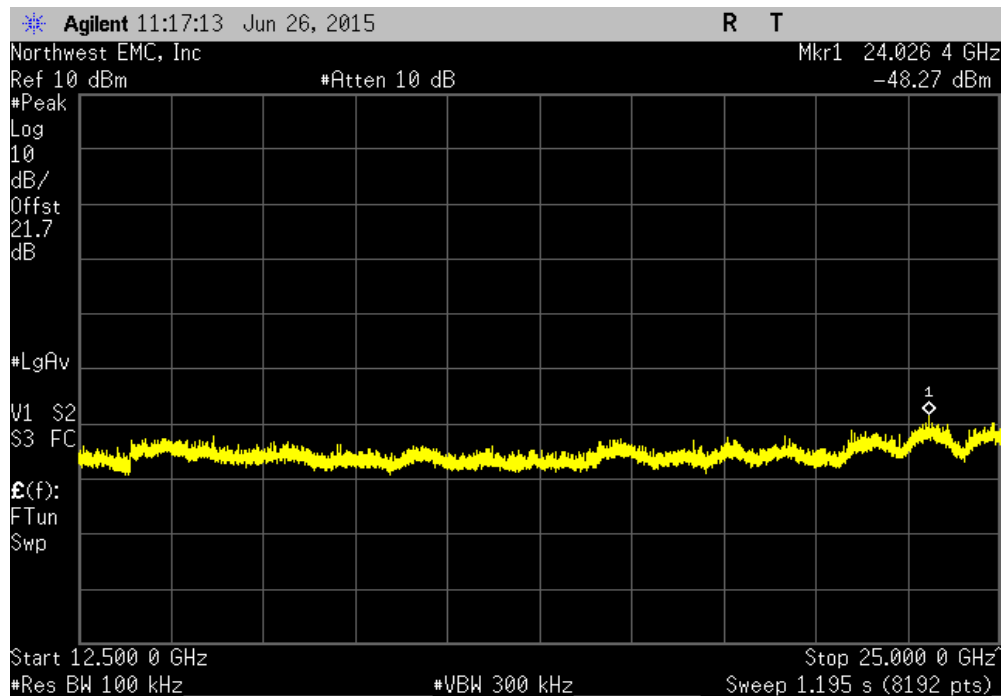


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-54.42	-20	Pass	

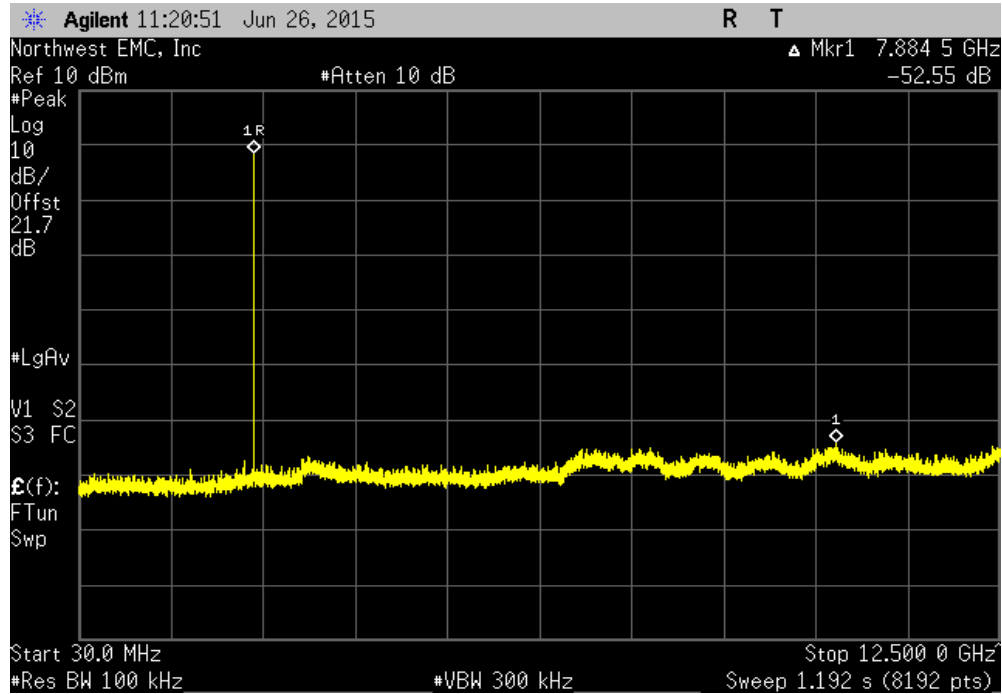


Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-49.04	-20	Pass	

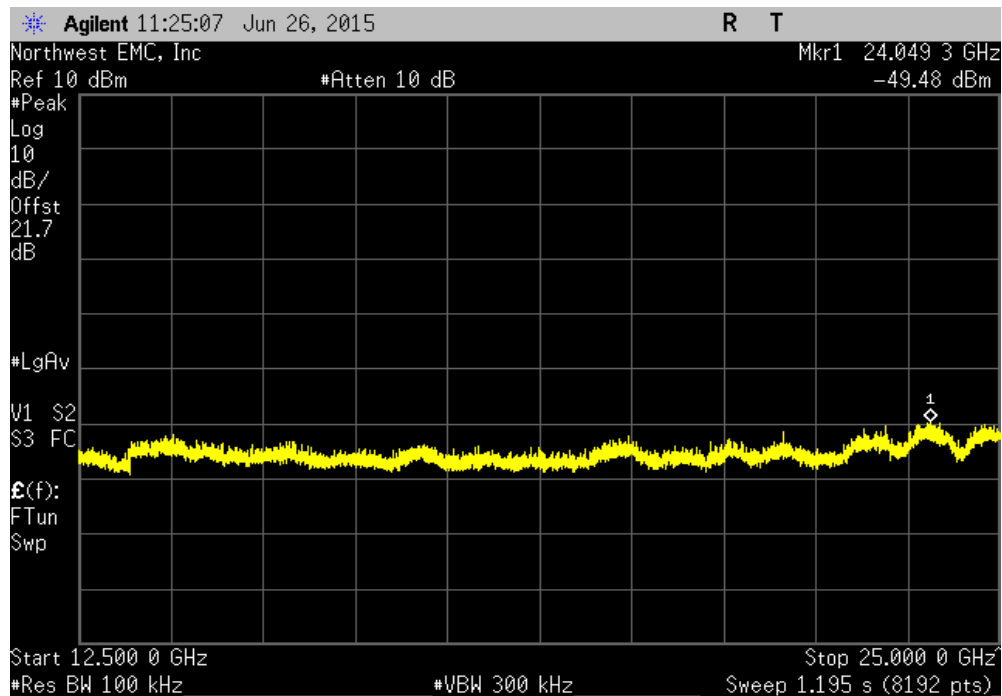


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.55	-20	Pass	

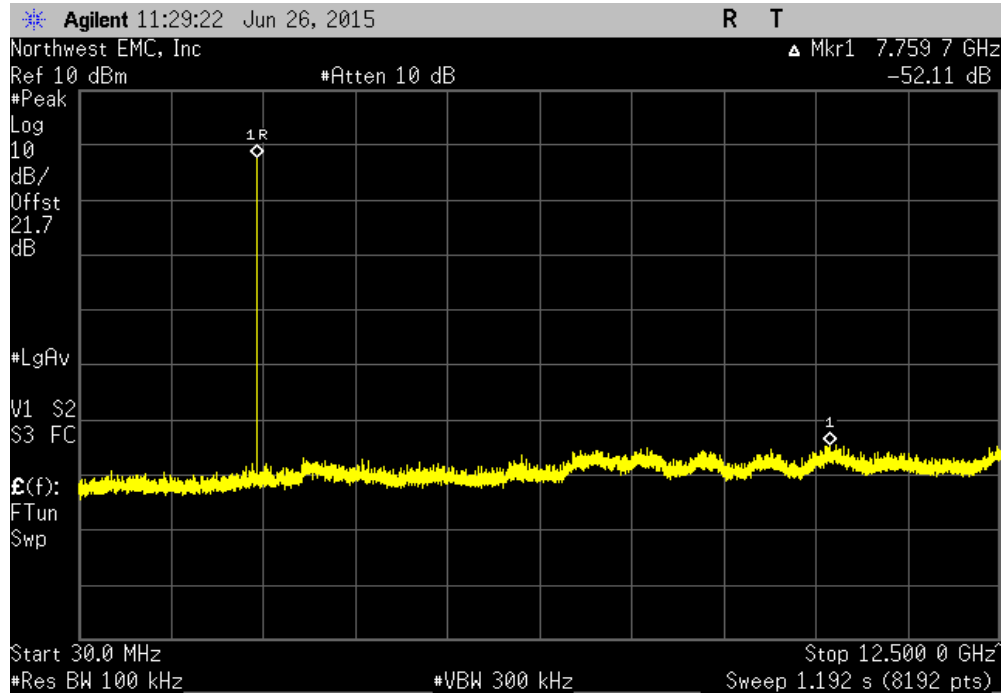


Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-47.98	-20	Pass	

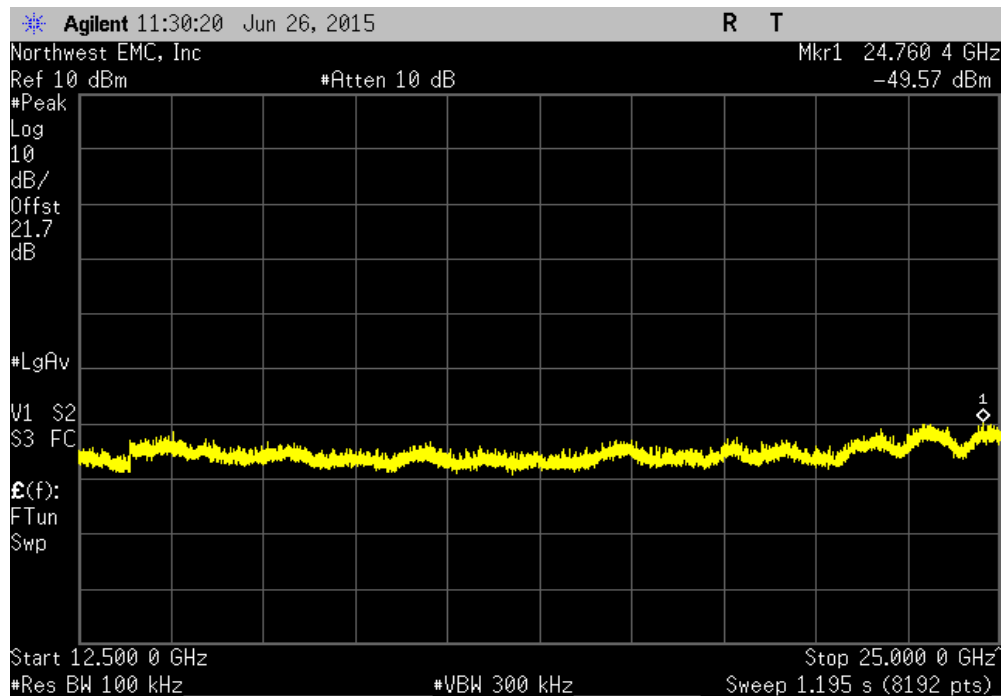


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.11	-20	Pass	

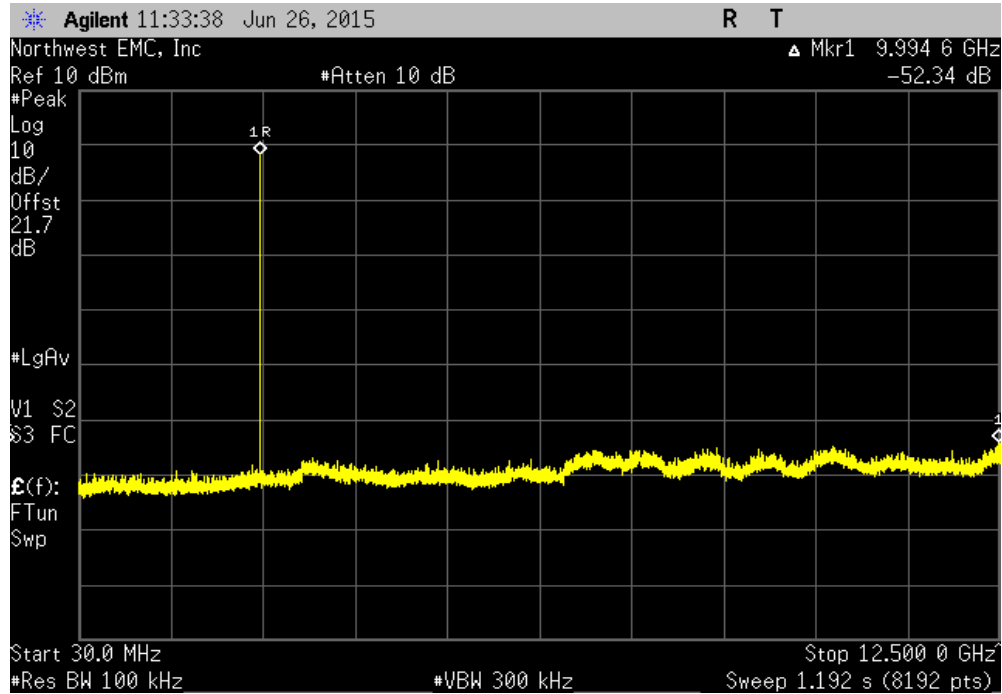


Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-47.32	-20	Pass	

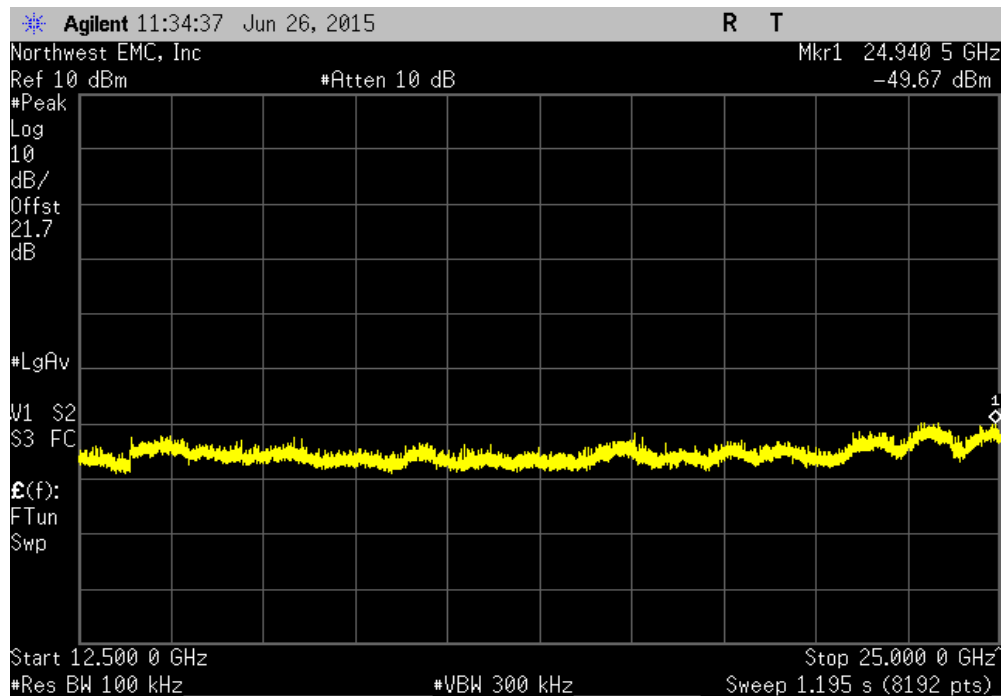


SPURIOUS CONDUCTED EMISSIONS

Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	-52.34	-20	Pass	



Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz				
Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	-47.96	-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
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/6/2015	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/6/2015	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36

TEST DESCRIPTION

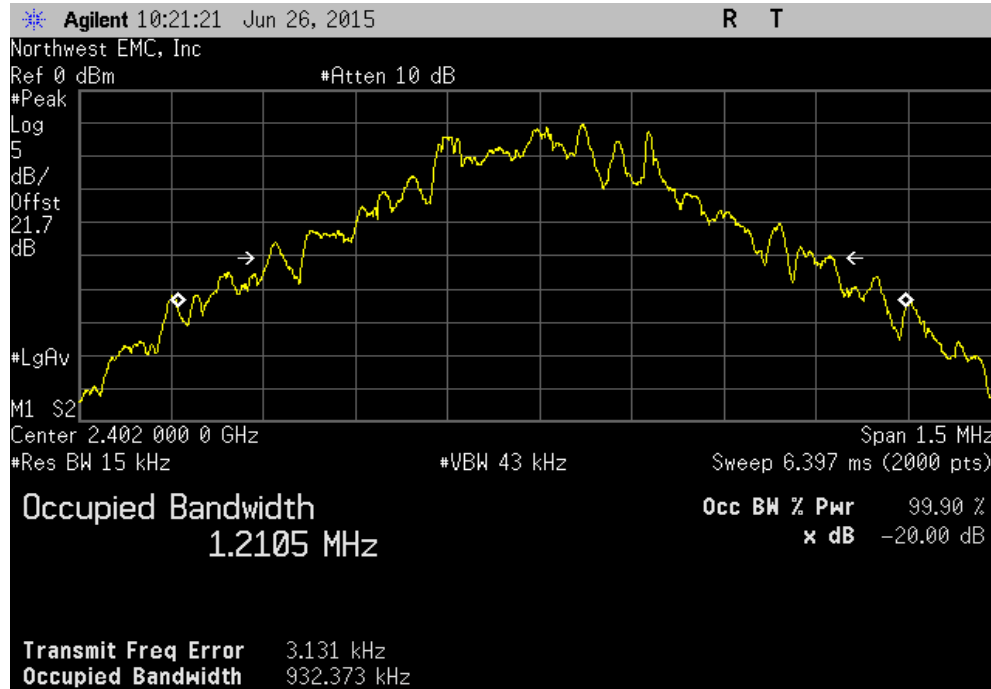
The occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

OCCUPIED BANDWIDTH

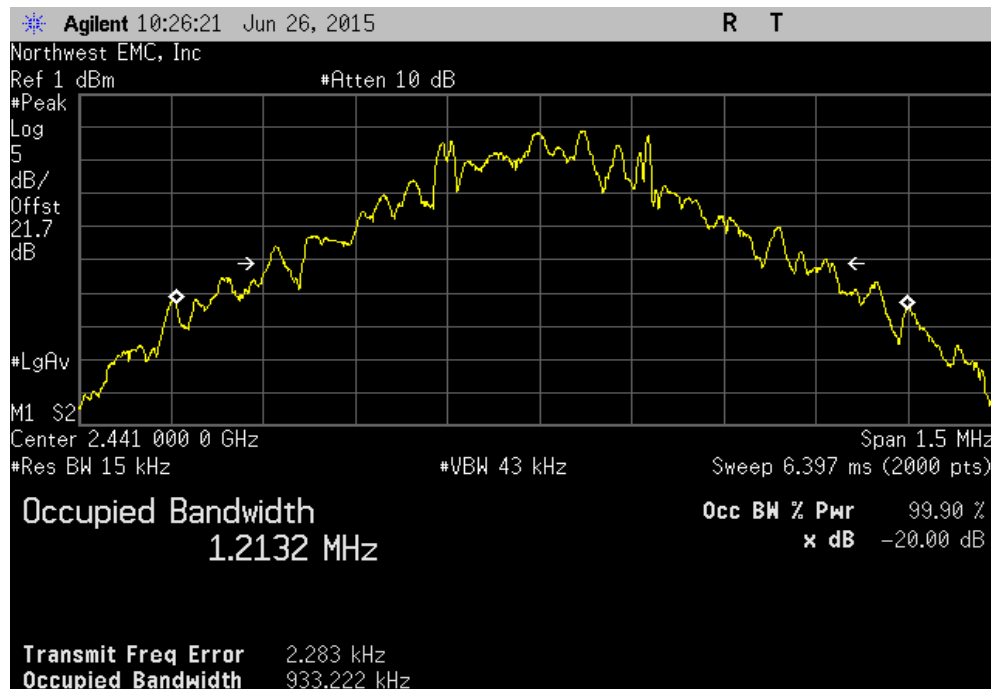
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit (<)
Non-Hopping Mode			Result
DH5			
Low Channel 0, 2402 MHz		932.373 kHz	1.5 MHz Pass
Mid Channel 39, 2441 MHz		933.222 kHz	1.5 MHz Pass
High Channel 78, 2480 MHz		930.628 kHz	1.5 MHz Pass
2DH5			
Low Channel 0, 2402 MHz		1.3 MHz	1.5 MHz Pass
Mid Channel 39, 2441 MHz		1.3 MHz	1.5 MHz Pass
High Channel 78, 2480 MHz		1.312 MHz	1.5 MHz Pass
3DH5			
Low Channel 0, 2402 MHz		1.268 MHz	1.5 MHz Pass
Mid Channel 39, 2441 MHz		1.277 MHz	1.5 MHz Pass
High Channel 78, 2480 MHz		1.273 MHz	1.5 MHz Pass

OCCUPIED BANDWIDTH

Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				932.373 kHz	1.5 MHz	Pass

