



**Microsoft Corporation
1516**

**Report #: MCSO1601.5 Rev 01
FCC 15.247: 2012
Bluetooth LE Radio**



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

Last Date of Test: August 9, 2012
Microsoft Corporation
Model: 1516

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 Number	Description	Date	Page Number
01	Corrected frequency range of investigation and updated equipment list.	9/17/12	60,63

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.

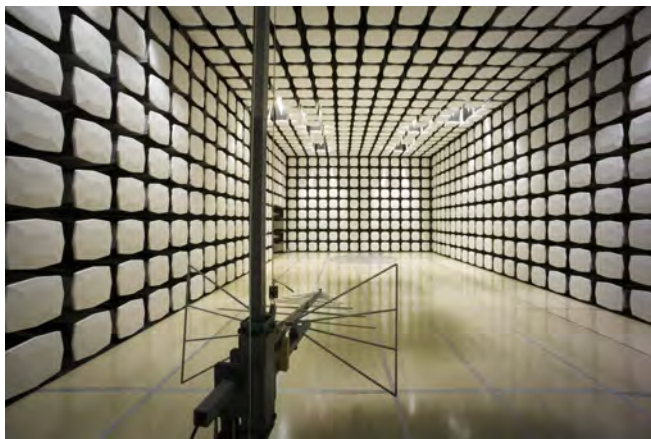
SCOPE

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

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



<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:	1516
First Date of Test:	August 4, 2012
Last Date of Test:	August 9, 2012
Receipt Date of Samples:	July 16, 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):
Tablet computer containing WLAN (802.11a/b/g/n, 2x2 MIMO) and Bluetooth (EDR, LE) radios
Clocks and Oscillators of the EUT:
None Provided
Testing Objective:
To demonstrate compliance of the Bluetooth LE radio to FCC 15.247 DTS requirements.

Configuration MCSO1601- 1

Software/Firmware Running during test	
Description	Version
BT_scripts	1.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Tablet	Microsoft	EV3BB-V24	000309122652

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	Tablet
USB adapter	Yes	.2m	No	Tablet	Ethernet CAT 5 Cable
Ethernet CAT 5 Cable	Yes	1.0m	No	USB adapter	Remote PC

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

Configuration MCSO1608- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
1516 Sample 4	Microsoft	1516	000215622952

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Membrane Keyboard	Microsoft	unknown	000759722151
AC Adapter	Microsoft	PA-1240-06MX	0D21005652219
USB Ethernet Adapter	Cisco	USB300M	CU906M310544
Earbuds	Microsoft	Unknown	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.5m	No	DC Power Supply	1516
Headphone	No	1.3m	No	1516	Earbuds
CAT-5e	No	3.0m	Yes	USB Ethernet Adapter	Ethernet Hub
USB	Yes	0.1m	No	USB Ethernet Adapter	1516
HDMI	Yes	1.0m	No	1516	Unterminated

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	8/4/2012	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	8/8/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	8/9/2012	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.
4	8/9/2012	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.
5	8/9/2012	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.
6	8/9/2012	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.
7	8/9/2012	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.
8	8/9/2012	Spurious 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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.



Duty Cycle

XMit 2012.07.31
PsaTx 2012.08.06

EUT: 1516	Work Order: MCSO1601
Serial Number: 000309122652	Date: 08/09/12
Customer: Microsoft Corporation	Temperature: 24°C
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 1016
Tested by: Brandon Hobbs	Power: 12VDC
	Job Site: EV06

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

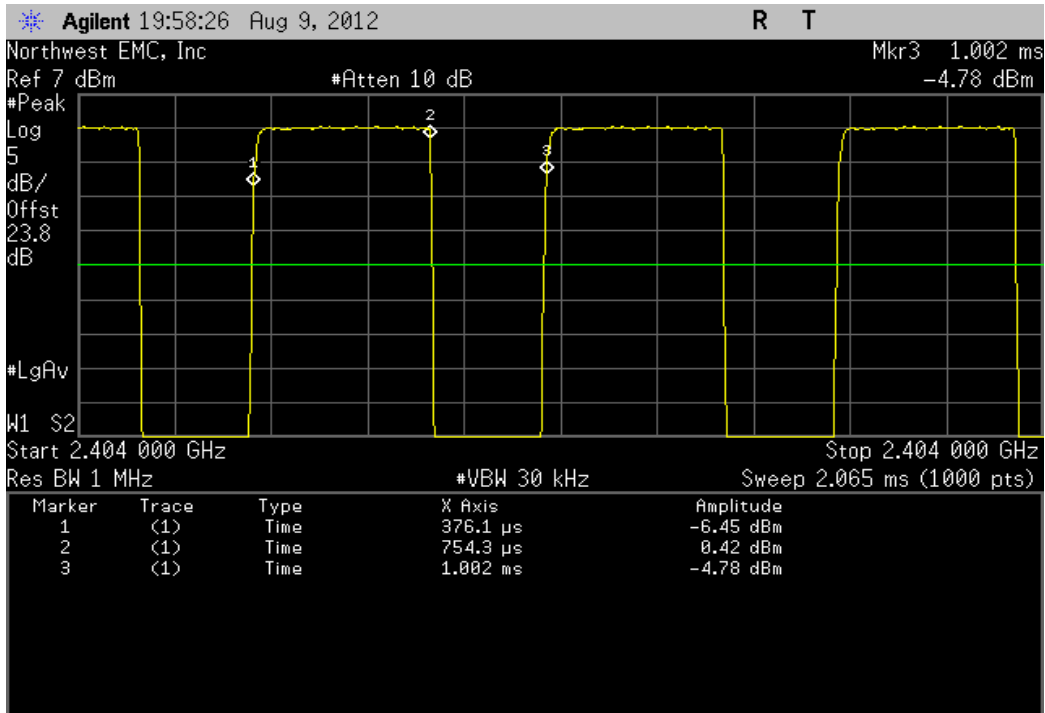
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

