



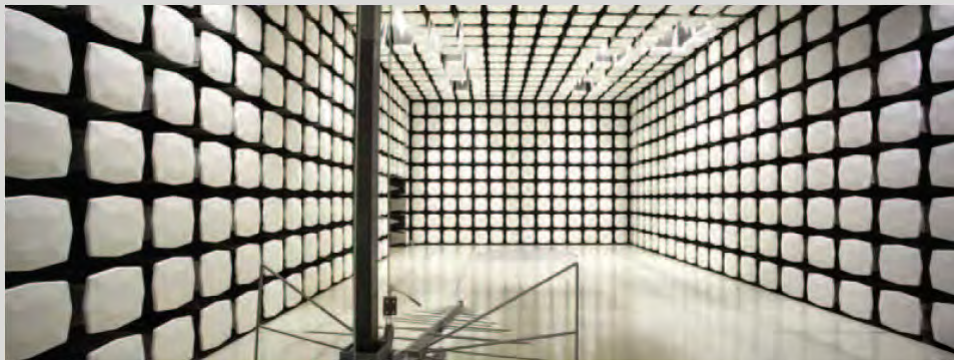
Microsoft Corporation

1514

FCC 15.247:2012

FCC 15.207:2012

Report #: MCSO1633.1



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

Last Date of Test: November 20, 2012
Microsoft Corporation
Model: 1514

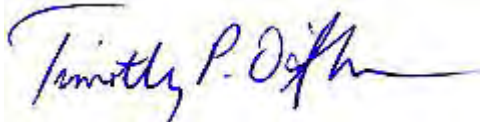
Emissions

Test Description	Specification	Test Method	Pass/Fail
Duty Cycle	FCC 15.247:2012	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2012	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2012	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2012	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass
Power Spectral Density	FCC 15.247:2012	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2012	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200630-0

Test Facility

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

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

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

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

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

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

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

United States

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

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Hong Kong

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

Vietnam

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

Russia

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

SCOPE

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

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

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.

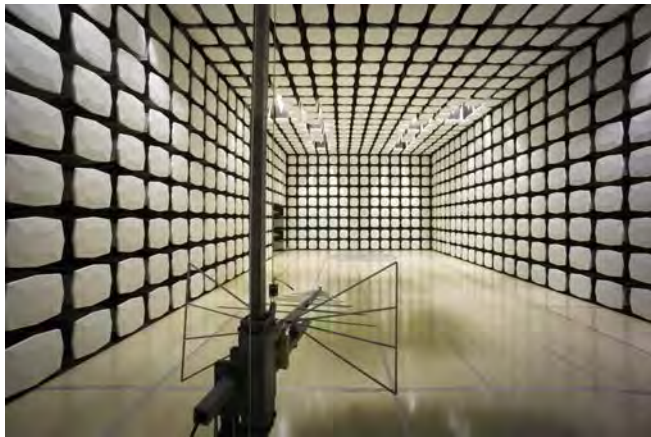
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement 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 16-4-1 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)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	4.00	-4.00
AC Powerline Conducted Emissions (dB)	2.70	-2.70



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





WTD 12.5.23

PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Test Requested By:	Mike Boucher
Model:	1514
First Date of Test:	October 30, 2012
Last Date of Test:	November 20, 2012
Receipt Date of Samples:	October 29, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

A Hand held computing device with 802.11b/g/a/n and Bluetooth radios.

Testing Objective:

To demonstrate compliance under FCC 15.247 for a Bluetooth transmitter in the hand held computing device.

Configuration MCSO1633- 1

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

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

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Microsoft Corporation	PA-2480-06MX	0D21033282239
USB Ethernet Adapter	LinkSys	USB300M	CU906M703796

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Remote Laptop	Lenovo	4174-BB4	R9-PMLAF 12/06

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Headphone	No	1.2m	No	Hand Held Computing Device	Earbuds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Hand Held Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Hand Held Computing Device
Ethernet	No	1.0m	No	Remote Laptop	USB Ethernet Adapter

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Configuration MCSO1633- 2

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

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Hand Held Computing Device	Microsoft Corporation	1514	000215624253

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Microsoft Corporation	PA-2480-06MX	0D21033282239
USB Ethernet Adapter	LinkSys	USB300M	CU906M703796

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Remote Laptop	Lenovo	4174-BB4	R9-PMLAF 12/06

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	0.5m	No	AC Adapter	AC Mains
USB	Yes	0.1m	No	USB Ethernet Adapter	Hand Held Computing Device
Ethernet	No	1.0m	No	Remote Laptop	USB Ethernet Adapter

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Configuration MCSO1638- 1

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

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

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

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC mains	Yes	1.0m	No	AC Mains	Hand Held Computing Device
USB adapter	Yes	.2m	No	Hand Held Computing Device	Ethernet CAT 5 Cable
Ethernet CAT 5 Cable	No	1.0m	No	USB adapter	Remote PC

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	10/30/2012	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.
2	11/5/2012	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	11/5/2012	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.
4	11/5/2012	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.
5	11/5/2012	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.
6	11/5/2012	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	11/5/2012	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.
8	11/20/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

TEST DESCRIPTION

The Duty Cycle (x) were 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.



DUTY CYCLE

XMit 2012.09.20
PsaTx 2012.09.10

EUT: 1514	Work Order: MCSO1638
Serial Number: 000109423753	Date: 11/05/12
Customer: Microsoft Corporation	Temperature: 22.3°C
Attendees: None	Humidity: 52%
Project: None	Barometric Pres.: 1013
Tested by: Brandon Hobbs/Rod Peloquin	Power: 110VAC/60Hz
	Job Site: EV06
TEST SPECIFICATIONS	
FCC 15.247:2012	ANSI C63.10:2009
TEST METHOD	

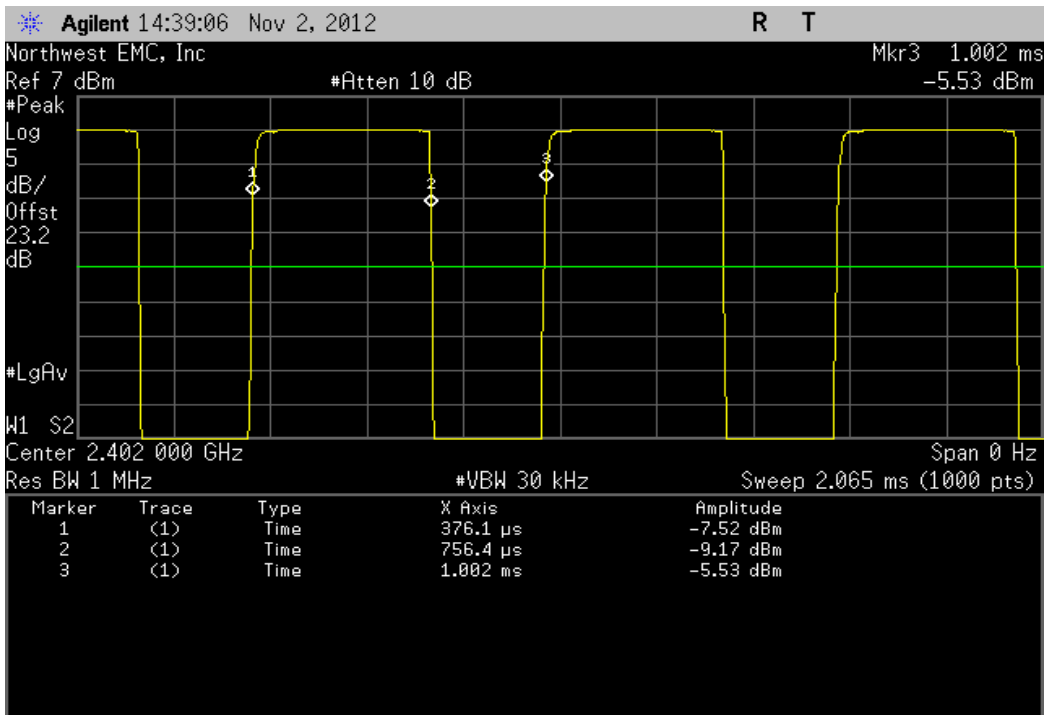
COMMENTS
All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD
None

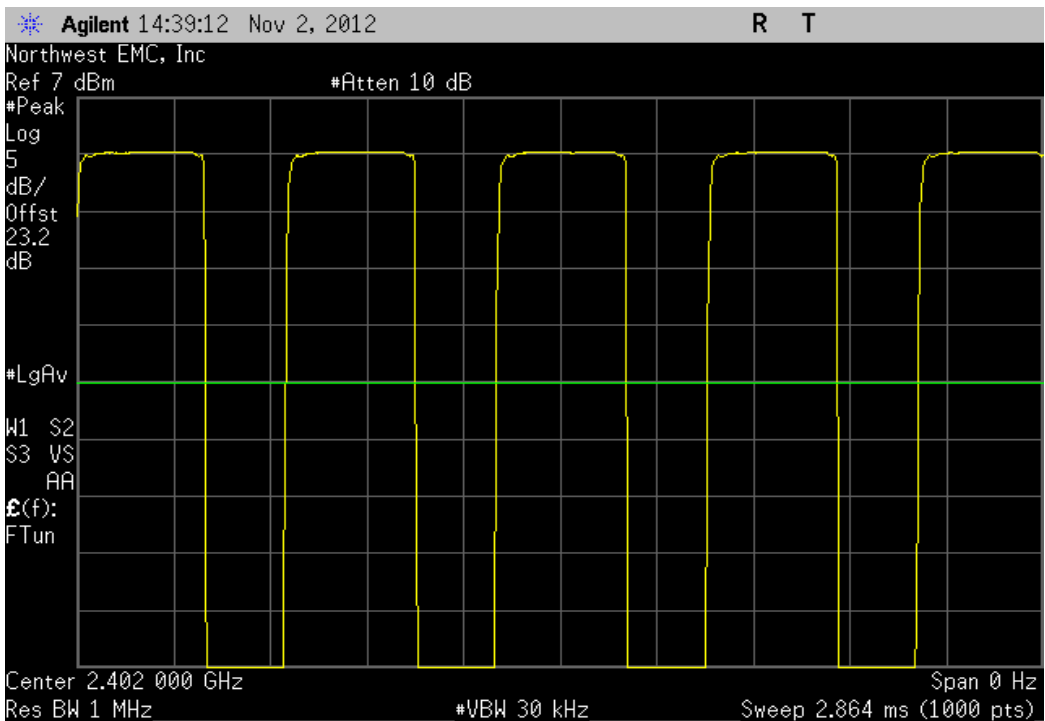
Configuration #	1	Signature <i>Brandon Hobbs</i>
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	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
BLE - Advertising						
Low Channel, 2402 MHz	380.3 uS	626.2 uS	1	60.7	N/A	N/A
Low Channel, 2402 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel, 2426 MHz	378.2 uS	626.2 uS	1	60.4	N/A	N/A
Mid Channel, 2426 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel, 2480 MHz	380.3 uS	624.2 uS	1	60.9	N/A	N/A
High Channel, 2480 MHz	N/A	N/A	5	N/A	N/A	N/A
BLE - Data						
Low Channel, 2404 MHz	378.2 uS	624.1 uS	1	60.6	N/A	N/A
Low Channel, 2404 MHz	N/A	N/A	5	N/A	N/A	N/A
Mid Channel, 2442 MHz	378.2 uS	624.2 uS	1	60.6	N/A	N/A
Mid Channel, 2442 MHz	N/A	N/A	5	N/A	N/A	N/A
High Channel, 2478 MHz	380.3 uS	626.2 uS	1	60.7	N/A	N/A
High Channel, 2478 MHz	N/A	N/A	5	N/A	N/A	N/A

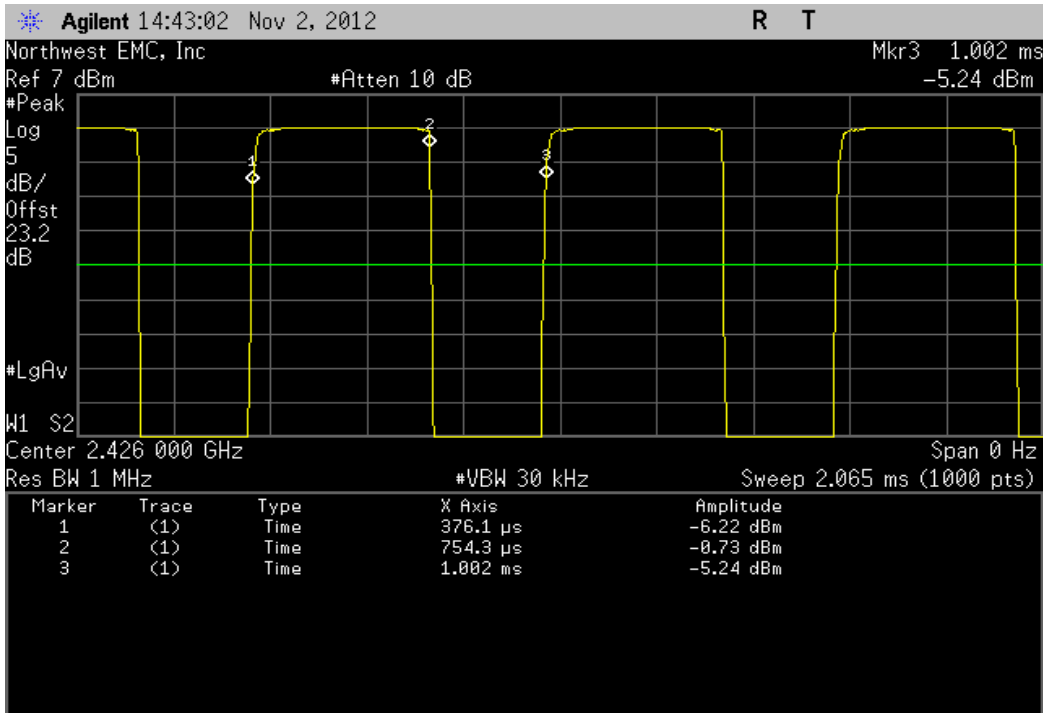
BLE - Advertising, Low Channel, 2402 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
380.3 uS	626.2 uS	1	60.7	N/A	N/A	



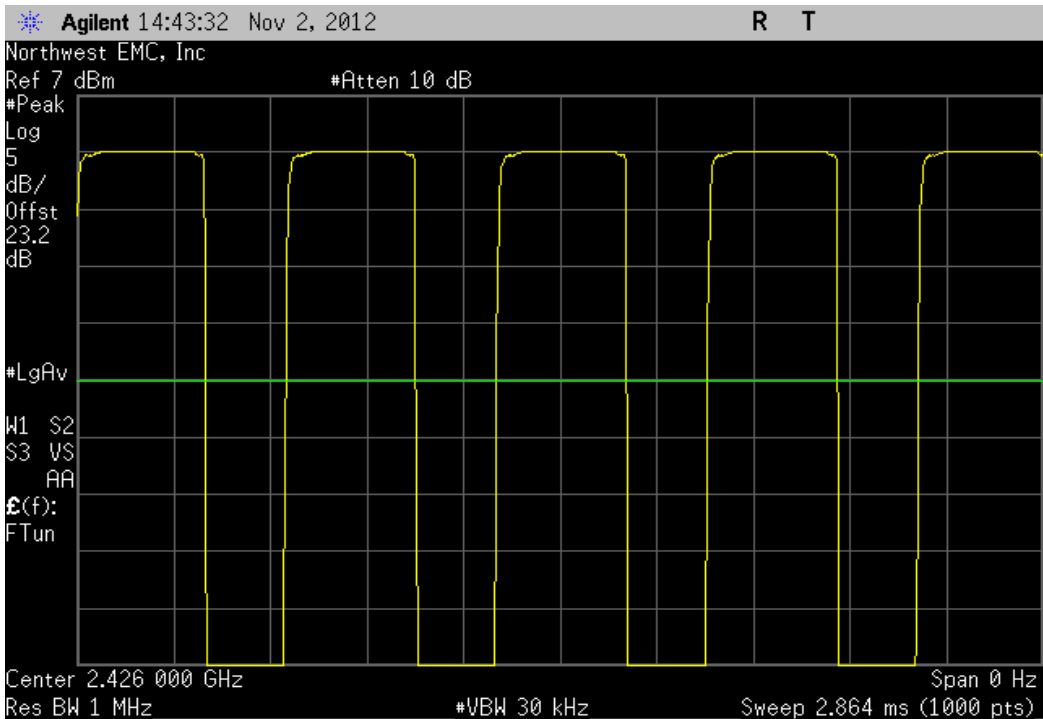
BLE - Advertising, Low Channel, 2402 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



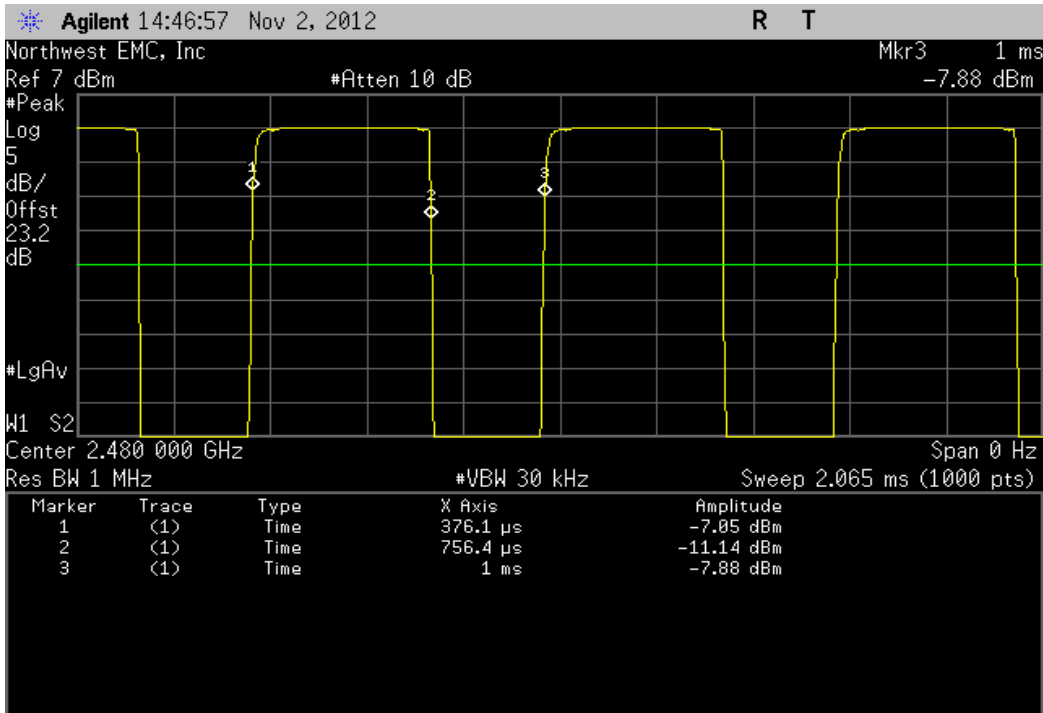
BLE - Advertising, Mid Channel, 2426 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	626.2 uS	1	60.4	N/A	N/A	



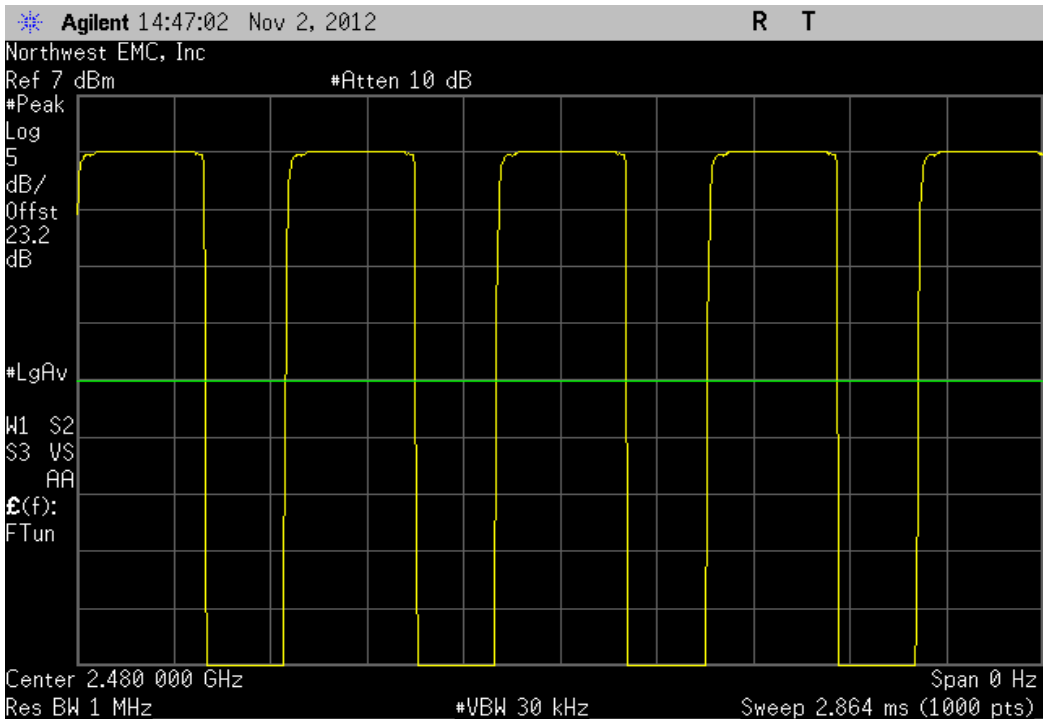
BLE - Advertising, Mid Channel, 2426 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



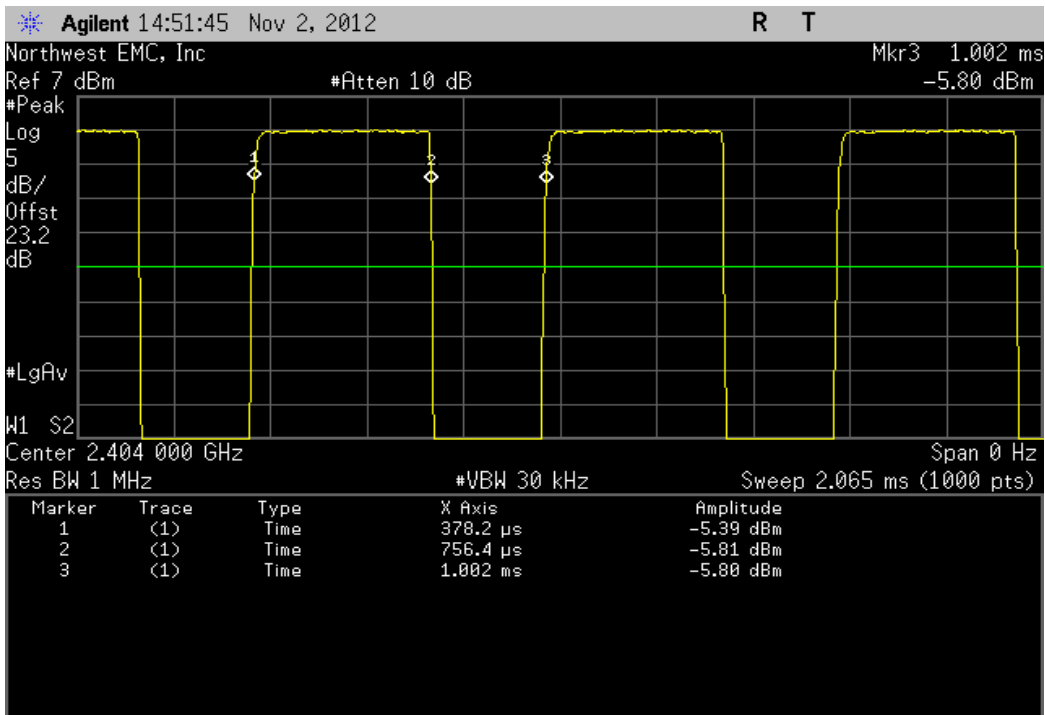
BLE - Advertising, High Channel, 2480 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
380.3 uS	624.2 uS	1	60.9	N/A	N/A	