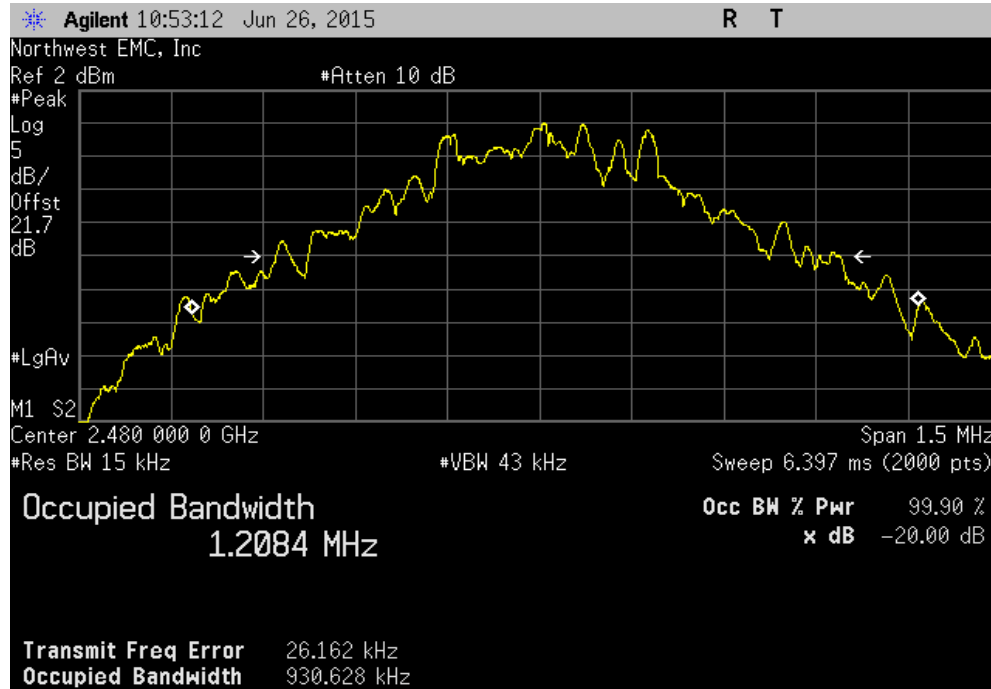


Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				933.222 kHz	1.5 MHz	Pass

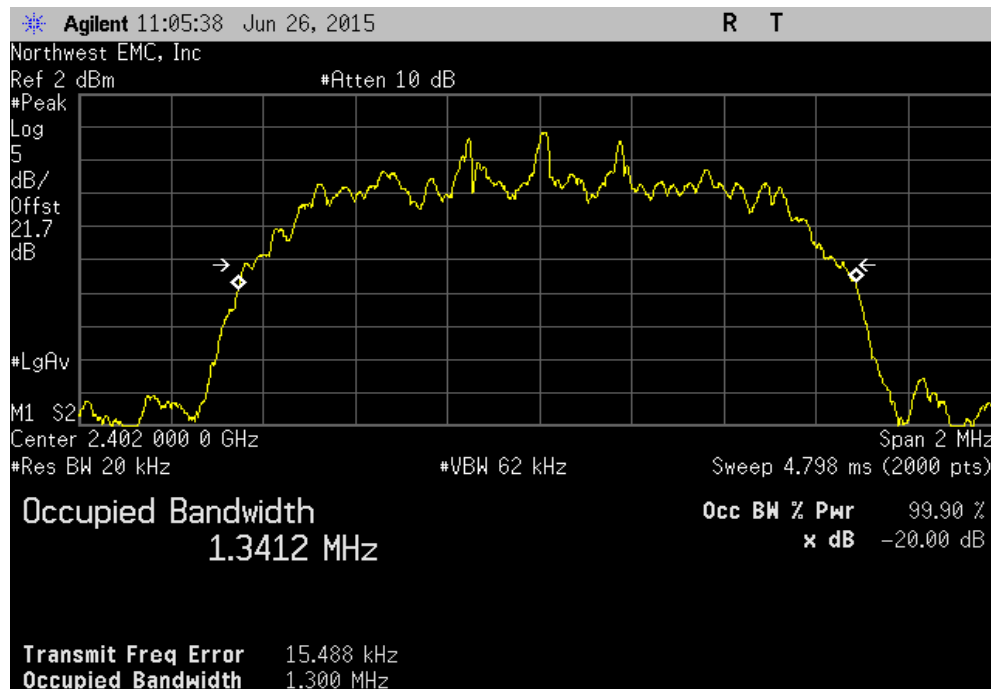


OCCUPIED BANDWIDTH

Non-Hopping Mode, DH5, High Channel 78, 2480 MHz						
				Value	Limit (<)	Result
				930.628 kHz	1.5 MHz	Pass

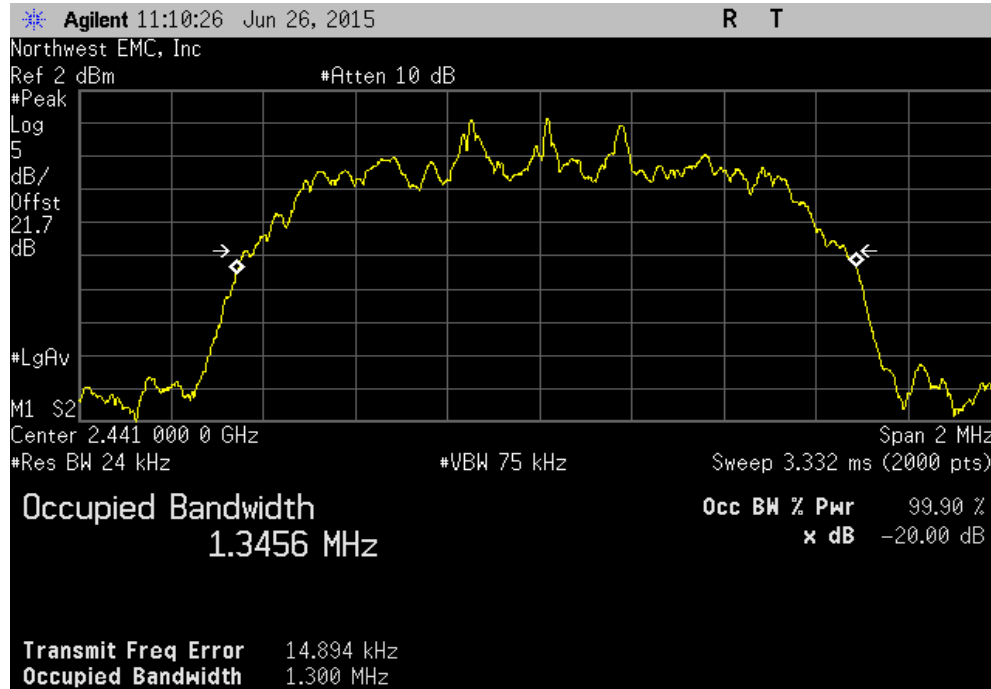


Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				1.3 MHz	1.5 MHz	Pass

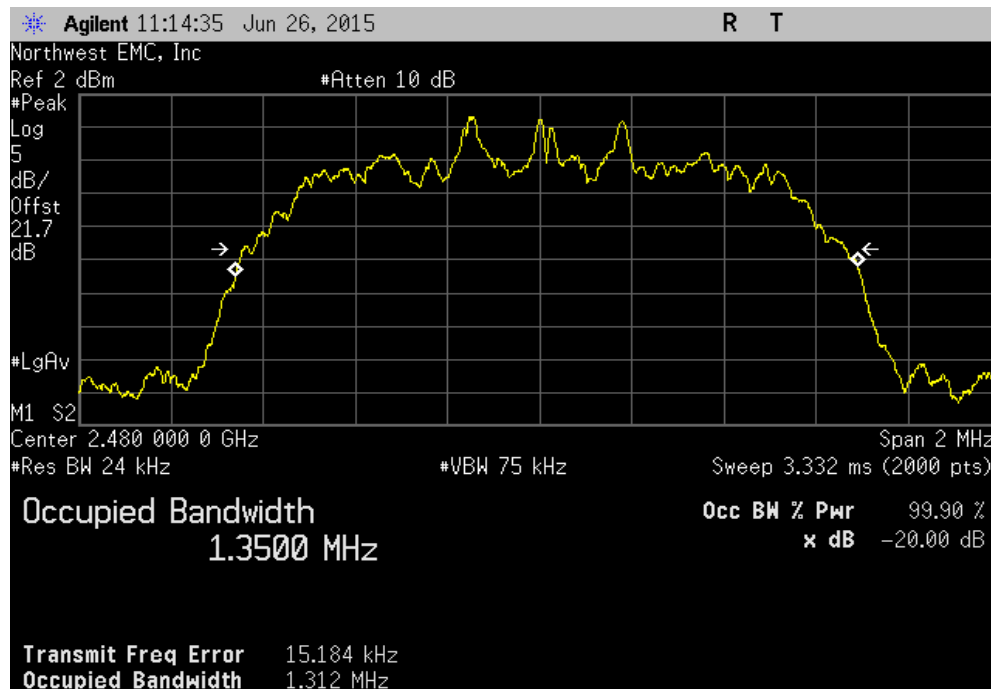


OCCUPIED BANDWIDTH

Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				1.3 MHz	1.5 MHz	Pass



Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
				Value	Limit (<)	Result
				1.312 MHz	1.5 MHz	Pass

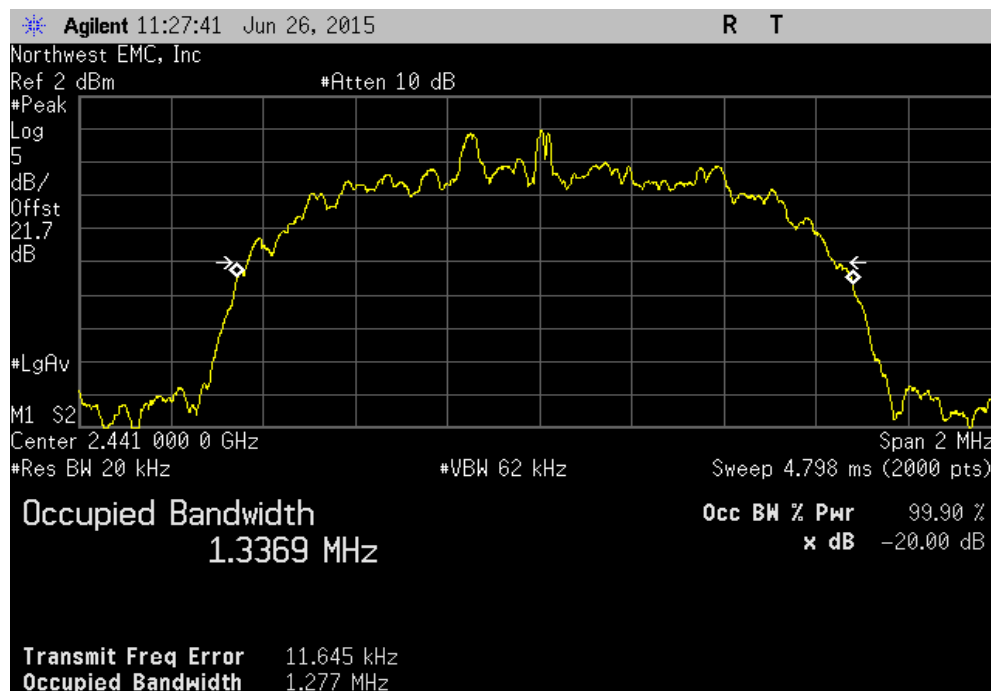


OCCUPIED BANDWIDTH

Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				1.268 MHz	1.5 MHz	Pass

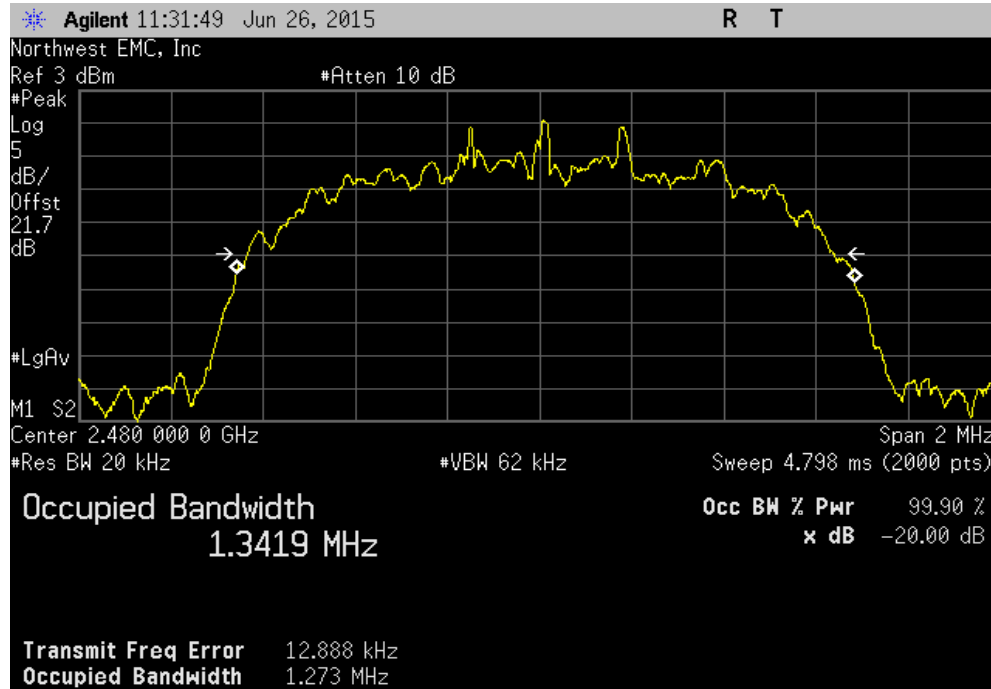


Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				1.277 MHz	1.5 MHz	Pass



OCCUPIED BANDWIDTH

Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
				Value	Limit (≤)	Result
				1.273 MHz	1.5 MHz	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
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/6/2015	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/6/2015	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36

TEST DESCRIPTION

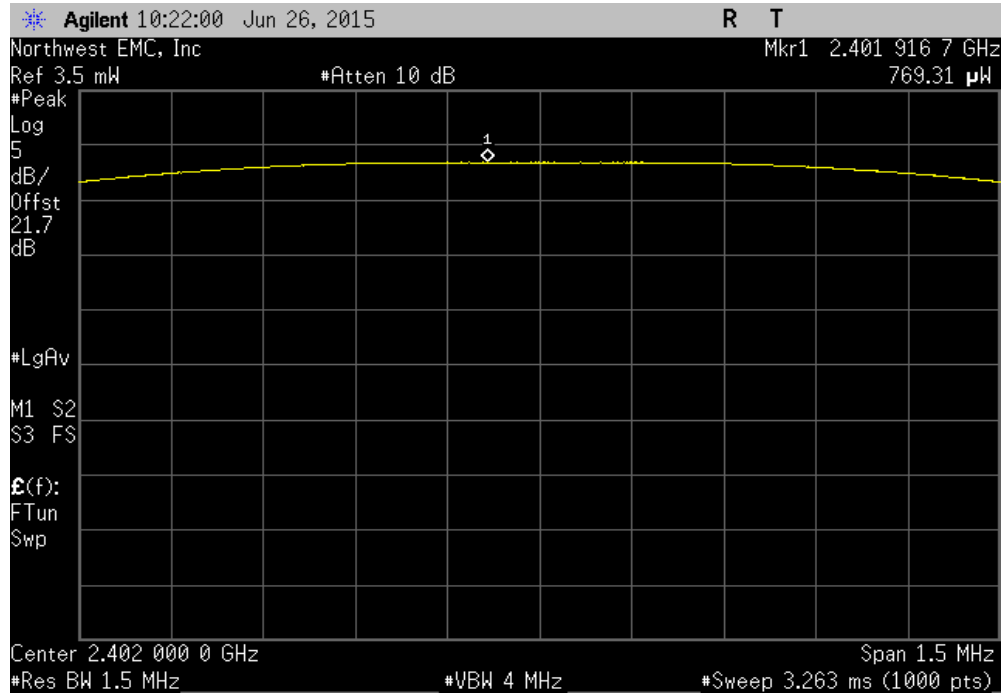
The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

OUTPUT POWER

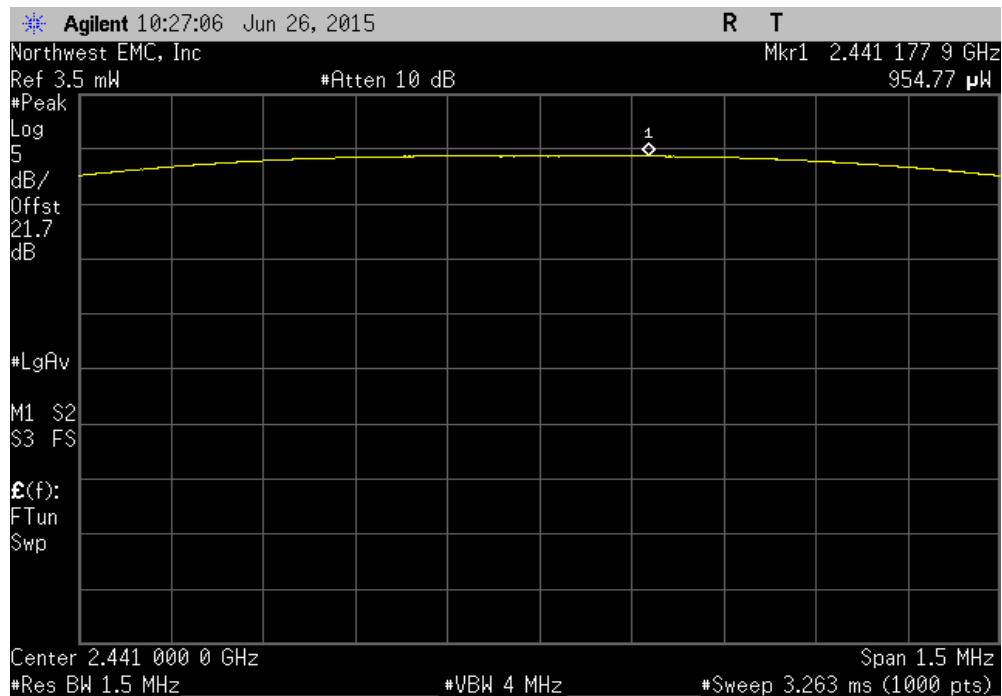
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit (<) Result
Non-Hopping Mode			
DH5			
	Low Channel 0, 2402 MHz	769.308 uW	125 mW Pass
	Mid Channel 39, 2441 MHz	954.773 uW	125 mW Pass
	High Channel 78, 2480 MHz	1.23 mW	125 mW Pass
2DH5			
	Low Channel 0, 2402 MHz	1.324 mW	125 mW Pass
	Mid Channel 39, 2441 MHz	1.608 mW	125 mW Pass
	High Channel 78, 2480 MHz	1.993 mW	125 mW Pass
3DH5			
	Low Channel 0, 2402 MHz	1.462 mW	125 mW Pass
	Mid Channel 39, 2441 MHz	1.767 mW	125 mW Pass
	High Channel 78, 2480 MHz	2.185 mW	125 mW Pass

OUTPUT POWER

Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				769.308 uW	125 mW	Pass

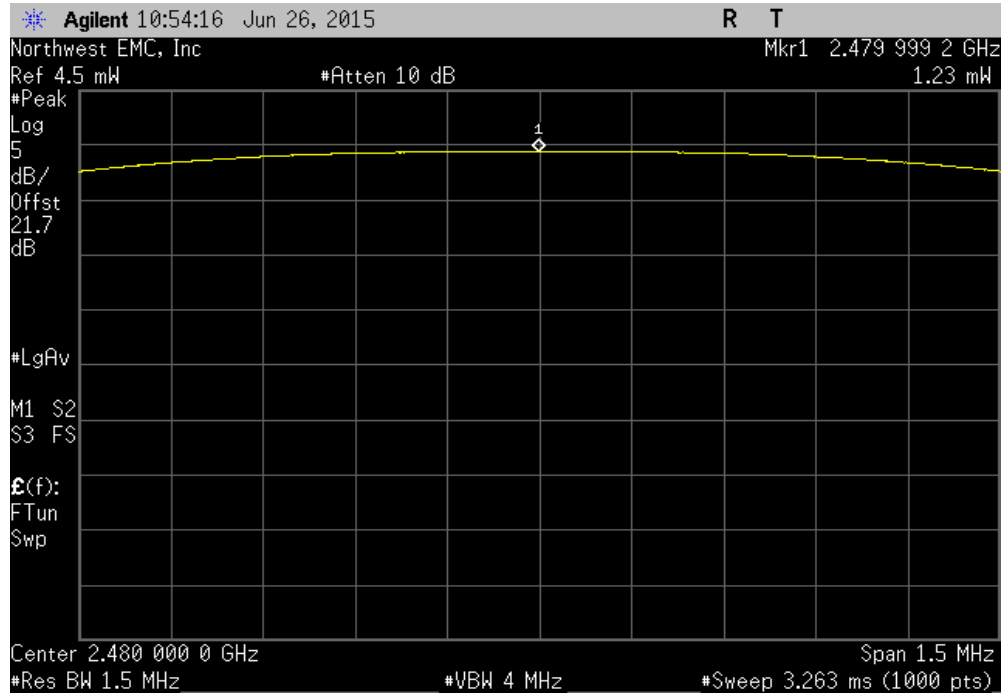


Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				954.773 uW	125 mW	Pass

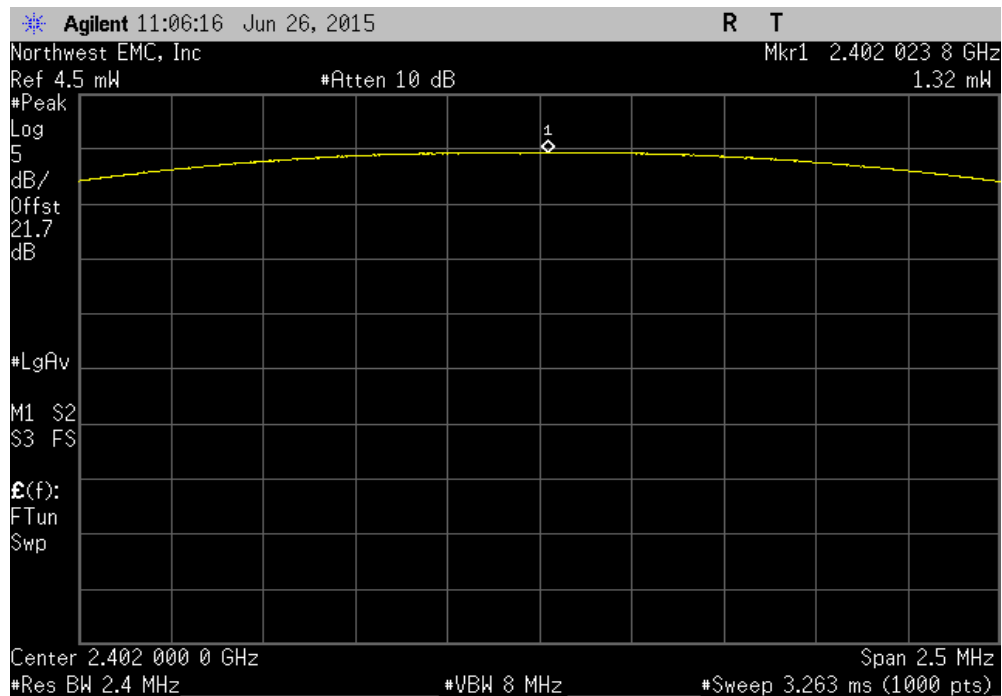


OUTPUT POWER

Non-Hopping Mode, DH5, High Channel 78, 2480 MHz						
				Value	Limit (<)	Result
				1.23 mW	125 mW	Pass