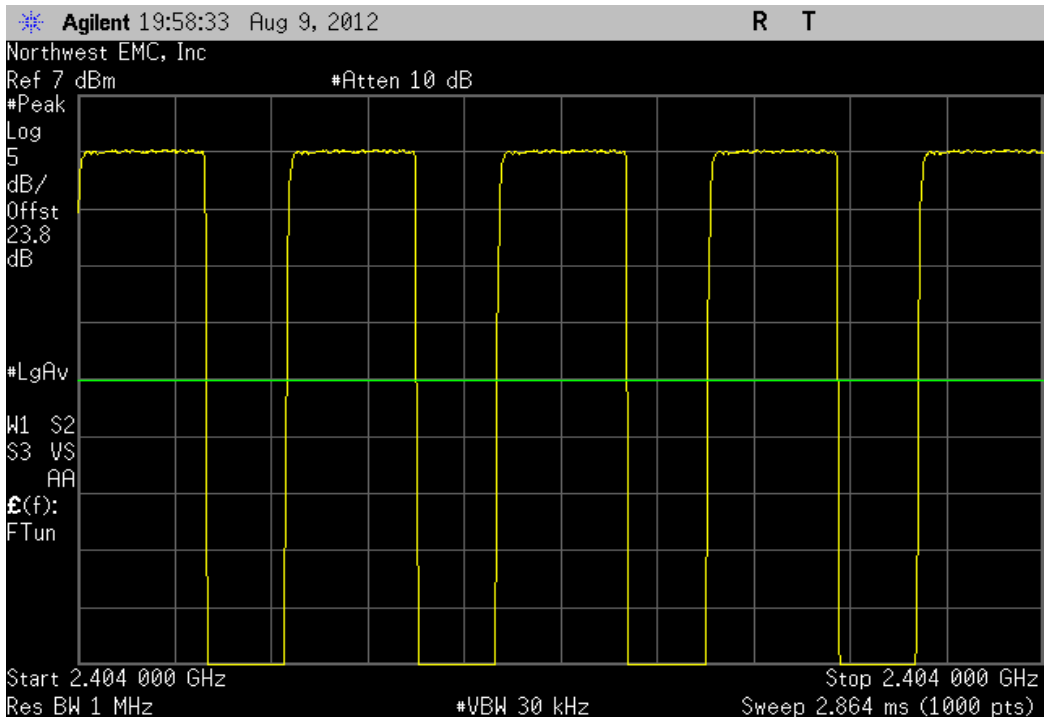
Configuration #	1	Signature <i>Brandon Hobbs</i>
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	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
Antenna A, Normal Test Conditions						
BE_LE						
(Data) Low Channel 1, 2404MHz	378.2 uS	626.2 uS	1	60.4	N/A	N/A
(Data) Low Channel 1, 2404MHz	N/A	N/A	5	N/A	N/A	N/A
(Data) Mid Channel 20, 2442MHz	378.2 uS	624.2 uS	1	60.6	N/A	N/A
(Data) Mid Channel 20, 2442MHz	N/A	N/A	5	N/A	N/A	N/A
(Data) High Channel 38, 2478MHz	378.2 uS	624.2 uS	1	60.6	N/A	N/A
(Data) High Channel 38, 2478MHz	N/A	N/A	5	N/A	N/A	N/A
(Adv) Low Channel 12, 2402MHz	378.2 uS	624.2 uS	1	60.6	N/A	N/A
(Adv) Low Channel 12, 2402MHz	N/A	N/A	5	N/A	N/A	N/A
(Adv) Mid Channel 12, 2426MHz	378.2 uS	626.2 uS	1	60.4	N/A	N/A
(Adv) Mid Channel 12, 2426MHz	N/A	N/A	5	N/A	N/A	N/A
(Adv) High Channel 39, 2480MHz	378.2 uS	624.2 uS	1	60.6	N/A	N/A
(Adv) High Channel 39, 2480MHz	N/A	N/A	5	N/A	N/A	N/A

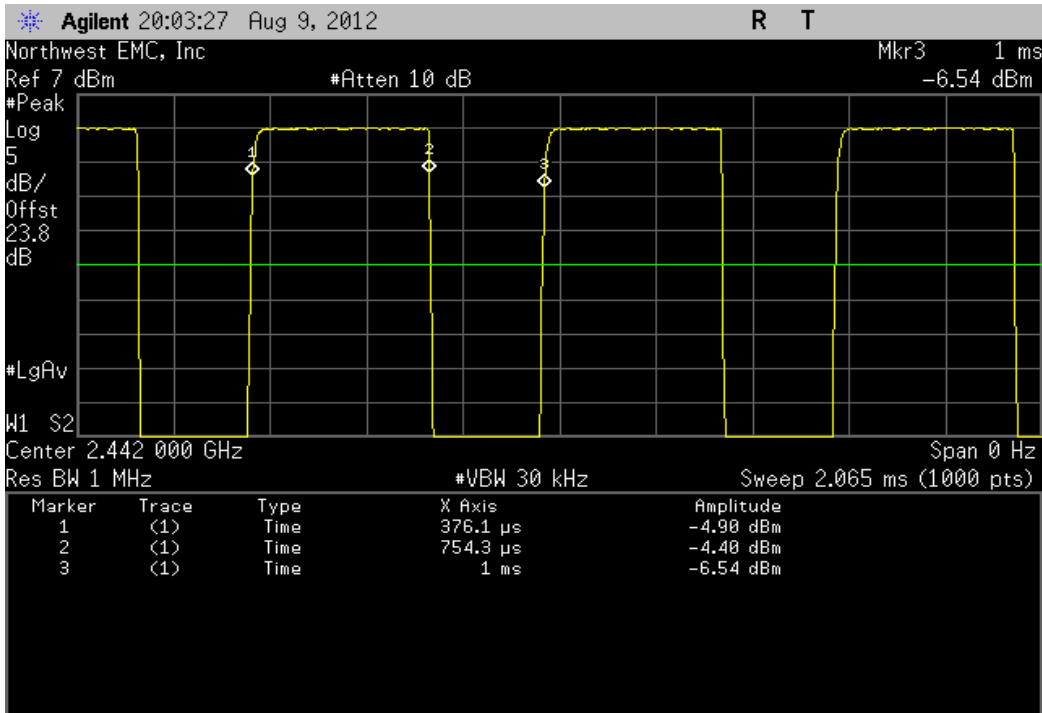
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	626.2 uS	1	60.4	N/A	N/A	



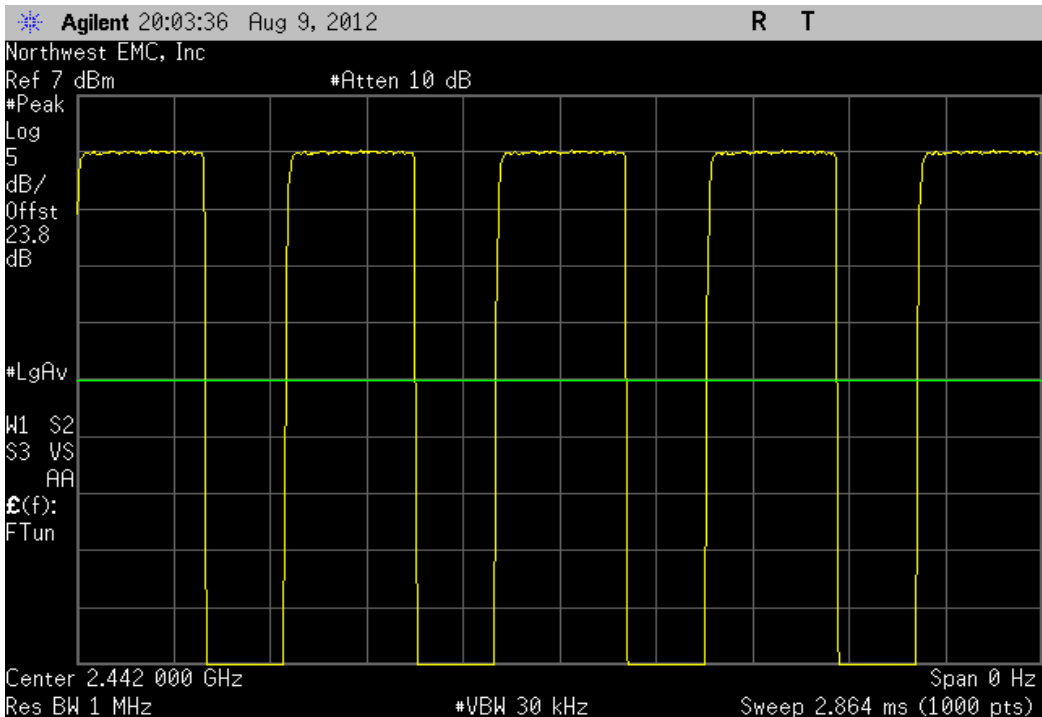
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