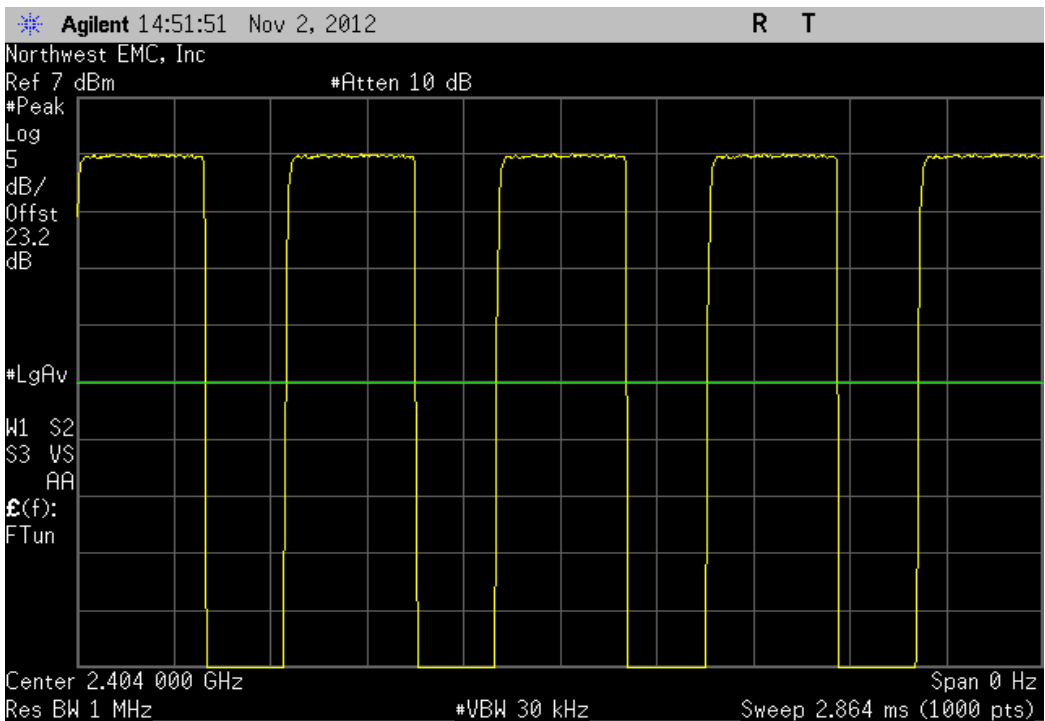
BLE - Advertising, High Channel, 2480 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



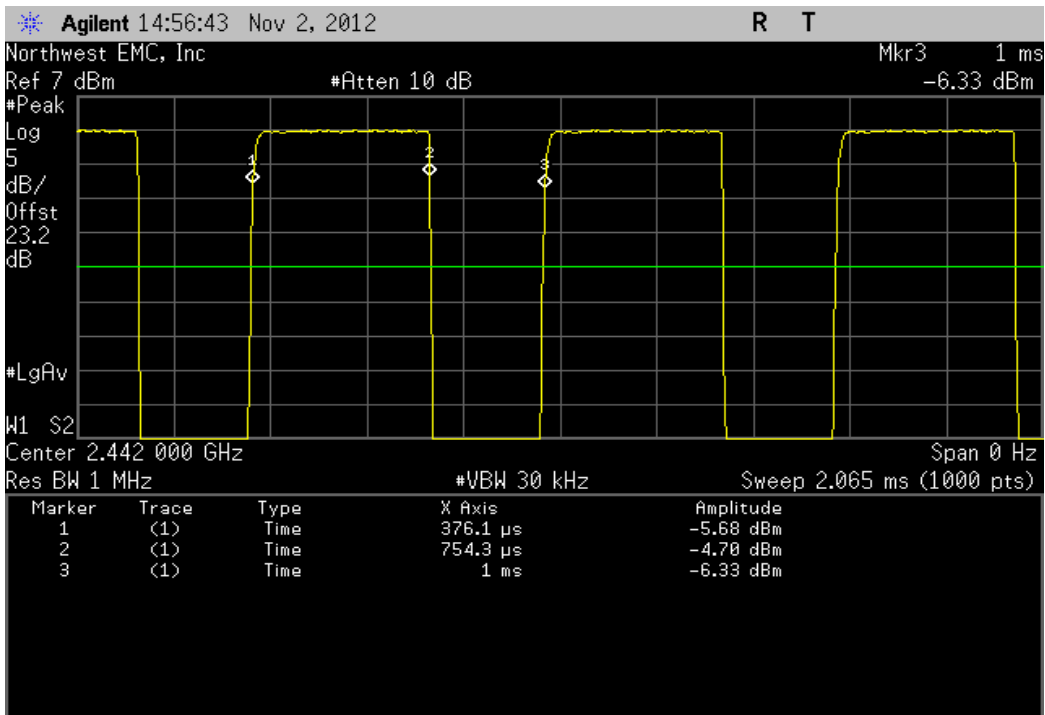
BLE - Data, Low Channel, 2404 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	624.1 uS	1	60.6	N/A	N/A	



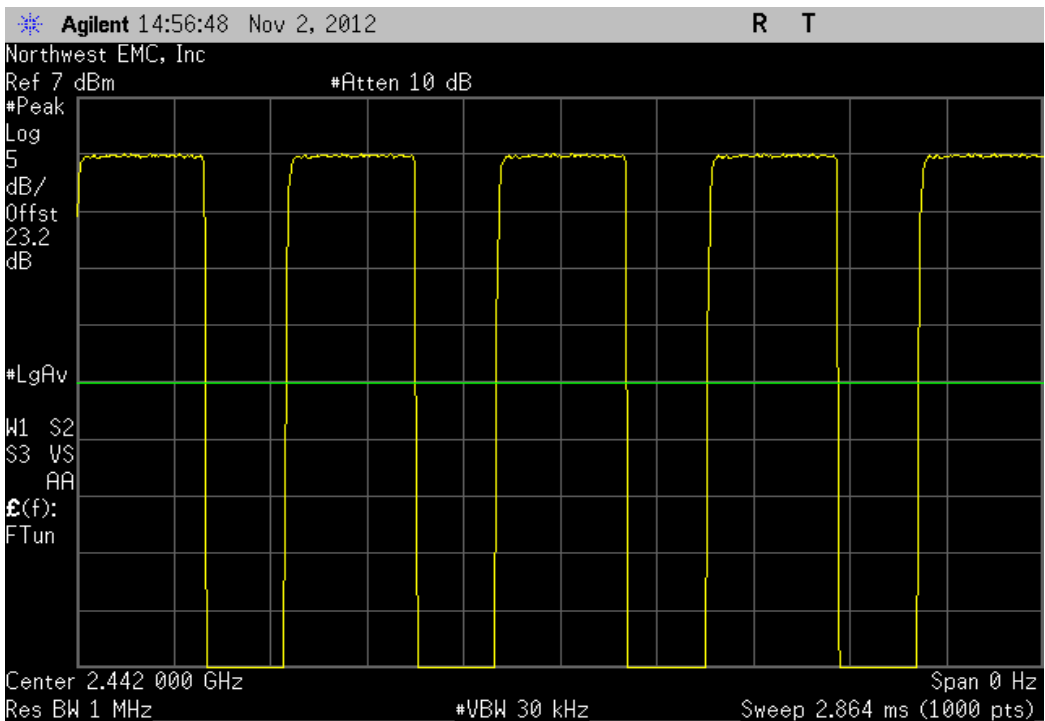
BLE - Data, Low Channel, 2404 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



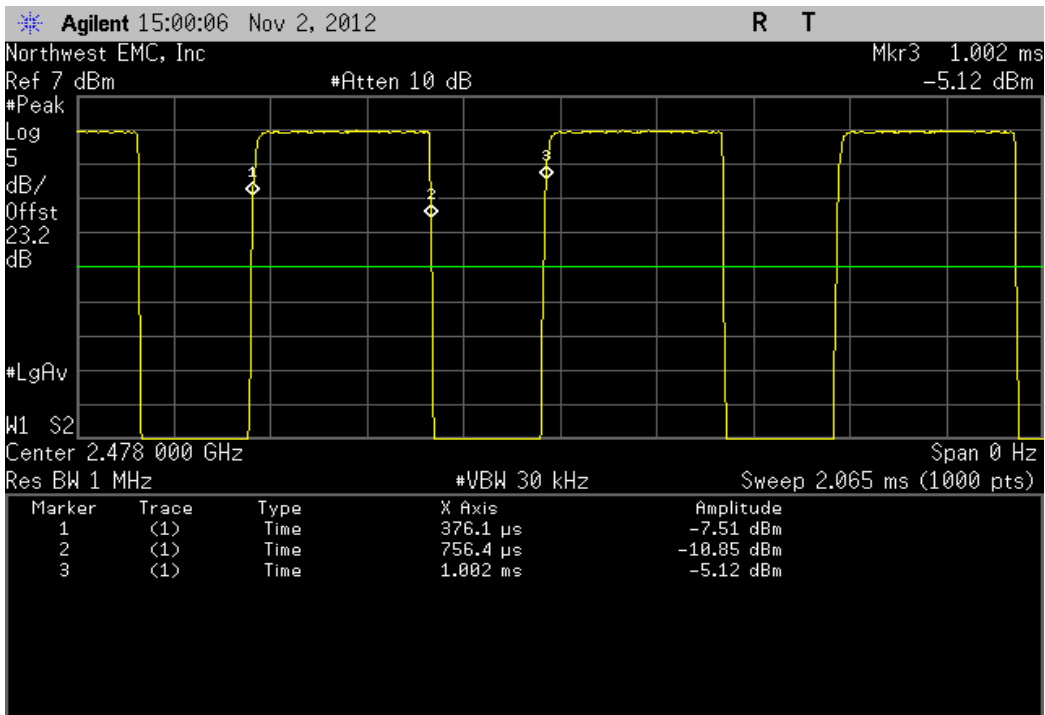
BLE - Data, Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	624.2 uS	1	60.6	N/A	N/A	



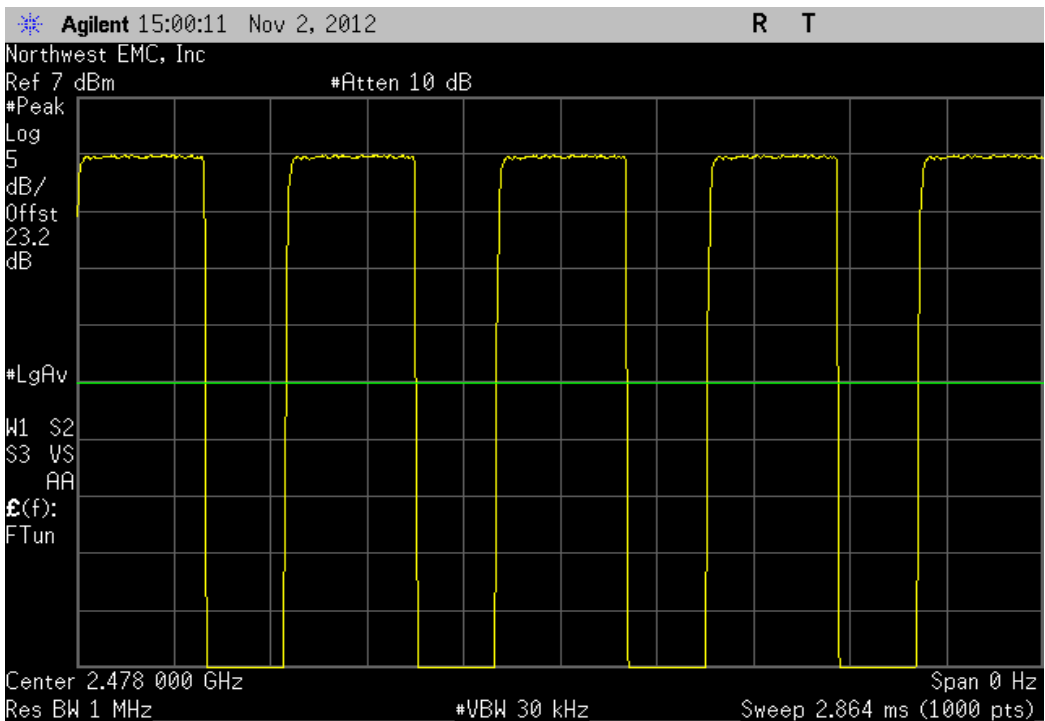
BLE - Data, Mid Channel, 2442 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



BLE - Data, High Channel, 2478 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
380.3 uS	626.2 uS	1	60.7	N/A	N/A	



BLE - Data, High Channel, 2478 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



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

TEST DESCRIPTION

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

The EUT was 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.



OCCUPIED BANDWIDTH

XMit 2012.09.20
PsaTx 2012.09.10

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

FCC 15.247:2012	ANSI C63.10:2009
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COMMENTS

All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

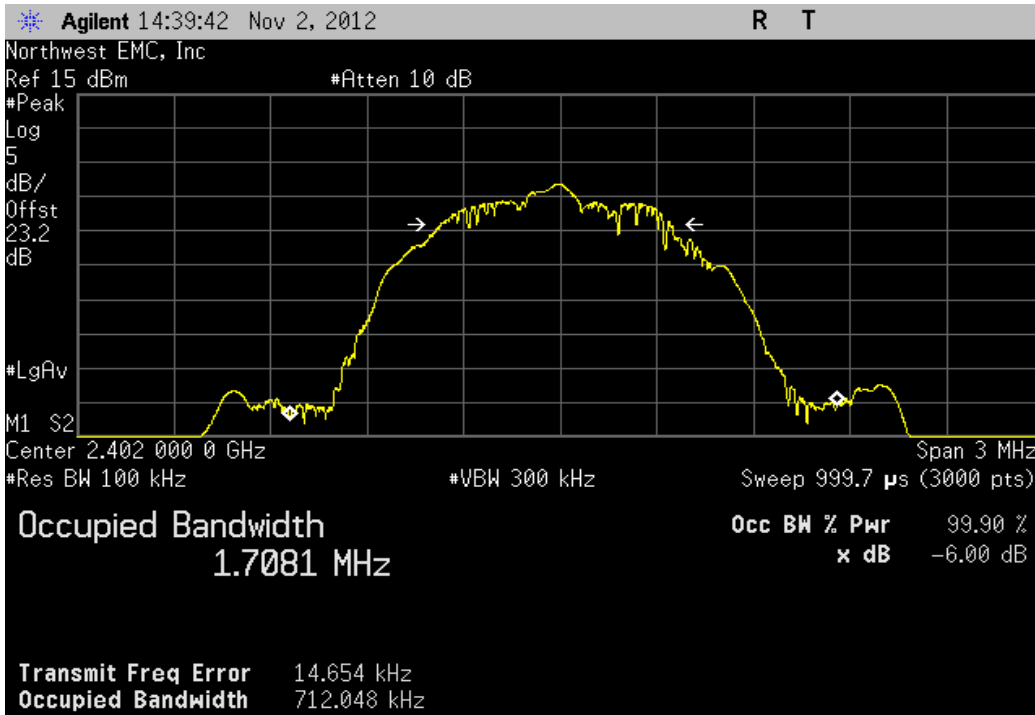
DEVIATIONS FROM TEST STANDARD

None

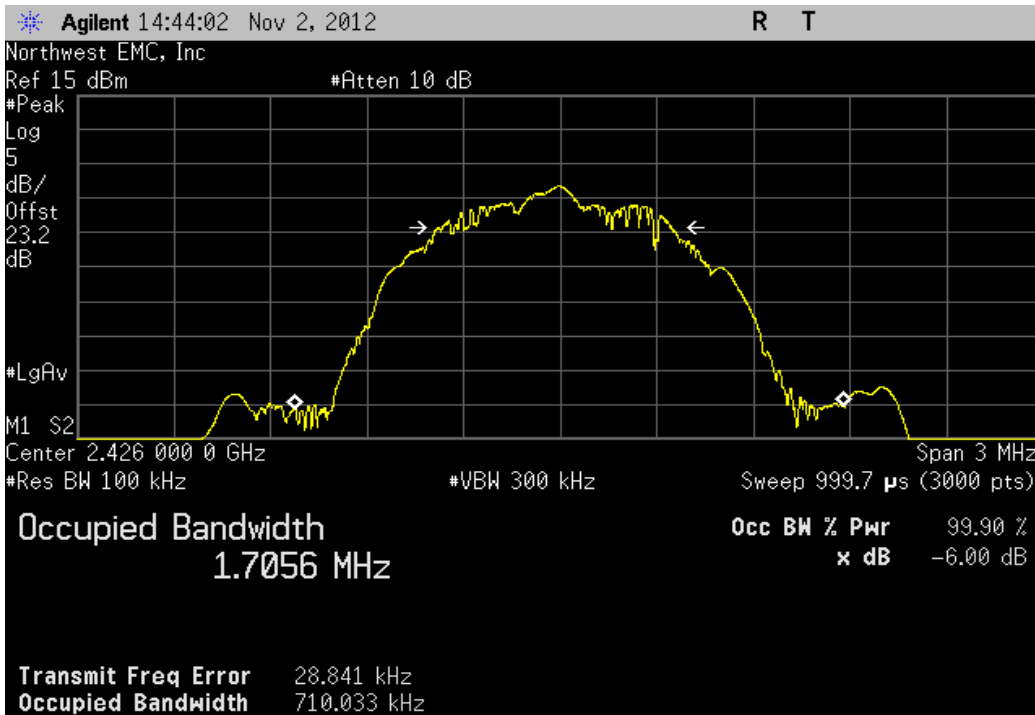
Configuration #	1	Signature <i>Brandon Hobbs</i>
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		Value	Limit	Result
BLE - Advertising				
	Low Channel, 2402 MHz	712.048 kHz	≥ 500 kHz	Pass
	Mid Channel, 2426 MHz	710.033 kHz	≥ 500 kHz	Pass
	High Channel, 2480 MHz	700.385 kHz	≥ 500 kHz	Pass
BLE - Data				
	Low Channel, 2404 MHz	741.951 kHz	≥ 500 kHz	Pass
	Mid Channel, 2442 MHz	758.194 kHz	≥ 500 kHz	Pass
	High Channel, 2478 MHz	754.451 kHz	≥ 500 kHz	Pass

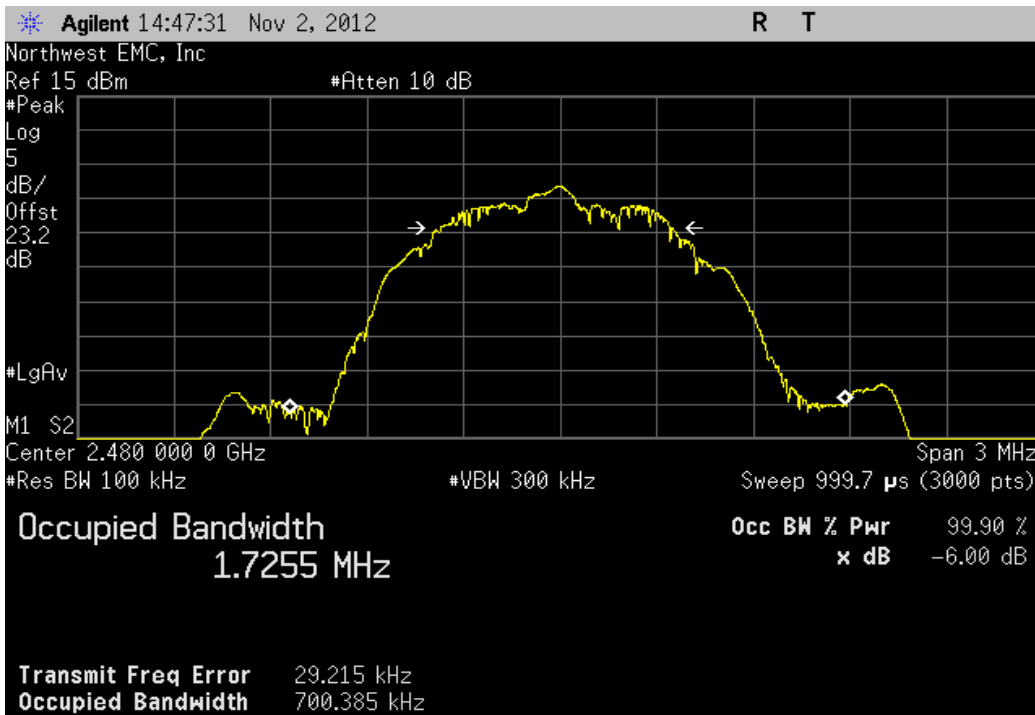
BLE - Advertising, Low Channel, 2402 MHz			
	Value	Limit	Result
	712.048 kHz	≥ 500 kHz	Pass



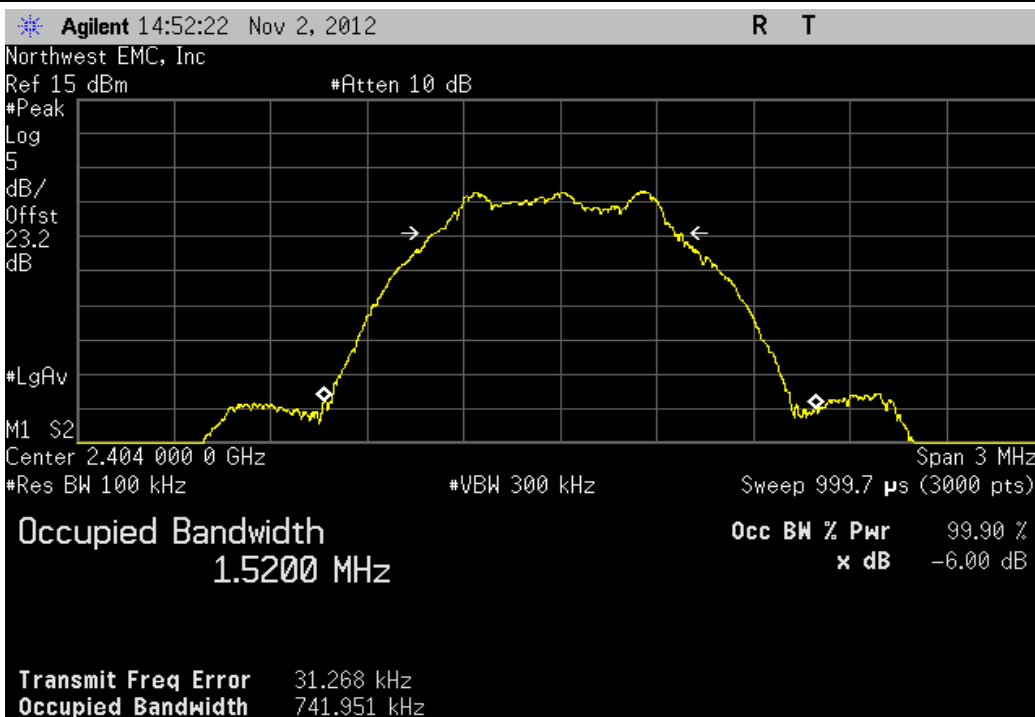
BLE - Advertising, Mid Channel, 2426 MHz			
	Value	Limit	Result
	710.033 kHz	≥ 500 kHz	Pass