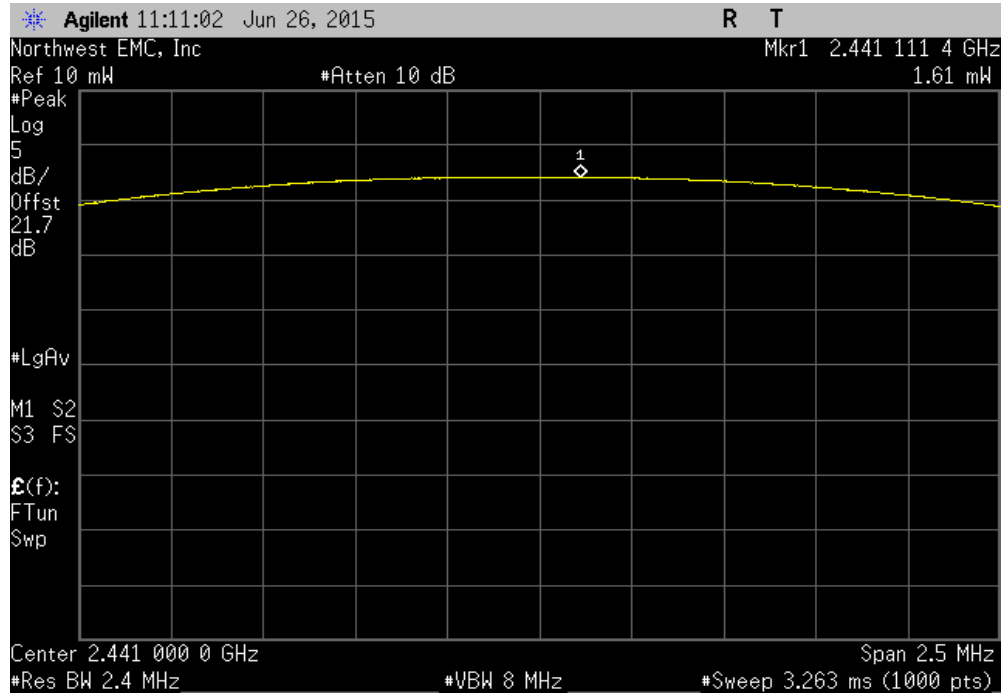


Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				1.324 mW	125 mW	Pass

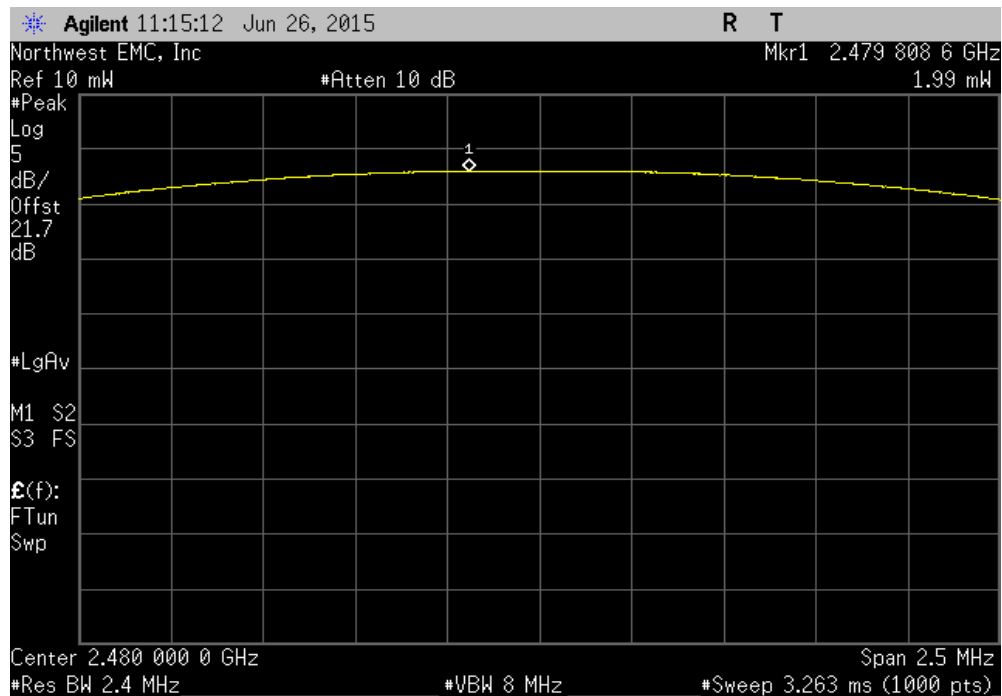


OUTPUT POWER

Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				1.608 mW	125 mW	Pass

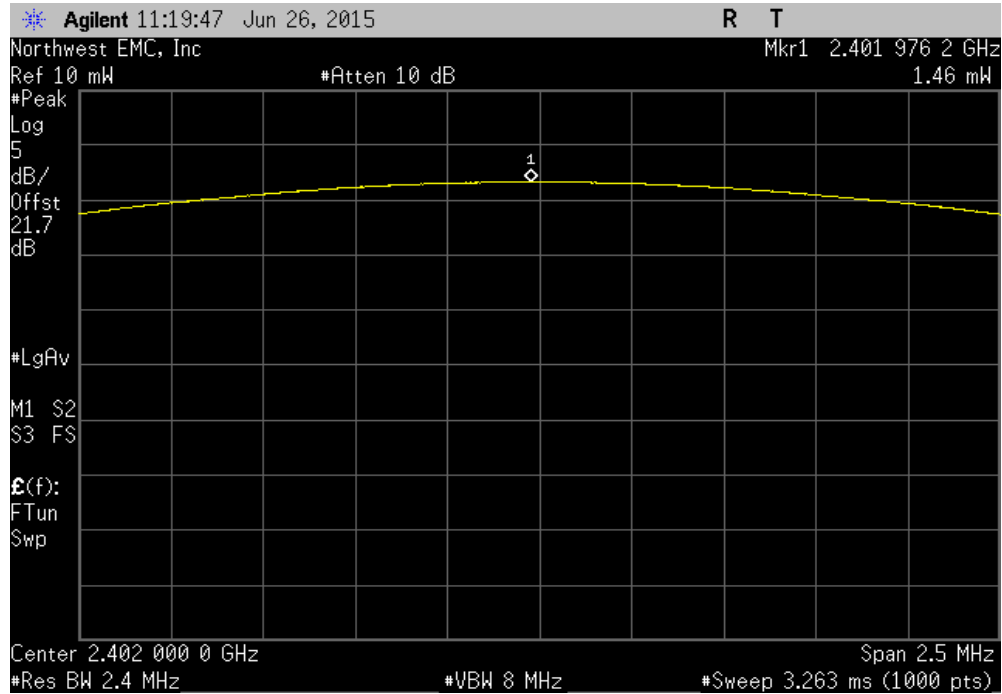


Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
				Value	Limit (<)	Result
				1.993 mW	125 mW	Pass

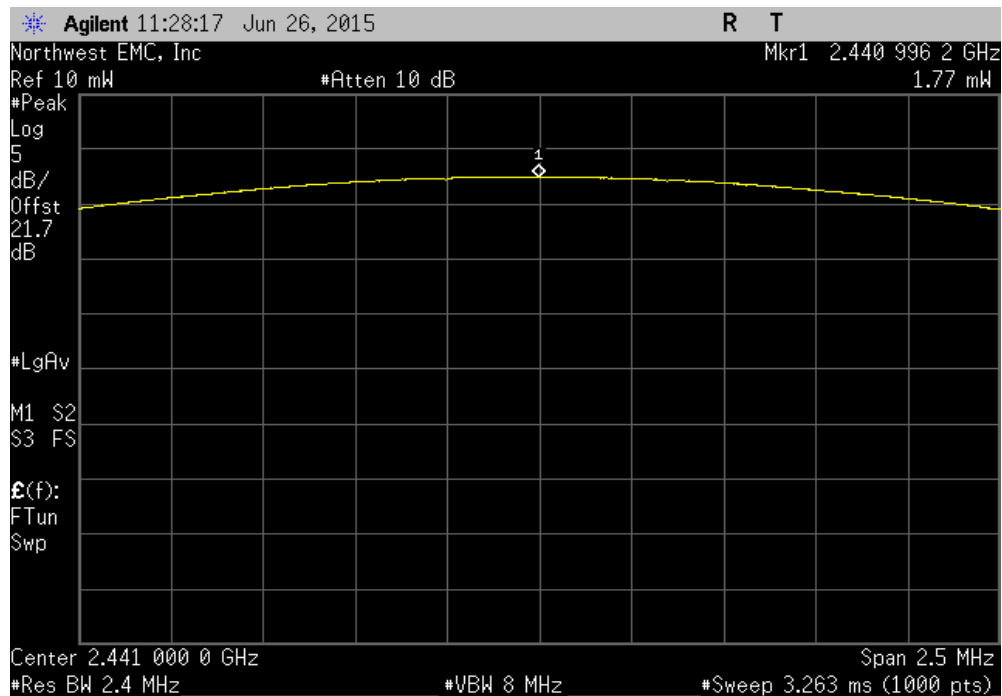


OUTPUT POWER

Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
				Value	Limit (<)	Result
				1.462 mW	125 mW	Pass

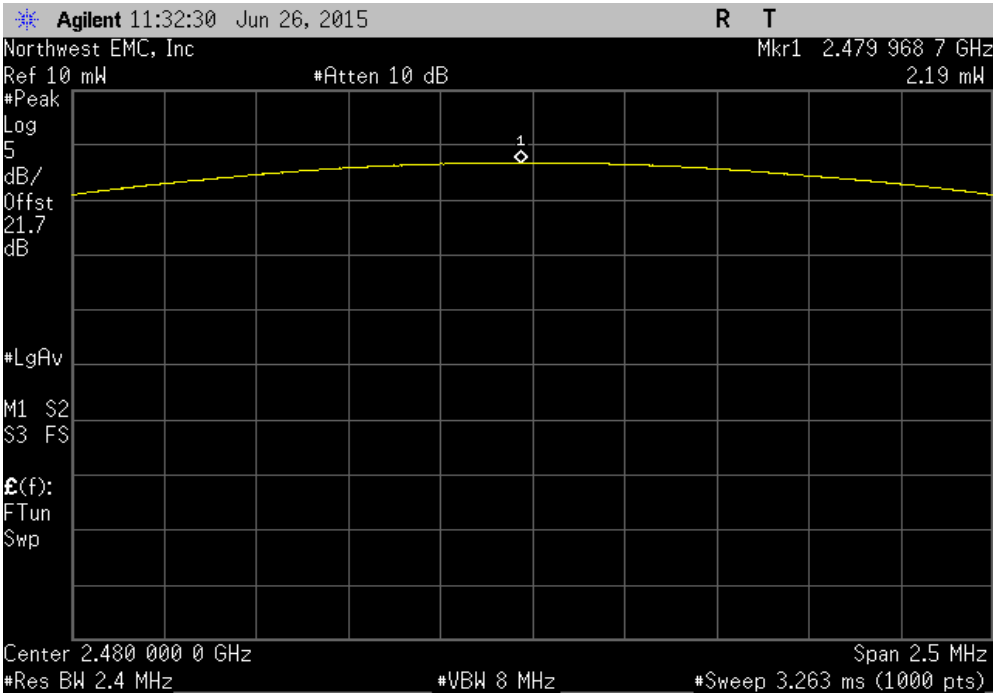


Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (<)	Result
				1.767 mW	125 mW	Pass



OUTPUT POWER

Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
Value				Limit	Result	
				(<)		
2.185 mW				125 mW	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
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	6/6/2015	12
Attenuator	Fairview Microwave	SA4014-20	TKE	1/16/2015	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMJ	6/6/2015	12
Signal Generator	Agilent	N5183A	TIA	4/7/2014	36

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.

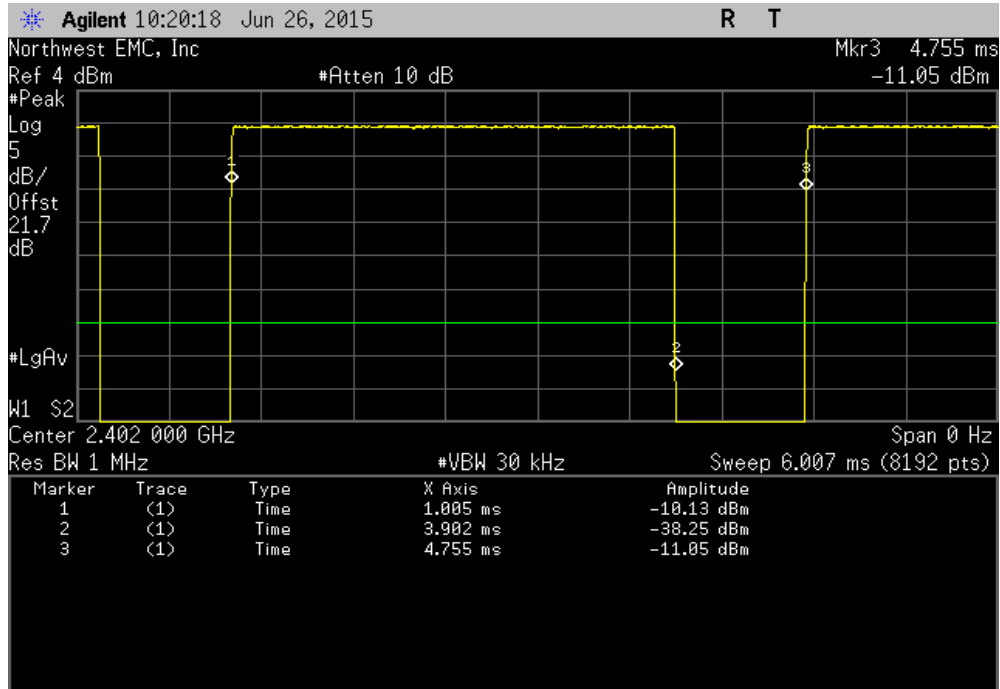
If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.

**NORTHWEST
EMC**

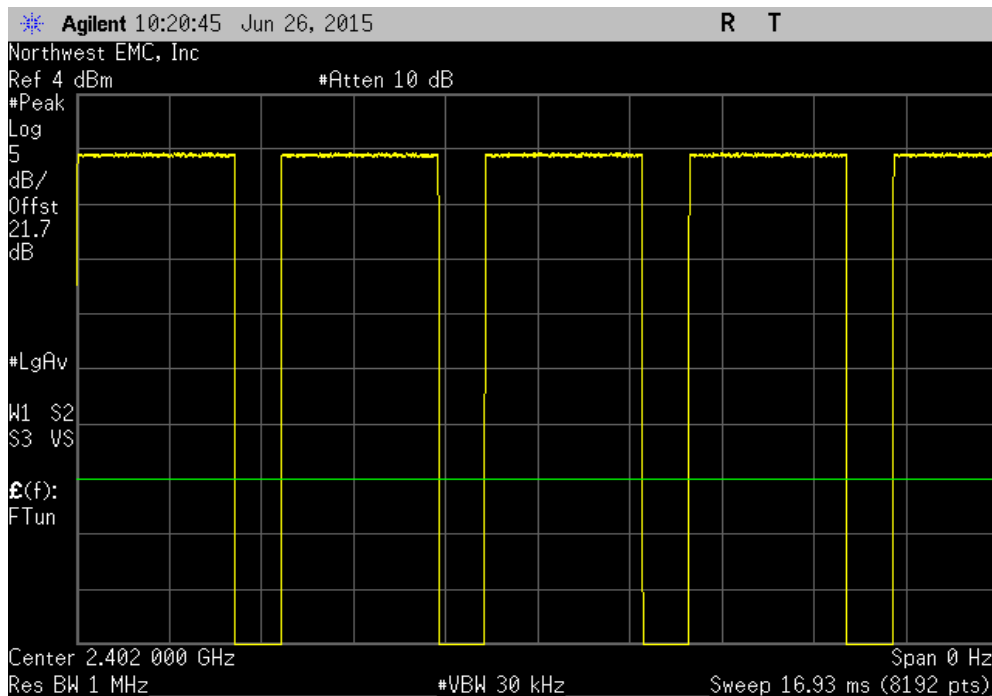
EUT: 1721				Work Order: MCSO1732			
Serial Number: 2937901005079752549				Date: 06/26/15			
Customer: Microsoft Corporation				Temperature: 24°C			
Attendees: None				Humidity: 45%			
Project: None				Barometric Pres.: 1020 mbar			
Tested by: Richard Mellroth			Power: USB	Job Site: NC02			
TEST SPECIFICATIONS							
FCC 15.247:2015			Test Method ANSI C63.10:2009				
COMMENTS							
EUT power setting at maximum.							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	1	Signature 					
		Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
Non-Hopping Mode							
DH5							
	Low Channel 0, 2402 MHz	2.897 ms	3.75 ms	1	77.3	N/A	N/A
	Low Channel 0, 2402 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 39, 2441 MHz	2.897 ms	3.75 ms	1	77.3	N/A	N/A
	Mid Channel 39, 2441 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 78, 2480 MHz	2.896 ms	3.75 ms	1	77.2	N/A	N/A
	High Channel 78, 2480 MHz	N/A	N/A	5	N/A	N/A	N/A
2DH5							
	Low Channel 0, 2402 MHz	2.902 ms	3.75 ms	1	77.4	N/A	N/A
	Low Channel 0, 2402 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 39, 2441 MHz	2.901 ms	3.75 ms	1	77.4	N/A	N/A
	Mid Channel 39, 2441 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 78, 2480 MHz	2.901 ms	3.75 ms	1	77.4	N/A	N/A
	High Channel 78, 2480 MHz	N/A	N/A	5	N/A	N/A	N/A
3DH5							
	Low Channel 0, 2402 MHz	2.903 ms	3.75 ms	1	77.4	N/A	N/A
	Low Channel 0, 2402 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel 39, 2441 MHz	2.903 ms	3.75 ms	1	77.4	N/A	N/A
	Mid Channel 39, 2441 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel 78, 2480 MHz	2.904 ms	3.75 ms	1	77.4	N/A	N/A
	High Channel 78, 2480 MHz	N/A	N/A	5	N/A	N/A	N/A

DUTY CYCLE

Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.897 ms	3.75 ms	1	77.3	N/A	N/A

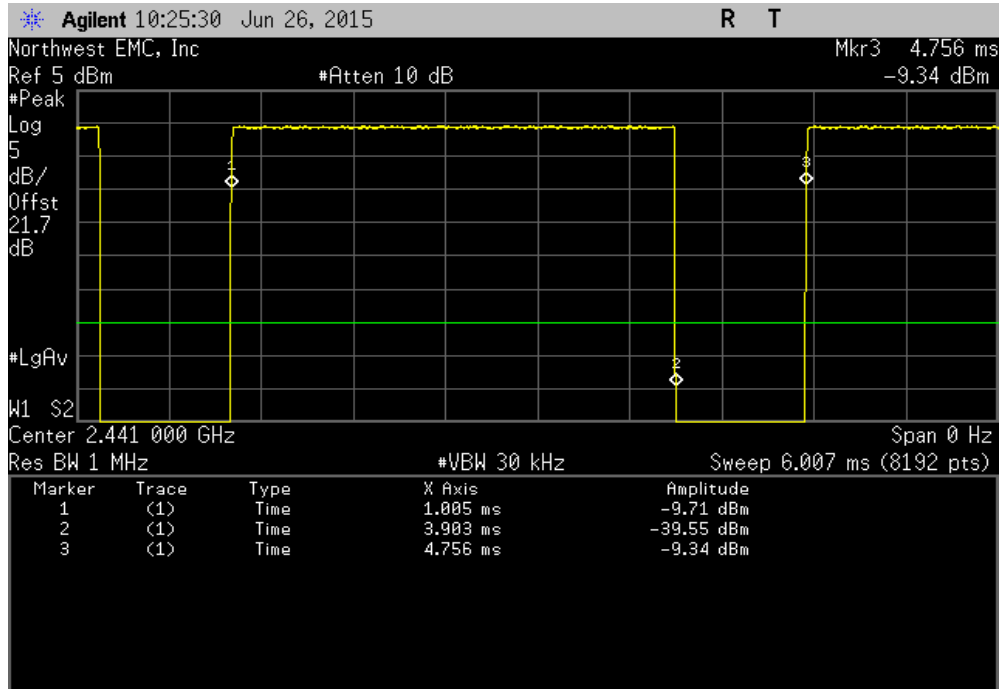


Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

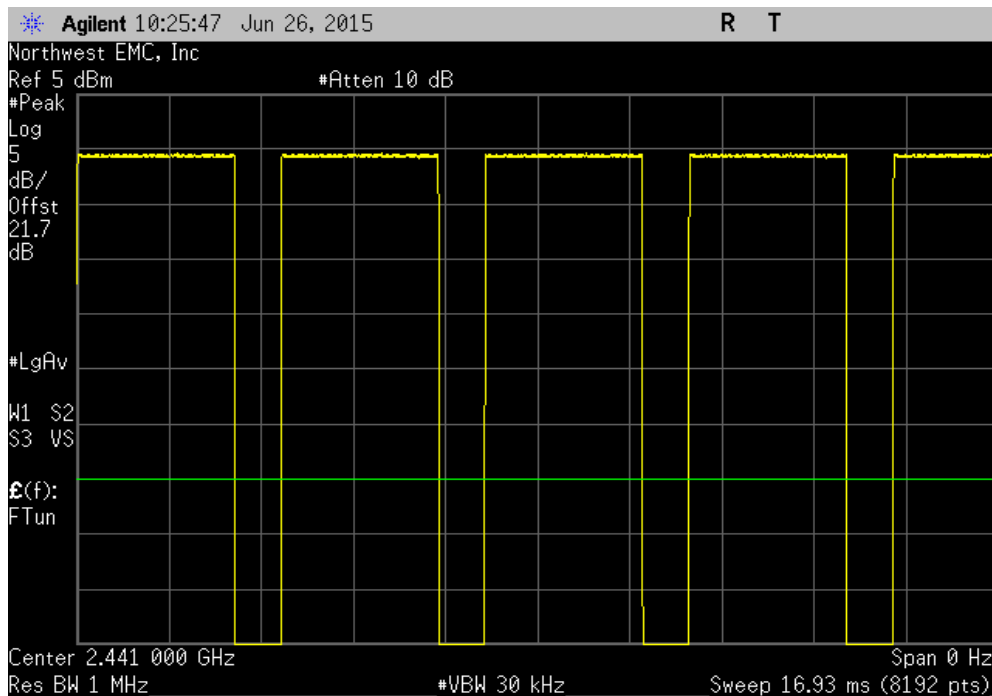


DUTY CYCLE

Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.897 ms	3.75 ms	1	77.3	N/A	N/A