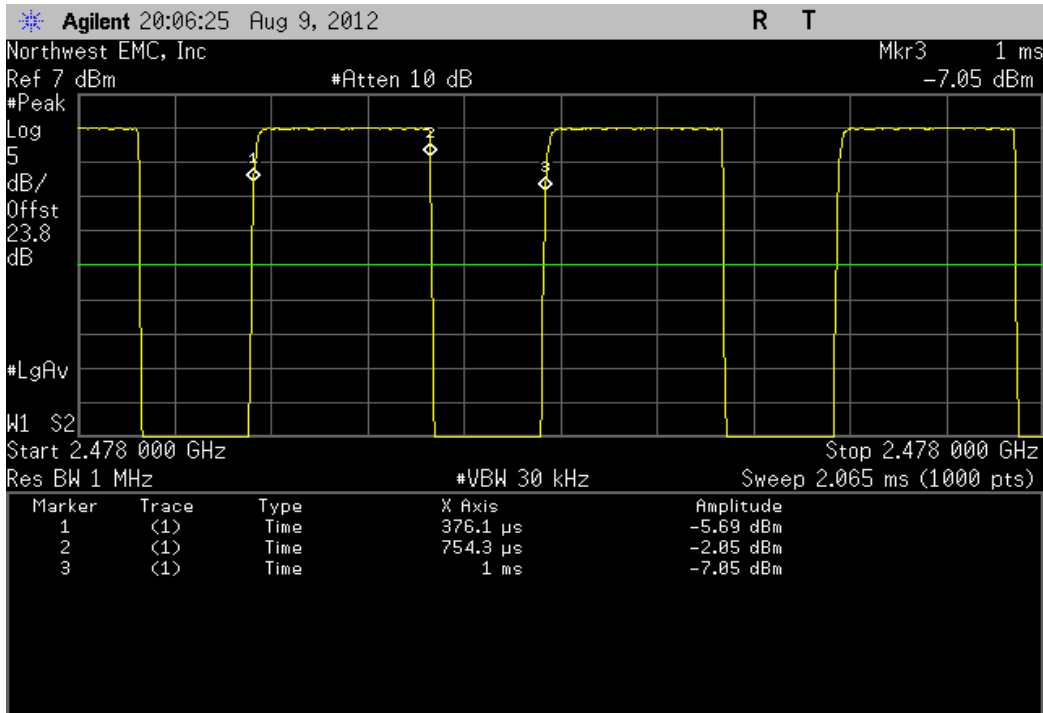
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	378.2 uS	624.2 uS	1	60.6	N/A	N/A



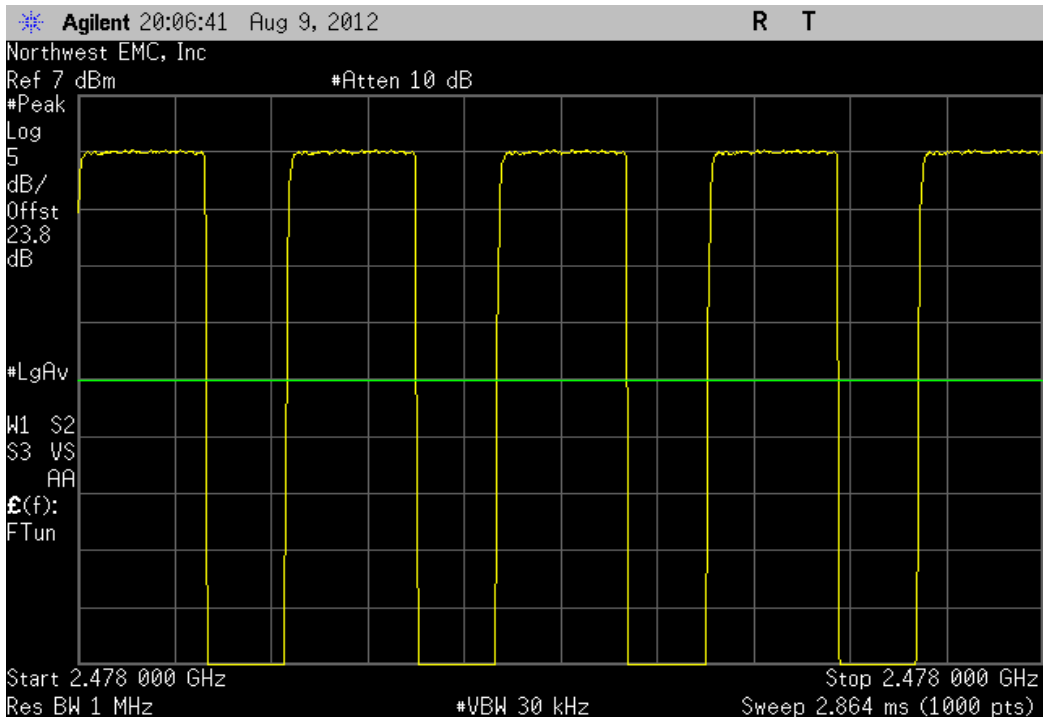
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



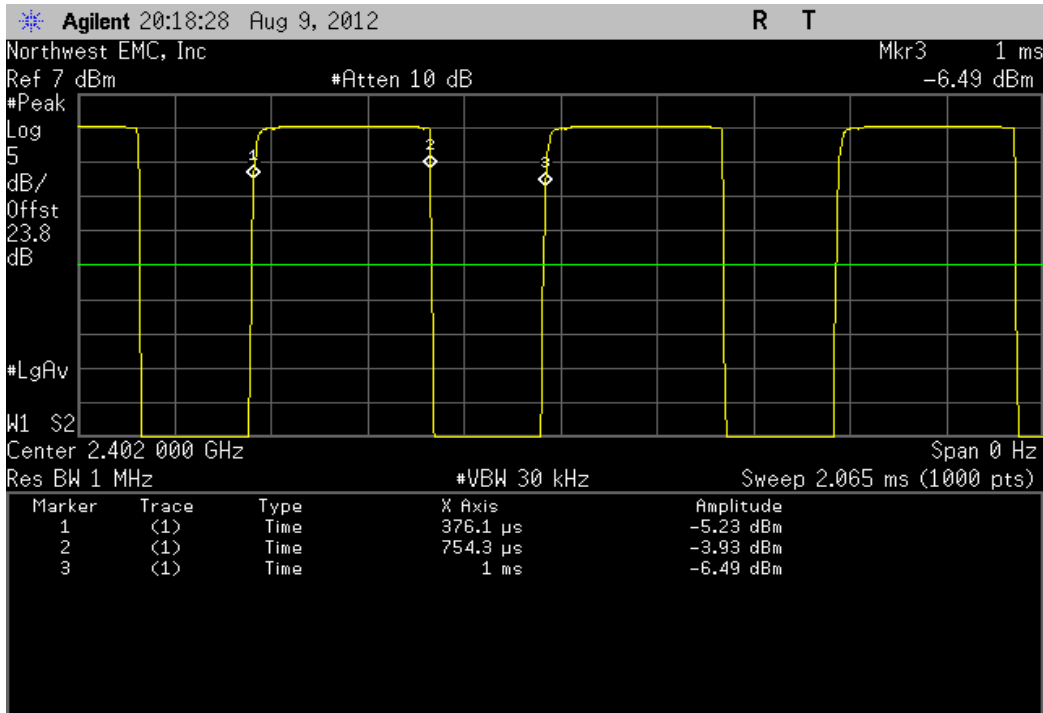
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	624.2 uS	1	60.6	N/A	N/A	