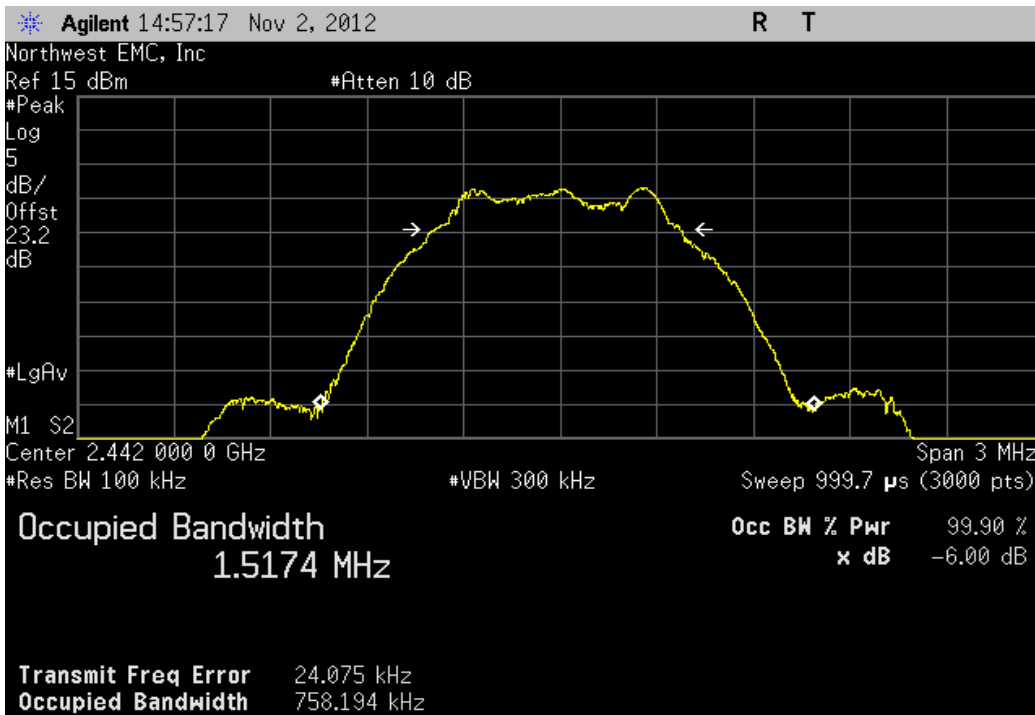
BLE - Advertising, High Channel, 2480 MHz			
	Value	Limit	Result
	700.385 kHz	≥ 500 kHz	Pass



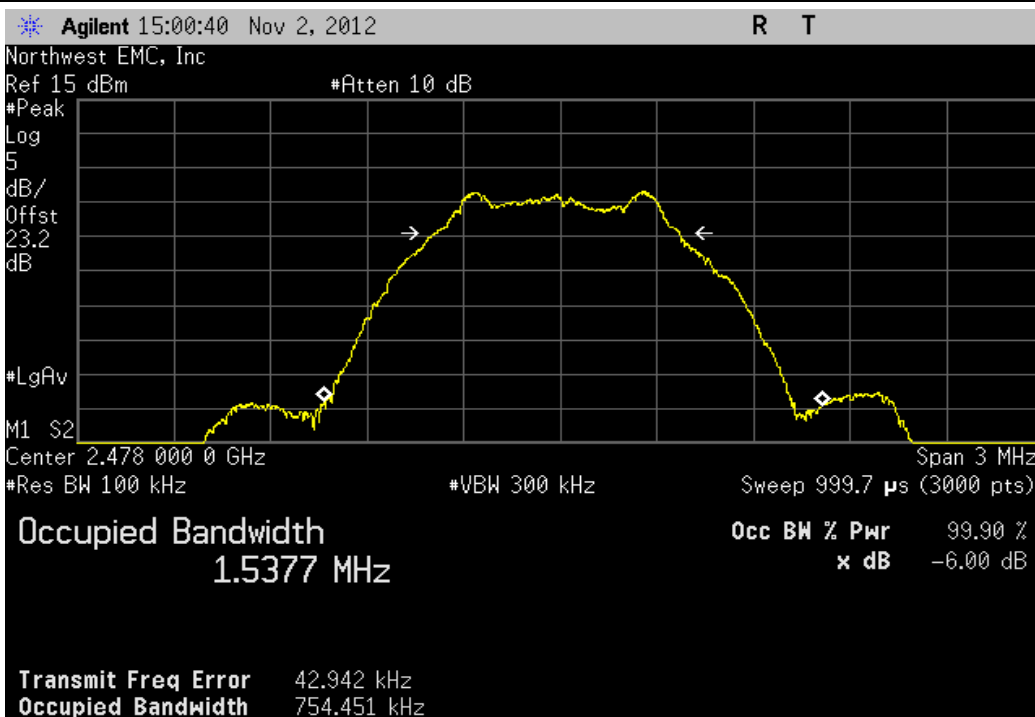
BLE - Data, Low Channel, 2404 MHz			
	Value	Limit	Result
	741.951 kHz	≥ 500 kHz	Pass



BLE - Data, Mid Channel, 2442 MHz			
	Value	Limit	Result
	758.194 kHz	≥ 500 kHz	Pass



BLE - Data, High Channel, 2478 MHz			
	Value	Limit	Result
	754.451 kHz	≥ 500 kHz	Pass



OUTPUT POWER

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

TEST EQUIPMENT

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

TEST DESCRIPTION

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

Method Option 1 found in KDB 558074 DTS D01 Measurement Section 8.1.1 was used because the RBW on the analyzer was greater than the Emission Bandwidth of the radio.

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



OUTPUT POWER

XMit 2012.09.20
PsaTx 2012.09.10

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

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

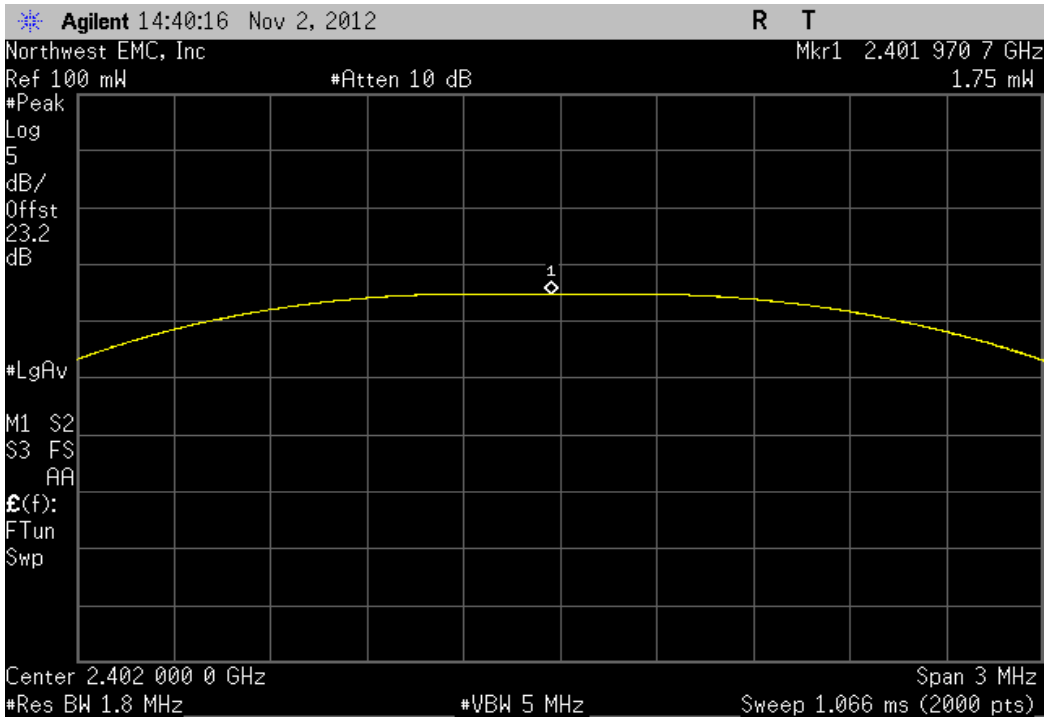
COMMENTS
All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD
None

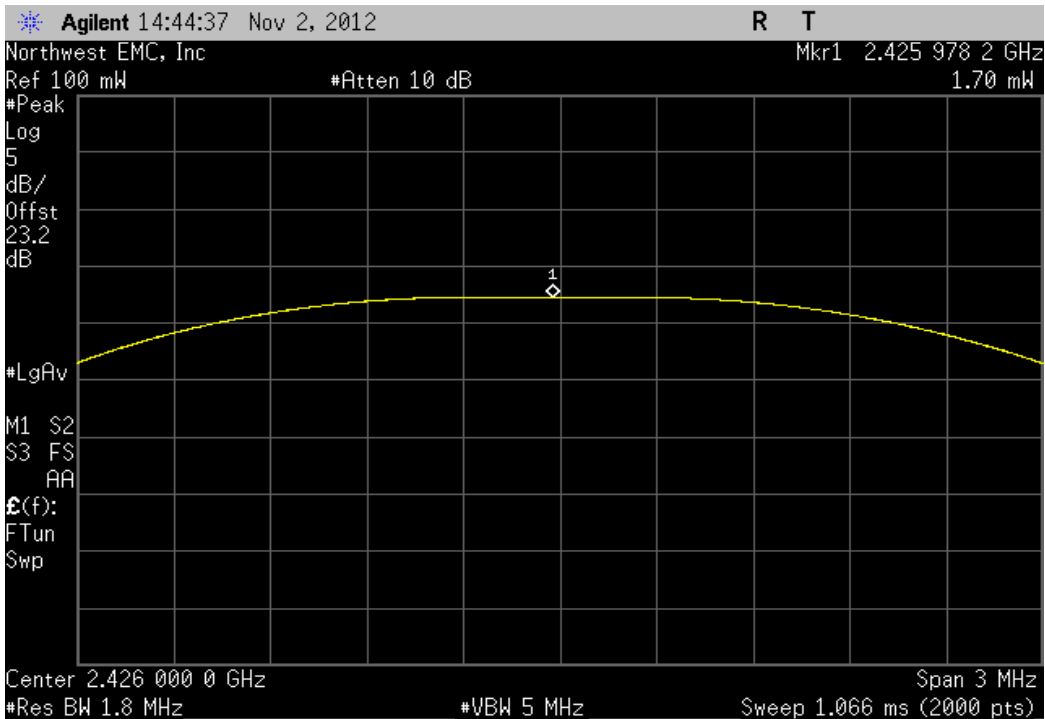
Configuration #	1	Signature <i>Brandon Hobbs</i>
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		Value	Limit	Result
BLE - Advertising				
	Low Channel, 2402 MHz	1.747 mW	< 1 W	Pass
	Mid Channel, 2426 MHz	1.697 mW	< 1 W	Pass
	High Channel, 2480 MHz	1.719 mW	< 1 W	Pass
BLE - Data				
	Low Channel, 2404 MHz	1.741 mW	< 1 W	Pass
	Mid Channel, 2442 MHz	1.751 mW	< 1 W	Pass
	High Channel, 2478 MHz	1.713 mW	< 1 W	Pass

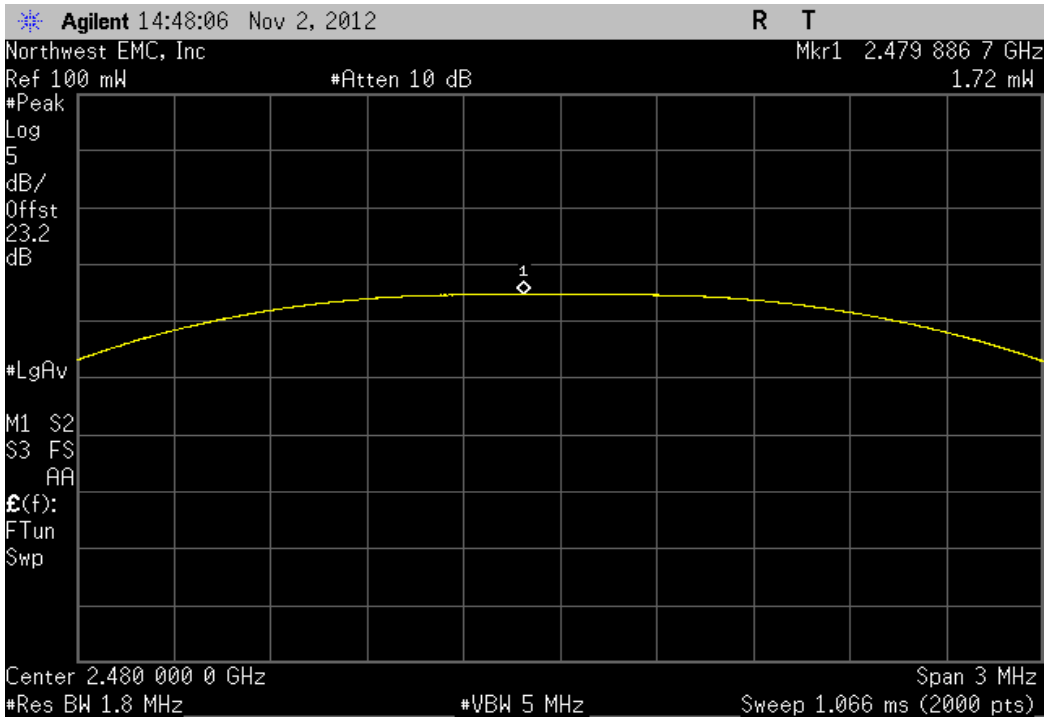
BLE - Advertising, Low Channel, 2402 MHz			
	Value	Limit	Result
	1.747 mW	< 1 W	Pass



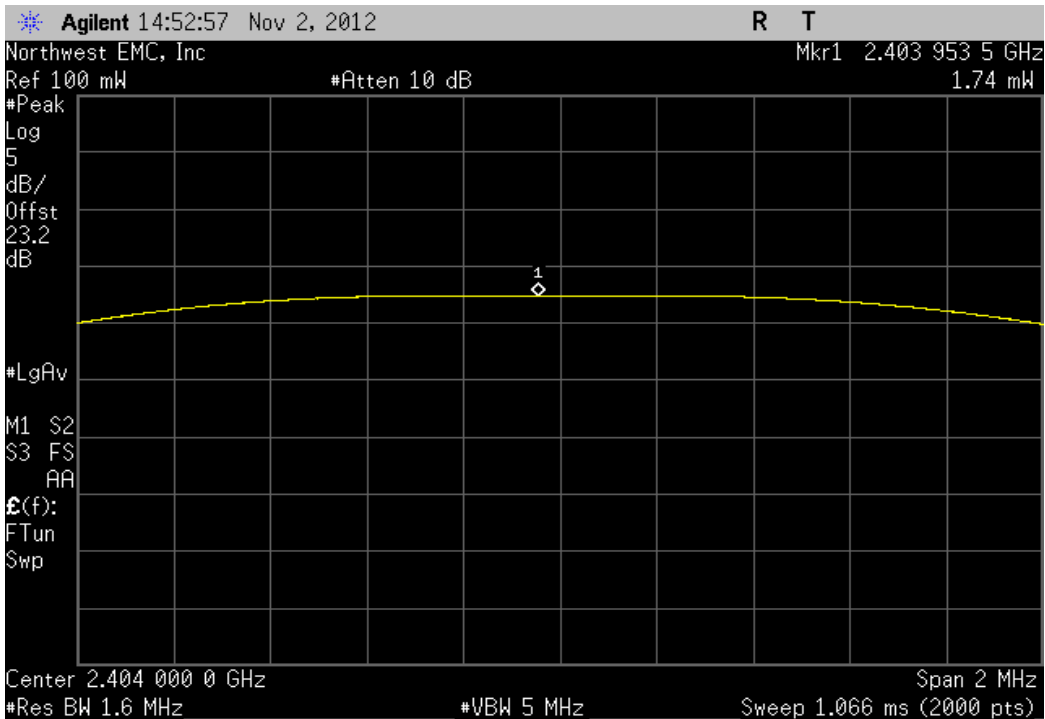
BLE - Advertising, Mid Channel, 2426 MHz			
	Value	Limit	Result
	1.697 mW	< 1 W	Pass



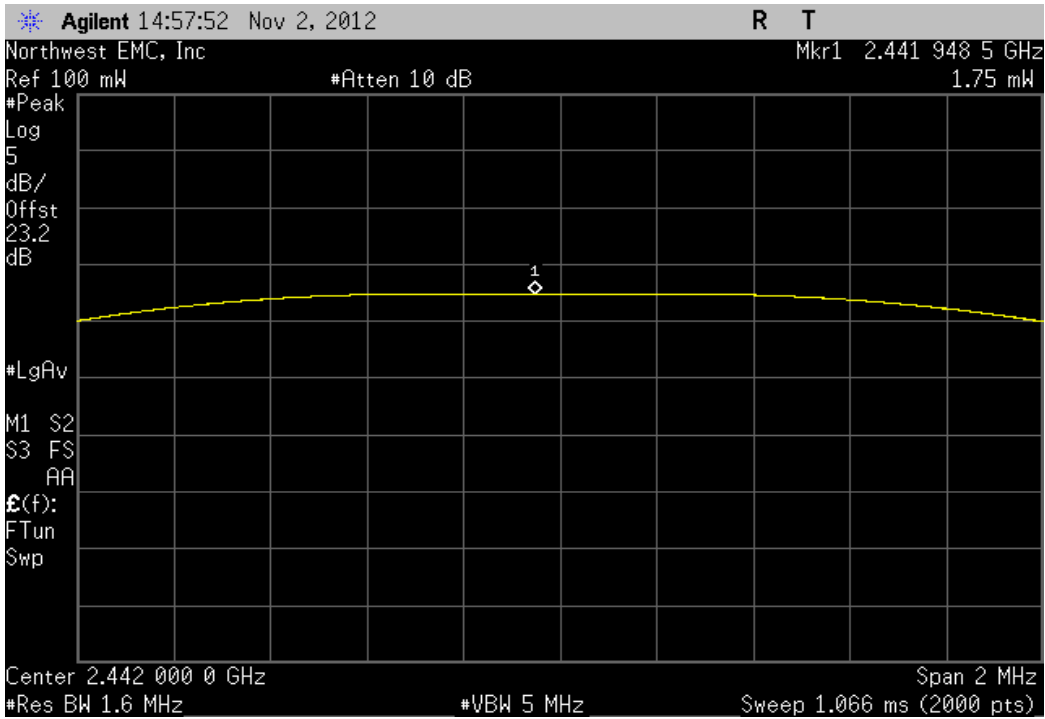
BLE - Advertising, High Channel, 2480 MHz			
	Value	Limit	Result
	1.719 mW	< 1 W	Pass



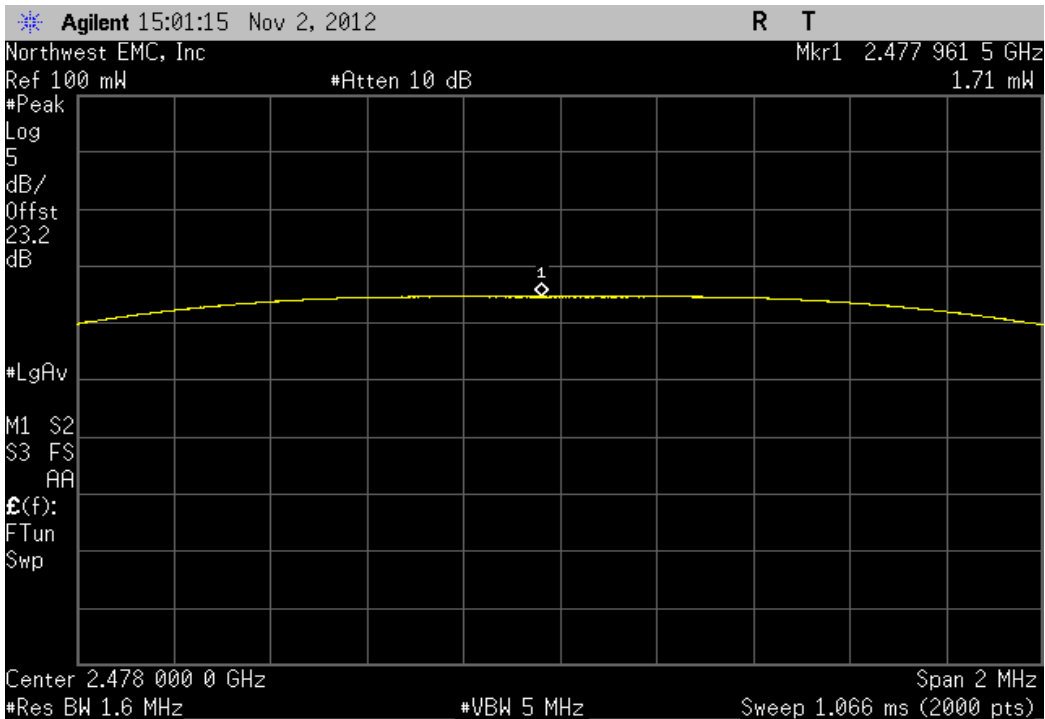
BLE - Data, Low Channel, 2404 MHz			
	Value	Limit	Result
	1.741 mW	< 1 W	Pass



BLE - Data, Mid Channel, 2442 MHz			
	Value	Limit	Result
	1.751 mW	< 1 W	Pass



BLE - Data, High Channel, 2478 MHz			
	Value	Limit	Result
	1.713 mW	< 1 W	Pass



BAND EDGE COMPLIANCE

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

TEST EQUIPMENT

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

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting in the modes listed in the datasheet.