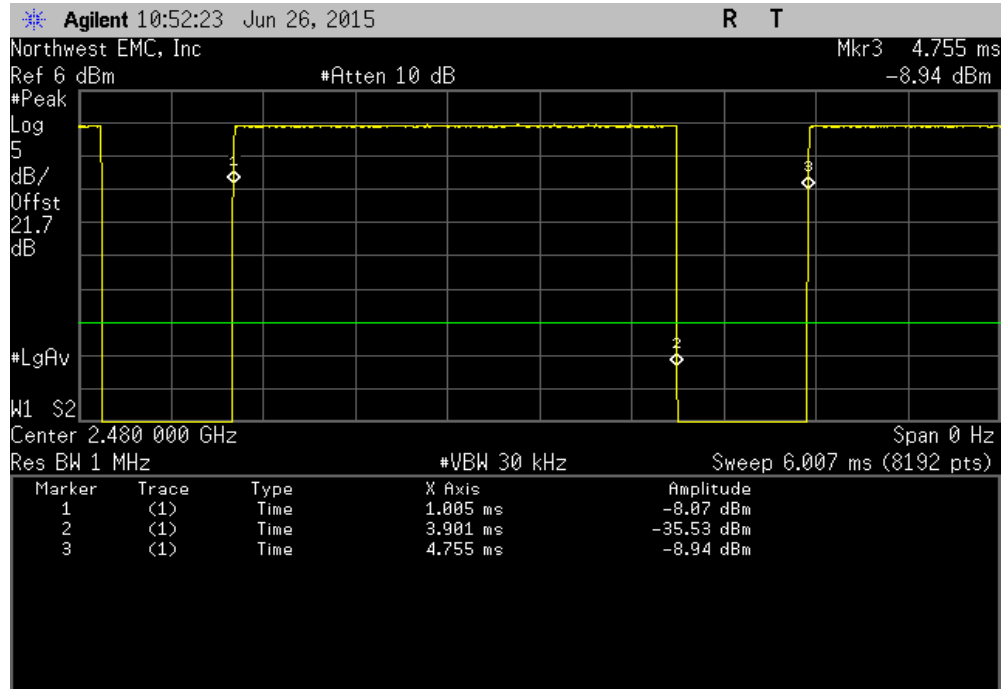


Non-Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

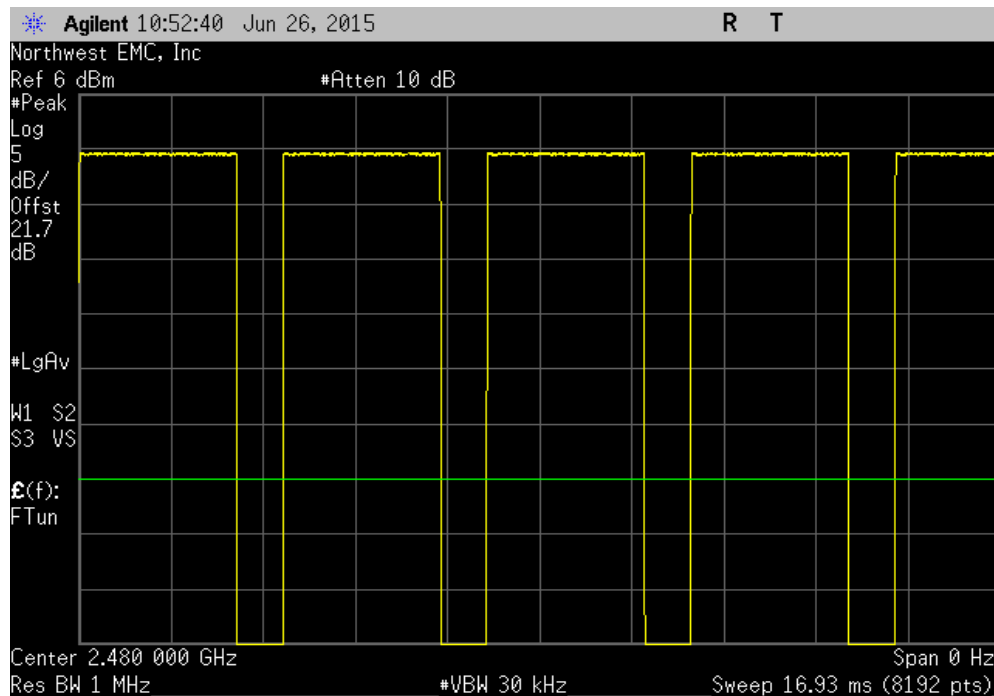


DUTY CYCLE

Non-Hopping Mode, DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.896 ms	3.75 ms	1	77.2	N/A	N/A

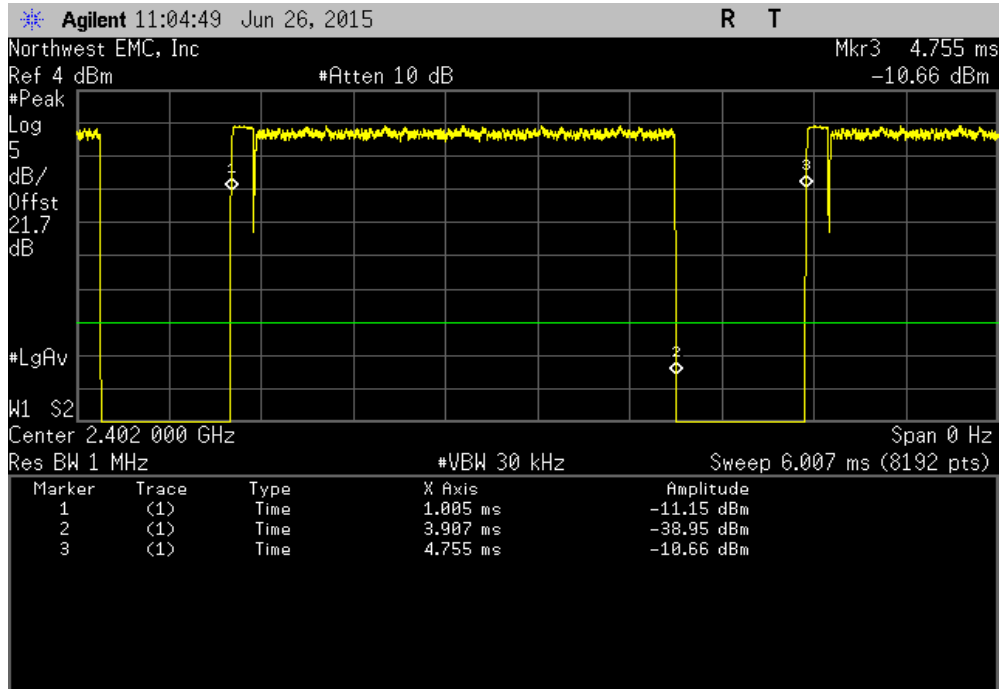


Non-Hopping Mode, DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

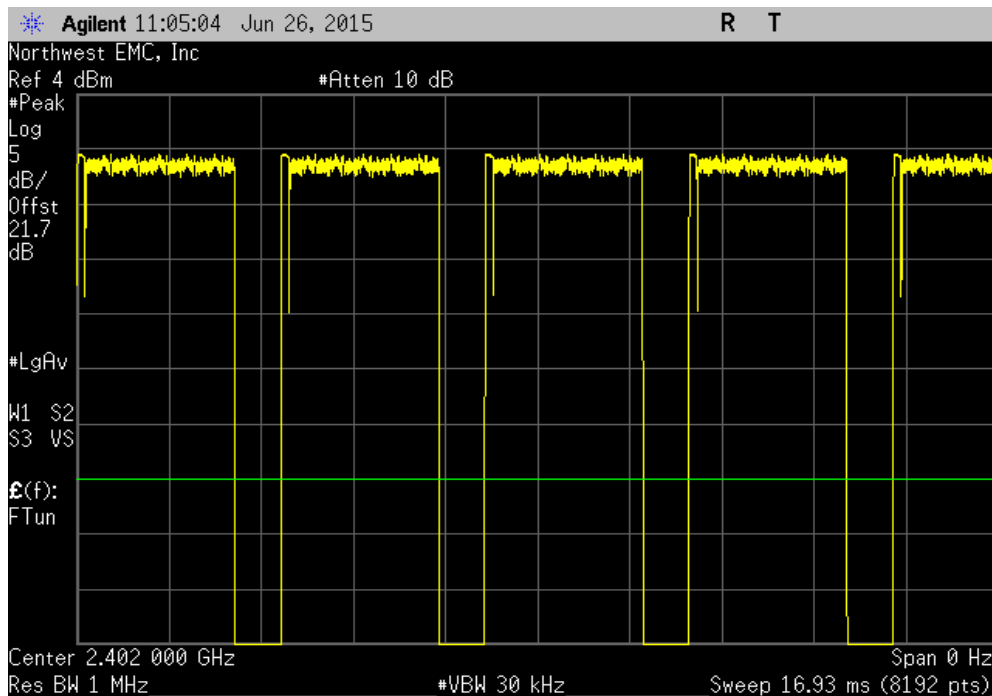


DUTY CYCLE

Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.902 ms	3.75 ms	1	77.4	N/A	N/A

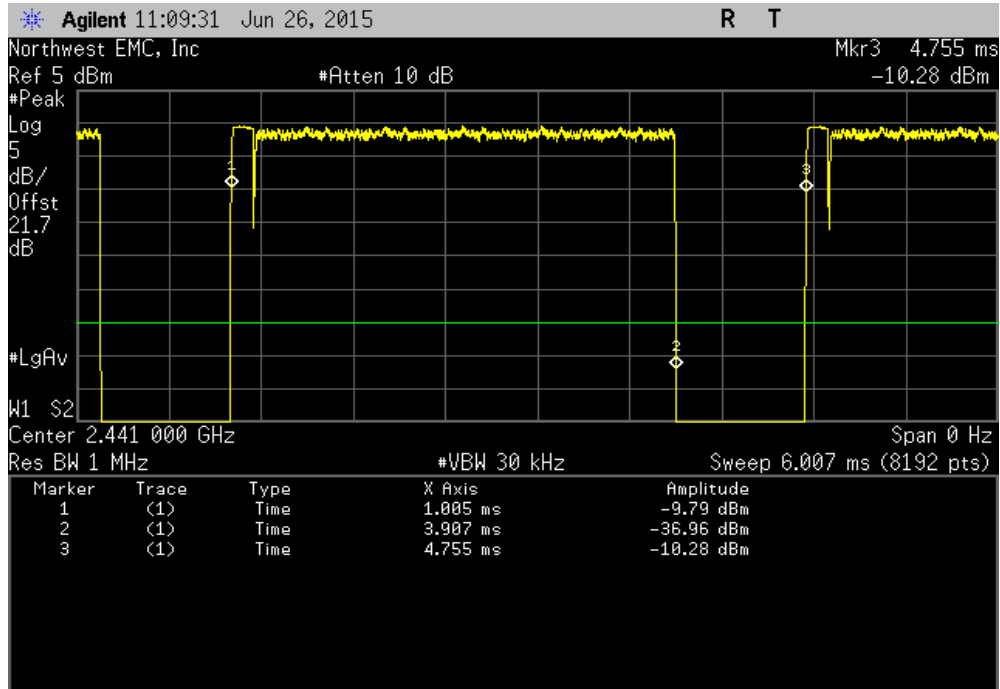


Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

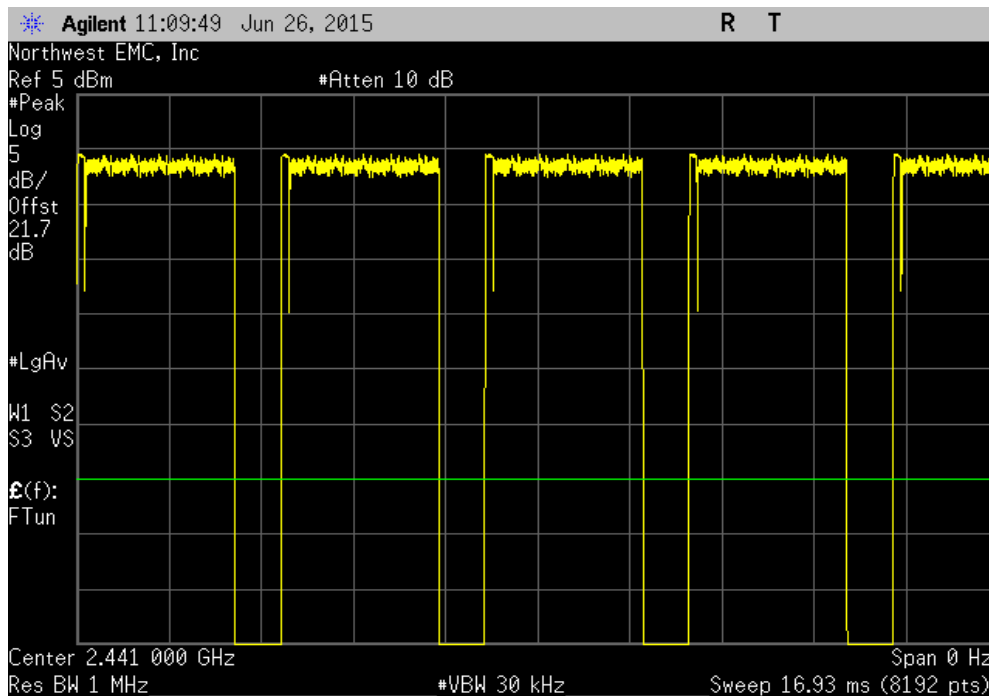


DUTY CYCLE

Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.901 ms	3.75 ms	1	77.4	N/A	N/A

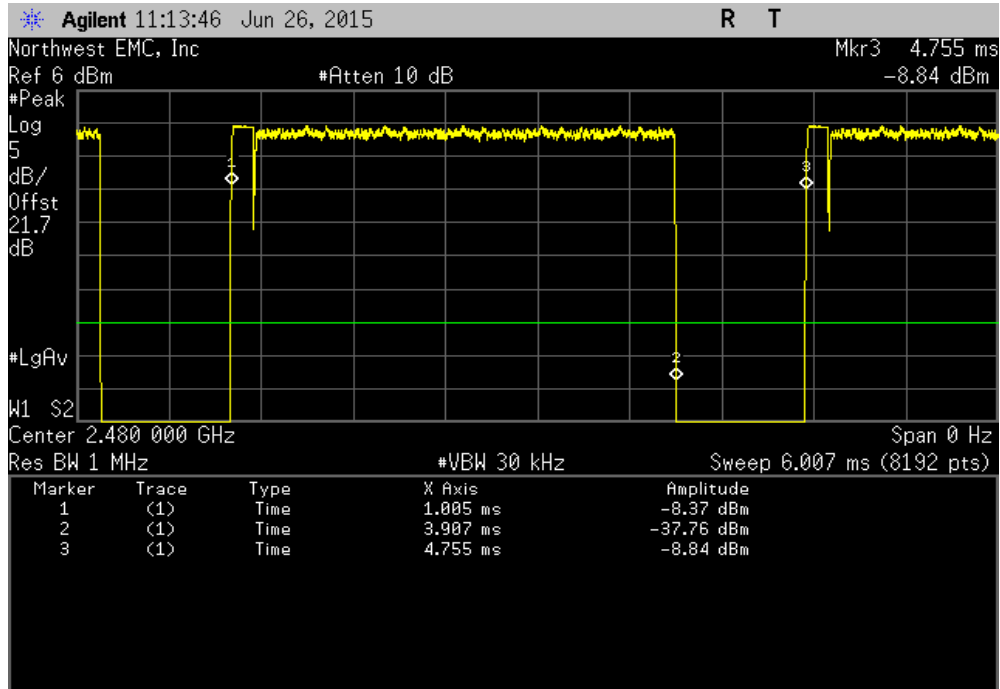


Non-Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

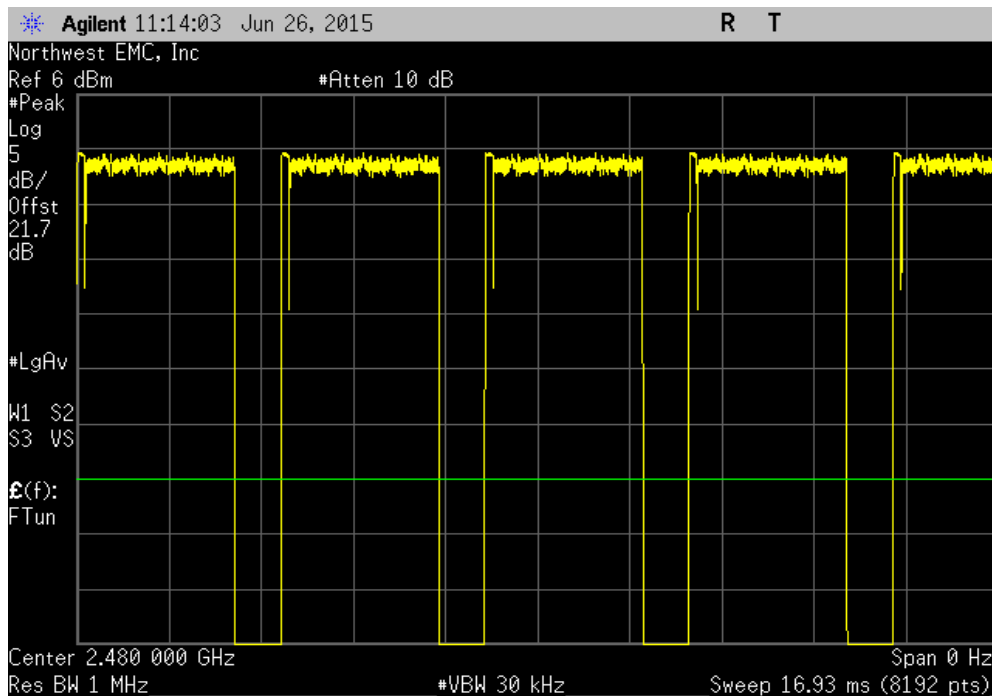


DUTY CYCLE

Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.901 ms	3.75 ms	1	77.4	N/A	N/A

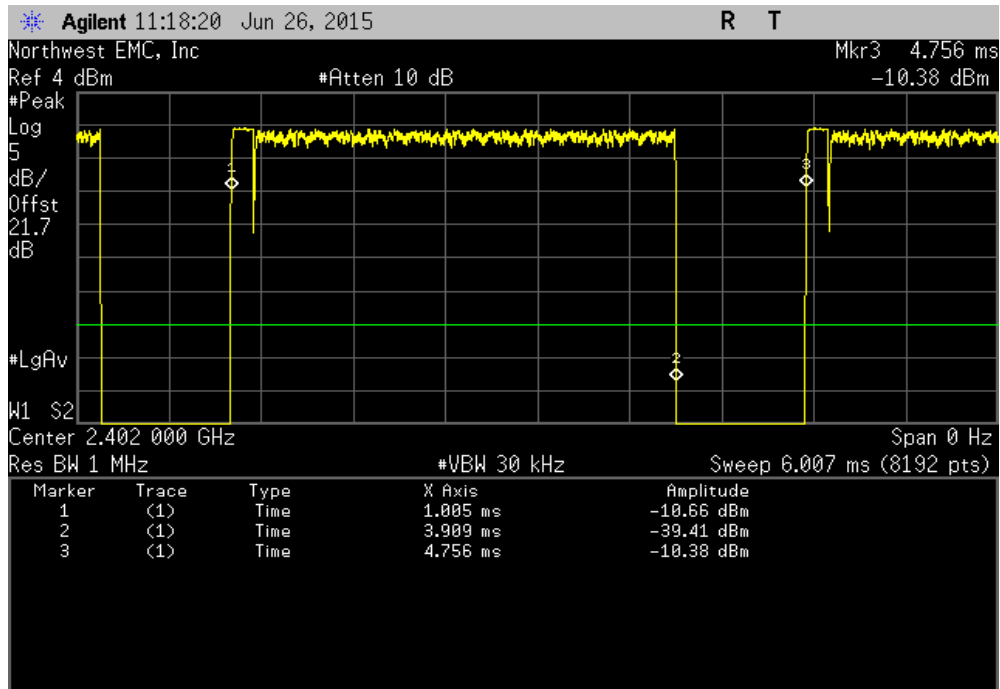


Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

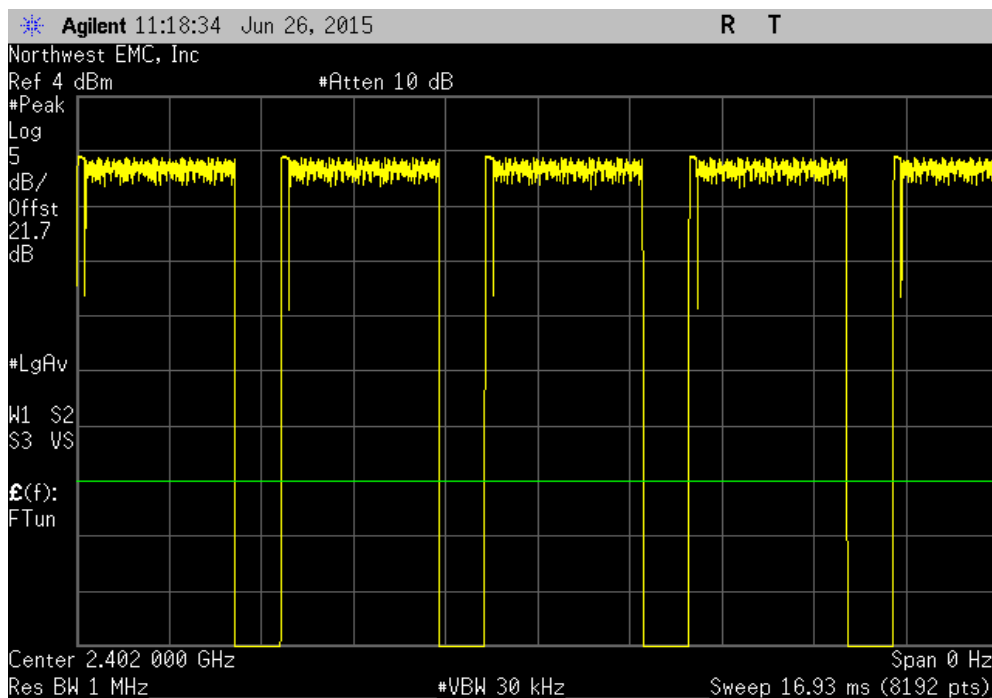


DUTY CYCLE

Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.903 ms	3.75 ms	1	77.4	N/A	N/A