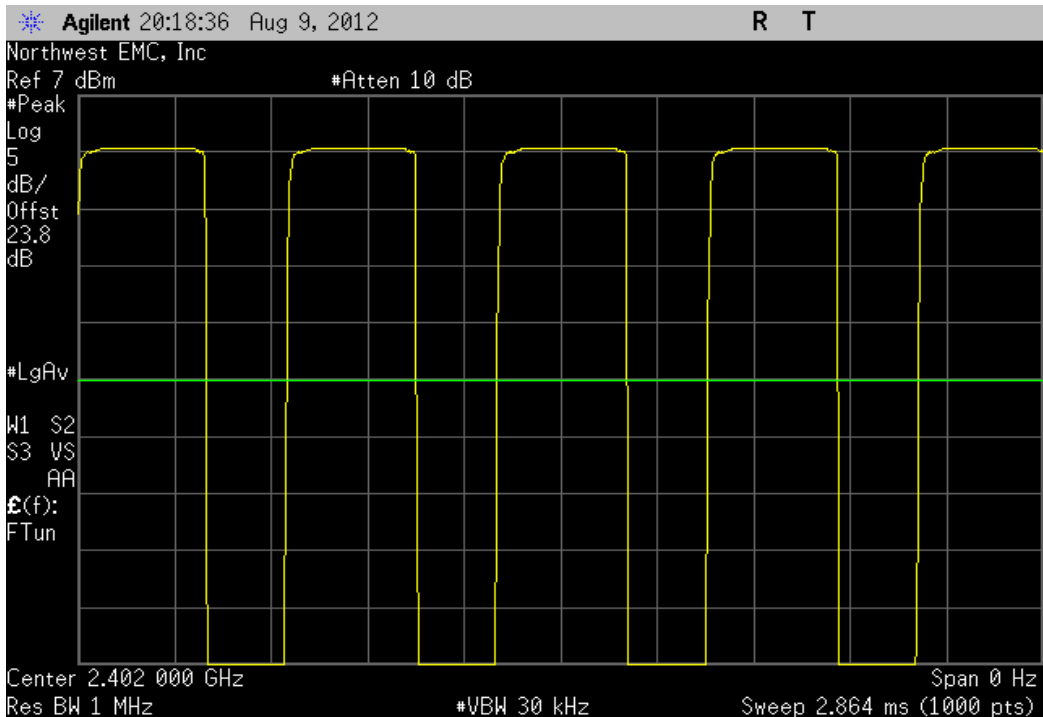
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



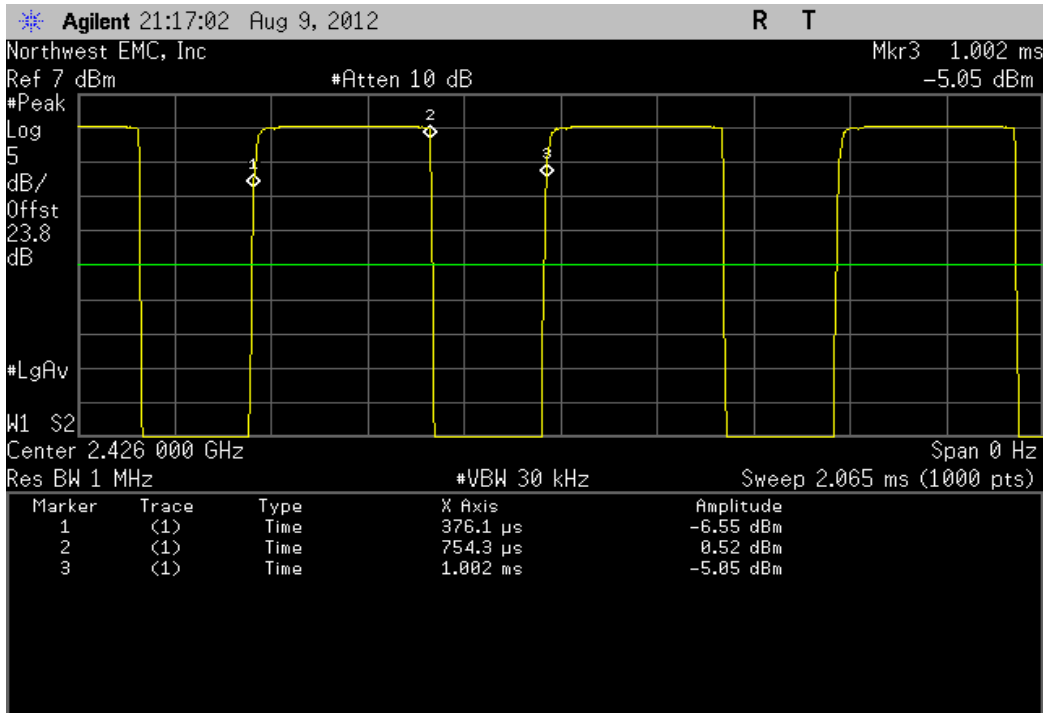
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	624.2 uS	1	60.6	N/A	N/A	



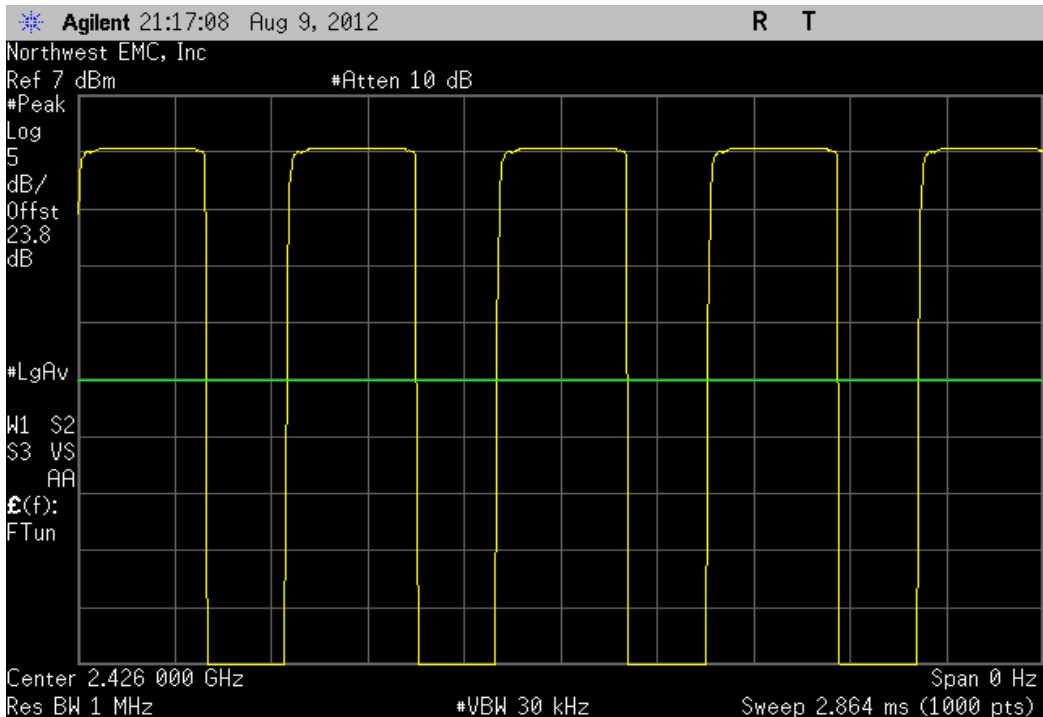
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