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



BAND EDGE COMPLIANCE

XMit 2012.09.20
PsaTx 2012.09.10

EUT: 1514	Work Order: MCSO1638
Serial Number: 000109423753	Date: 11/05/12
Customer: Microsoft Corporation	Temperature: 22.3°C
Attendees: None	Humidity: 52%
Project: None	Barometric Pres.: 1013
Tested by: Brandon Hobbs/Rod Peloquin	Power: 110VAC/60Hz
	Job Site: EV06
TEST SPECIFICATIONS	
FCC 15.247:2012	ANSI C63.10:2009

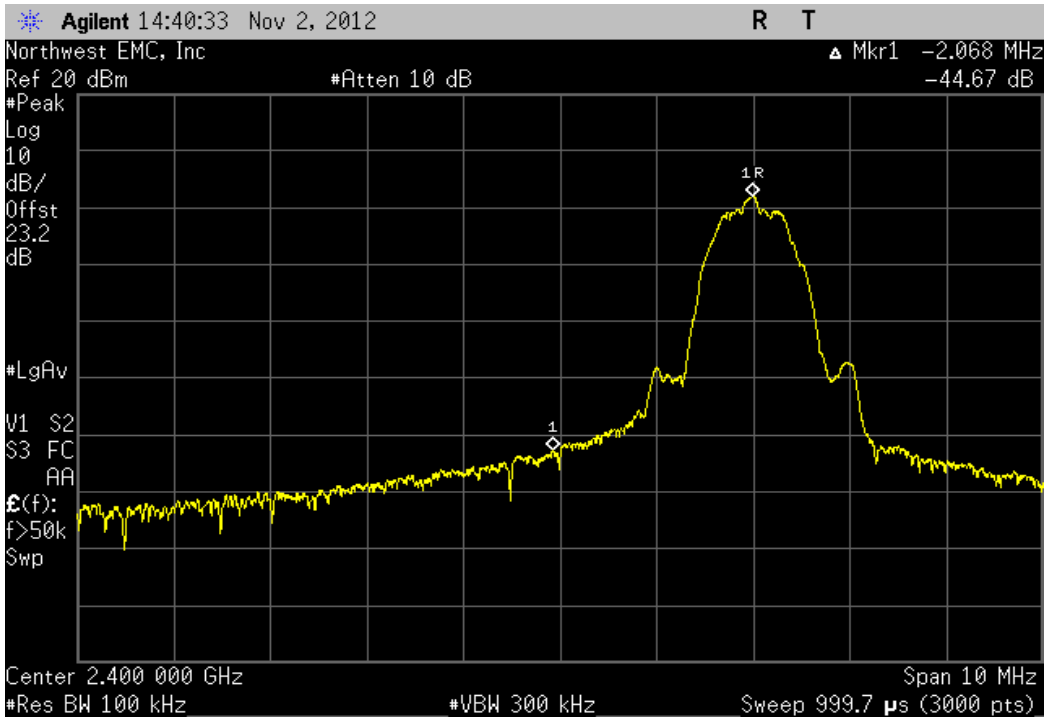
COMMENTS
All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD
None

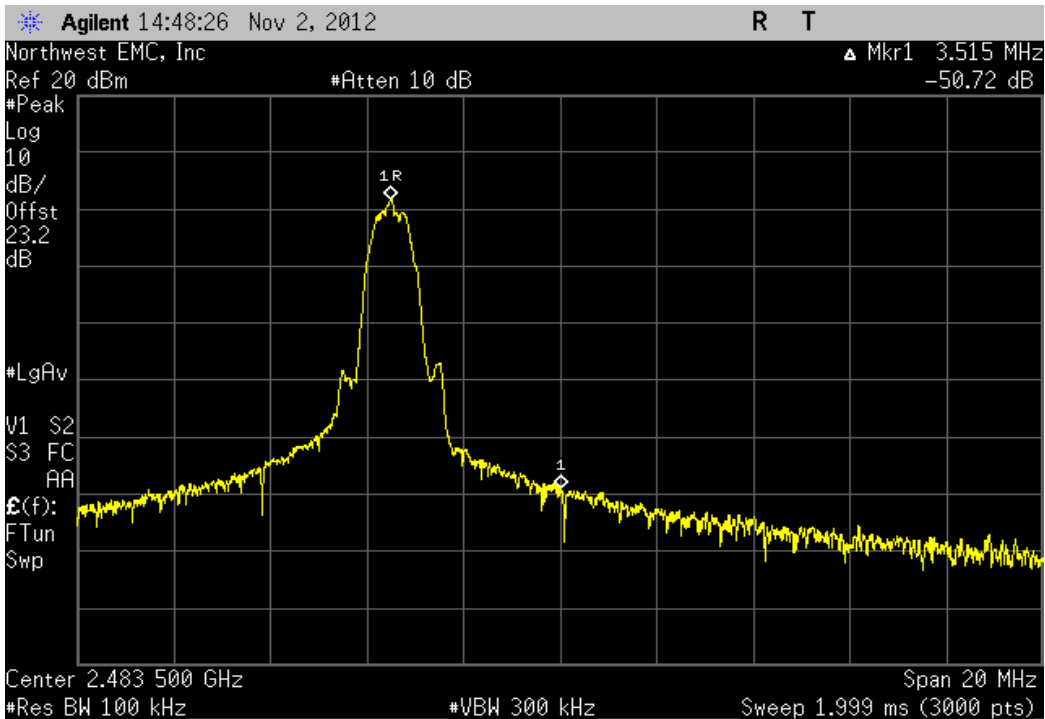
Configuration #	1	Signature <i>Brandon Hobbs</i>
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		Value	Limit	Result
BLE - Advertising	Low Channel, 2402 MHz	-44.67 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz	-50.72 dBc	≤ -20 dBc	Pass
BLE - Data	Low Channel, 2404 MHz	-50.12 dBc	≤ -20 dBc	Pass
	High Channel, 2478 MHz	-53.8 dBc	≤ -20 dBc	Pass

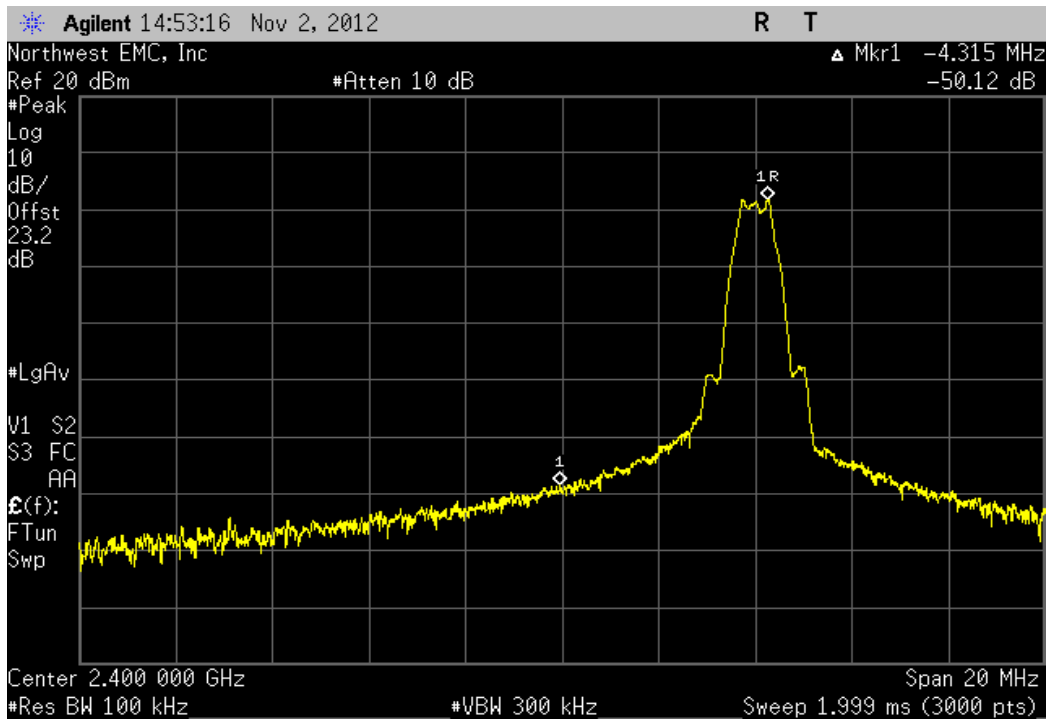
BLE - Advertising, Low Channel, 2402 MHz			
	Value	Limit	Result
	-44.67 dBc	≤ -20 dBc	Pass



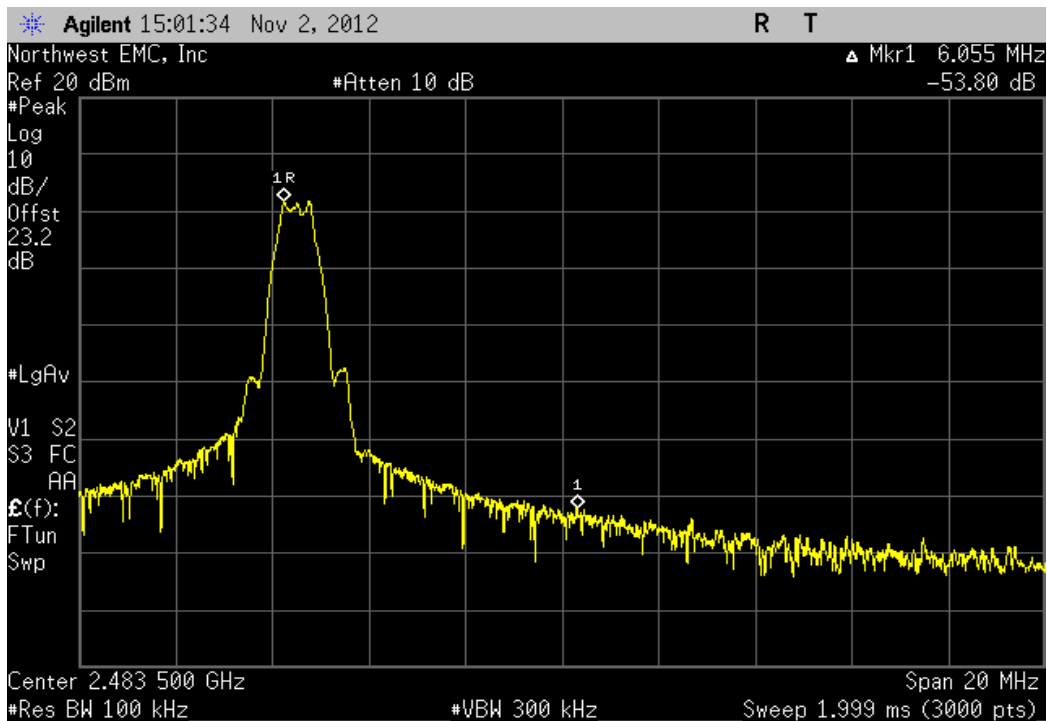
BLE - Advertising, High Channel, 2480 MHz			
	Value	Limit	Result
	-50.72 dBc	≤ -20 dBc	Pass



BLE - Data, Low Channel, 2404 MHz			
	Value	Limit	Result
	-50.12 dBc	≤ -20 dBc	Pass



BLE - Data, High Channel, 2478 MHz			
	Value	Limit	Result
	-53.8 dBc	≤ -20 dBc	Pass



**SPURIOUS CONDUCTED
EMISSIONS**

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

TEST EQUIPMENT

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

TEST DESCRIPTION

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



SPURIOUS CONDUCTED EMISSIONS

XMit 2012.09.20
PsaTx 2012.09.10

EUT: 1514	Work Order: MCSO1638
Serial Number: 000109423753	Date: 11/05/12
Customer: Microsoft Corporation	Temperature: 22.3°C
Attendees: None	Humidity: 52%
Project: None	Barometric Pres.: 1013
Tested by: Brandon Hobbs/Rod Peloquin	Power: 110VAC/60Hz
	Job Site: EV06
TEST SPECIFICATIONS	
FCC 15.247:2012	ANSI C63.10:2009
TEST METHOD	

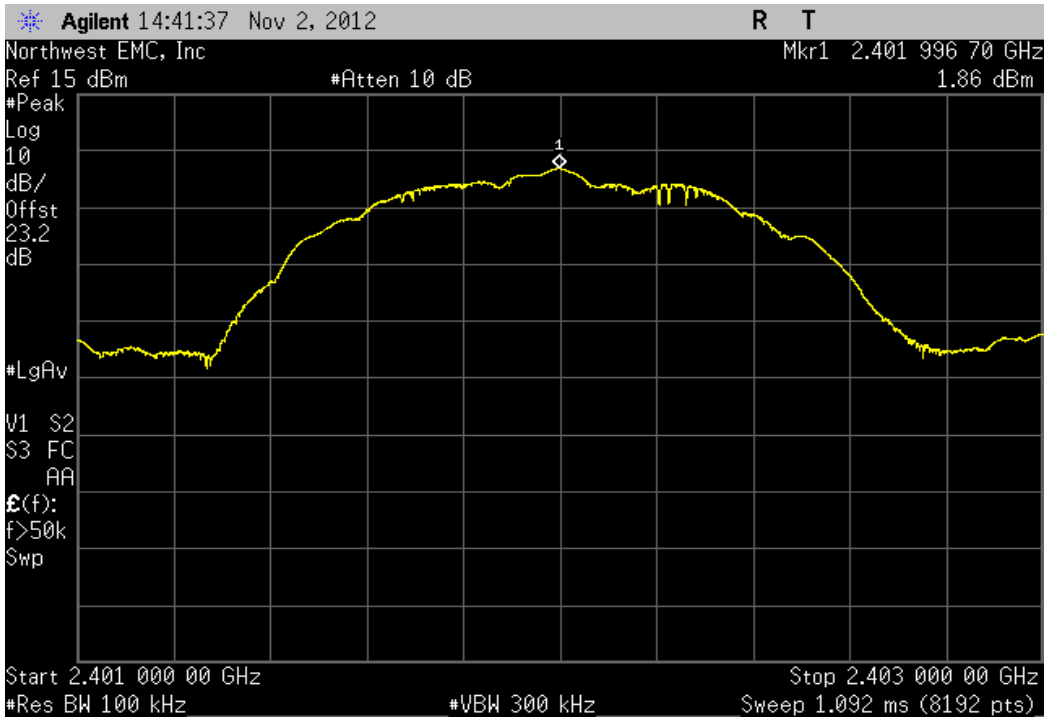
COMMENTS
All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD
None

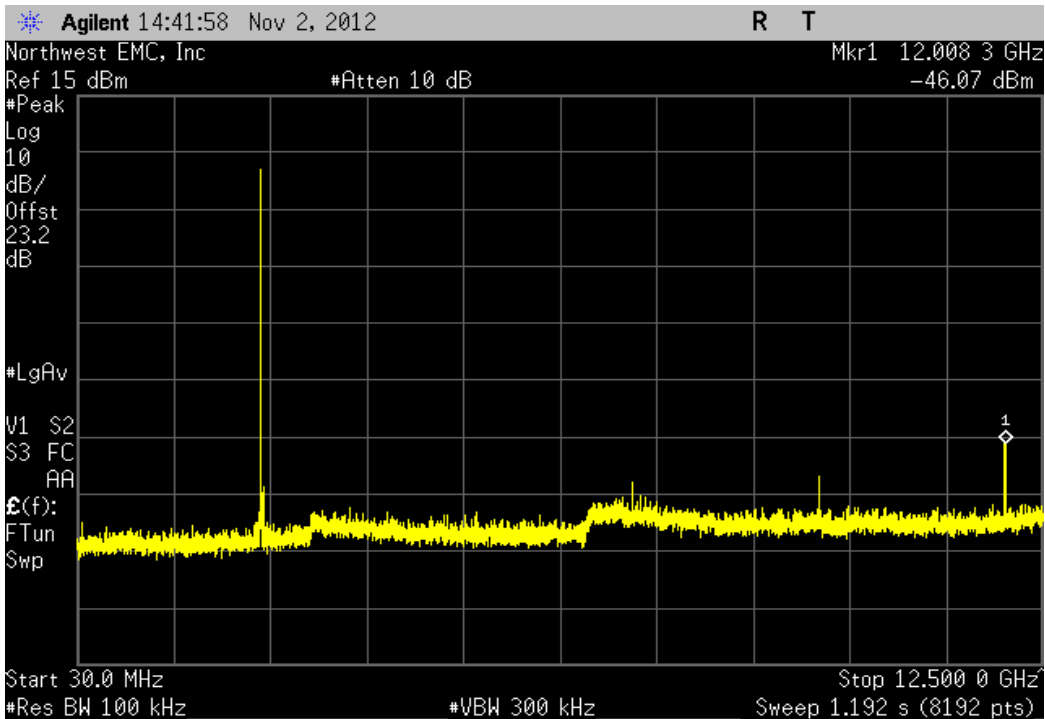
Configuration #	1	Signature <i>Brandon Hobbs</i>
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	Frequency Range	Value	Limit	Result
BLE - Advertising				
Low Channel, 2402 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-47.93 dBc	≤ -20 dBc	Pass
Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-54.22 dBc	≤ -20 dBc	Pass
Mid Channel, 2426 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2426 MHz	30 MHz - 12.5 GHz	-48 dBc	≤ -20 dBc	Pass
Mid Channel, 2426 MHz	12.5 GHz - 25 GHz	-53.6 dBc	≤ -20 dBc	Pass
High Channel, 2480 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2480 MHz	30 MHz - 12.5 GHz	-48.27 dBc	≤ -20 dBc	Pass
High Channel, 2480 MHz	12.5 GHz - 25 GHz	-53.64 dBc	≤ -20 dBc	Pass
BLE - Data				
Low Channel, 2404 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2404 MHz	30 MHz - 12.5 GHz	-46.39 dBc	≤ -20 dBc	Pass
Low Channel, 2404 MHz	12.5 GHz - 25 GHz	-53.52 dBc	≤ -20 dBc	Pass
Mid Channel, 2442 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-46.38 dBc	≤ -20 dBc	Pass
Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-52.92 dBc	≤ -20 dBc	Pass
High Channel, 2478 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2478 MHz	30 MHz - 12.5 GHz	-46.72 dBc	≤ -20 dBc	Pass
High Channel, 2478 MHz	12.5 GHz - 25 GHz	-53.47 dBc	≤ -20 dBc	Pass

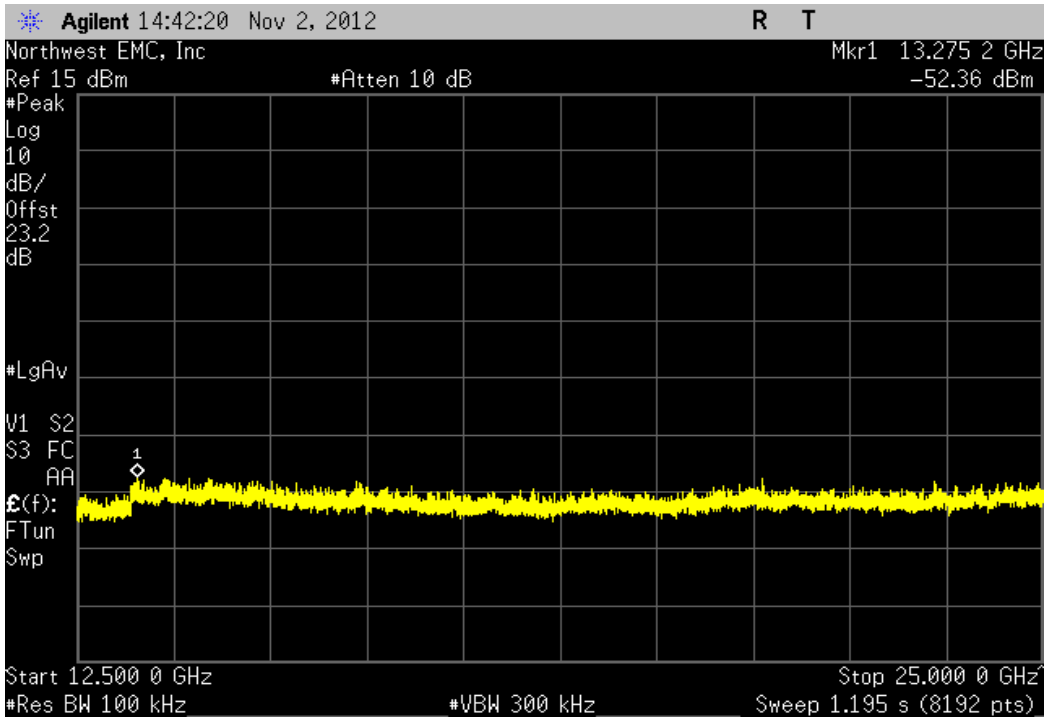
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



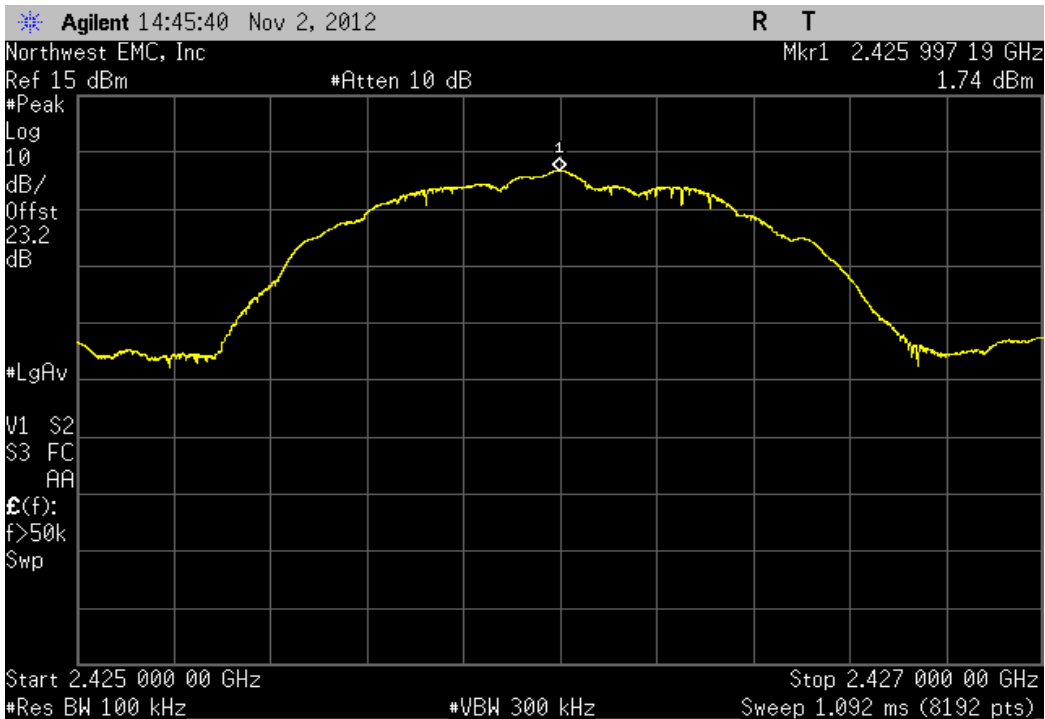
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-47.93 dBc	≤ -20 dBc	Pass