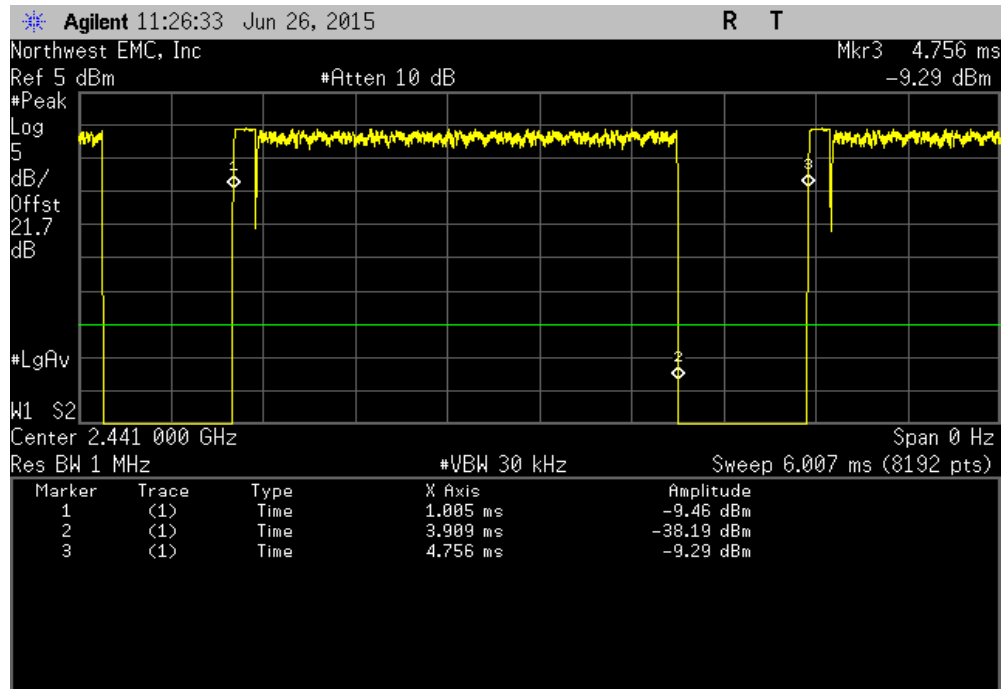


Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

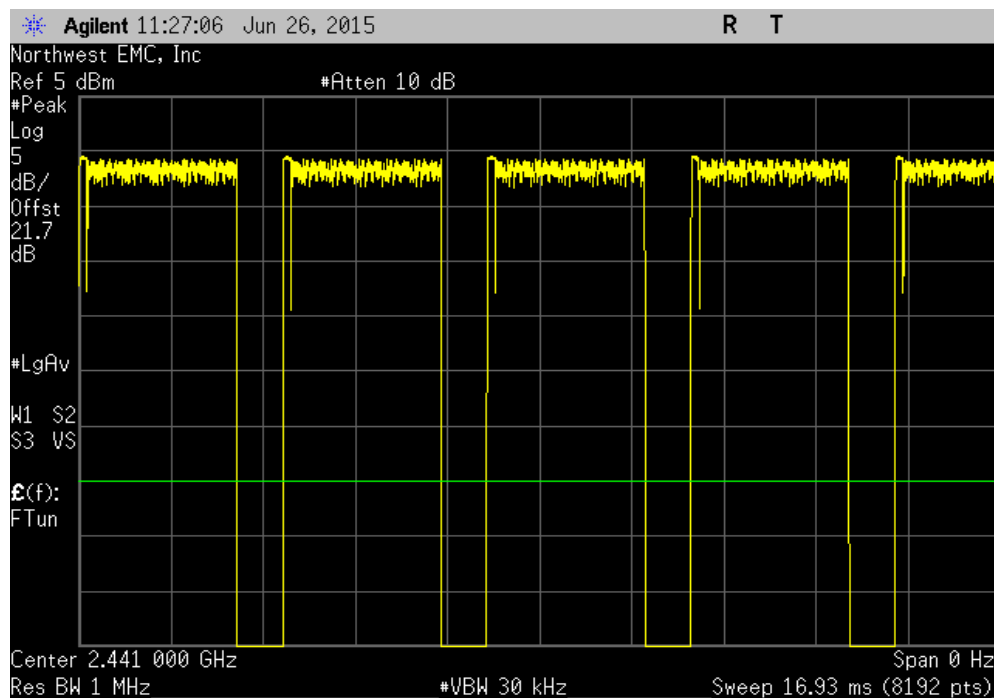


DUTY CYCLE

Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.903 ms	3.75 ms	1	77.4	N/A	N/A

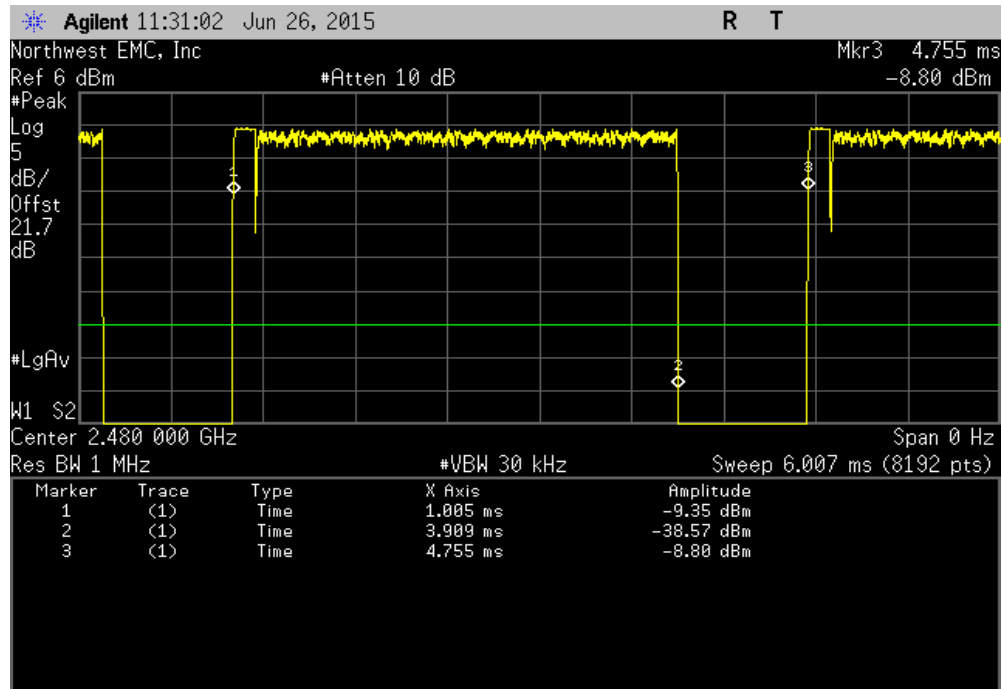


Non-Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

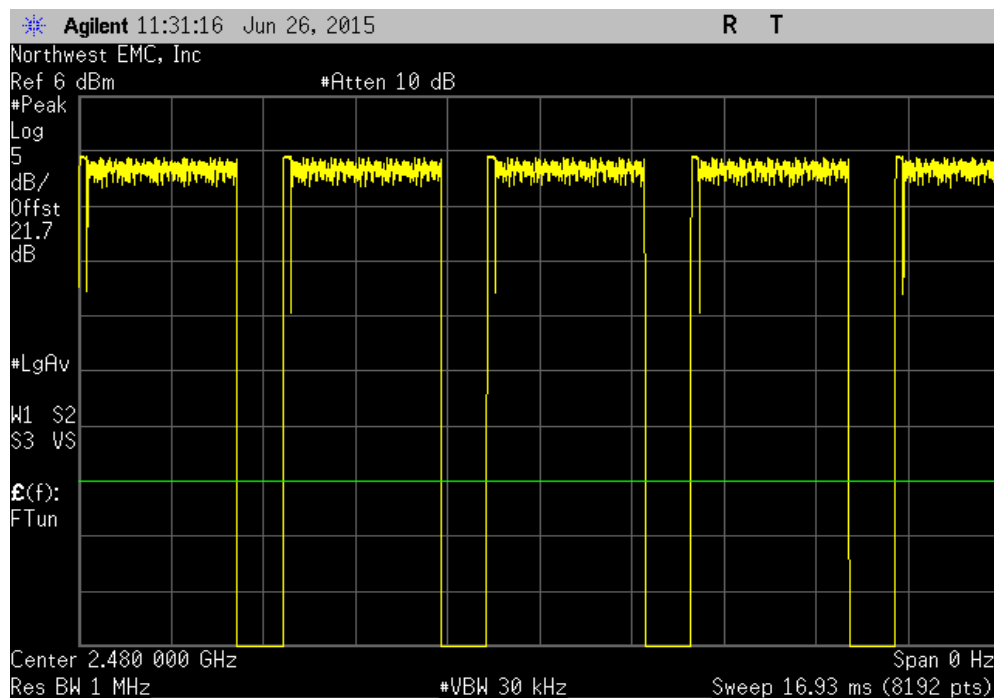


DUTY CYCLE

Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	2.904 ms	3.75 ms	1	77.4	N/A	N/A



Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



CARRIER FREQUENCY SEPARATION

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

TEST DESCRIPTION

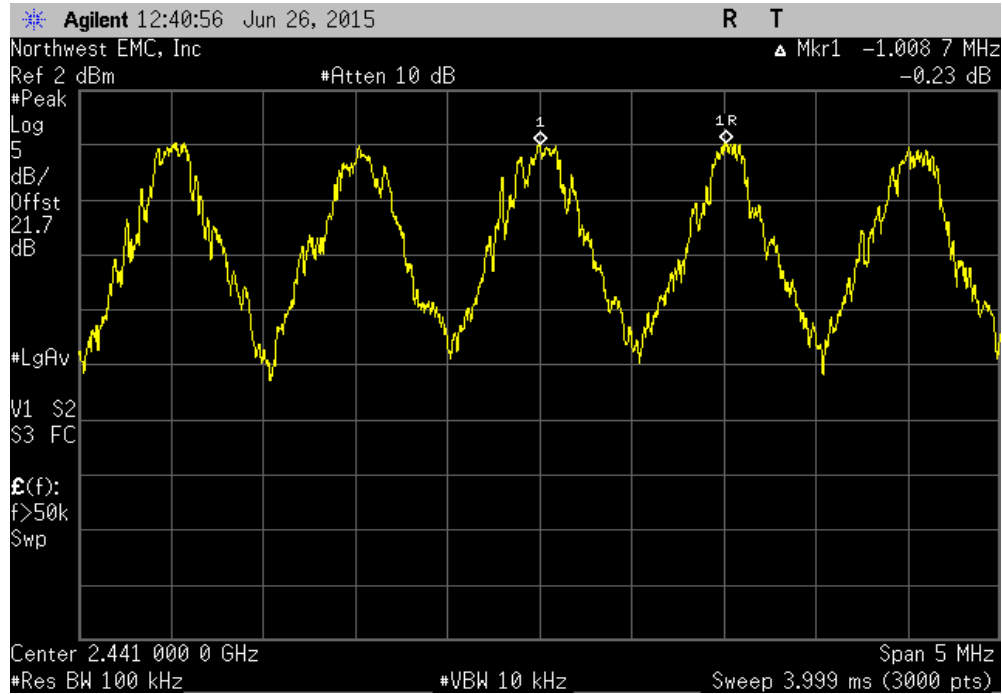
The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

CARRIER FREQUENCY SEPARATION

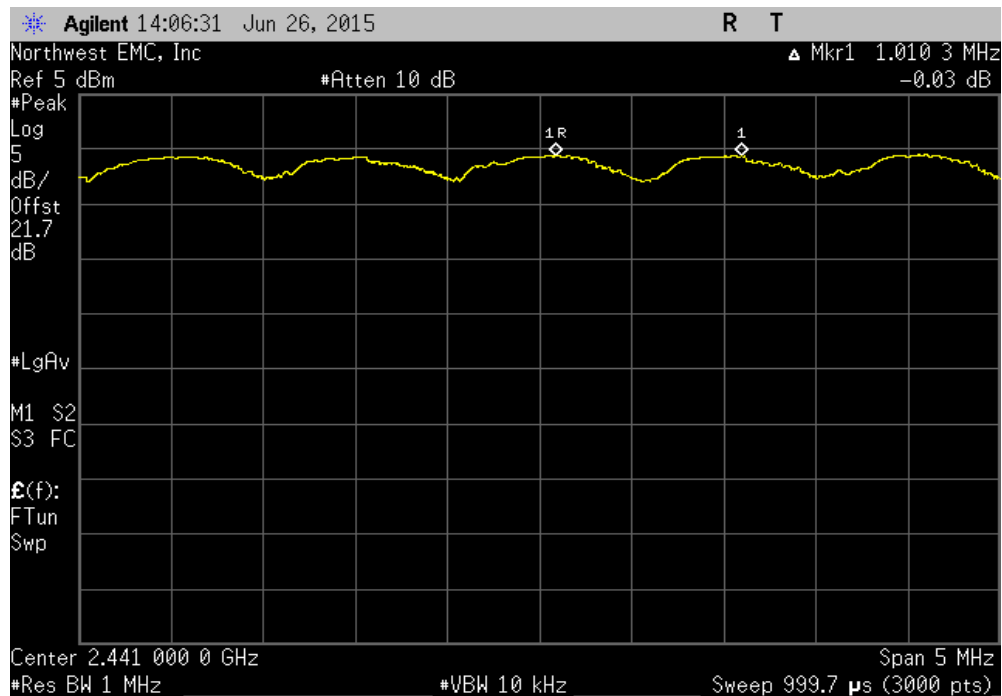
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit (±) Results
Hopping Mode			
DH5			
Mid Channel 39, 2441 MHz		1.0 MHz	622 kHz Pass
2DH5			
Mid Channel 39, 2441 MHz		1.0 MHz	875 kHz Pass
3DH5			
Mid Channel 39, 2441 MHz		1.0 MHz	851 kHz Pass

CARRIER FREQUENCY SEPARATION

Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (≥)	Results
				1.0 MHz	622 kHz	Pass

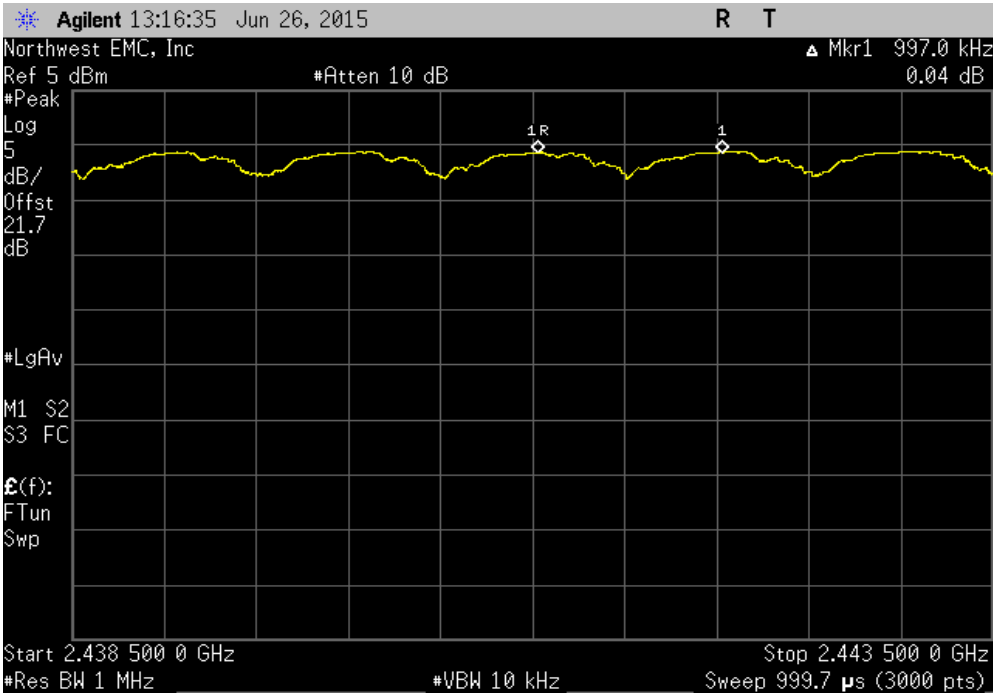


Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (≥)	Results
				1.0 MHz	875 kHz	Pass



CARRIER FREQUENCY SEPARATION

Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
				Value	Limit (≥)	Results
				1.0 MHz	851 kHz	Pass



NUMBER OF HOPPING FREQUENCIES

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

TEST DESCRIPTION

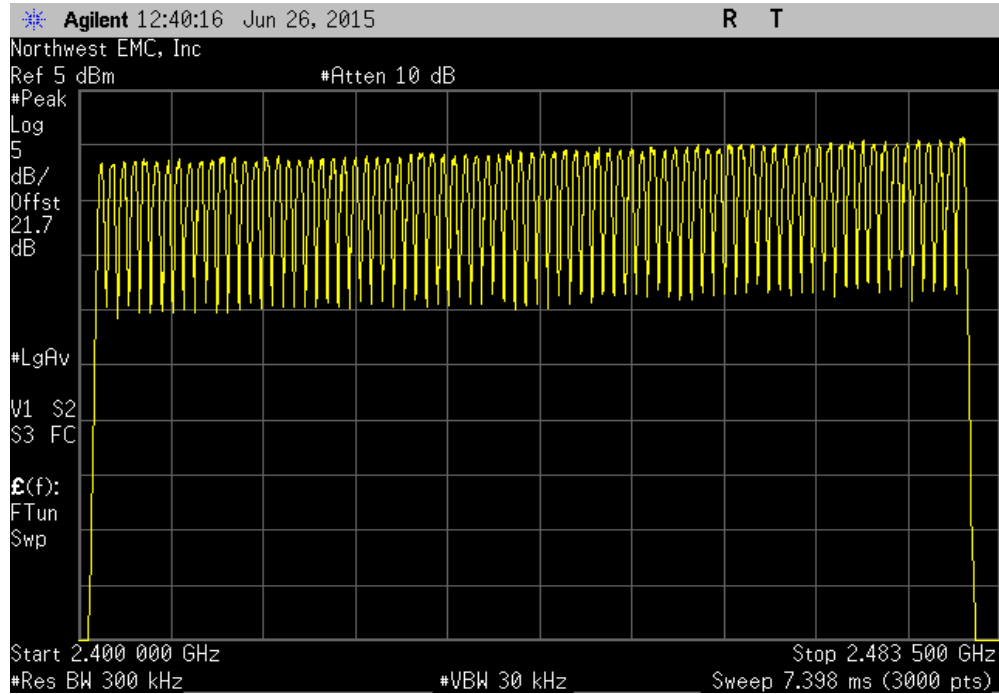
The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES

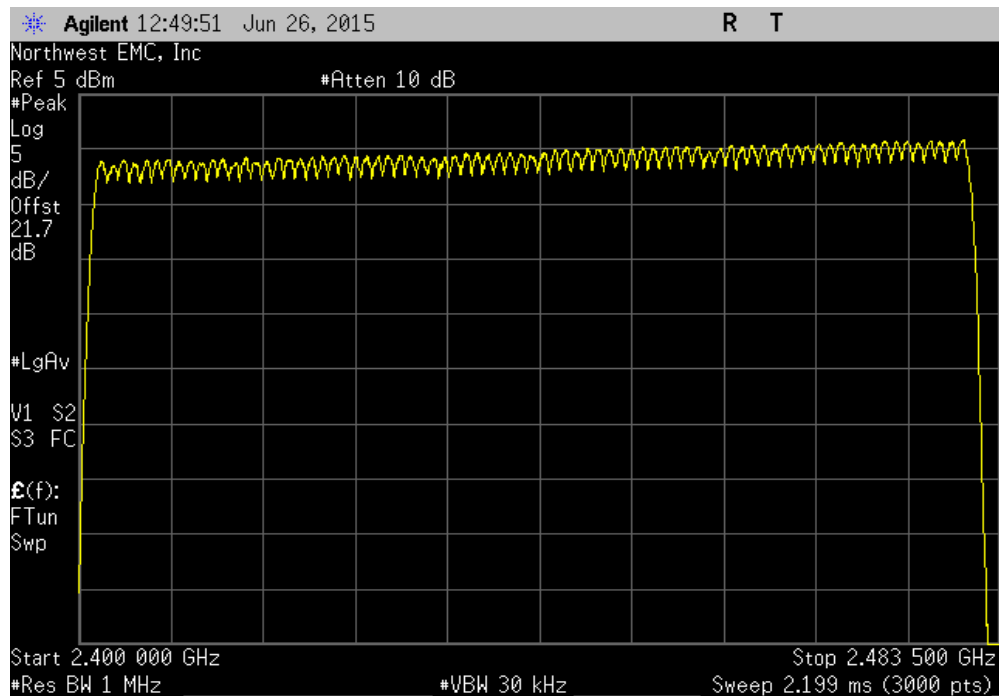
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Number of Channels	Limit
			Results
Hopping Mode			
DH5			
Mid Channel 39, 2441 MHz		79	>15 Pass
2DH5			
Mid Channel 39, 2441 MHz		79	>15 Pass
3DH5			
Mid Channel 39, 2441 MHz		79	>15 Pass