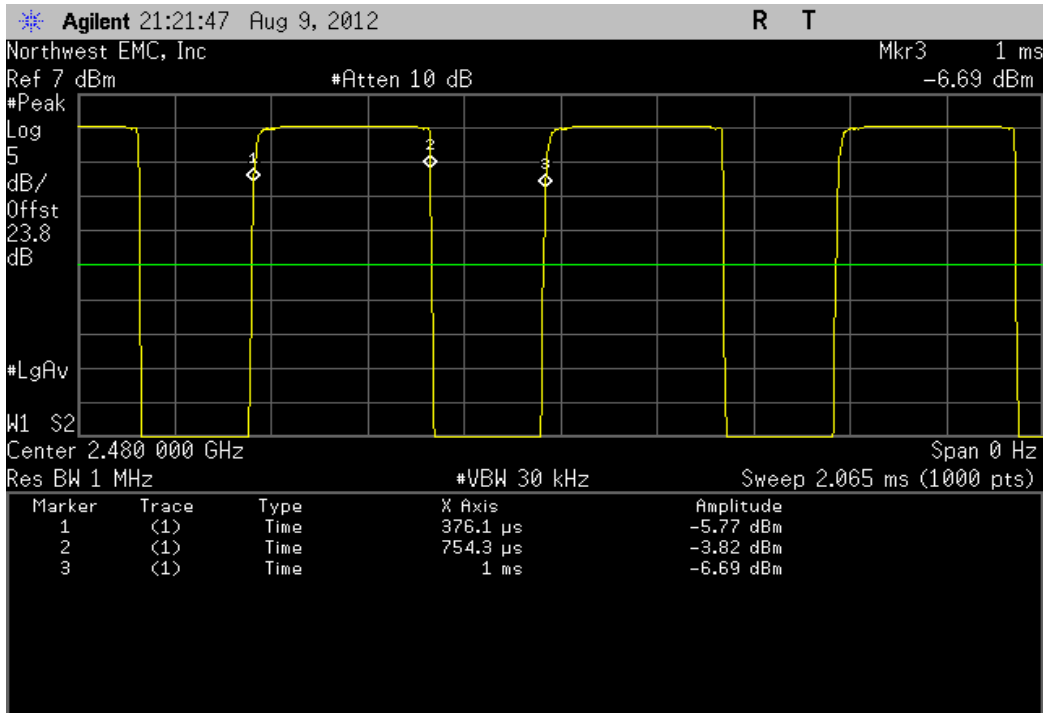
Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	626.2 uS	1	60.4	N/A	N/A	



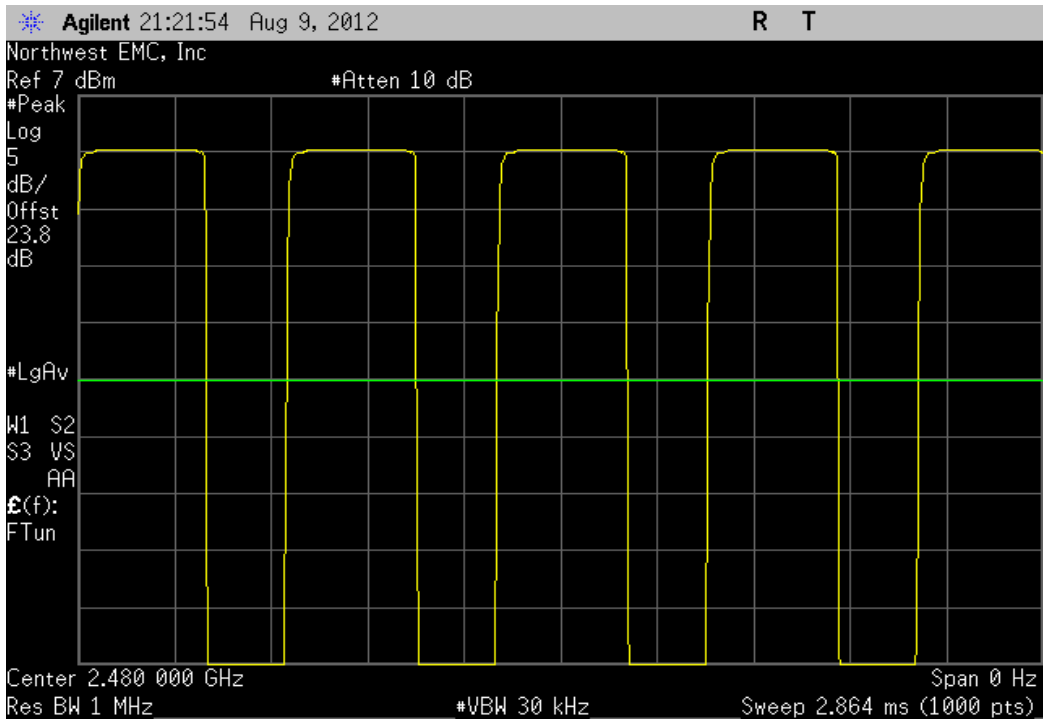
Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
N/A	N/A	5	N/A	N/A	N/A	



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result	
378.2 uS	624.2 uS	1	60.6	N/A	N/A	



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz						
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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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.