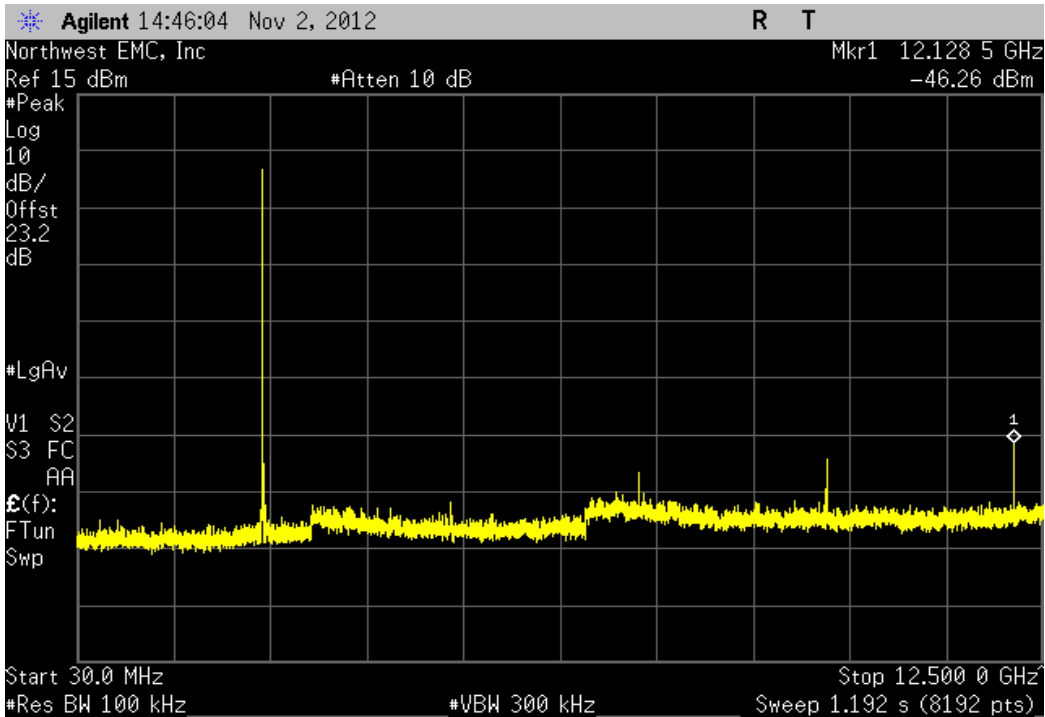
BLE - Advertising, Low Channel, 2402 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-54.22 dBc	≤ -20 dBc	Pass



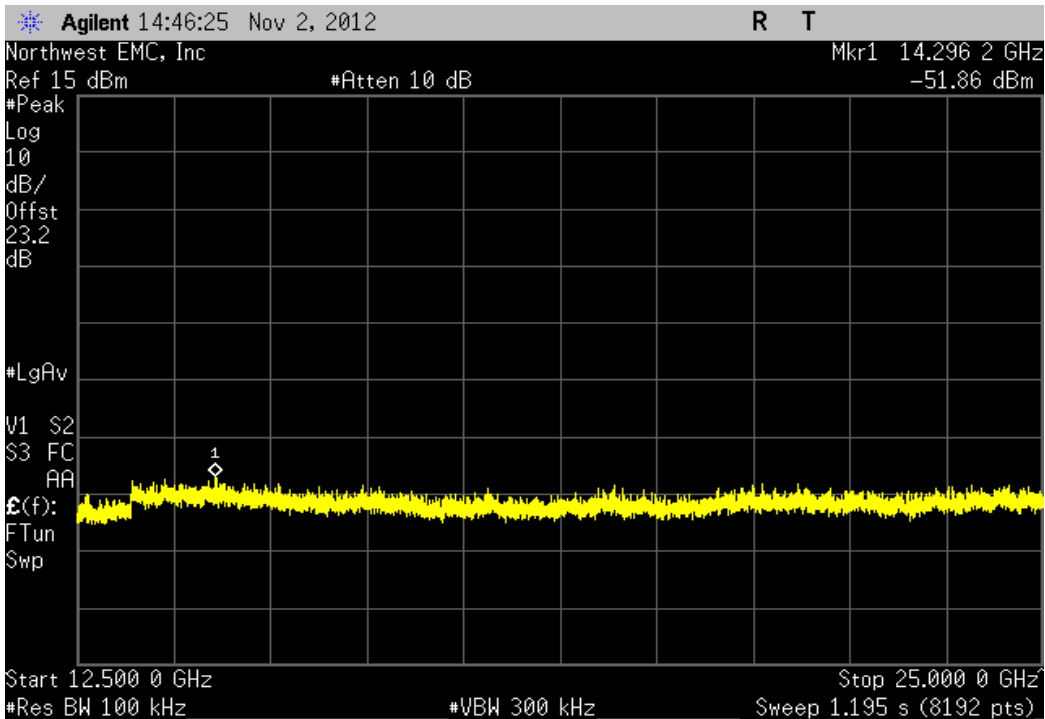
BLE - Advertising, Mid Channel, 2426 MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



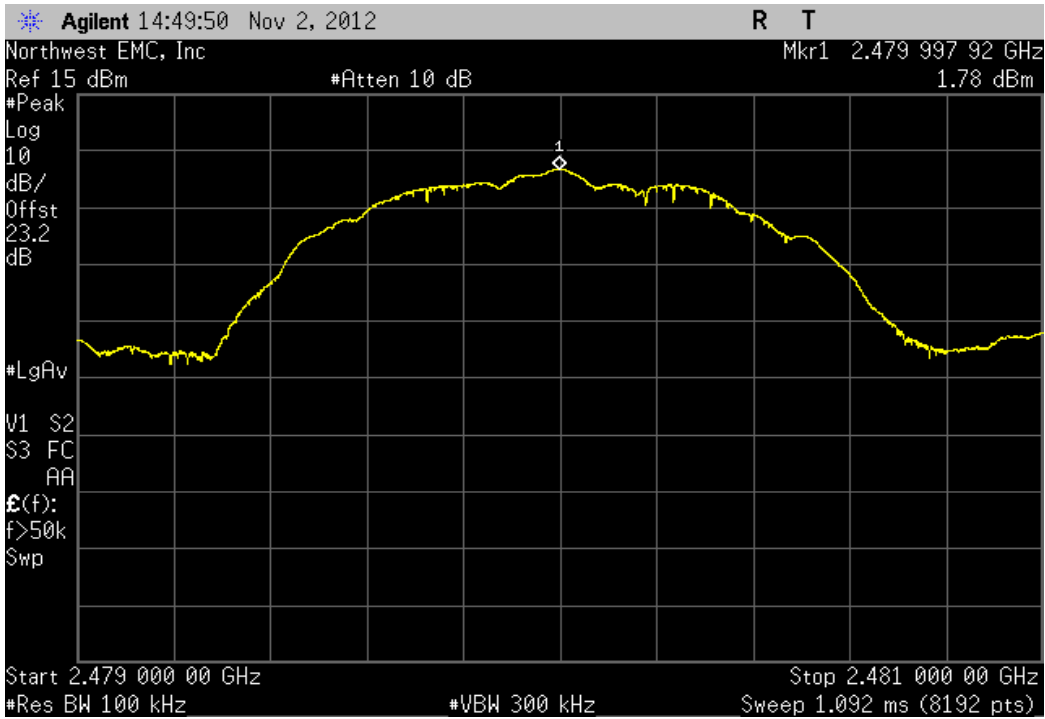
BLE - Advertising, Mid Channel, 2426 MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-48 dBc	≤ -20 dBc	Pass



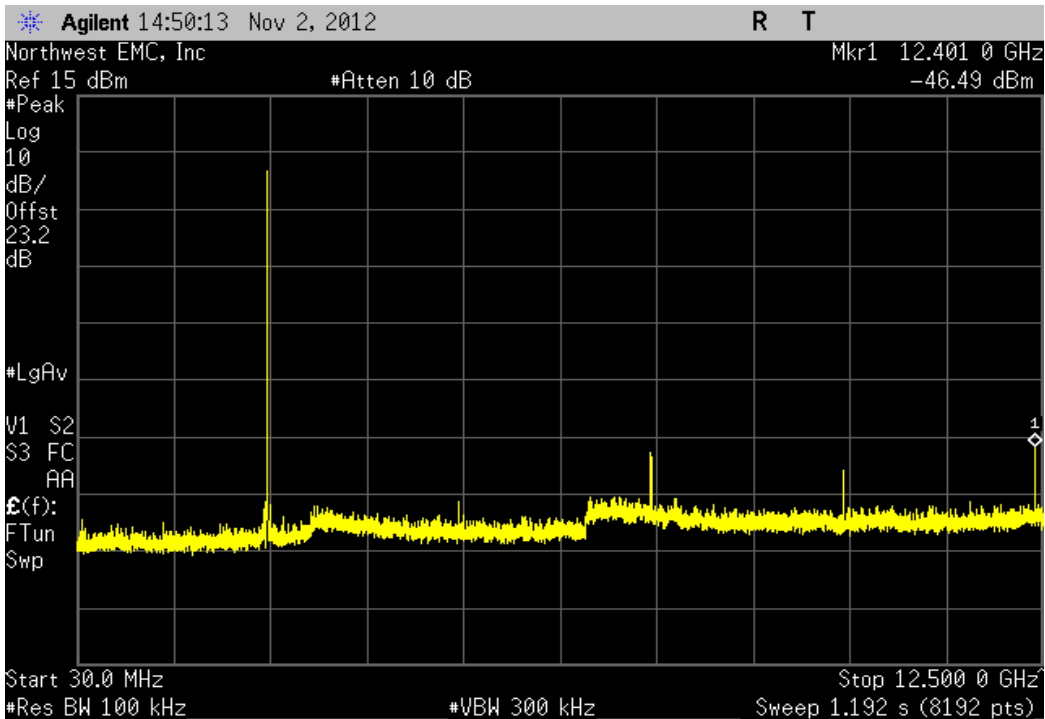
BLE - Advertising, Mid Channel, 2426 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-53.6 dBc	≤ -20 dBc	Pass



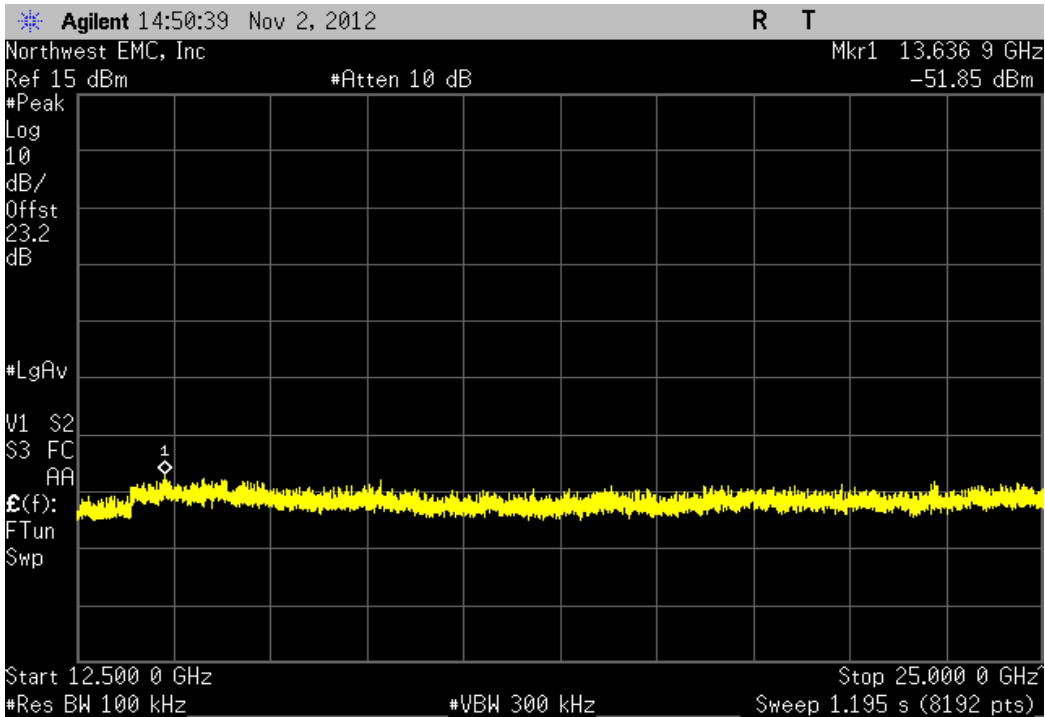
BLE - Advertising, High Channel, 2480 MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



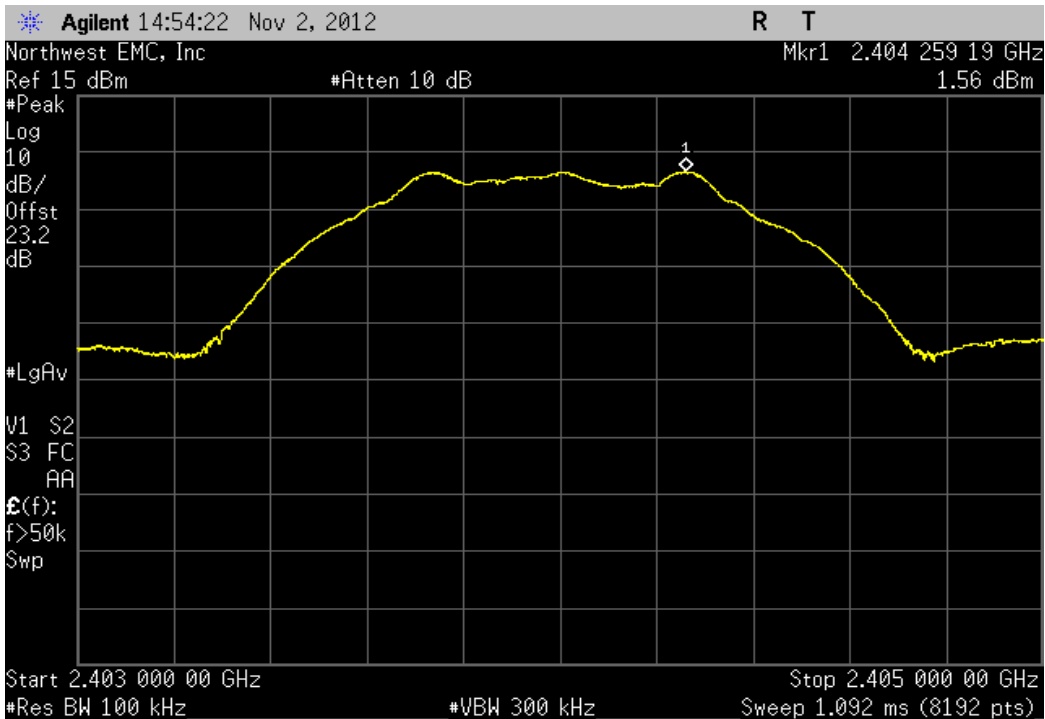
BLE - Advertising, High Channel, 2480 MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-48.27 dBc	≤ -20 dBc	Pass



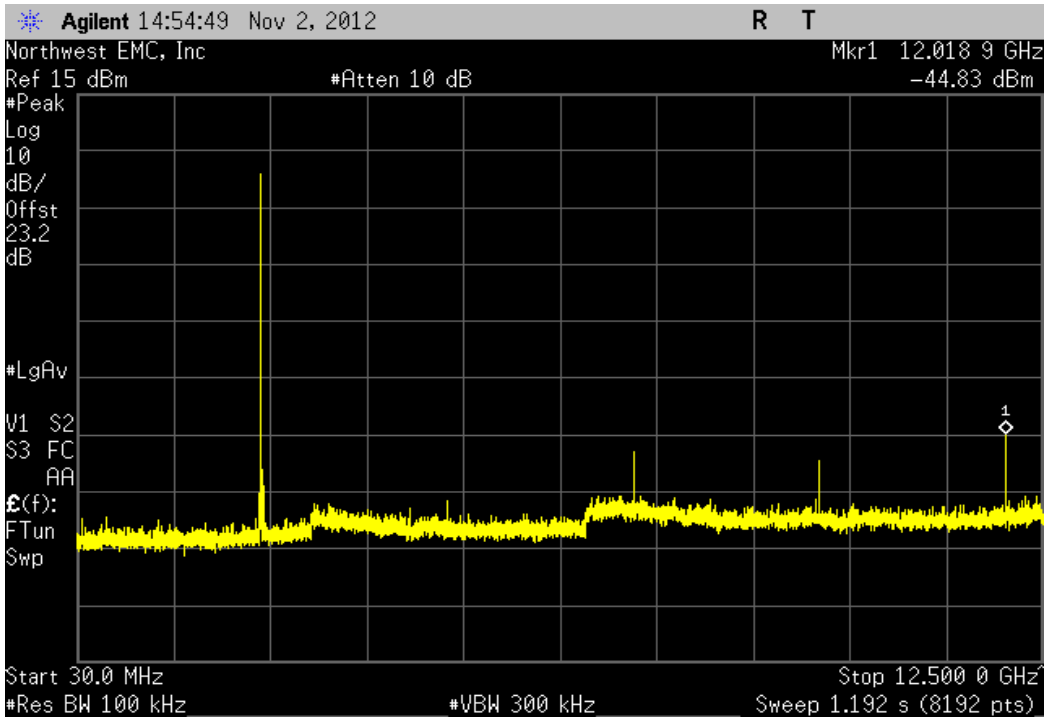
BLE - Advertising, High Channel, 2480 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-53.64 dBc	≤ -20 dBc	Pass



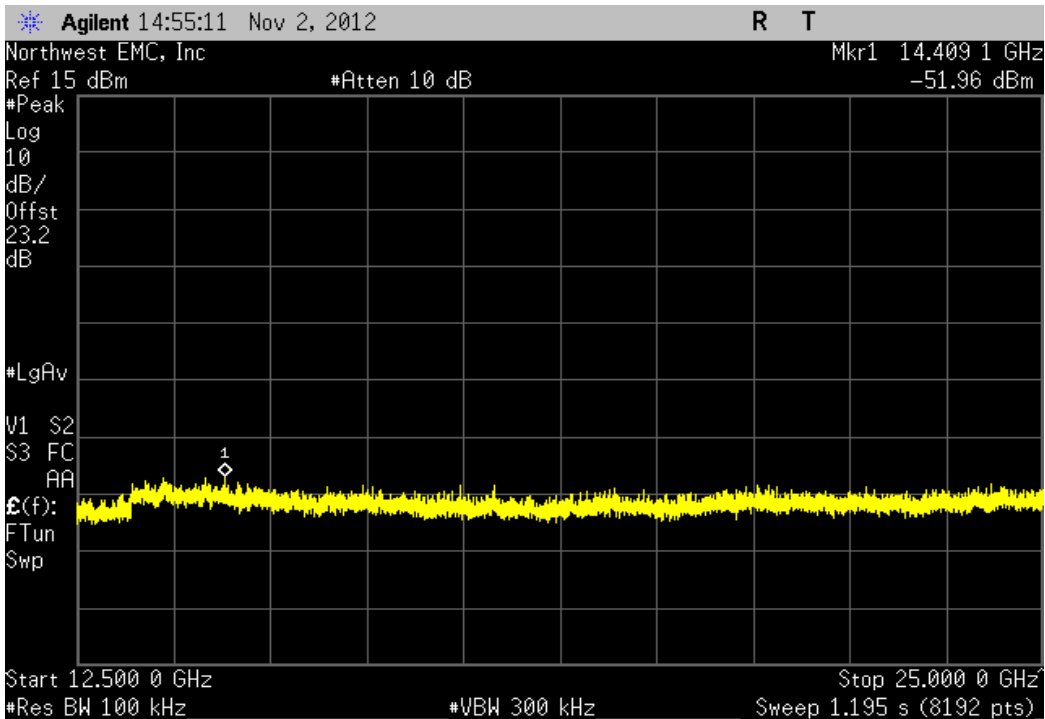
BLE - Data, Low Channel, 2404 MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



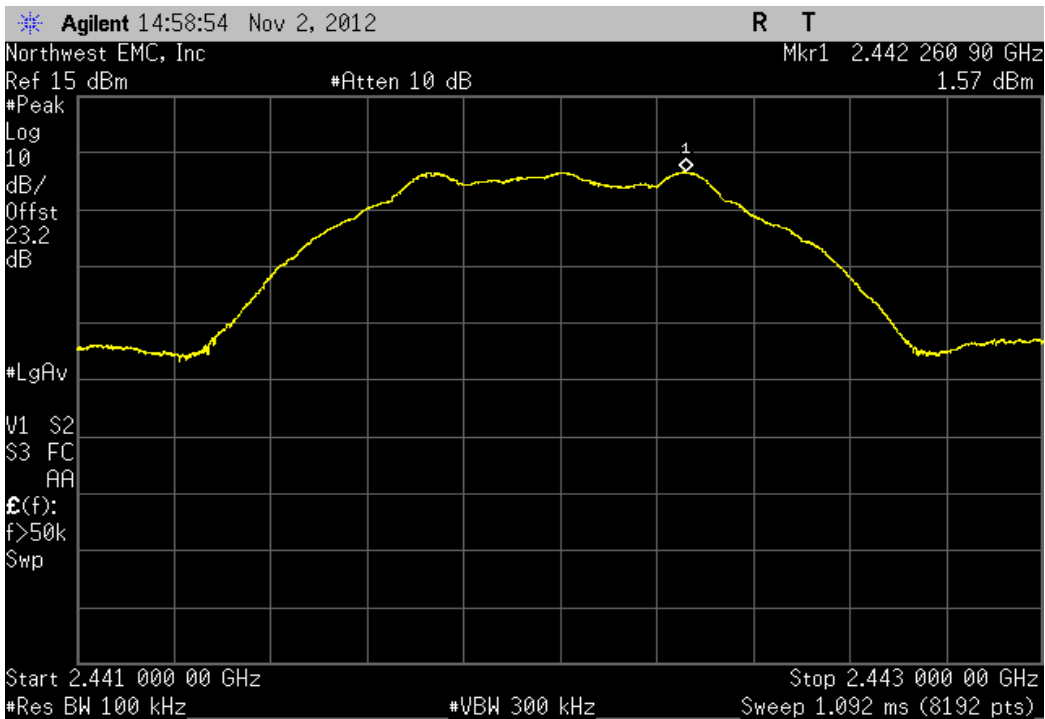
BLE - Data, Low Channel, 2404 MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-46.39 dBc	≤ -20 dBc	Pass



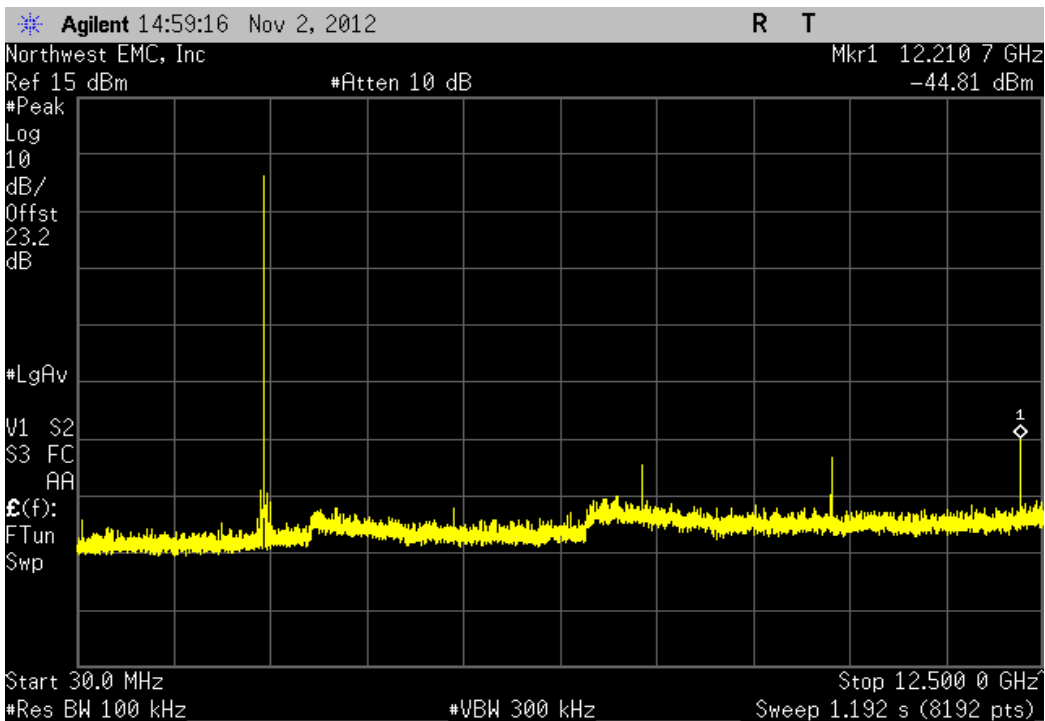
BLE - Data, Low Channel, 2404 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-53.52 dBc	≤ -20 dBc	Pass