NUMBER OF HOPPING FREQUENCIES

Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
				Number of Channels	Limit	Results
				79	>15	Pass

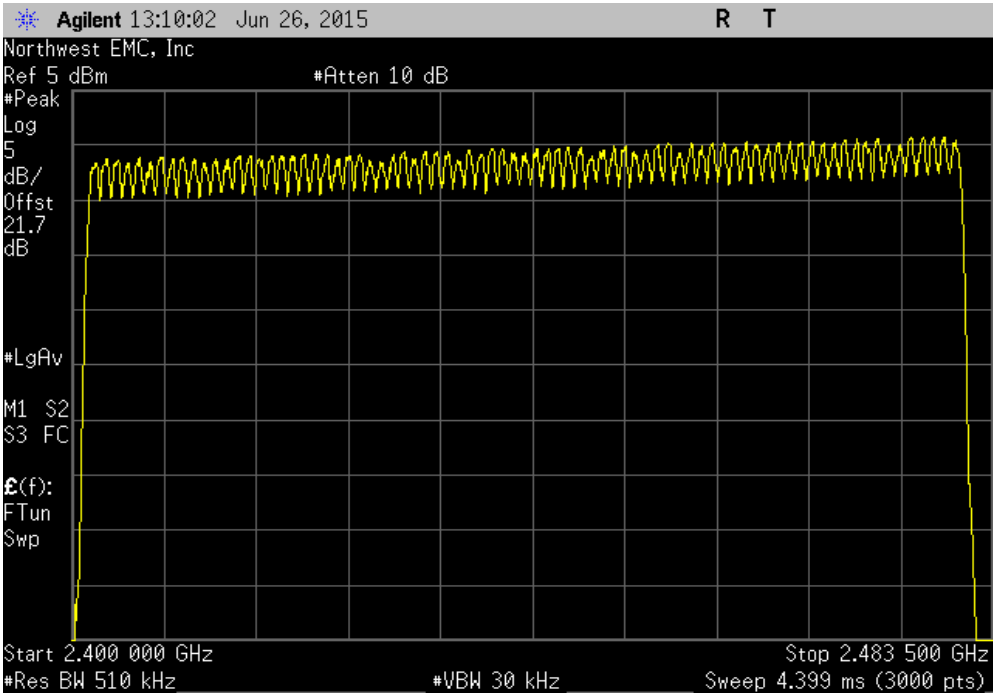


Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
				Number of Channels	Limit	Results
				79	>15	Pass



NUMBER OF HOPPING FREQUENCIES

Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
				Number of Channels	Limit	Results
				79	>15	Pass



DWELL TIME

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

TEST DESCRIPTION

The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For Bluetooth this would be 79 Channels * 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width * Average Number of Pulses * Scale Factor

➤ Average Number of Pulses is based on 4 samples.

➤ Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5

DWELL TIME

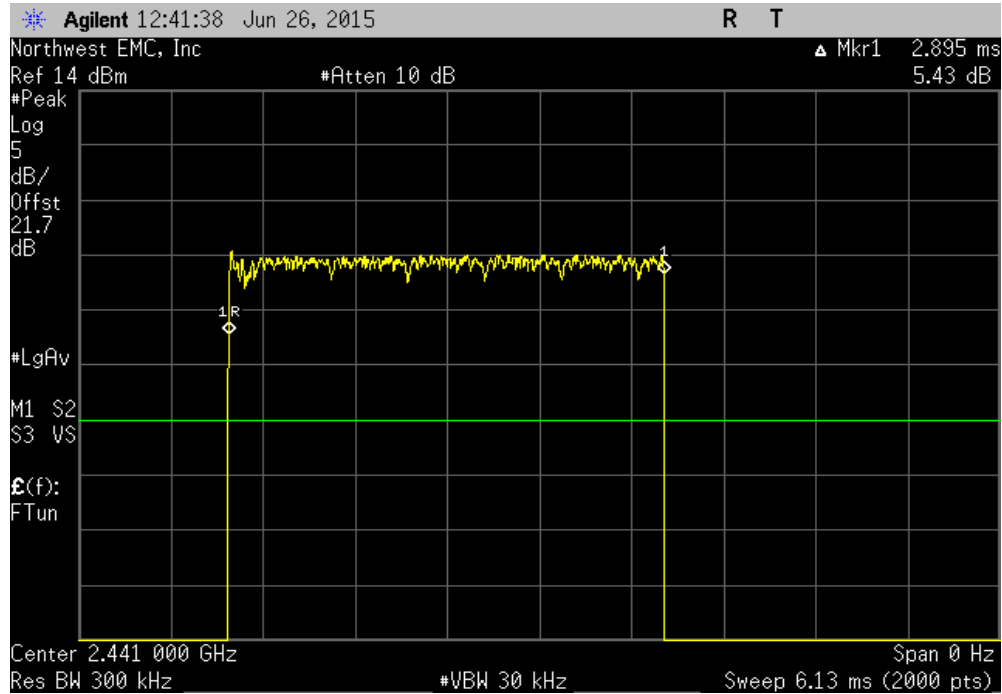


XMR 2015.01.14

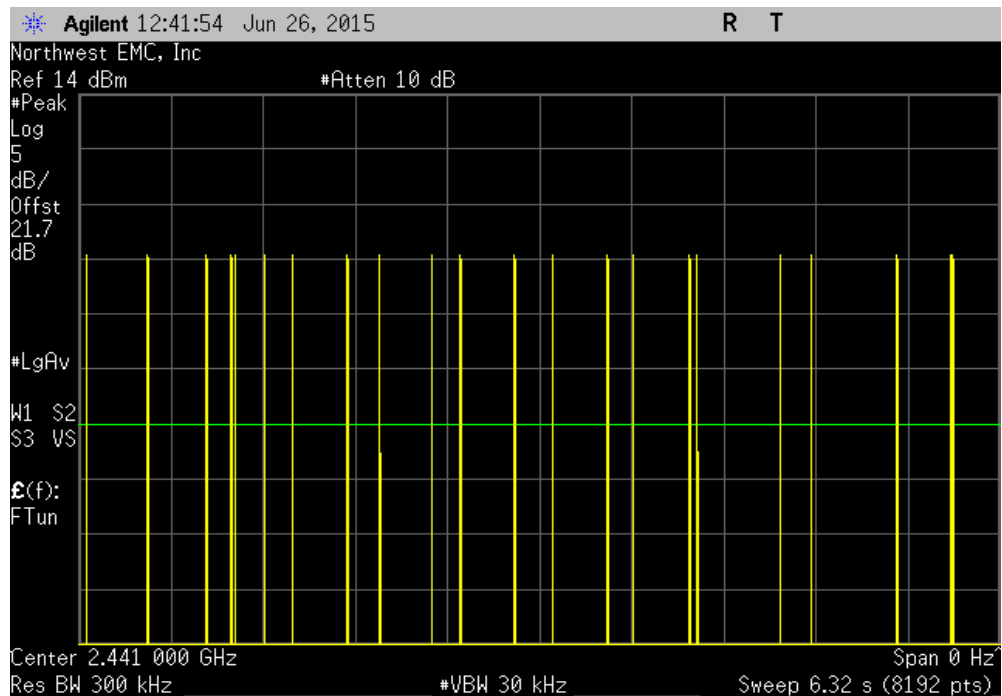
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	
Job Site: NC02			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Pulse Width (ms)	Number of Pulses
		Average No. of Pulses	Scale Factor
		On Time (ms) During 31.6 s	Limit (ms)
			Results
Hopping Mode			
DH5			
	Mid Channel 39, 2441 MHz	2.895	N/A
	Mid Channel 39, 2441 MHz	N/A	22
	Mid Channel 39, 2441 MHz	N/A	20
	Mid Channel 39, 2441 MHz	N/A	20
	Mid Channel 39, 2441 MHz	N/A	26
	Mid Channel 39, 2441 MHz	2.895	N/A
2DH5			
	Mid Channel 39, 2441 MHz	2.898	N/A
	Mid Channel 39, 2441 MHz	N/A	26
	Mid Channel 39, 2441 MHz	N/A	16
	Mid Channel 39, 2441 MHz	N/A	16
	Mid Channel 39, 2441 MHz	N/A	23
	Mid Channel 39, 2441 MHz	2.898	N/A
3DH5			
	Mid Channel 39, 2441 MHz	2.904	N/A
	Mid Channel 39, 2441 MHz	N/A	19
	Mid Channel 39, 2441 MHz	N/A	22
	Mid Channel 39, 2441 MHz	N/A	27
	Mid Channel 39, 2441 MHz	N/A	22
	Mid Channel 39, 2441 MHz	2.904	N/A

DWELL TIME

Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.895	N/A	N/A	N/A	N/A	N/A	N/A

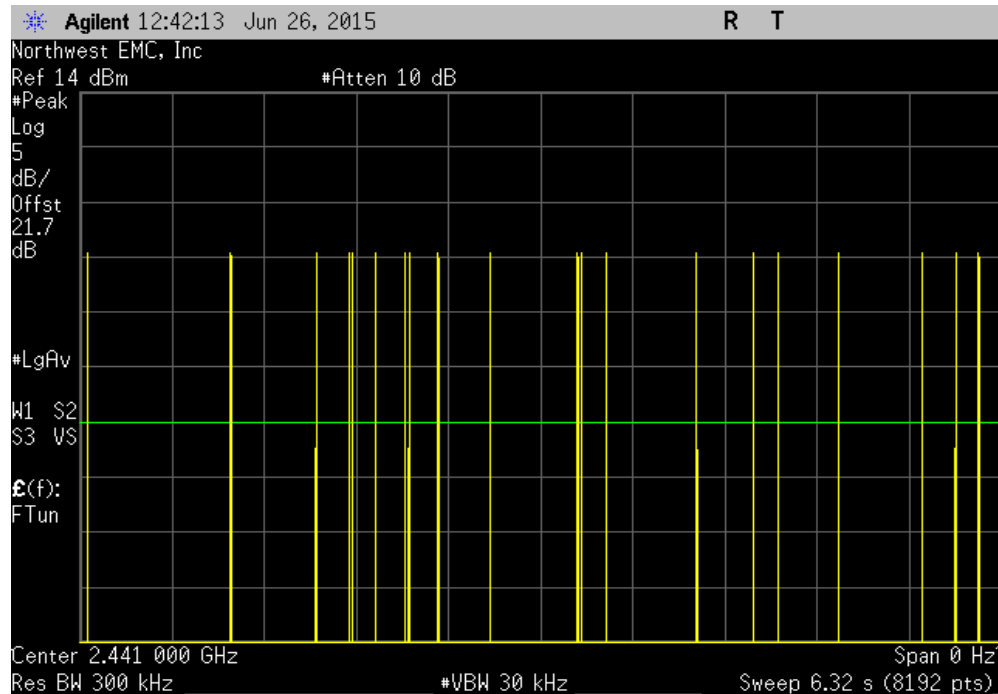


Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A

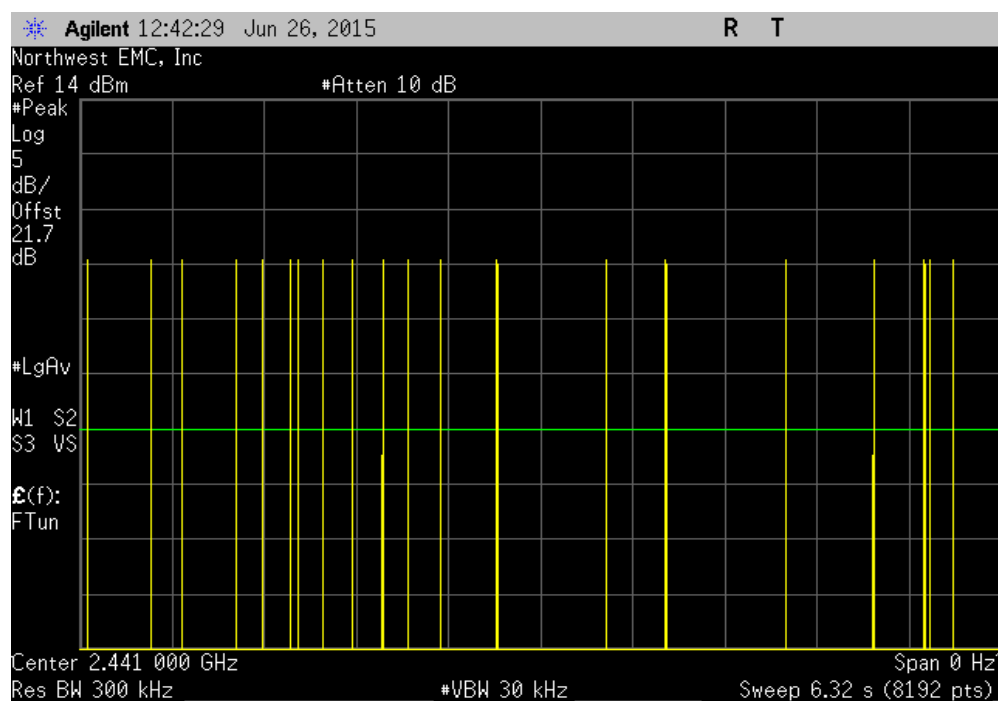


DWELL TIME

Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A

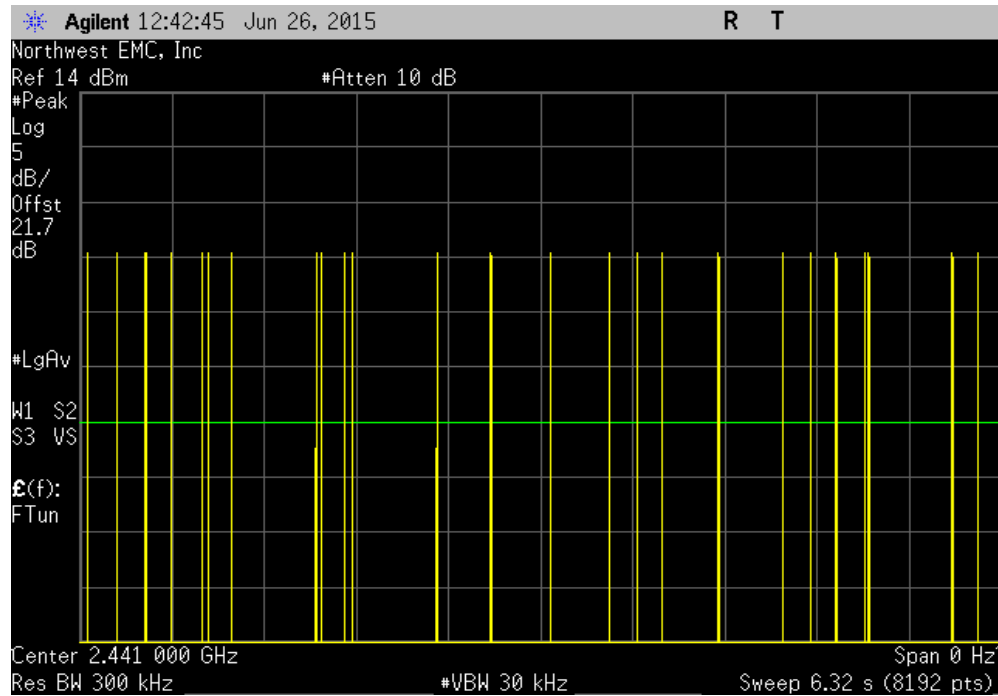


Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	20	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	26	N/A	N/A	N/A	N/A	N/A



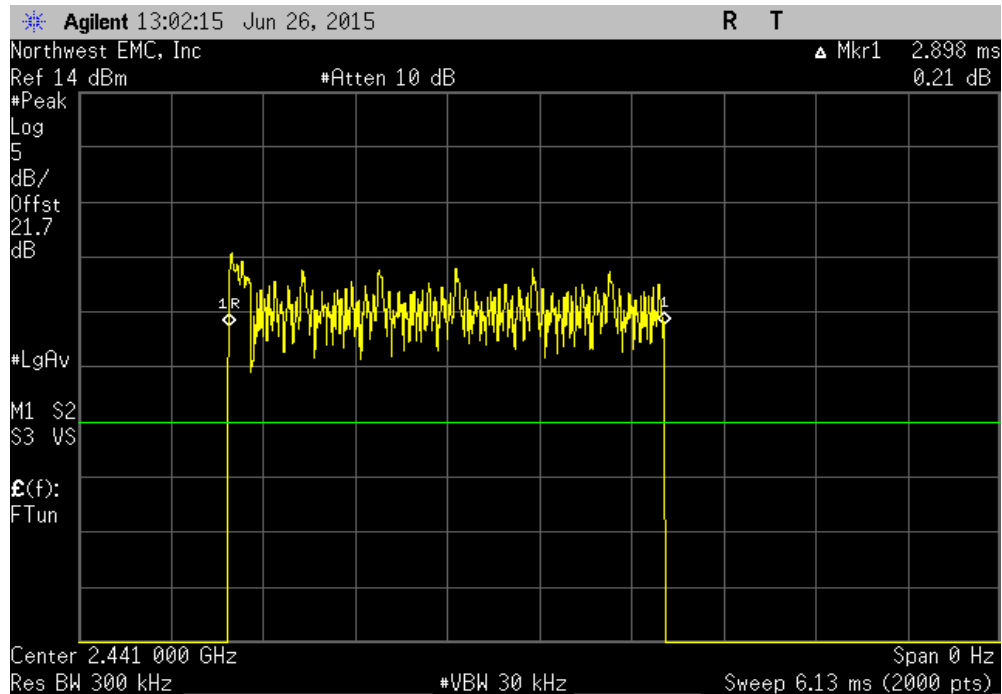
Hopping Mode, DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.895	N/A	22	5	318.45	400	Pass

Calculation Only

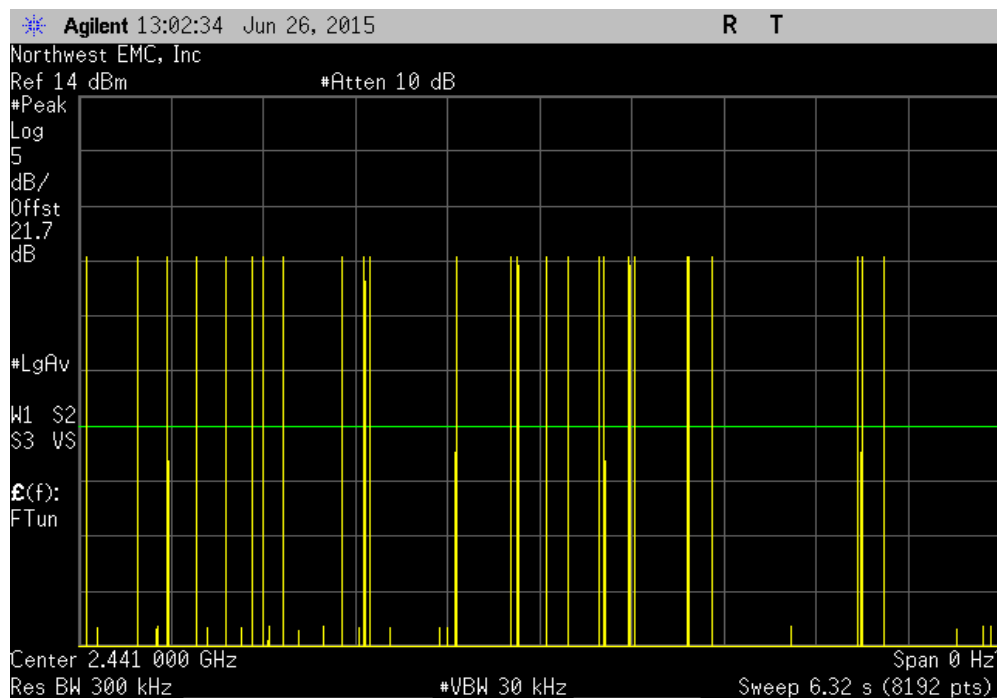
No Screen Capture Required

DWELL TIME

Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.898	N/A	N/A	N/A	N/A	N/A	N/A