Occupied Bandwidth

XMit 2012.07.31
PsaTx 2012.08.06

EUT: 1516	Work Order: MCSO1602
Serial Number: 000309122652	Date: 08/09/12
Customer: Microsoft Corporation	Temperature: 24°C
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 1016
Tested by: Brandon Hobbs	Power: 12VDC
	Job Site: EV06

TEST SPECIFICATIONS	FCC 15.247:2012	Test Method	ANSI C63.10:2009
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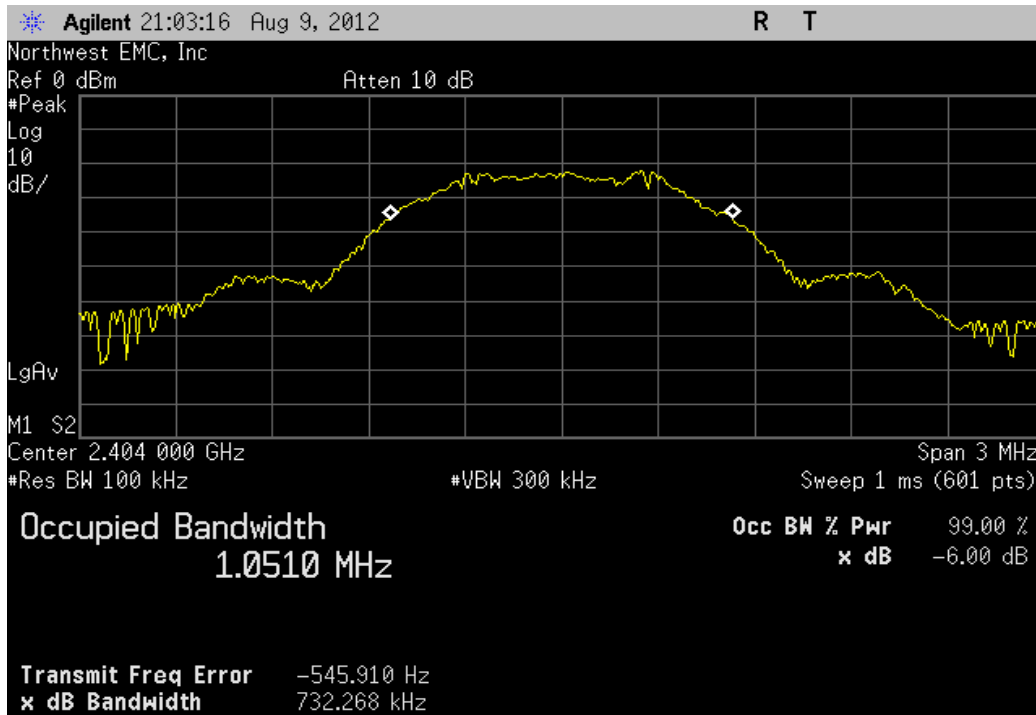
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

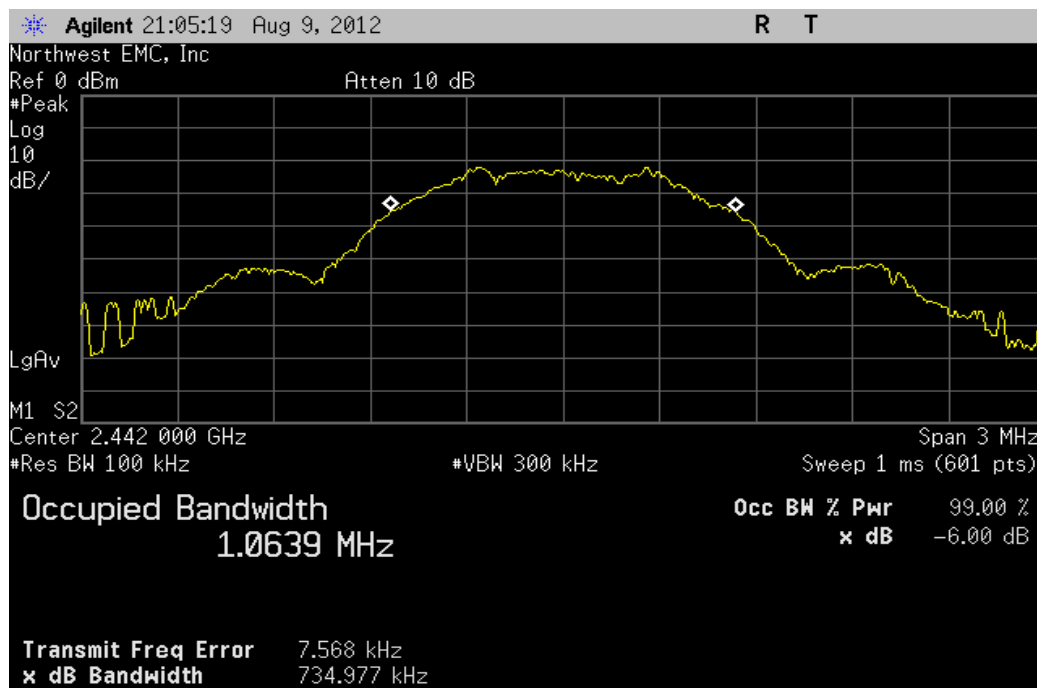
Configuration #	1	Signature <i>Robyn L. Polyzos</i>
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	Value	Limit	Result
Antenna A, Normal Test Conditions			
BE_LE			
(Data) Low Channel 1, 2404MHz	732.268 kHz	> 500 kHz	Pass
(Data) Mid Channel 20, 2442MHz	734.977 kHz	> 500 kHz	Pass
(Data) High Channel 38, 2478MHz	742.189 kHz	> 500 kHz	Pass
(Adv) Low Channel 12, 2402MHz	650.551 kHz	> 500 kHz	Pass
(Adv) Mid Channel 12, 2426MHz	705.728kHz	> 500 kHz	Pass
(Adv) High Channel 39, 2480MHz	605.065 kHz	> 500 kHz	Pass

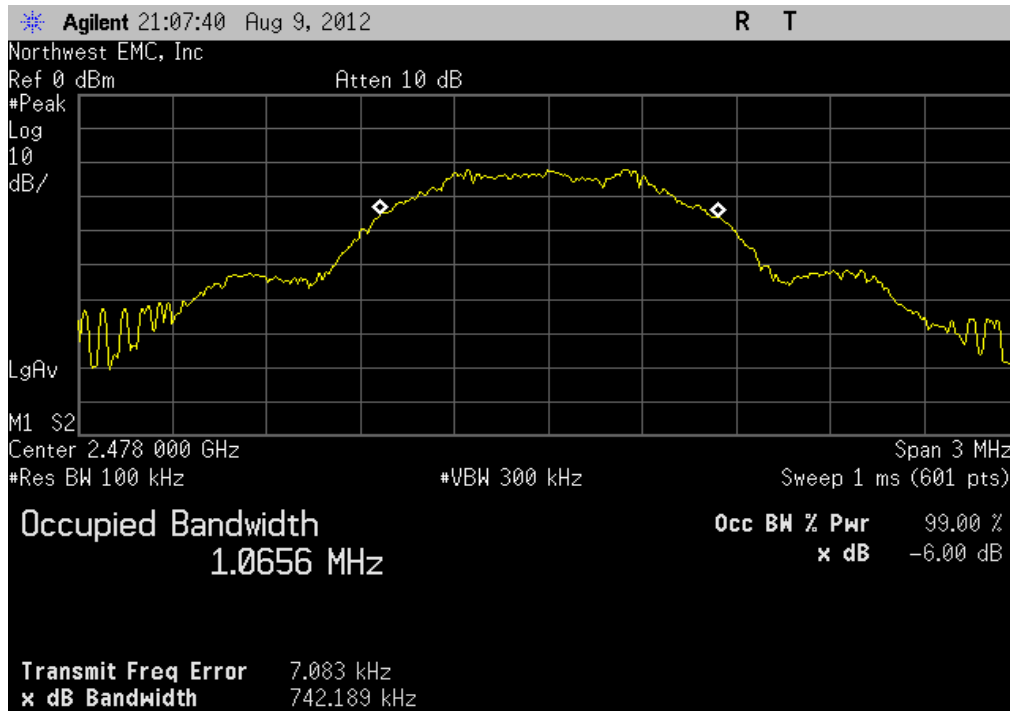
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz			
	Value	Limit	Result
	732.268 kHz	> 500 kHz	Pass