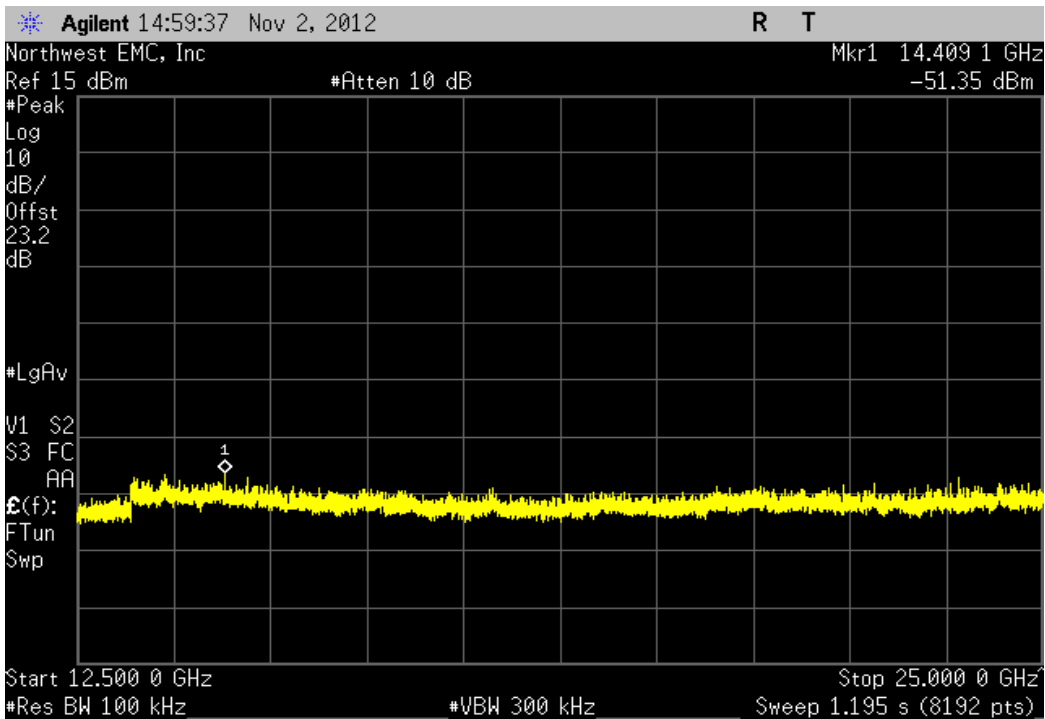
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



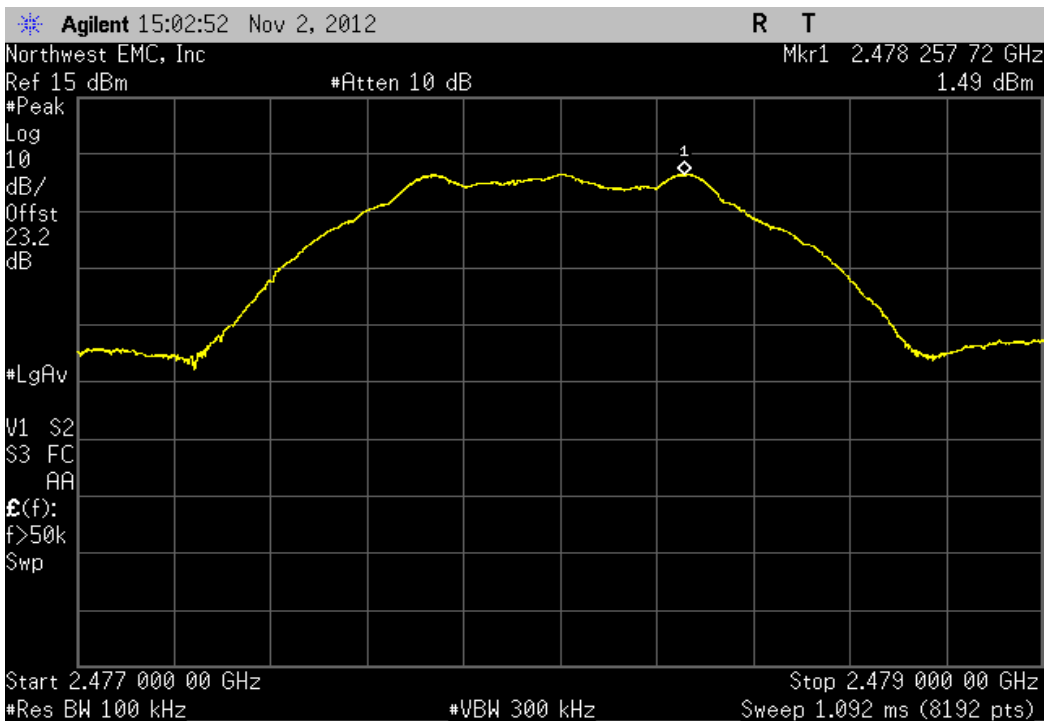
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-46.38 dBc	≤ -20 dBc	Pass



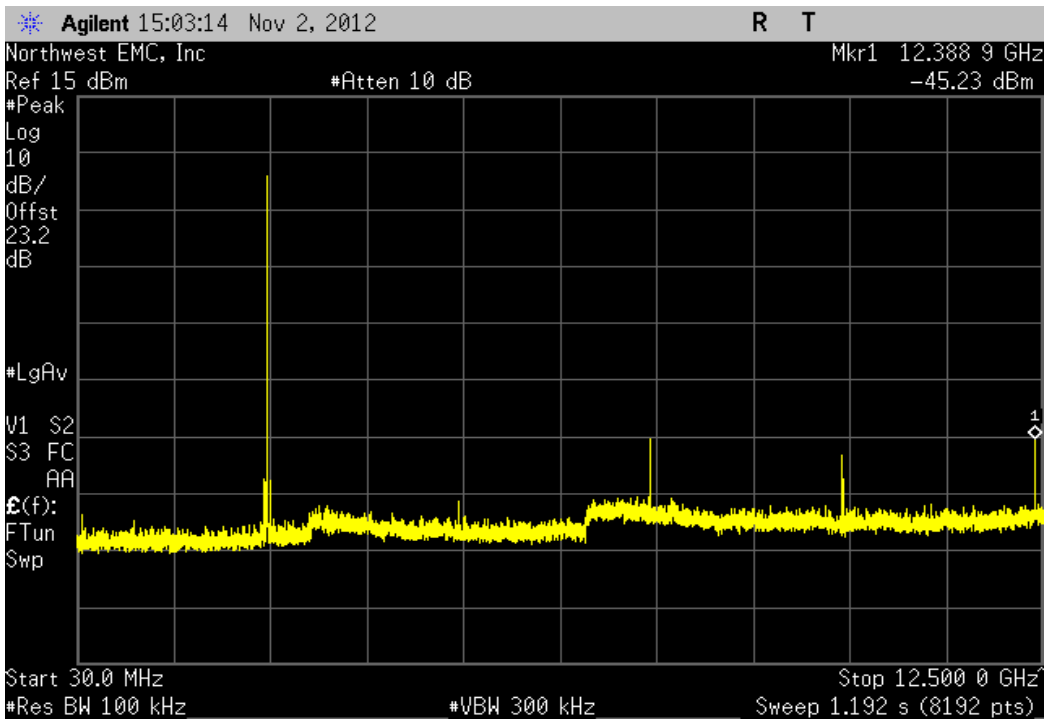
BLE - Data, Mid Channel, 2442 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.92 dBc	≤ -20 dBc	Pass



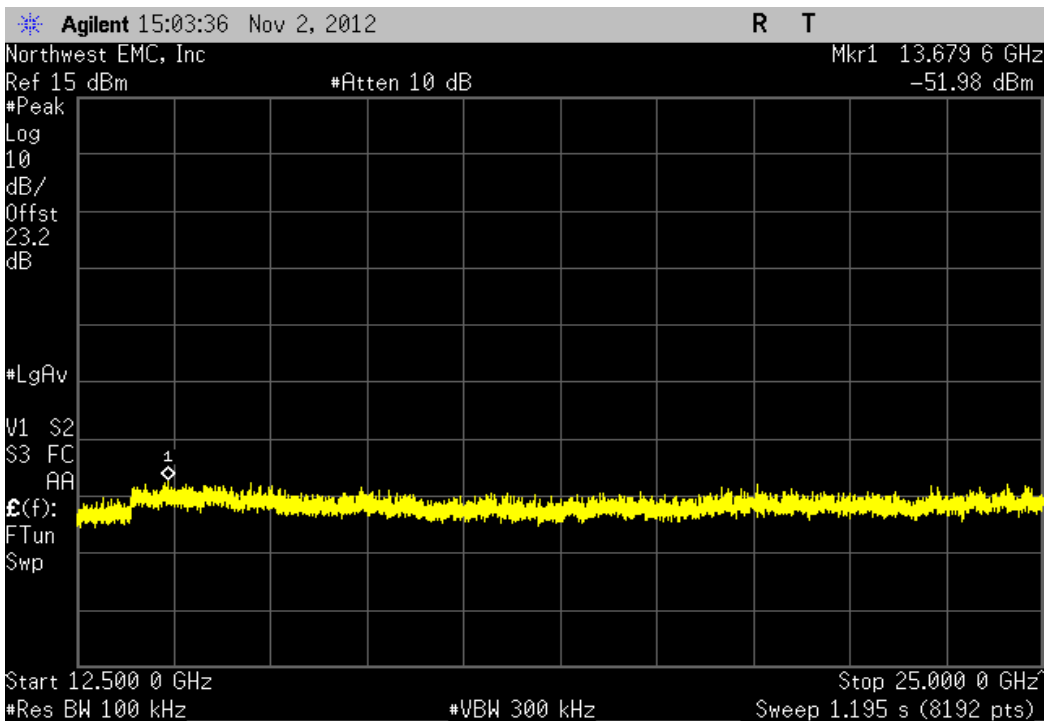
BLE - Data, High Channel, 2478 MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



BLE - Data, High Channel, 2478 MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-46.72 dBc	≤ -20 dBc	Pass



BLE - Data, High Channel, 2478 MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-53.47 dBc	≤ -20 dBc	Pass



POWER SPECTRAL DENSITY

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

TEST EQUIPMENT

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

TEST DESCRIPTION

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

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

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

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

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



POWER SPECTRAL DENSITY

XMit 2012.09.20
PsaTx 2012.09.10

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

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

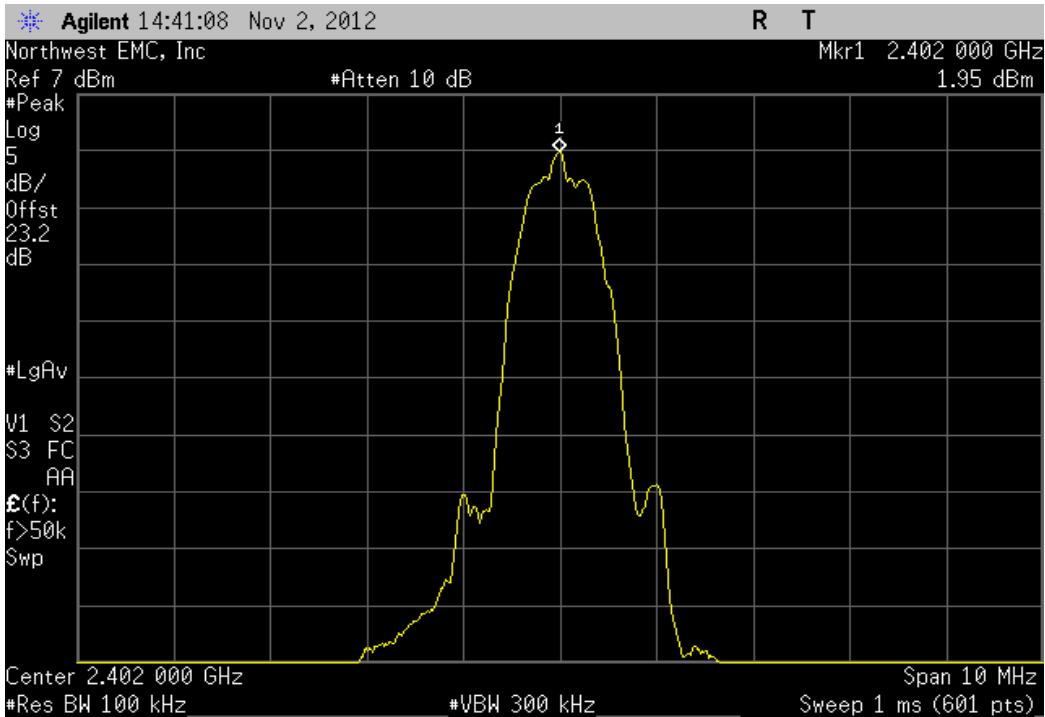
COMMENTS
All cable losses for 2.4GHz and 5.0GHz bands are accounted for in the analyzer offset calculations

DEVIATIONS FROM TEST STANDARD
None

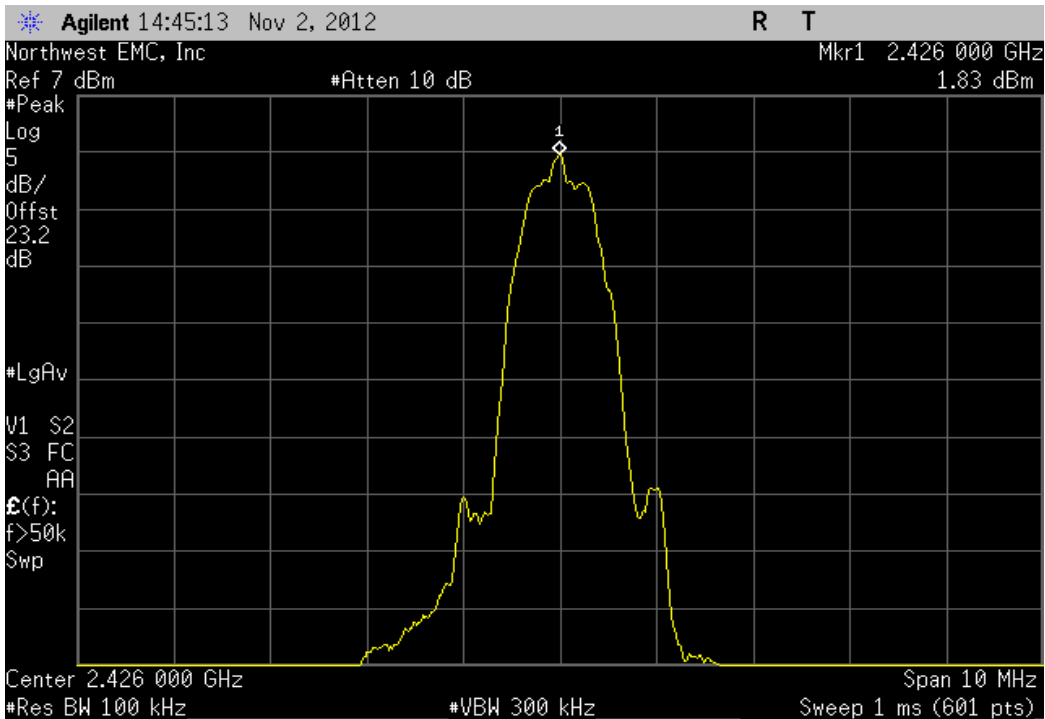
Configuration #	1	Signature <i>Brandon Hobbs</i>
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		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
BLE - Advertising						
	Low Channel, 2402 MHz	1.951	-15.2	-13.249	8	Pass
	Mid Channel, 2426 MHz	1.828	-15.2	-13.372	8	Pass
	High Channel, 2480 MHz	1.856	-15.2	-13.344	8	Pass
BLE - Data						
	Low Channel, 2404 MHz	1.772	-15.2	-13.428	8	Pass
	Mid Channel, 2442 MHz	1.789	-15.2	-13.411	8	Pass
	High Channel, 2478 MHz	1.688	-15.2	-13.512	8	Pass

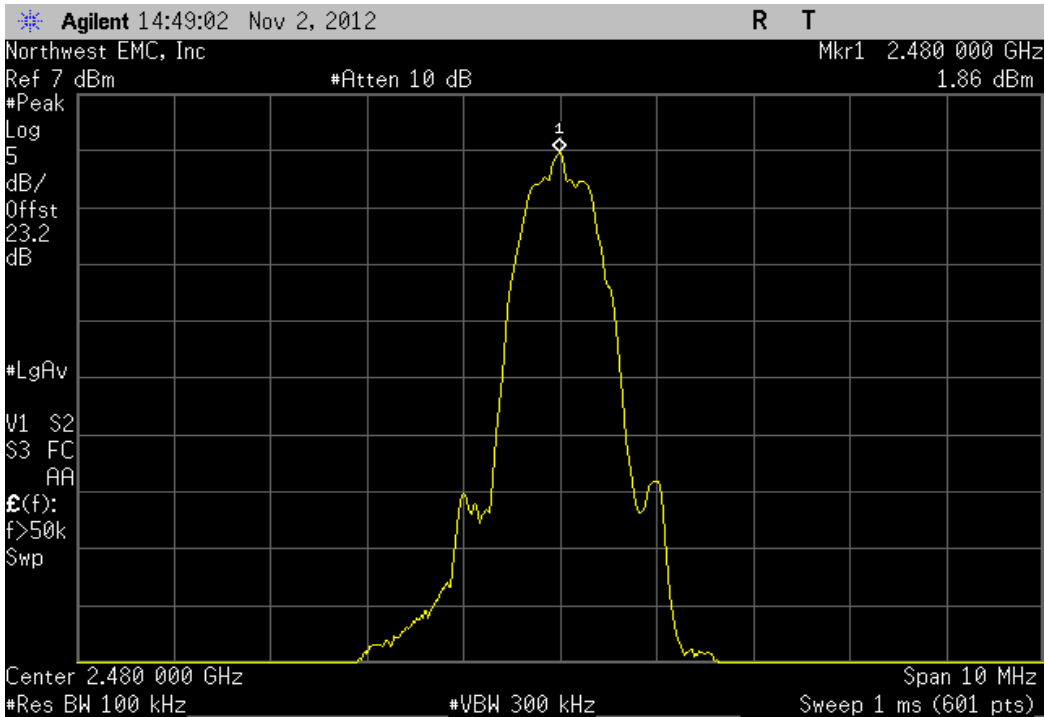
BLE - Advertising, Low Channel, 2402 MHz					
Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Result
dBm/100kHz			dBm/3kHz	dBm/3kHz	
	1.951	-15.2	-13.249	8	Pass



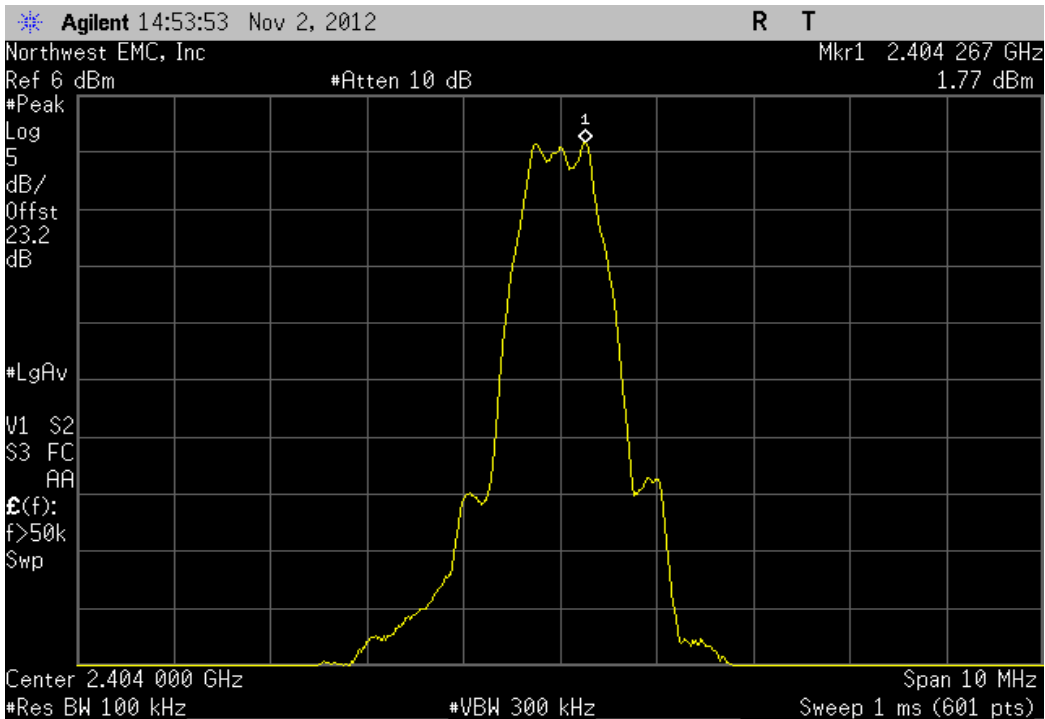
BLE - Advertising, Mid Channel, 2426 MHz					
Value	dBm/100kHz	To dBm/3kHz	Value	Limit	Result
dBm/100kHz			dBm/3kHz	dBm/3kHz	
	1.828	-15.2	-13.372	8	Pass



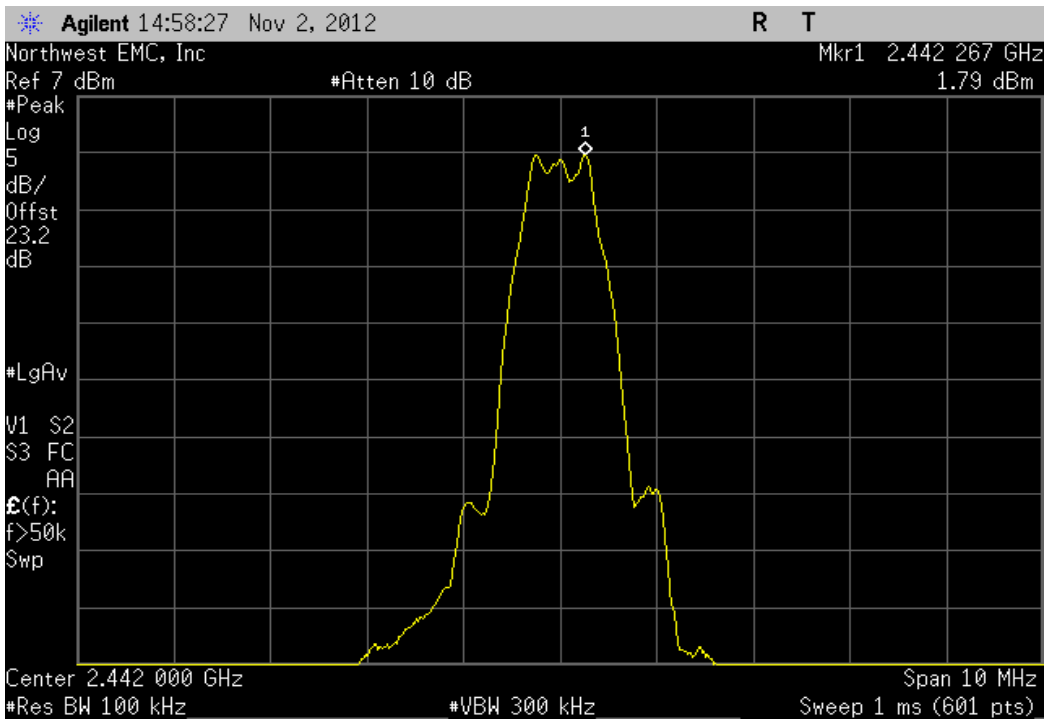
BLE - Advertising, High Channel, 2480 MHz					
Value	dBm/100kHz	Value	Limit		
	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.856	-15.2	-13.344	8	Pass