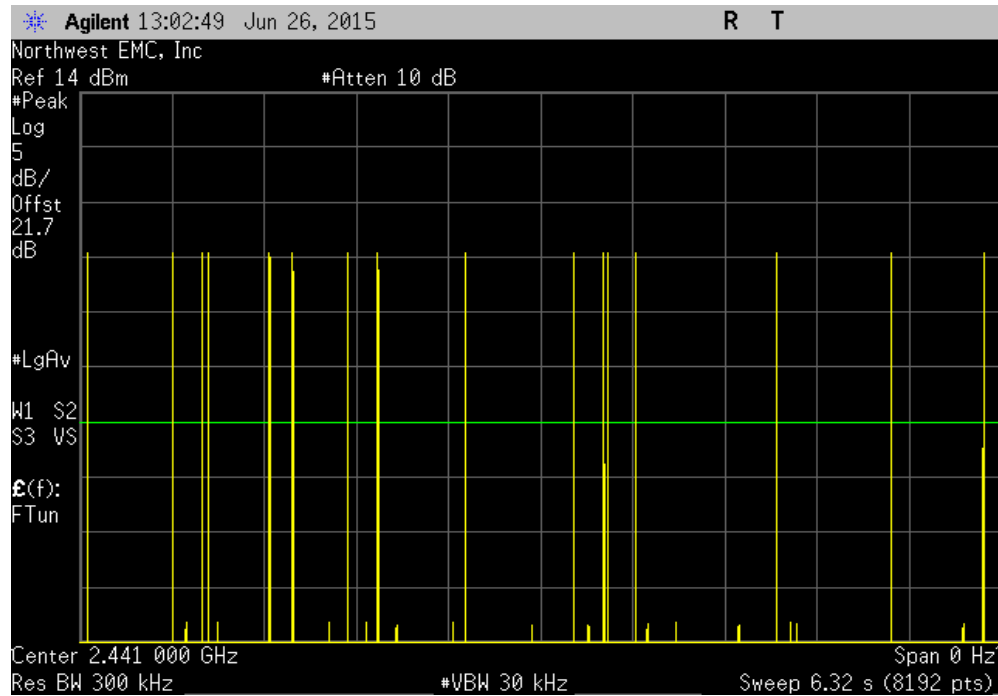


Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	26	N/A	N/A	N/A	N/A	N/A

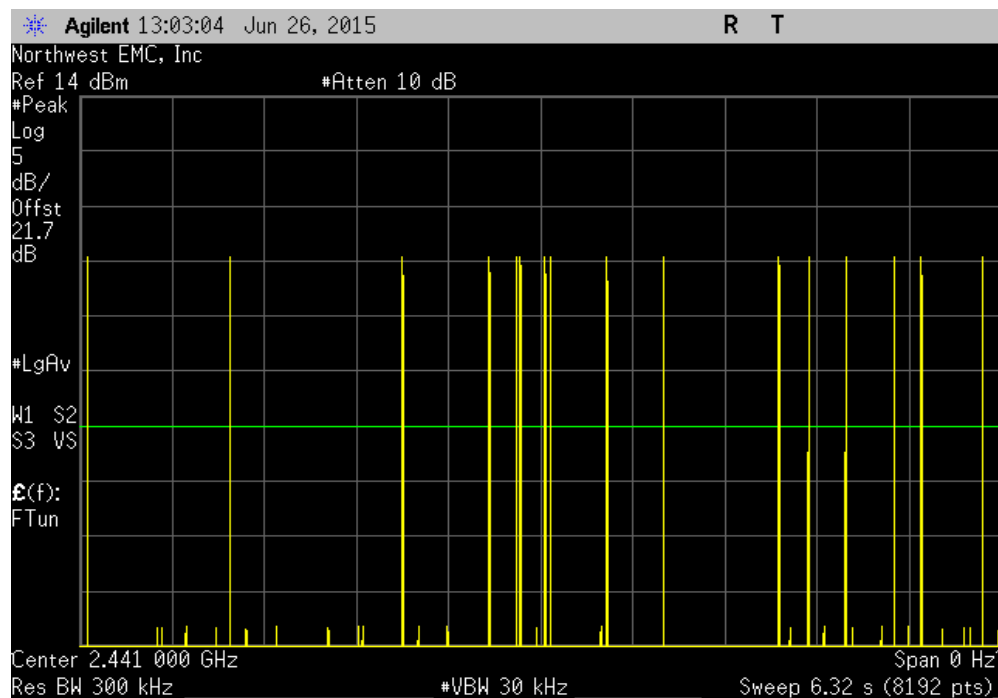


DWELL TIME

Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	16	N/A	N/A	N/A	N/A	N/A

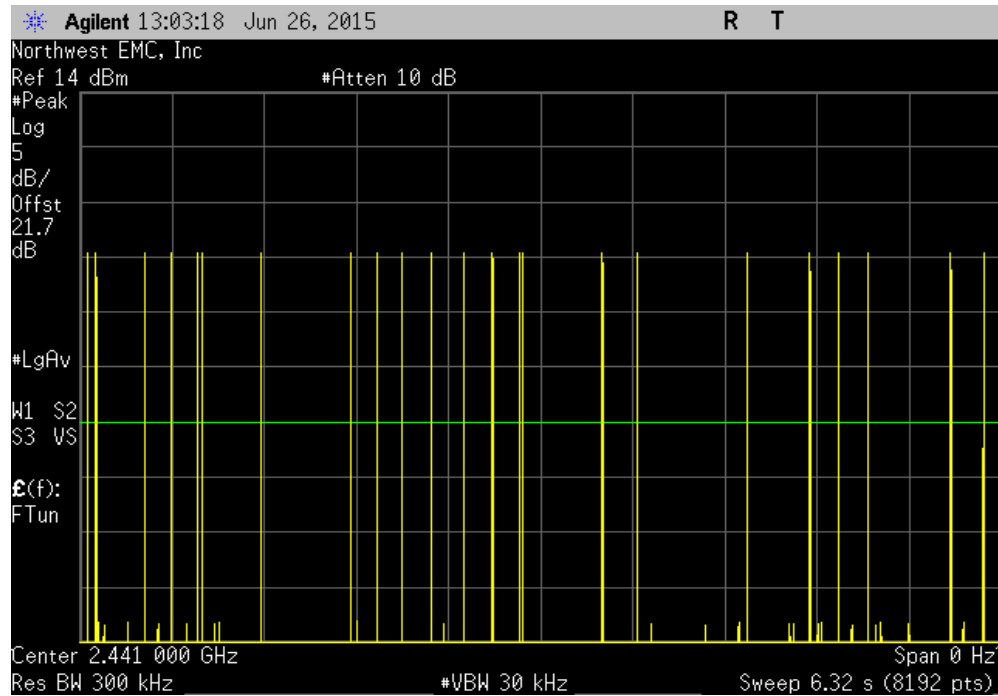


Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	16	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	23	N/A	N/A	N/A	N/A	N/A



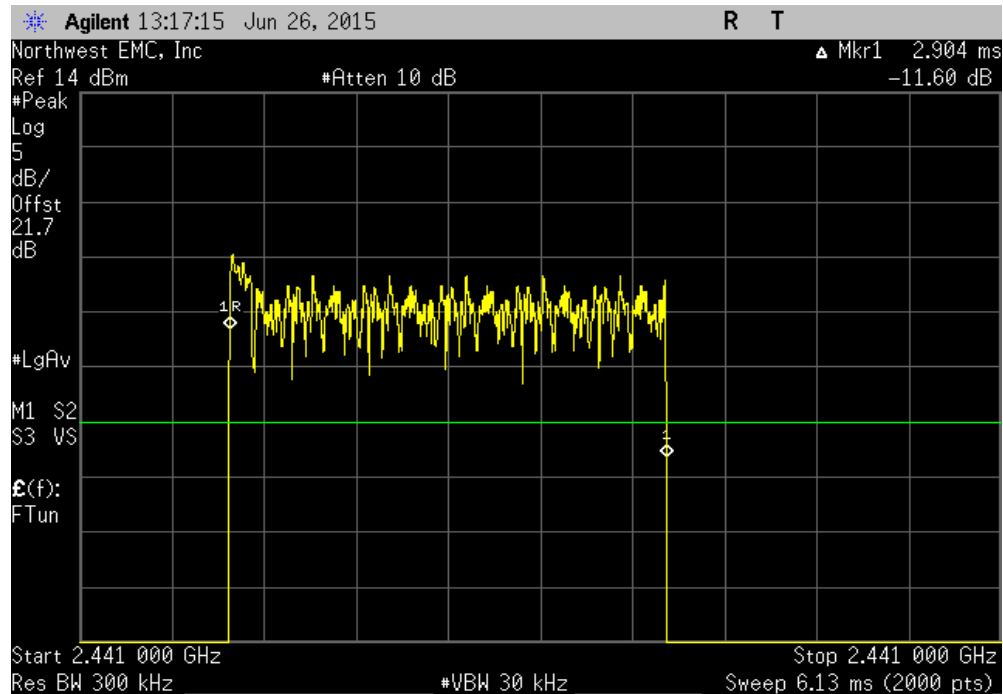
Hopping Mode, 2DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.898	N/A	20.25	5	293.42	400	Pass

Calculation Only

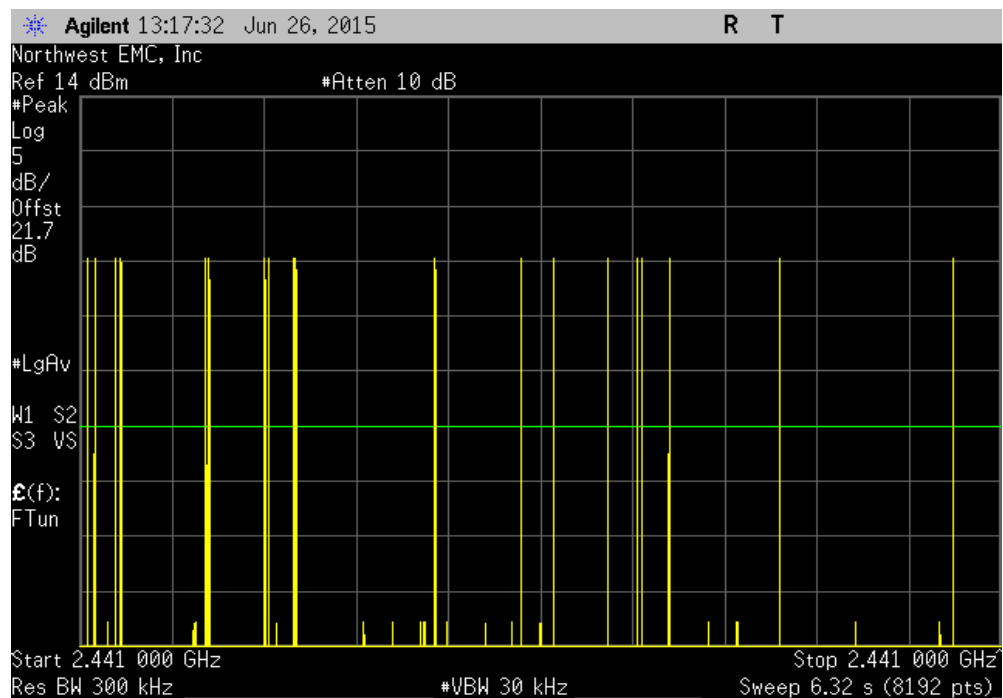
No Screen Capture Required

DWELL TIME

Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.904	N/A	N/A	N/A	N/A	N/A	N/A

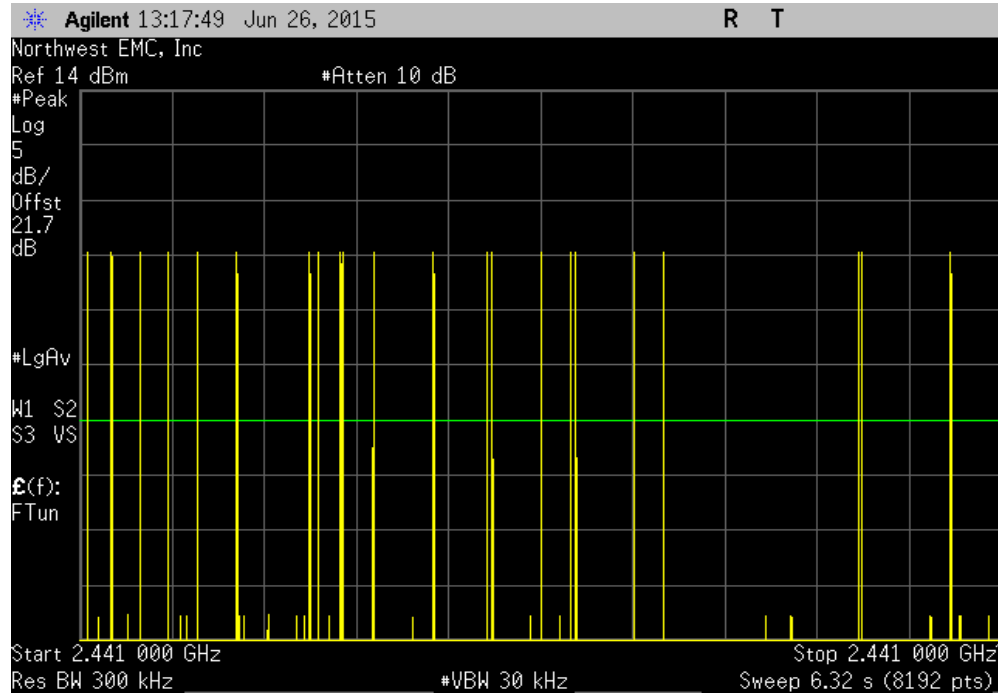


Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	19	N/A	N/A	N/A	N/A	N/A

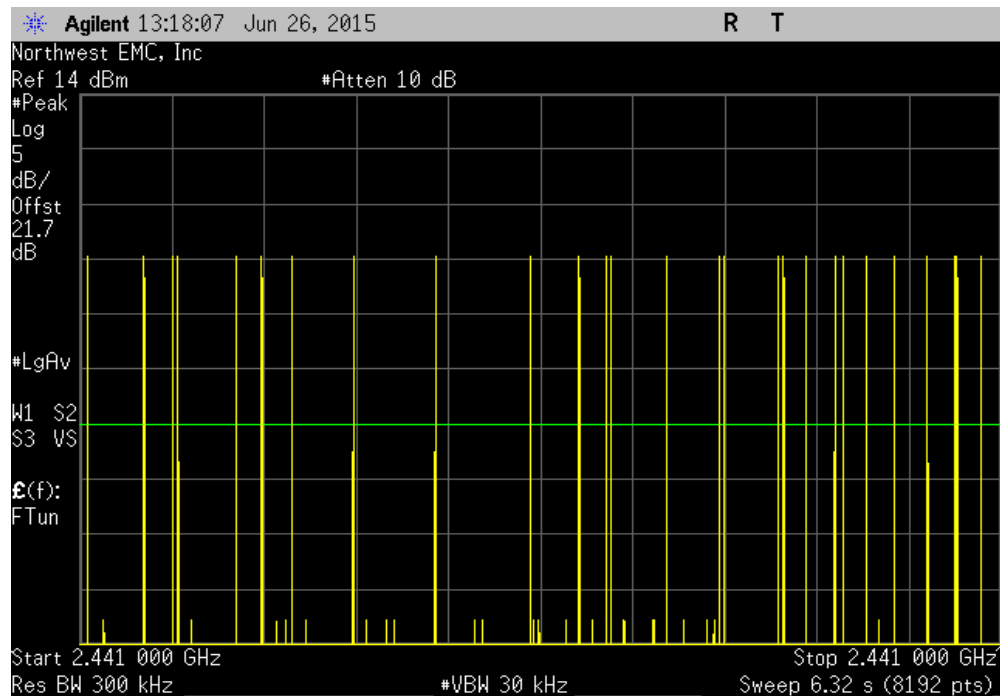


DWELL TIME

Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A

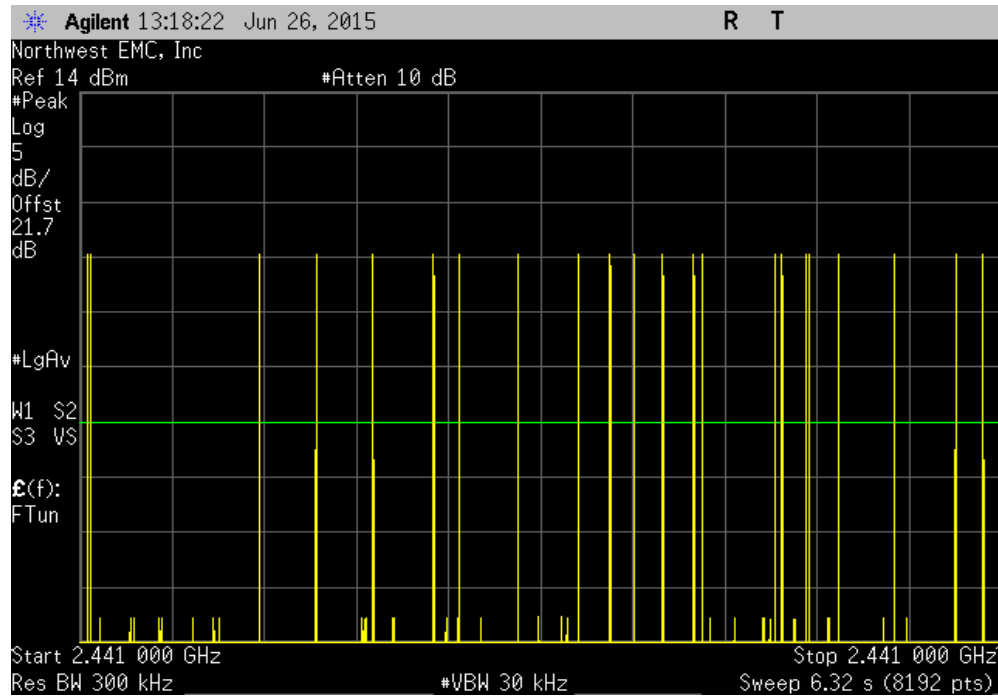


Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	27	N/A	N/A	N/A	N/A	N/A



DWELL TIME

Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
N/A	22	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 3DH5, Mid Channel 39, 2441 MHz						
Pulse Width (ms)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (ms) During 31.6 s	Limit (ms)	Results
2.904	N/A	22.5	5	326.7	400	Pass

Calculation Only

No Screen Capture Required

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

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. 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 in a no hop mode. The channels closest to the band edges were selected.

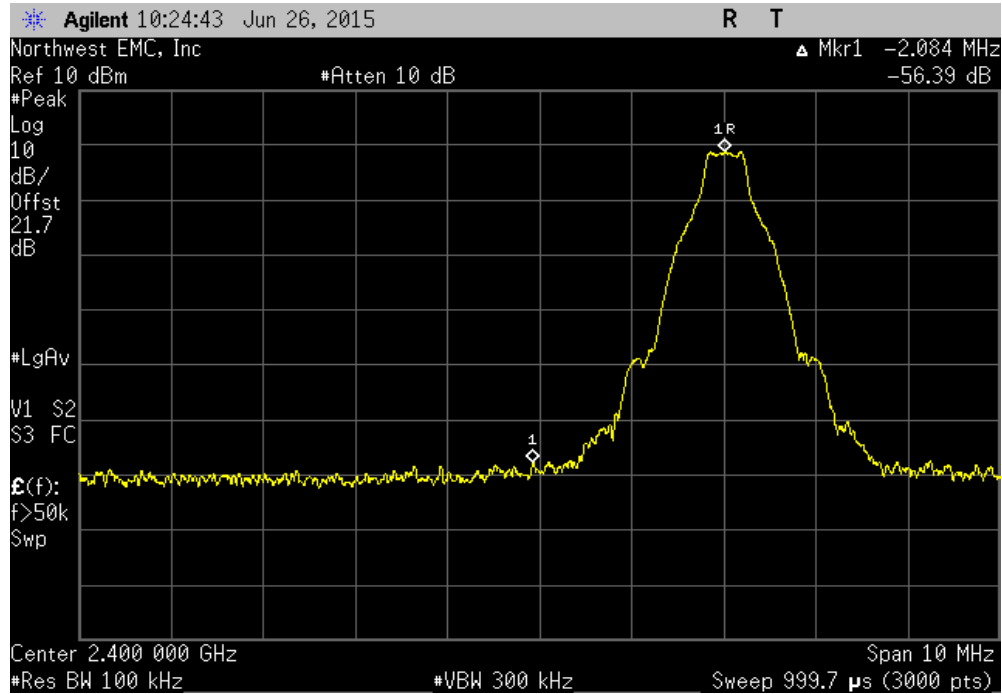
The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

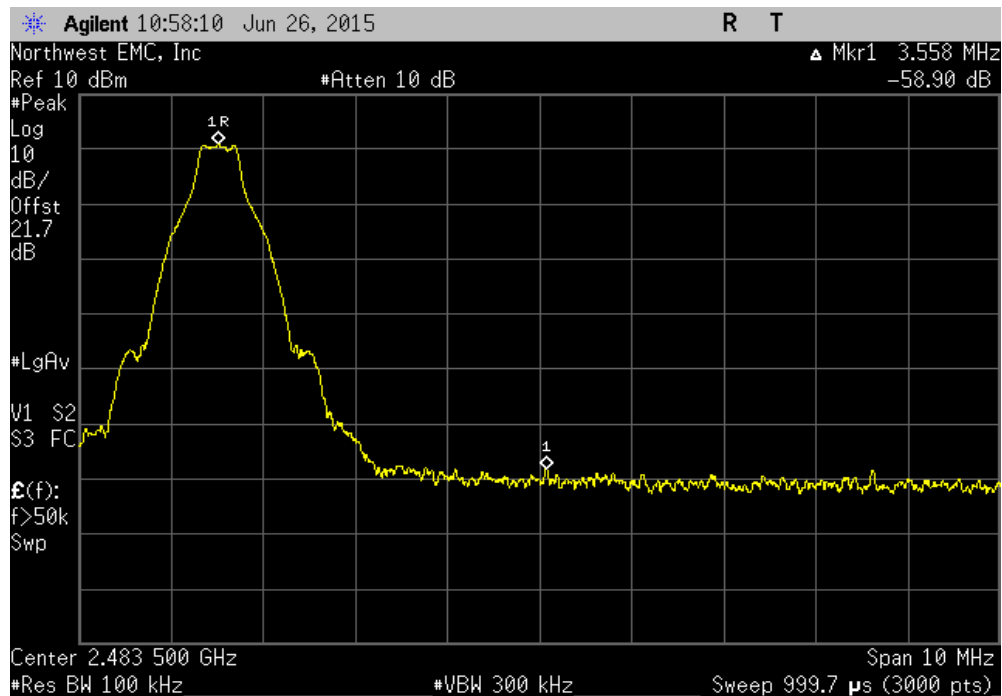
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	Job Site: NC02
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value (dBc)	Limit ≤ (dBc) Result
Non-Hopping Mode			
DH5			
Low Channel 0, 2402 MHz		-56.39	-20 Pass
High Channel 78, 2480 MHz		-58.9	-20 Pass
2DH5			
Low Channel 0, 2402 MHz		-55.33	-20 Pass
High Channel 78, 2480 MHz		-58.15	-20 Pass
3DH5			
Low Channel 0, 2402 MHz		-54.47	-20 Pass
High Channel 78, 2480 MHz		-59.59	-20 Pass