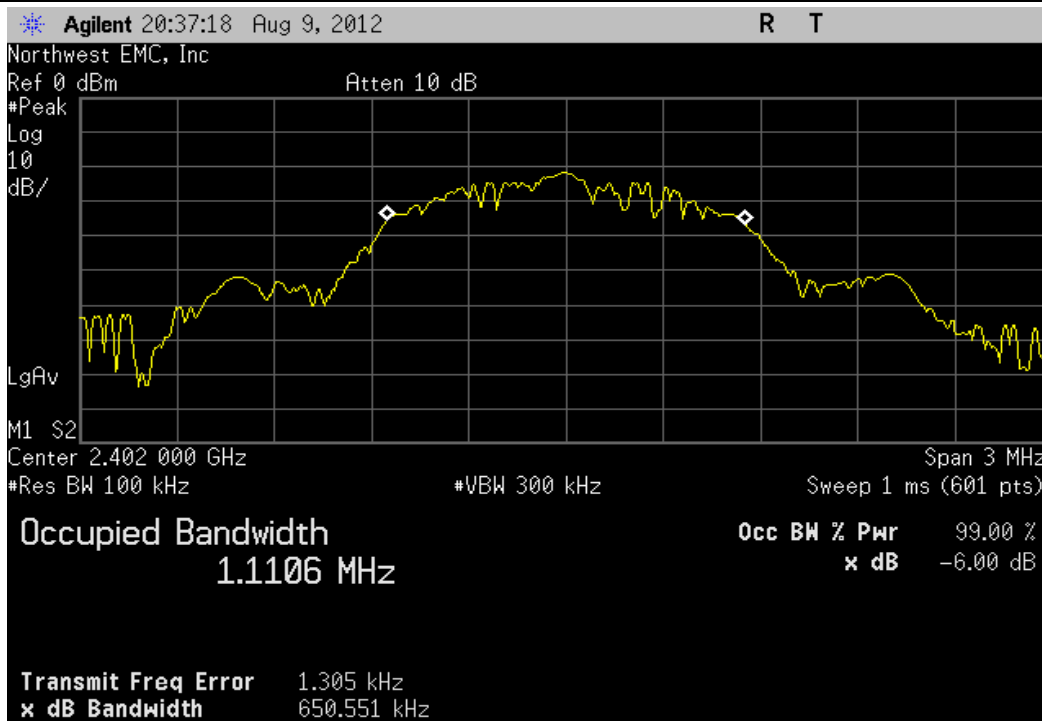
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz			
	Value	Limit	Result
	734.977 kHz	> 500 kHz	Pass



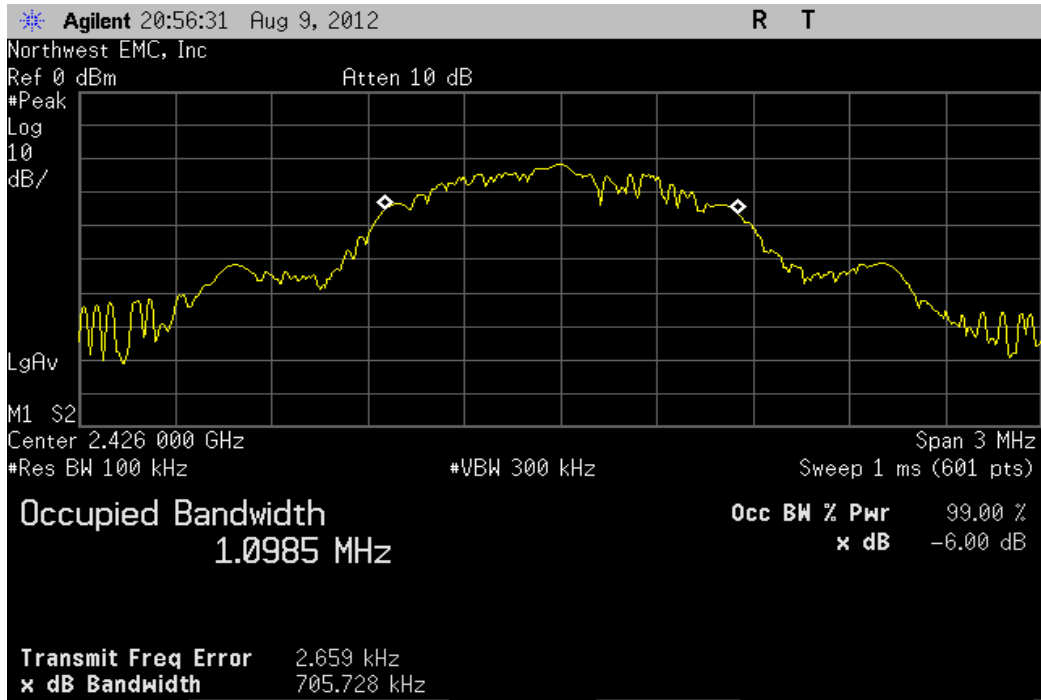
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz			
	Value	Limit	Result
	742.189 kHz	> 500 kHz	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
	Value	Limit	Result
	650.551 kHz	> 500 kHz	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz		
Value	Limit	Result
705.728kHz	> 500 kHz	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz		
Value	Limit	Result
605.065 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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +27dBm.



Output Power

EUT: 1516		Work Order: MCSO1602	
Serial Number: 000309122652		Date: 08/09/12	
Customer: Microsoft Corporation		Temperature: 24°C	
Attendees: None		Humidity: 45%	
Project: None		Barometric Pres.: 1016	
Tested by: Brandon Hobbs		Power: 12VDC	
		Job Site: EV06	