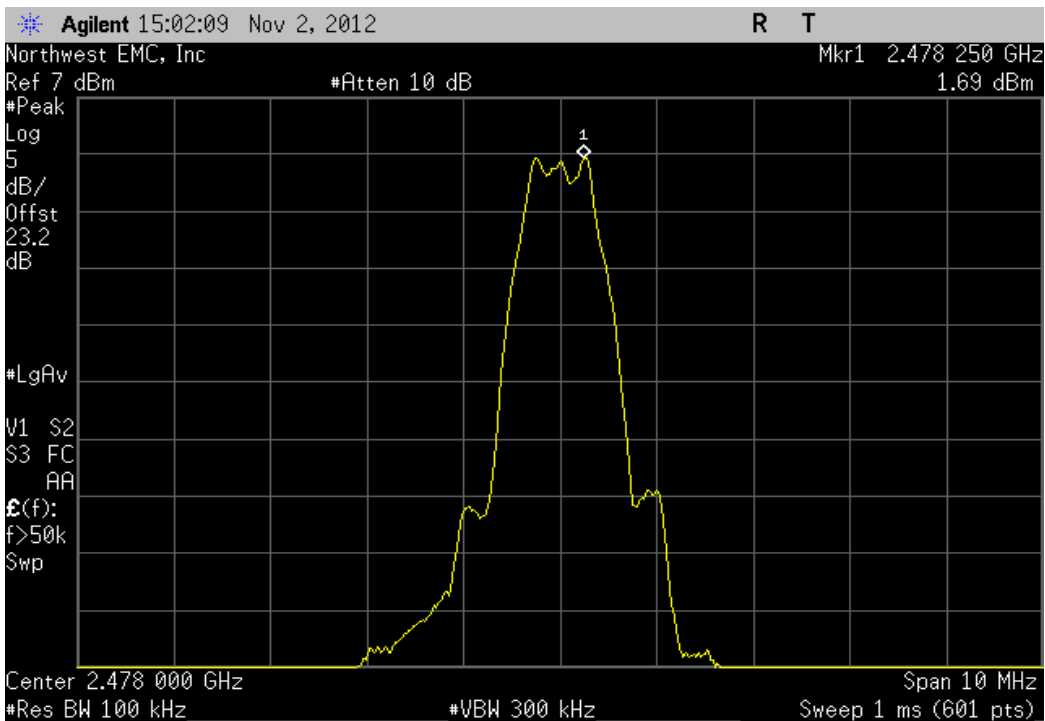
BLE - Data, Low Channel, 2404 MHz					
Value	dBm/100kHz	Value	Limit		
	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.772	-15.2	-13.428	8	Pass



BLE - Data, Mid Channel, 2442 MHz						
	Value	dBm/100kHz	Value	Limit	Result	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	1.789	-15.2	-13.411	8	Pass	



BLE - Data, High Channel, 2478 MHz						
	Value	dBm/100kHz	Value	Limit	Result	
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	1.688	-15.2	-13.512	8	Pass	



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

MODES OF OPERATION

Transmitting Bluetooth LE

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1633 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	12 mo


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

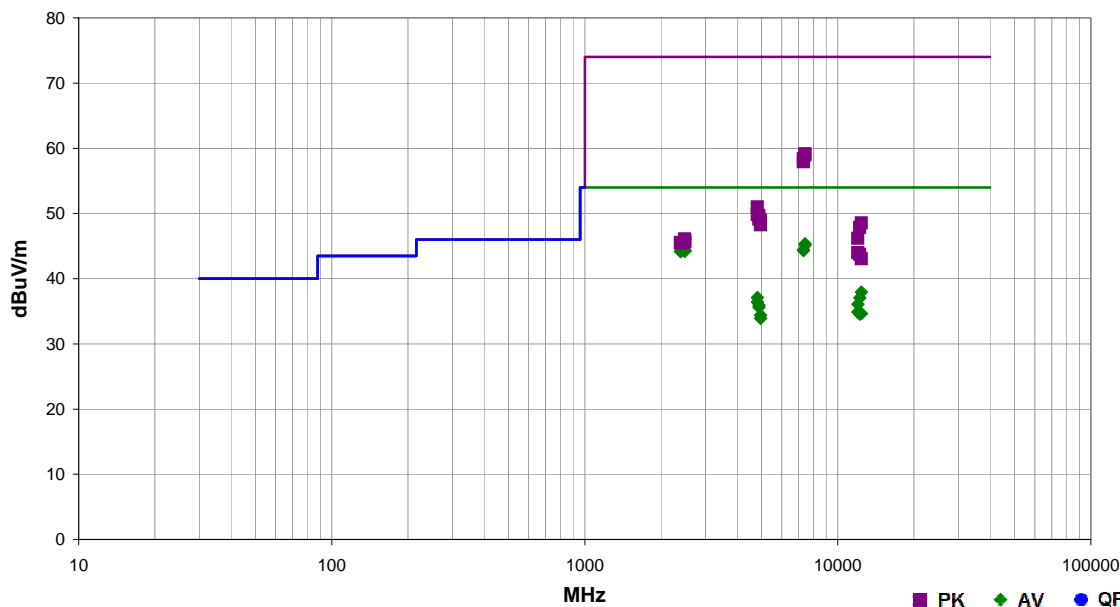
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify 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.

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1633	Date:	10/30/12	
Project:	None	Temperature:	23.4 °C	
Job Site:	EV01	Humidity:	55% RH	
Serial Number:	000012424053	Barometric Pres.:	1010 mbar	
Tested by:				
EUT:	1514			
Configuration:	1			
Customer:	Microsoft Corporation			
Attendees:	Mike Boucher			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	See comments below for channel, EUT orientation, and data rate.			

Test Specifications	FCC 15.247:2012	Test Method	ANSI C63.10:2009
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Run #	19	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.337	24.1	1.9	1.5	183.0	3.0	20.0	Vert	AV	0.0	46.0	54.0	-8.0	CH 38 (2478MHz), EUT Vertical
7433.333	25.9	19.4	1.1	0.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Ch 38 (2478MHz), EUT on Side
7433.300	25.7	19.4	1.0	359.0	3.0	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Ch 38 (2478MHz), EUT Vertical
7325.313	25.4	19.0	1.5	6.0	3.0	0.0	Vert	AV	0.0	44.4	54.0	-9.6	Ch 20 (2442MHz), EUT Vertical
7325.360	25.3	19.0	1.1	348.0	3.0	0.0	Horz	AV	0.0	44.3	54.0	-9.7	Ch 20 (2442MHz), EUT on Side
2485.483	22.4	1.9	1.8	209.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	CH 38 (2478MHz), EUT on Side
2485.470	22.4	1.9	1.0	93.0	3.0	20.0	Horz	AV	0.0	44.3	54.0	-9.7	CH 38 (2478MHz), EUT on Side
2485.437	22.4	1.9	1.0	293.0	3.0	20.0	Horz	AV	0.0	44.3	54.0	-9.7	CH 38 (2478MHz), EUT Vertical
2485.413	22.4	1.9	4.0	153.0	3.0	20.0	Vert	AV	0.0	44.3	54.0	-9.7	CH 38 (2478MHz), EUT Horizontal
2485.183	22.4	1.9	2.8	199.0	3.0	20.0	Horz	AV	0.0	44.3	54.0	-9.7	CH 38 (2478MHz), EUT Horizontal
2389.160	22.6	1.5	3.4	245.0	3.0	20.0	Vert	AV	0.0	44.1	54.0	-9.9	CH 1 (2404MHz), EUT Vertical
2389.570	22.6	1.5	1.0	287.0	3.0	20.0	Horz	AV	0.0	44.1	54.0	-9.9	CH 1 (2404MHz), EUT on Side
7433.200	39.7	19.4	1.1	0.0	3.0	0.0	Horz	PK	0.0	59.1	74.0	-14.9	CH 38 (2478MHz), EUT on Side
7434.227	39.5	19.4	1.0	359.0	3.0	0.0	Vert	PK	0.0	58.9	74.0	-15.1	Ch 38 (2478MHz), EUT Vertical
7325.467	39.4	19.0	1.5	6.0	3.0	0.0	Vert	PK	0.0	58.4	74.0	-15.6	Ch 20 (2442MHz), EUT Vertical
12388.910	40.9	-2.9	1.0	20.0	3.0	0.0	Vert	AV	0.0	38.0	54.0	-16.0	CH 38 (2478MHz), EUT Vertical
7325.440	38.9	19.0	1.1	348.0	3.0	0.0	Horz	PK	0.0	57.9	74.0	-16.1	Ch 20 (2442MHz), EUT on Side
4807.707	26.9	10.2	1.0	15.0	3.0	0.0	Horz	AV	0.0	37.1	54.0	-16.9	Ch 38 (2478MHz), EUT on Side
12208.910	41.2	-4.1	1.0	23.0	3.0	0.0	Vert	AV	0.0	37.1	54.0	-16.9	CH 20 (2442MHz), EUT Vertical
4807.653	26.2	10.2	1.0	355.0	3.0	0.0	Vert	AV	0.0	36.4	54.0	-17.6	Ch 1 (2404MHz), EUT Vertical
12018.930	41.5	-5.4	1.4	26.0	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	CH 1 (2404MHz), EUT Vertical
4883.700	25.5	10.4	1.7	68.0	3.0	0.0	Horz	AV	0.0	35.9	54.0	-18.1	Ch 20 (2442MHz), EUT on Side
4883.613	25.2	10.4	1.0	11.0	3.0	0.0	Vert	AV	0.0	35.6	54.0	-18.4	Ch 20 (2442MHz), EUT Vertical
12018.900	40.3	-5.4	1.0	147.0	3.0	0.0	Horz	AV	0.0	34.9	54.0	-19.1	CH 1 (2404MHz), EUT on Side
12388.920	37.6	-2.9	1.0	62.0	3.0	0.0	Horz	AV	0.0	34.7	54.0	-19.3	CH 38 (2478MHz), EUT on Side
12208.910	38.7	-4.1	1.0	127.0	3.0	0.0	Horz	AV	0.0	34.6	54.0	-19.4	CH 20 (2442MHz), EUT on Side
4955.647	23.7	10.7	1.0	340.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	Ch 38 (2478MHz), EUT Vertical

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
4955.600	23.2	10.7	2.1	359.0	3.0	0.0	Horz	AV	0.0	33.9	54.0	-20.1	Ch 38 (2478MHz), EUT on Side
4808.487	40.8	10.2	1.0	15.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	Ch 1 (2404MHz), EUT on Side
4808.347	39.6	10.2	1.0	355.0	3.0	0.0	Vert	PK	0.0	49.8	74.0	-24.2	Ch 1 (2404MHz), EUT Vertical
4884.207	39.2	10.4	1.7	68.0	3.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	Ch 20 (2442MHz), EUT on Side
4883.460	38.7	10.4	1.0	11.0	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	Ch 20 (2442MHz), EUT Vertical
4955.400	38.2	10.7	1.0	340.0	3.0	0.0	Vert	PK	0.0	48.9	74.0	-25.1	Ch 38 (2478MHz), EUT Vertical
12388.910	51.5	-2.9	1.0	20.0	3.0	0.0	Vert	PK	0.0	48.6	74.0	-25.4	CH 38 (2478MHz), EUT Vertical
4956.187	37.5	10.7	2.1	359.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	Ch 38 (2478MHz), EUT on Side
12208.890	52.0	-4.1	1.0	23.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	CH 20 (2442MHz), EUT Vertical
12018.790	51.6	-5.4	1.4	26.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	CH 1 (2404MHz), EUT Vertical
2485.213	24.2	1.9	1.0	293.0	3.0	20.0	Horz	PK	0.0	46.1	74.0	-27.9	CH 38 (2478MHz), EUT Vertical
2484.457	24.1	1.9	1.8	209.0	3.0	20.0	Vert	PK	0.0	46.0	74.0	-28.0	CH 38 (2478MHz), EUT on Side
2485.030	24.0	1.9	4.0	153.0	3.0	20.0	Vert	PK	0.0	45.9	74.0	-28.1	CH 38 (2478MHz), EUT Horizontal
2484.447	23.8	1.9	2.8	199.0	3.0	20.0	Horz	PK	0.0	45.7	74.0	-28.3	CH 38 (2478MHz), EUT Horizontal
2484.447	23.8	1.9	2.8	272.0	3.0	20.0	Vert	PK	0.0	45.7	74.0	-28.3	CH 38 (2478MHz), EUT Vertical
2484.340	23.8	1.9	1.0	93.0	3.0	20.0	Horz	PK	0.0	45.7	74.0	-28.3	CH 38 (2478MHz), EUT on Side
2390.870	24.0	1.5	1.0	287.0	3.0	20.0	Horz	PK	0.0	45.5	74.0	-28.5	CH 1 (2404MHz), EUT on Side
2390.073	23.9	1.5	3.4	245.0	3.0	20.0	Vert	PK	0.0	45.4	74.0	-28.6	CH 1 (2404MHz), EUT Vertical
12018.830	49.4	-5.4	1.0	147.0	3.0	0.0	Horz	PK	0.0	44.0	74.0	-30.0	CH 1 (2404MHz), EUT on Side
12208.810	47.9	-4.1	1.0	127.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	CH 20 (2442MHz), EUT on Side
12388.830	46.0	-2.9	1.0	62.0	3.0	0.0	Horz	PK	0.0	43.1	74.0	-30.9	CH 38 (2478MHz), EUT on Side



AC POWERLINE CONDUCTED EMISSIONS

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

MODES OF OPERATION

Transmitting Bluetooth LE

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1633 - 2

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

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

MEASUREMENT BANDWIDTHS

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

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


TEST DESCRIPTION

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

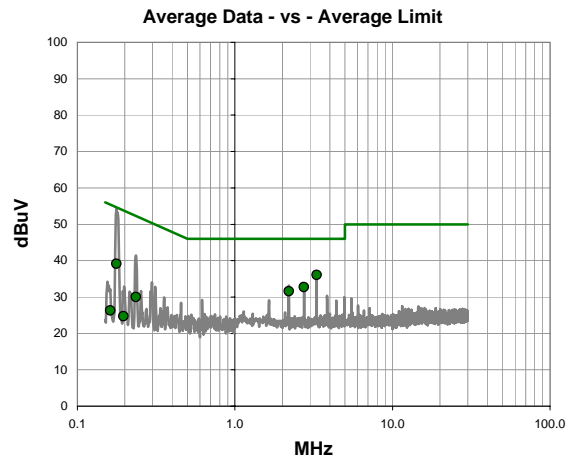
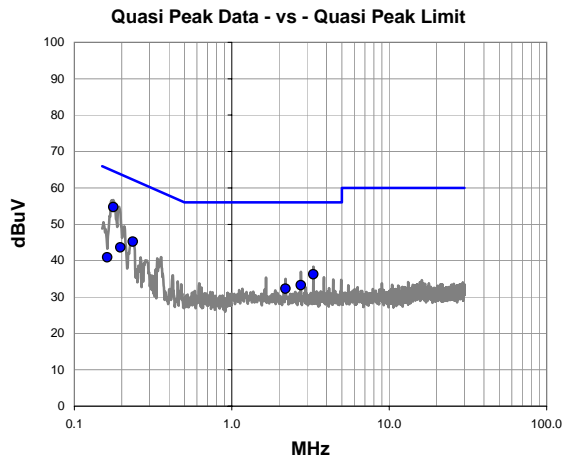


AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514	Tested by:	Brandon Hobbs/Sabrina Sanders	
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS Low Channel 2402 MHz			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
Run #	21	Line:	High Line
Ext. Attenuation:	20	Results	Pass




Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.177	34.4	20.3	54.7	64.6	-9.9
0.235	24.9	20.4	45.3	62.3	-17.0
3.300	15.7	20.5	36.2	56.0	-19.8
0.196	23.3	20.4	43.7	63.8	-20.1
2.748	12.7	20.5	33.2	56.0	-22.8
2.200	11.8	20.5	32.3	56.0	-23.7
0.162	20.5	20.4	40.9	65.4	-24.5

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	15.5	20.5	36.0	46.0	-10.0
2.748	12.2	20.5	32.7	46.0	-13.3
2.200	11.1	20.5	31.6	46.0	-14.4
0.177	18.8	20.3	39.1	54.6	-15.5
0.235	9.6	20.4	30.0	52.3	-22.3
0.196	4.4	20.4	24.8	53.8	-29.0
0.162	5.9	20.4	26.3	55.4	-29.1



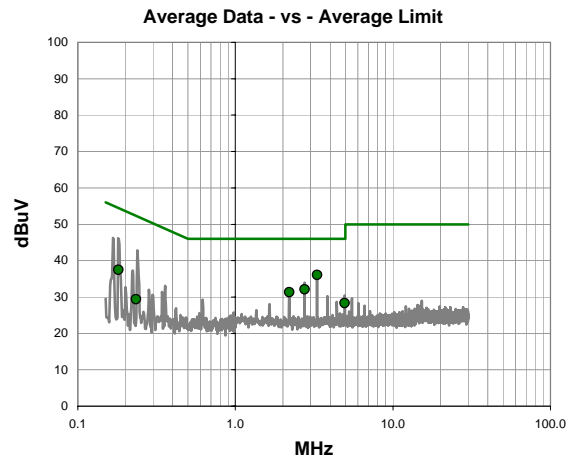
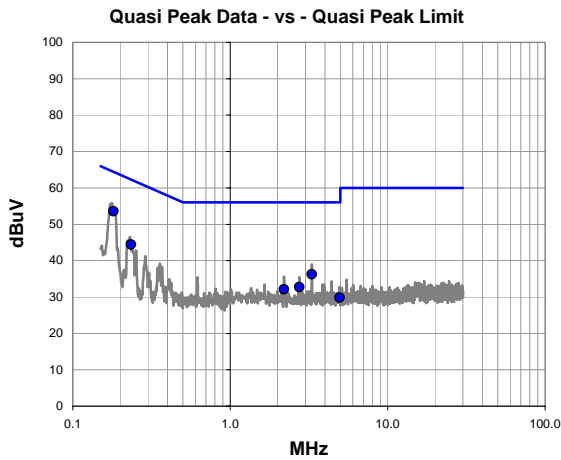
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS Low Channel 2402 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	22	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.181	33.2	20.3	53.5	64.4	-10.9
0.234	24.1	20.4	44.5	62.3	-17.9
3.300	15.7	20.5	36.2	56.0	-19.8
2.752	12.2	20.5	32.7	56.0	-23.3
2.200	11.6	20.5	32.1	56.0	-23.9
4.952	9.1	20.7	29.8	56.0	-26.2


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	15.5	20.5	36.0	46.0	-10.0
2.752	11.6	20.5	32.1	46.0	-13.9
2.200	10.8	20.5	31.3	46.0	-14.7
0.181	17.1	20.3	37.4	54.4	-17.0
4.952	7.6	20.7	28.3	46.0	-17.7
0.234	9.0	20.4	29.4	52.3	-23.0



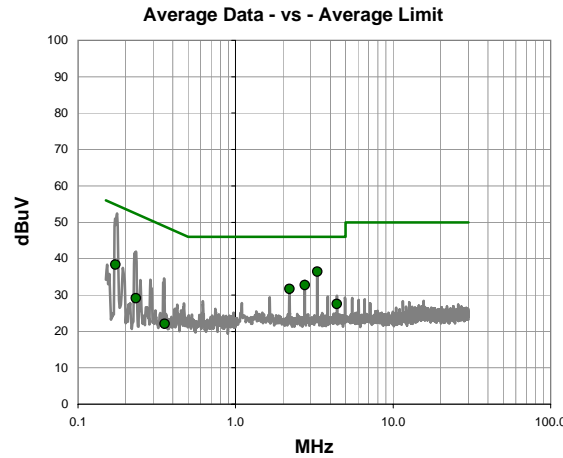
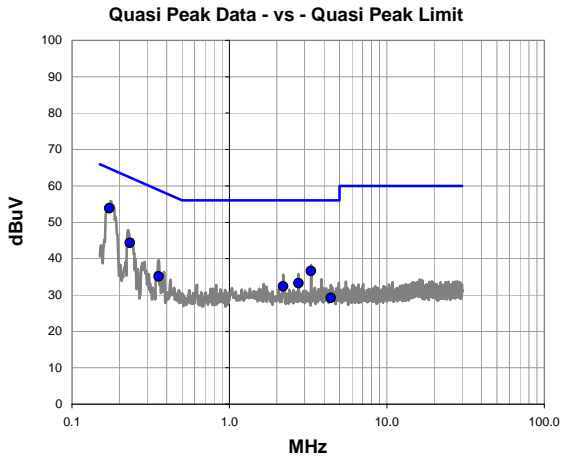
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS Mid Channel 2426 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	23	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.173	33.5	20.3	53.8	64.8	-11.0
0.233	24.0	20.4	44.4	62.3	-18.0
3.300	16.0	20.5	36.5	56.0	-19.5
2.752	12.7	20.5	33.2	56.0	-22.8
2.200	11.9	20.5	32.4	56.0	-23.6
0.356	14.8	20.3	35.1	58.8	-23.7
4.400	8.5	20.7	29.2	56.0	-26.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	15.9	20.5	36.4	46.0	-9.6
2.752	12.2	20.5	32.7	46.0	-13.3
2.200	11.2	20.5	31.7	46.0	-14.3
0.173	18.0	20.3	38.3	54.8	-16.5
4.400	6.8	20.7	27.5	46.0	-18.5
0.233	8.8	20.4	29.2	52.3	-23.2
0.356	1.8	20.3	22.1	48.8	-26.7