BAND EDGE COMPLIANCE

Non-Hopping Mode, DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-56.39	-20	Pass

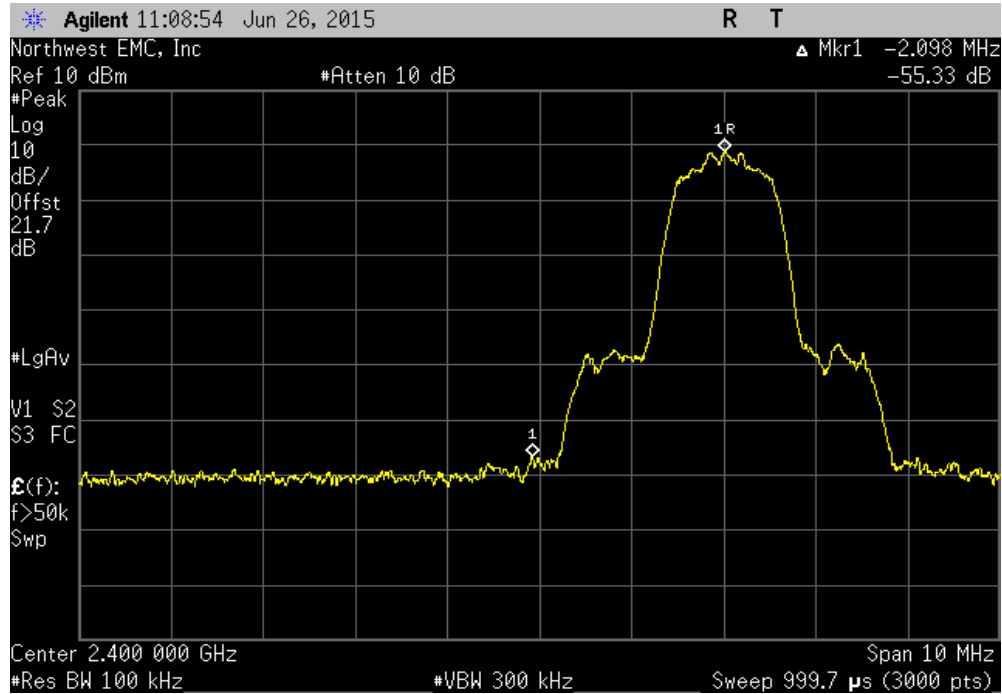


Non-Hopping Mode, DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-58.9	-20	Pass

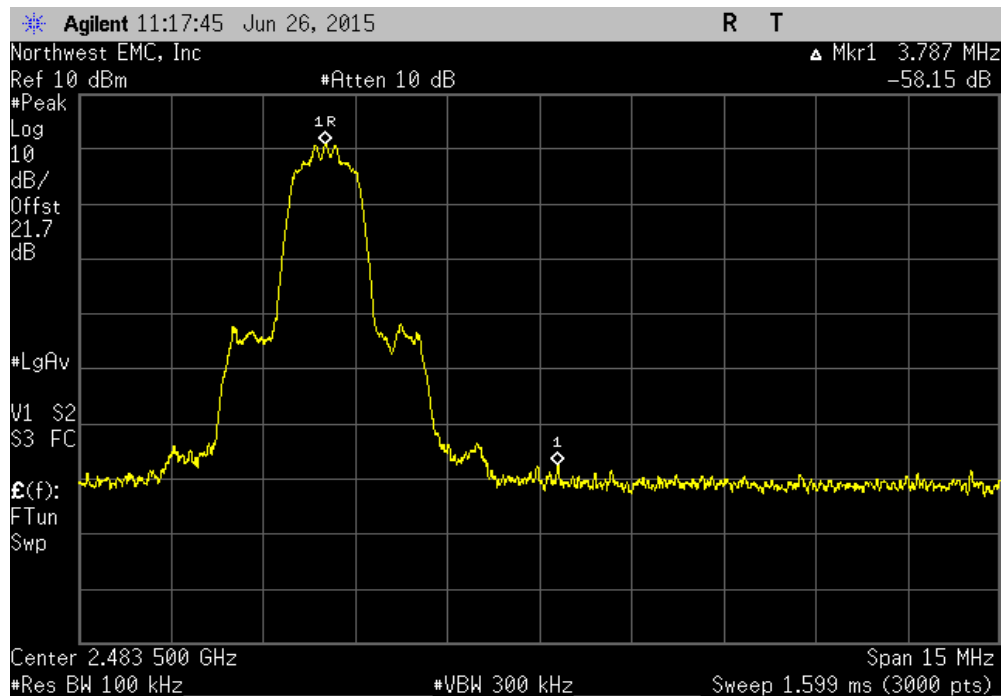


BAND EDGE COMPLIANCE

Non-Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.33	-20	Pass

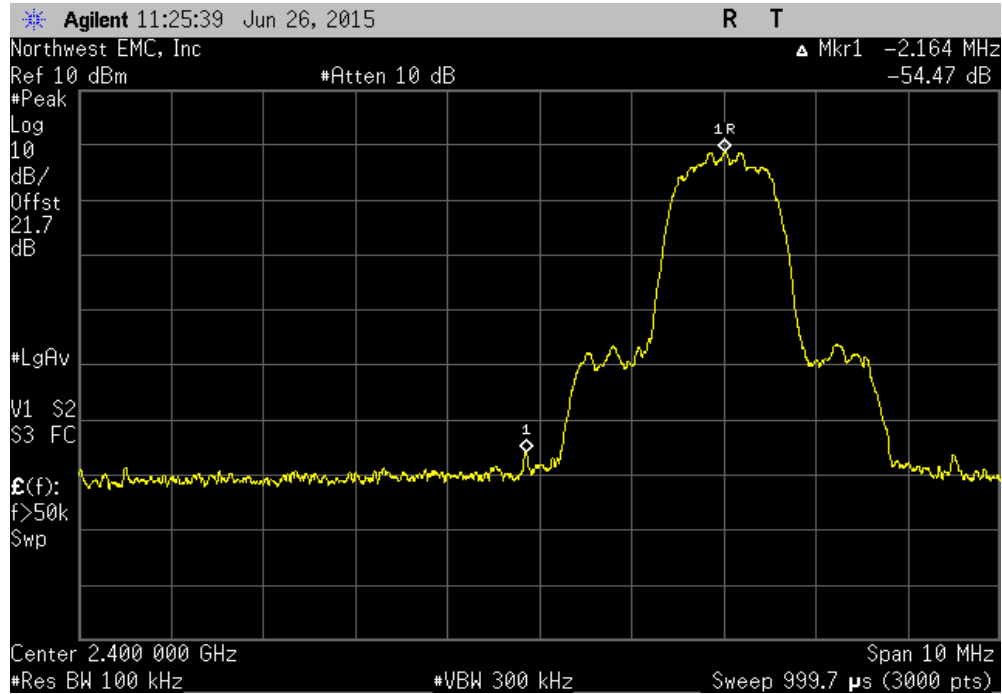


Non-Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-58.15	-20	Pass

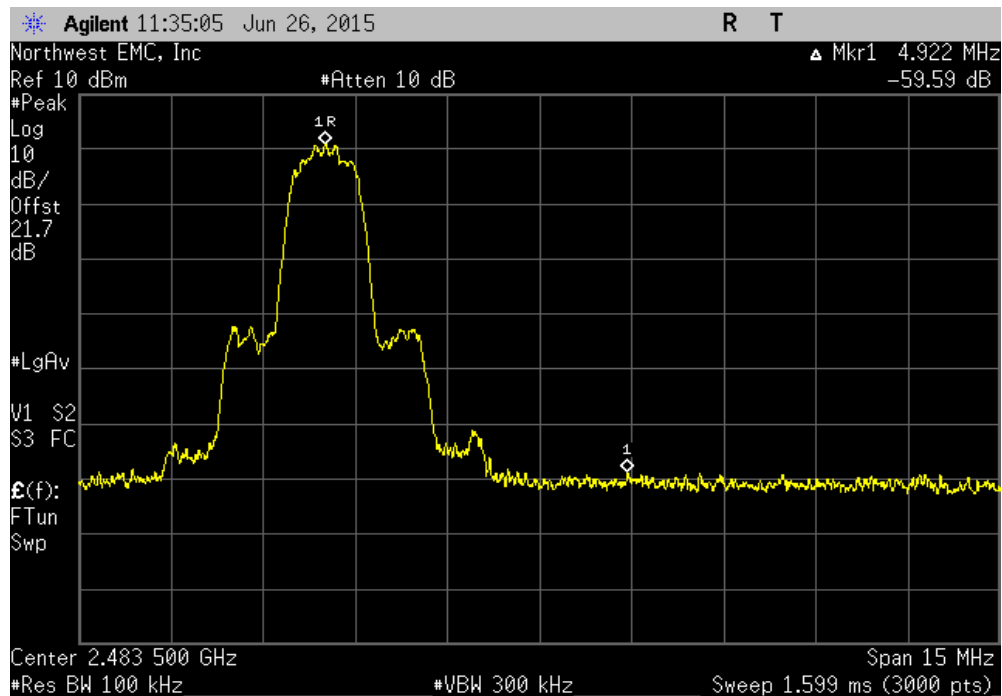


BAND EDGE COMPLIANCE

Non-Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.47	-20	Pass



Non-Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.59	-20	Pass



BAND EDGE COMPLIANCE -HOPPING MODE



XMit 2015.01.14

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

TEST EQUIPMENT

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

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. 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.

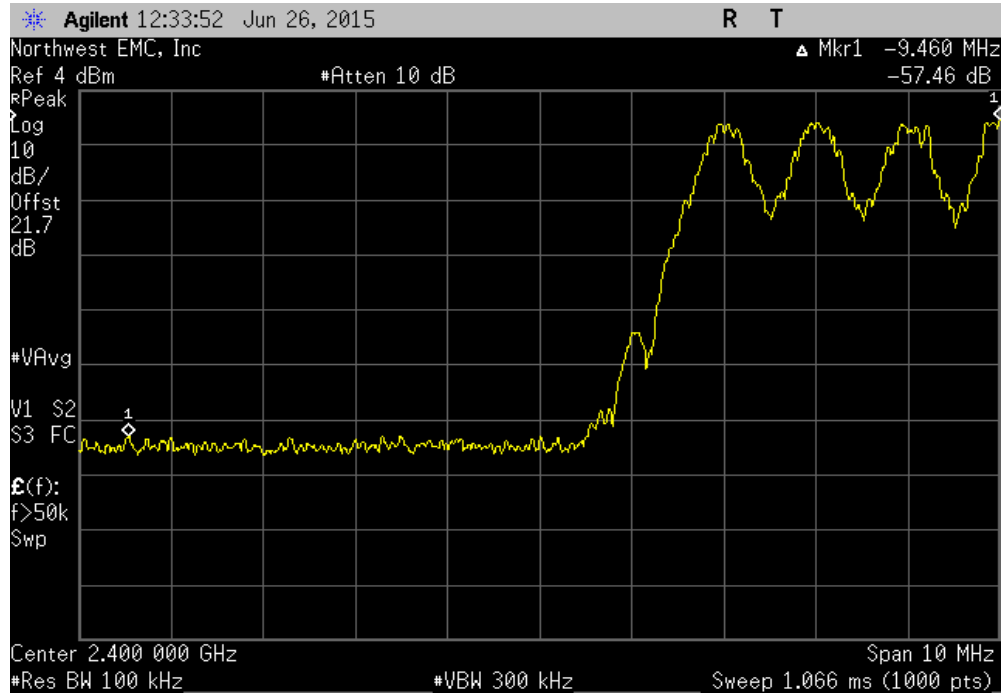
The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE -HOPPING MODE

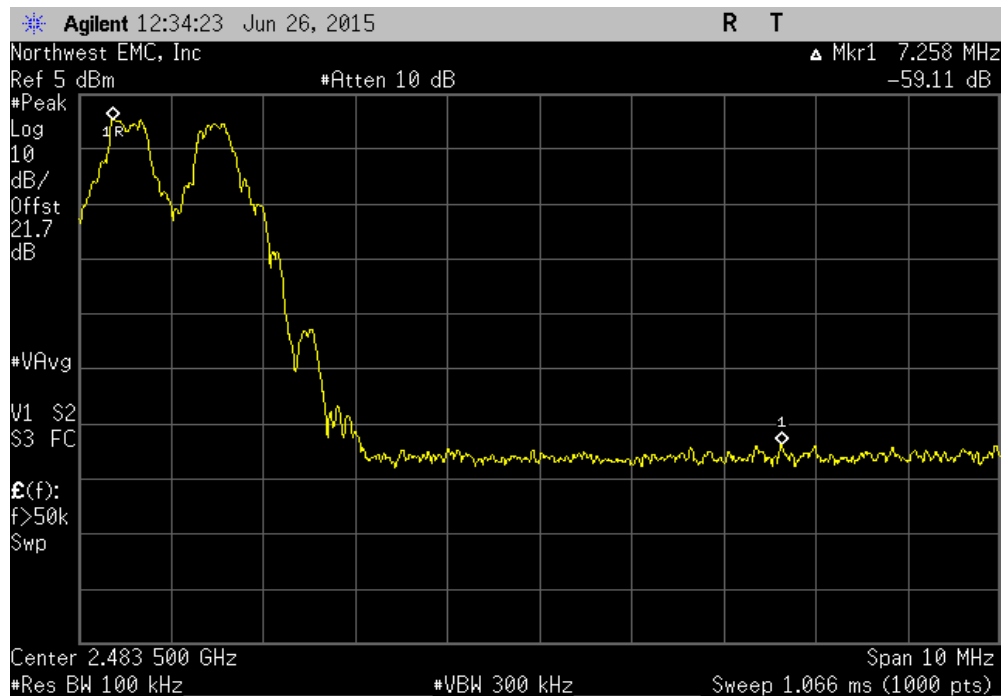
EUT: 1721		Work Order: MCSO1732	
Serial Number: 2937901005079752549		Date: 06/26/15	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1020 mbar	
Tested by: Richard Mellroth		Power: USB	
		Job Site: NC02	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2009	
COMMENTS			
EUT power setting at maximum.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value (dBc)	Limit ≤ (dBc) Result
Hopping Mode			
DH5			
Low Channel 0, 2402 MHz		-57.46	-20 Pass
High Channel 78, 2480 MHz		-59.11	-20 Pass
2DH5			
Low Channel 0, 2402 MHz		-55.1	-20 Pass
High Channel 78, 2480 MHz		-57.25	-20 Pass
3DH5			
Low Channel 0, 2402 MHz		-54.73	-20 Pass
High Channel 78, 2480 MHz		-58.25	-20 Pass

BAND EDGE COMPLIANCE -HOPPING MODE

Hopping Mode, DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-57.46	-20	Pass

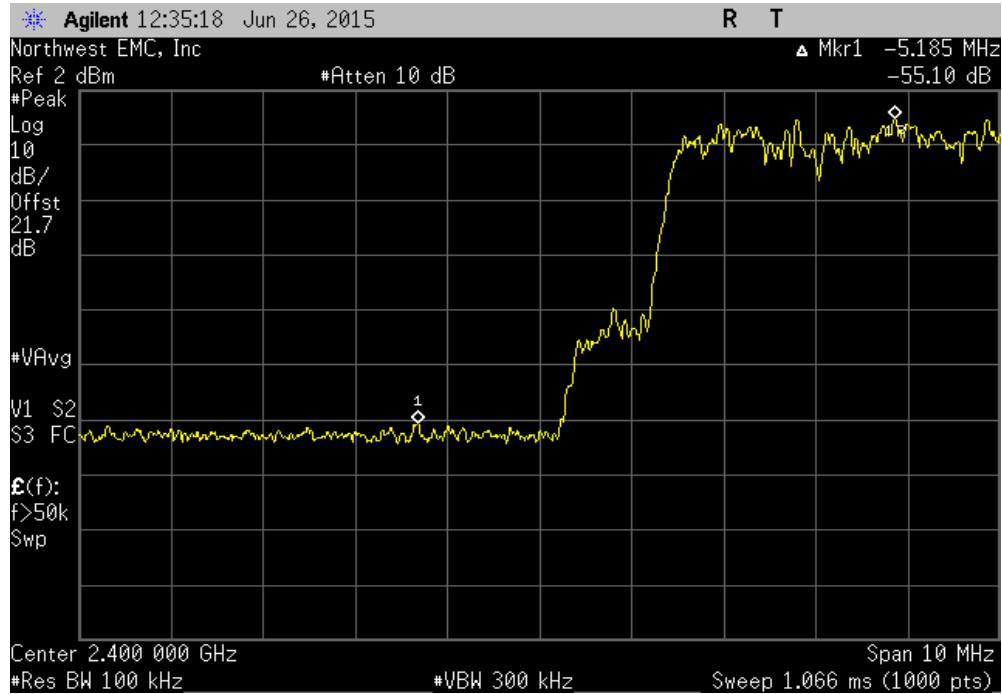


Hopping Mode, DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.11	-20	Pass

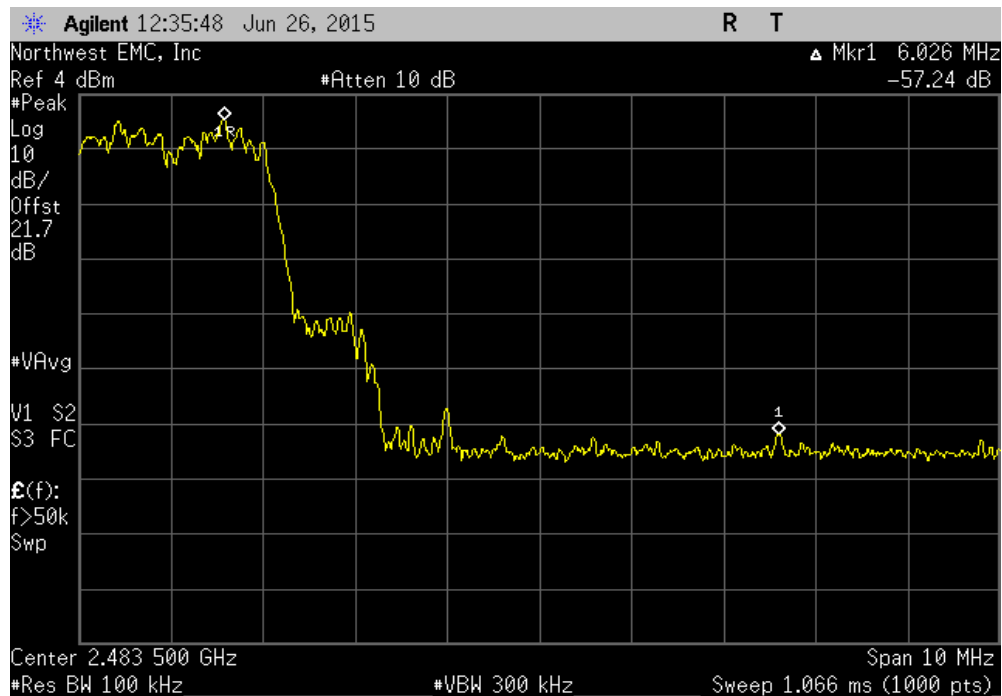


BAND EDGE COMPLIANCE -HOPPING MODE

Hopping Mode, 2DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.1	-20	Pass

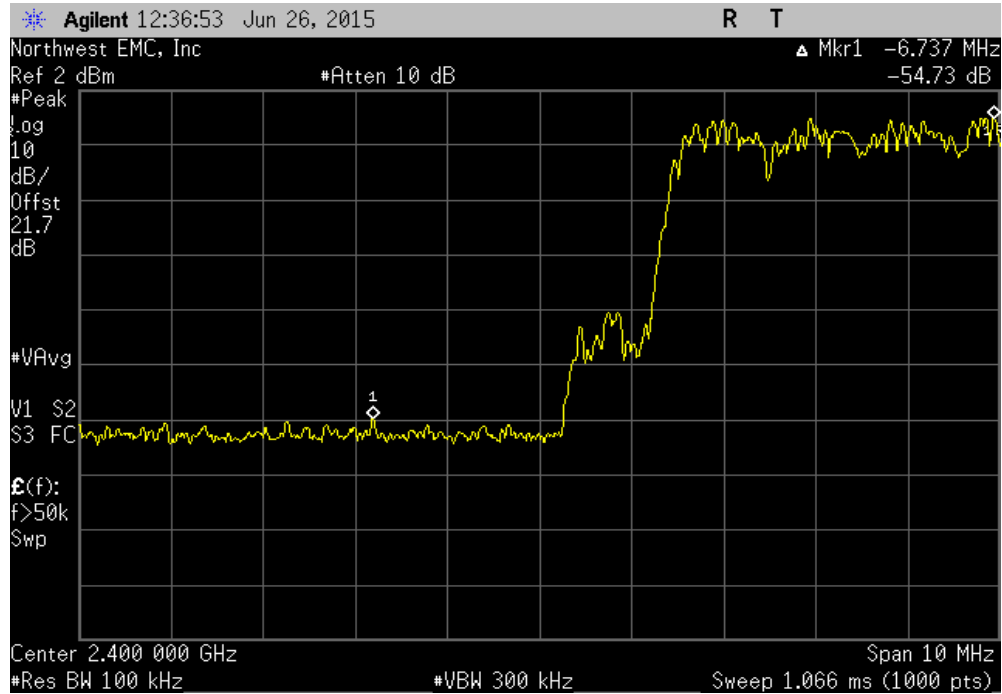


Hopping Mode, 2DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-57.25	-20	Pass



BAND EDGE COMPLIANCE -HOPPING MODE

Hopping Mode, 3DH5, Low Channel 0, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.73	-20	Pass



Hopping Mode, 3DH5, High Channel 78, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-58.25	-20	Pass