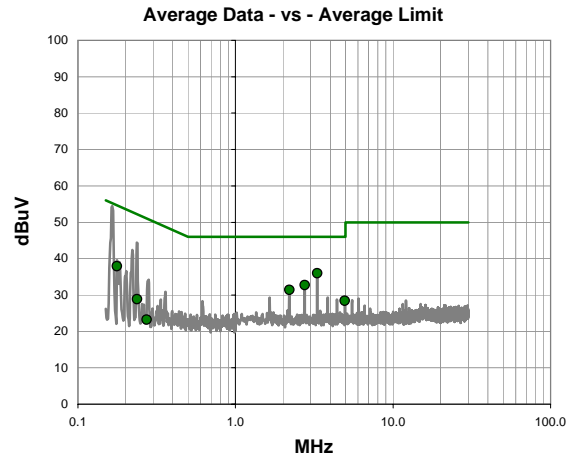
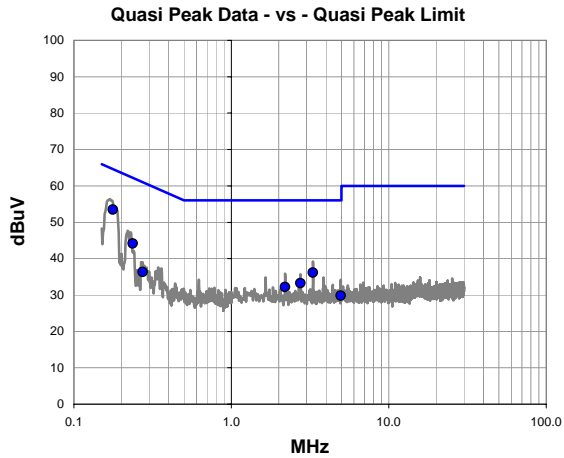
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS Mid Channel 2426 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	24	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.177	33.1	20.3	53.4	64.6	-11.2
0.237	23.8	20.3	44.1	62.2	-18.1
3.300	15.6	20.5	36.1	56.0	-19.9
2.752	12.7	20.5	33.2	56.0	-22.8
2.200	11.7	20.5	32.2	56.0	-23.8
0.273	16.0	20.3	36.3	61.0	-24.7
4.952	9.1	20.7	29.8	56.0	-26.2


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	15.4	20.5	35.9	46.0	-10.1
2.752	12.2	20.5	32.7	46.0	-13.3
2.200	10.9	20.5	31.4	46.0	-14.6
0.177	17.6	20.3	37.9	54.6	-16.7
4.952	7.7	20.7	28.4	46.0	-17.6
0.237	8.5	20.3	28.8	52.2	-23.4
0.273	2.9	20.3	23.2	51.0	-27.8



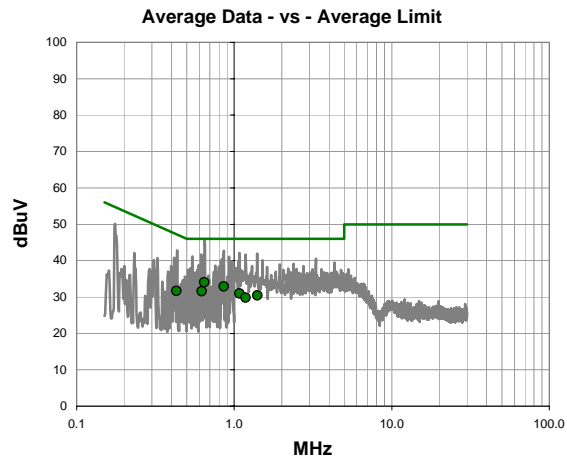
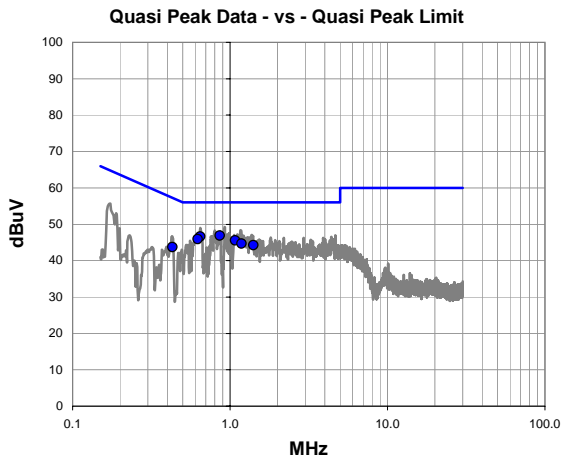
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS High Channel 2480 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	25	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.861	26.5	20.4	46.9	56.0	-9.1
0.646	26.3	20.3	46.6	56.0	-9.4
0.622	25.6	20.3	45.9	56.0	-10.1
1.080	25.2	20.4	45.6	56.0	-10.4
1.184	24.3	20.4	44.7	56.0	-11.3
1.404	23.8	20.4	44.2	56.0	-11.8
0.430	23.4	20.3	43.7	57.3	-13.6

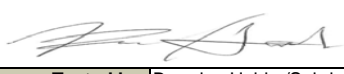
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.646	13.7	20.3	34.0	46.0	-12.0
0.861	12.5	20.4	32.9	46.0	-13.1
0.622	11.3	20.3	31.6	46.0	-14.4
1.080	10.6	20.4	31.0	46.0	-15.0
0.430	11.4	20.3	31.7	47.3	-15.6
1.404	10.0	20.4	30.4	46.0	-15.6
1.184	9.4	20.4	29.8	46.0	-16.2



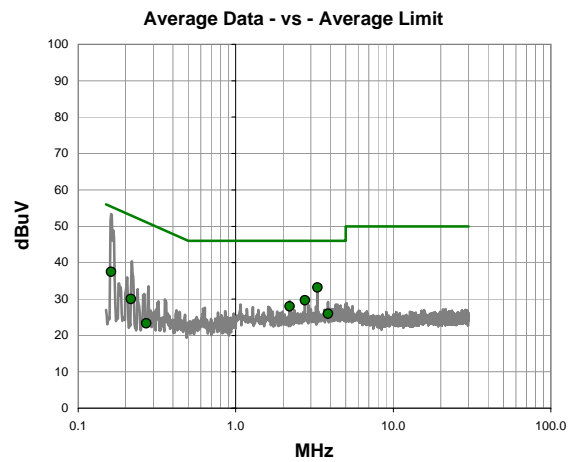
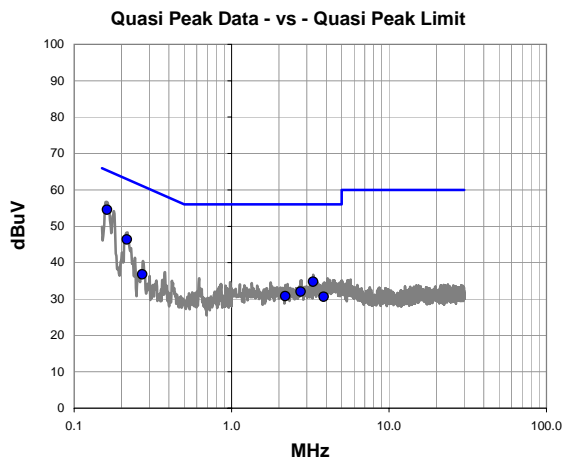
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	ADV DTS High Channel 2480 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	27	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	34.2	20.4	54.6	65.4	-10.8
0.216	26.0	20.4	46.4	63.0	-16.6
3.300	14.2	20.5	34.7	56.0	-21.3
2.752	11.5	20.5	32.0	56.0	-24.0
0.271	16.4	20.3	36.7	61.1	-24.4
2.200	10.3	20.5	30.8	56.0	-25.2
3.852	10.0	20.6	30.6	56.0	-25.4


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.6	20.5	33.1	46.0	-12.9
2.752	9.1	20.5	29.6	46.0	-16.4
0.162	17.1	20.4	37.5	55.4	-17.9
2.200	7.5	20.5	28.0	46.0	-18.0
3.852	5.3	20.6	25.9	46.0	-20.1
0.216	9.6	20.4	30.0	53.0	-23.0
0.271	3.0	20.3	23.3	51.1	-27.8



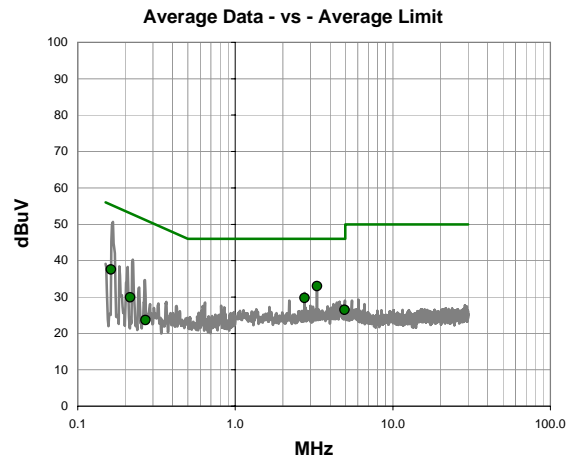
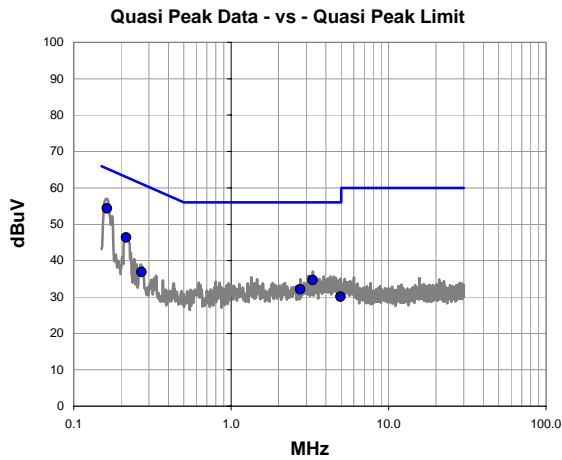
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS Low Channel 2404 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	28	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.163	34.0	20.4	54.4	65.3	-11.0
0.215	26.0	20.4	46.4	63.0	-16.6
3.300	14.1	20.5	34.6	56.0	-21.4
2.752	11.6	20.5	32.1	56.0	-23.9
0.270	16.5	20.3	36.8	61.1	-24.3
4.952	9.4	20.7	30.1	56.0	-25.9


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.4	20.5	32.9	46.0	-13.1
2.752	9.2	20.5	29.7	46.0	-16.3
0.163	17.2	20.4	37.6	55.3	-17.8
4.952	5.8	20.7	26.5	46.0	-19.5
0.215	9.5	20.4	29.9	53.0	-23.1
0.270	3.3	20.3	23.6	51.1	-27.5



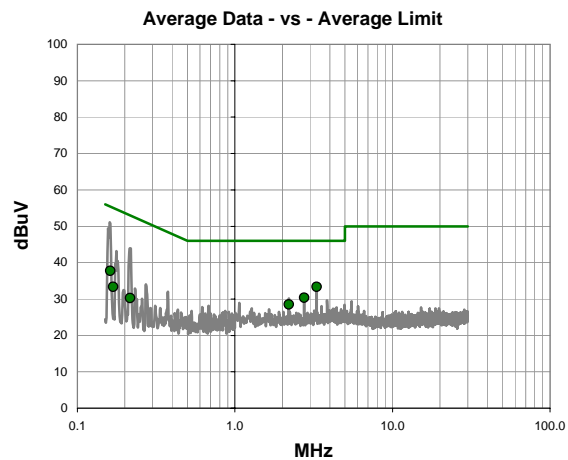
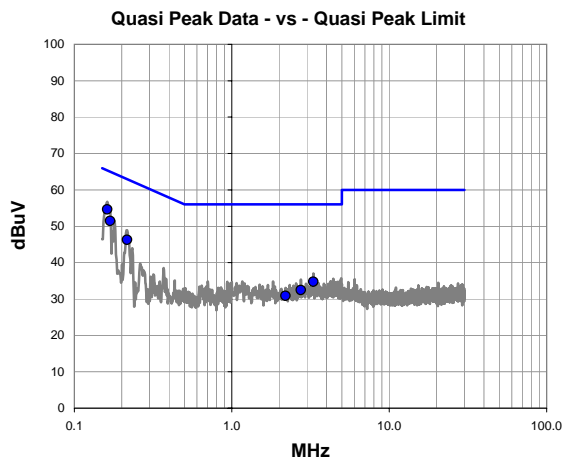
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS Low Channel 2404 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	29	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	34.3	20.4	54.7	65.4	-10.7
0.169	31.1	20.4	51.5	65.0	-13.6
0.216	25.9	20.4	46.3	63.0	-16.7
3.300	14.2	20.5	34.7	56.0	-21.3
2.752	11.9	20.5	32.4	56.0	-23.6
2.200	10.4	20.5	30.9	56.0	-25.1

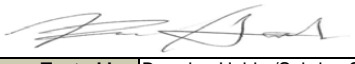
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.8	20.5	33.3	46.0	-12.7
2.752	9.8	20.5	30.3	46.0	-15.7
2.200	8.0	20.5	28.5	46.0	-17.5
0.162	17.4	20.4	37.8	55.4	-17.6
0.169	13.0	20.4	33.4	55.0	-21.7
0.216	9.9	20.4	30.3	53.0	-22.7



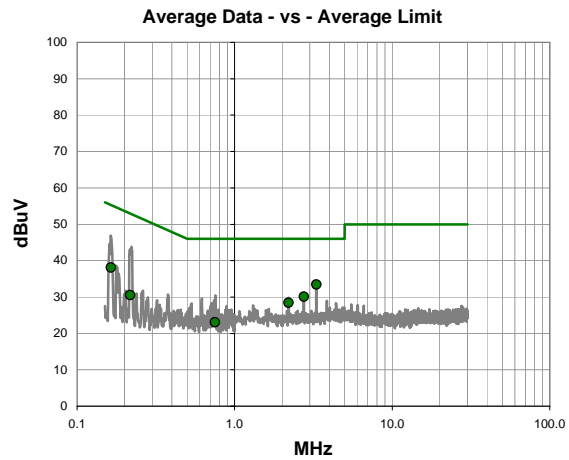
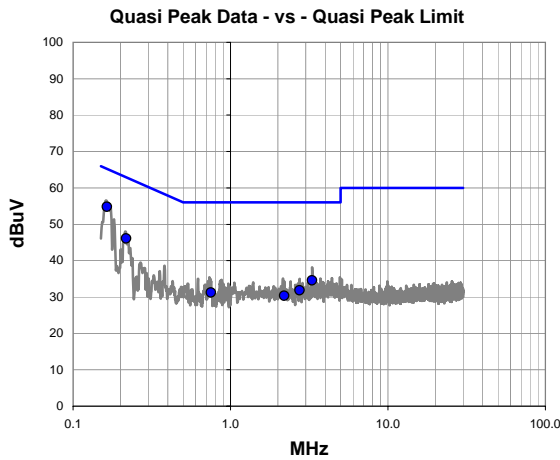
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS Mid Channel 2442 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	30	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	34.4	20.4	54.8	65.3	-10.5
0.217	25.7	20.4	46.1	62.9	-16.9
3.300	14.0	20.5	34.5	56.0	-21.5
2.752	11.3	20.5	31.8	56.0	-24.2
0.751	10.9	20.3	31.2	56.0	-24.8
2.200	9.9	20.5	30.4	56.0	-25.6


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.9	20.5	33.4	46.0	-12.6
2.752	9.6	20.5	30.1	46.0	-15.9
0.164	17.7	20.4	38.1	55.3	-17.2
2.200	7.9	20.5	28.4	46.0	-17.6
0.217	10.2	20.4	30.6	52.9	-22.4
0.751	2.7	20.3	23.0	46.0	-23.0



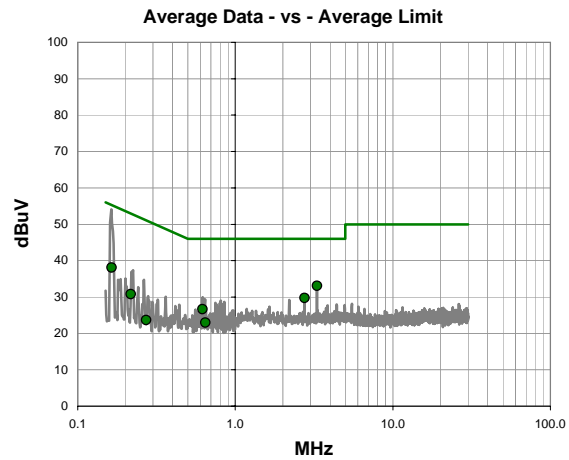
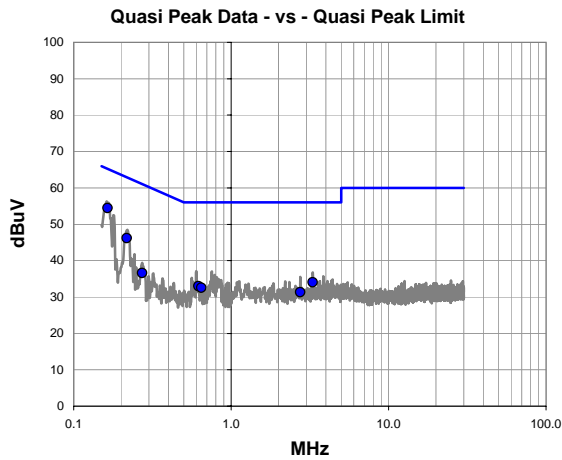
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS Mid Channel 2442 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	31	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	34.1	20.4	54.5	65.3	-10.8
0.217	25.8	20.4	46.2	62.9	-16.8
3.300	13.5	20.5	34.0	56.0	-22.0
0.619	12.7	20.3	33.0	56.0	-23.0
0.647	12.2	20.3	32.5	56.0	-23.5
0.272	16.3	20.3	36.6	61.1	-24.4
2.752	10.8	20.5	31.3	56.0	-24.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.5	20.5	33.0	46.0	-13.0
2.752	9.2	20.5	29.7	46.0	-16.3
0.164	17.7	20.4	38.1	55.3	-17.2
0.619	6.3	20.3	26.6	46.0	-19.4
0.217	10.4	20.4	30.8	52.9	-22.2
0.647	2.6	20.3	22.9	46.0	-23.1
0.272	3.3	20.3	23.6	51.1	-27.4



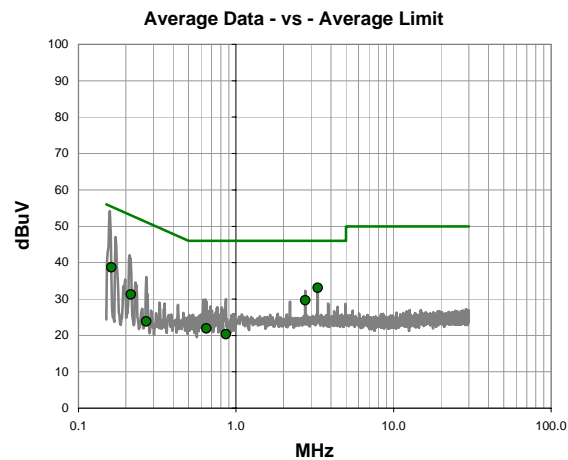
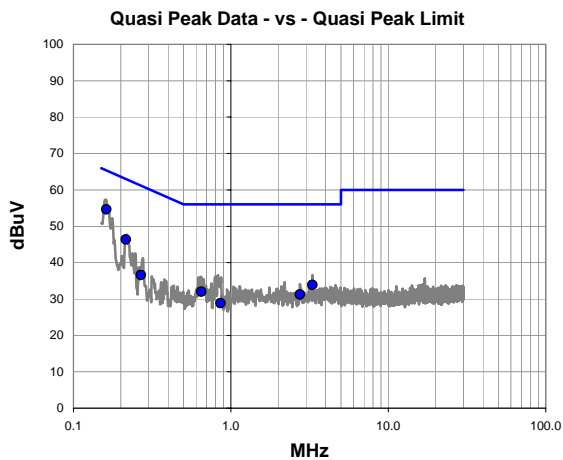
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS High Channel 2478 MHz			

Test Specifications	Test Method
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010

Run #	32	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	34.3	20.4	54.7	65.4	-10.7
0.215	26.0	20.4	46.4	63.0	-16.6
3.300	13.3	20.5	33.8	56.0	-22.2
0.649	11.7	20.3	32.0	56.0	-24.0
0.269	16.3	20.3	36.6	61.1	-24.5
2.752	10.7	20.5	31.2	56.0	-24.8
0.862	8.5	20.4	28.9	56.0	-27.1

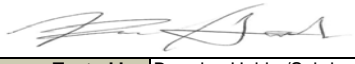
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.5	20.5	33.0	46.0	-13.0
2.752	9.1	20.5	29.6	46.0	-16.4
0.162	18.3	20.4	38.7	55.4	-16.7
0.215	10.9	20.4	31.3	53.0	-21.7
0.649	1.6	20.3	21.9	46.0	-24.1
0.862	0.0	20.4	20.4	46.0	-25.6
0.269	3.5	20.3	23.8	51.1	-27.3

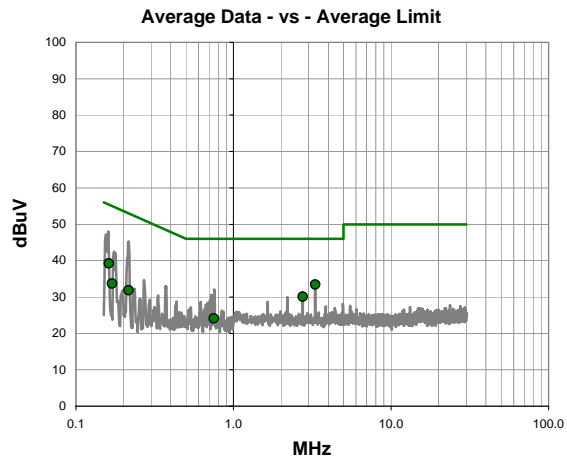
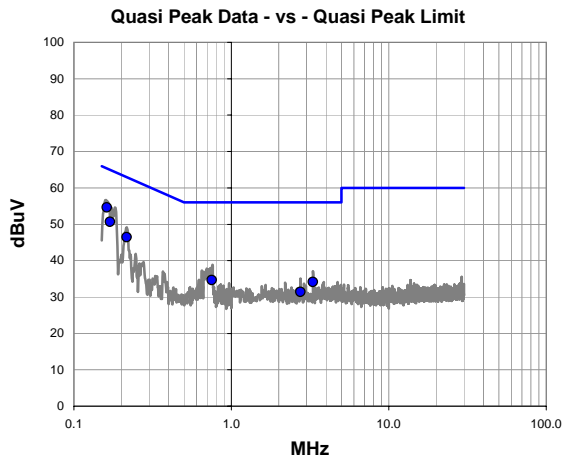


AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.09.25
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1633	Date:	11/20/12	
Project:	None	Temperature:	21 °C	
Job Site:	EV12	Humidity:	49% RH	
Serial Number:	000215624253	Barometric Pres.:	1002 mbar	
EUT:	1514			
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	Data DTS High Channel 2478 MHz			

Test Specifications	Test Method		
FCC 15.207:2012	ANSI C63.10:2009 RSS-Gen:2010		
Run #	Line:	Ext. Attenuation:	Results
33	High Line	20	Pass



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	34.3	20.4	54.7	65.4	-10.7
0.170	30.3	20.4	50.7	65.0	-14.3
0.216	26.1	20.4	46.5	63.0	-16.5
0.751	14.3	20.3	34.6	56.0	-21.4
3.300	13.6	20.5	34.1	56.0	-21.9
2.752	10.9	20.5	31.4	56.0	-24.6

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.300	12.9	20.5	33.4	46.0	-12.6
2.752	9.6	20.5	30.1	46.0	-15.9
0.162	18.9	20.4	39.3	55.4	-16.1
0.216	11.5	20.4	31.9	53.0	-21.1
0.170	13.3	20.4	33.7	55.0	-21.3
0.751	3.8	20.3	24.1	46.0	-21.9