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

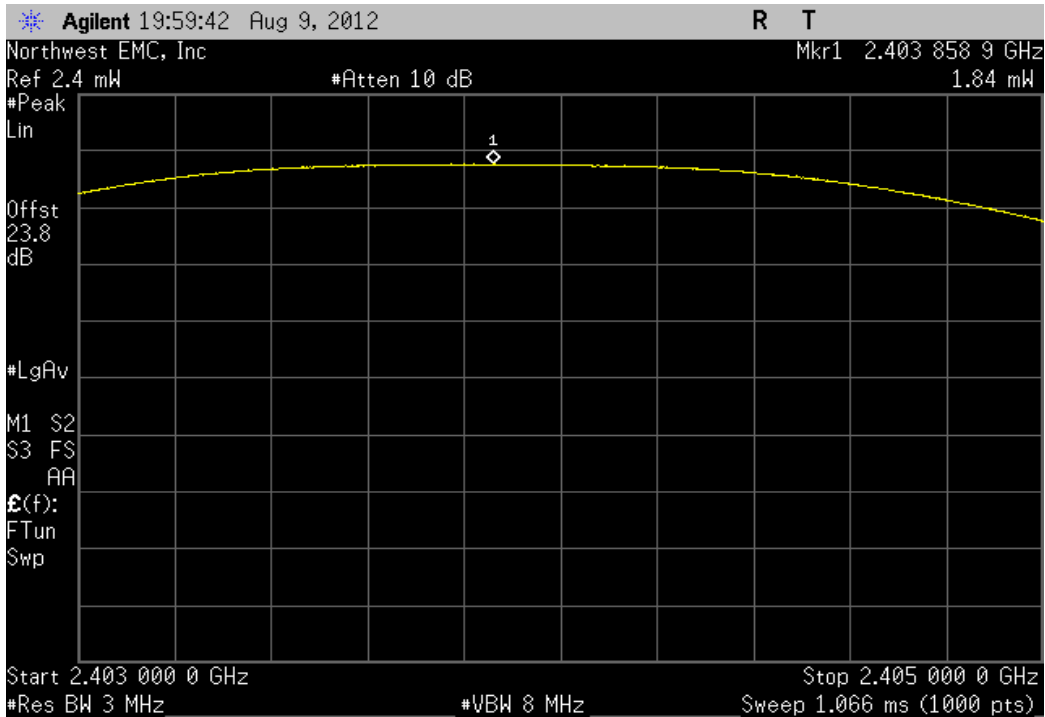
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

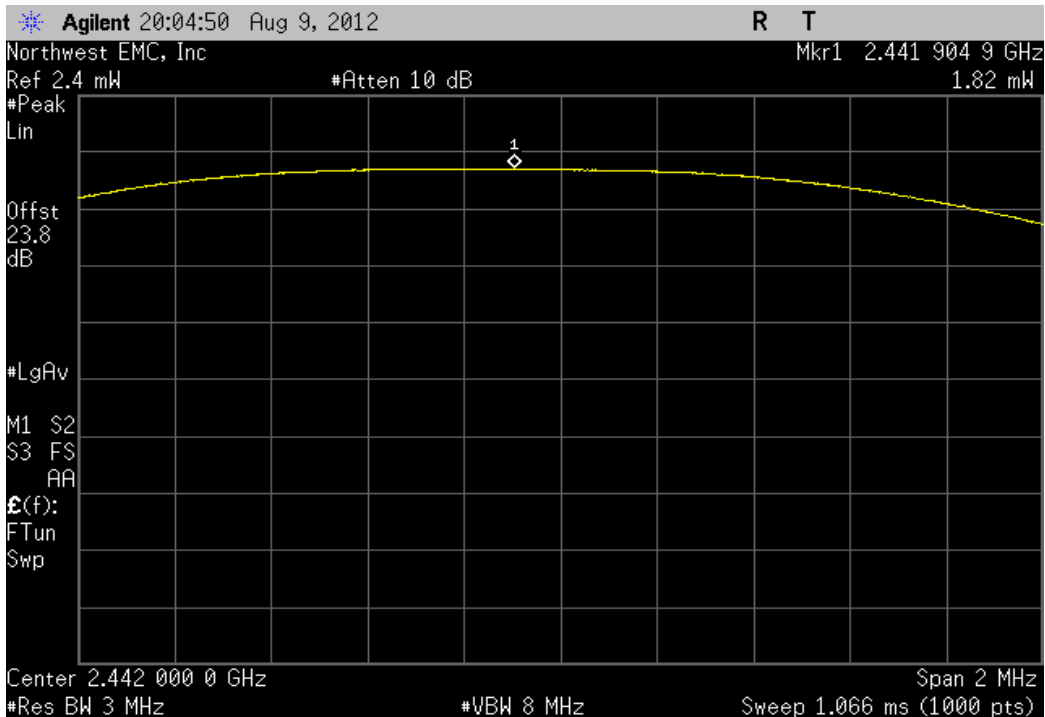
Configuration #	1	Signature <i>Anthony L. Polyzos</i>
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	Value	Limit	Result
Antenna A, Normal Test Conditions			
BE_LE			
(Data) Low Channel 1, 2404MHz	1.843 mW	< 1 W	Pass
(Data) Mid Channel 20, 2442MHz	1.821 mW	< 1 W	Pass
(Data) High Channel 38, 2478MHz	1.832 mW	< 1 W	Pass
(Adv) Low Channel 12, 2402MHz	1.81 mW	< 1 W	Pass
(Adv) Mid Channel 12, 2426MHz	1.824 mW	< 1 W	Pass
(Adv) High Channel 39, 2480MHz	1.801 mW	< 1 W	Pass

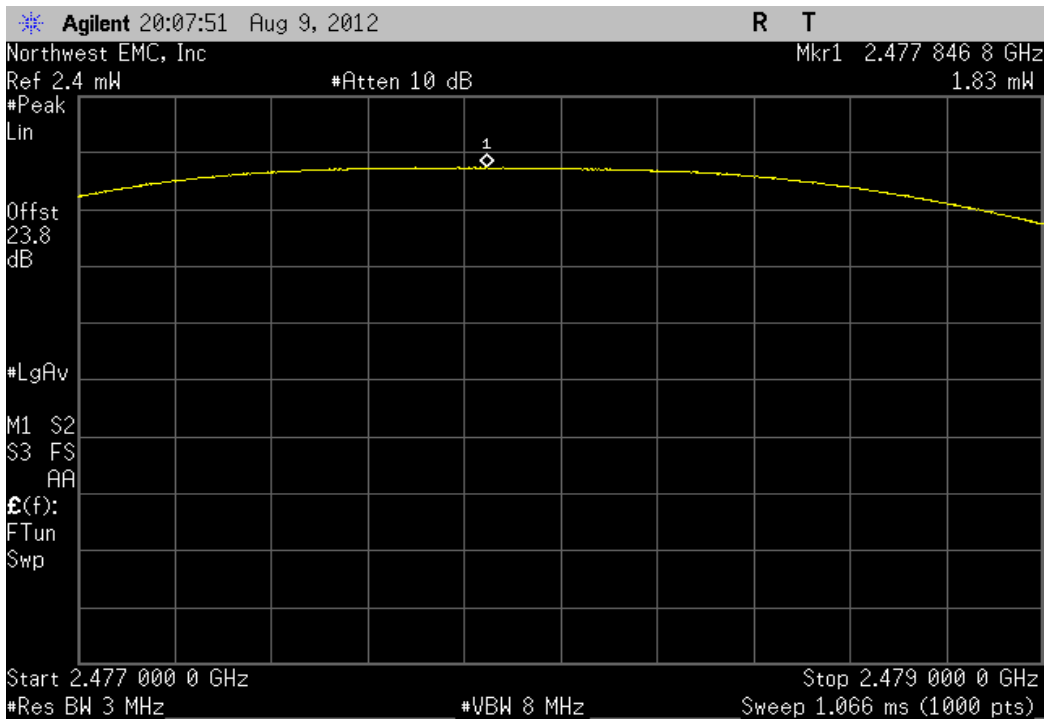
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz			
	Value	Limit	Result
	1.843 mW	< 1 W	Pass



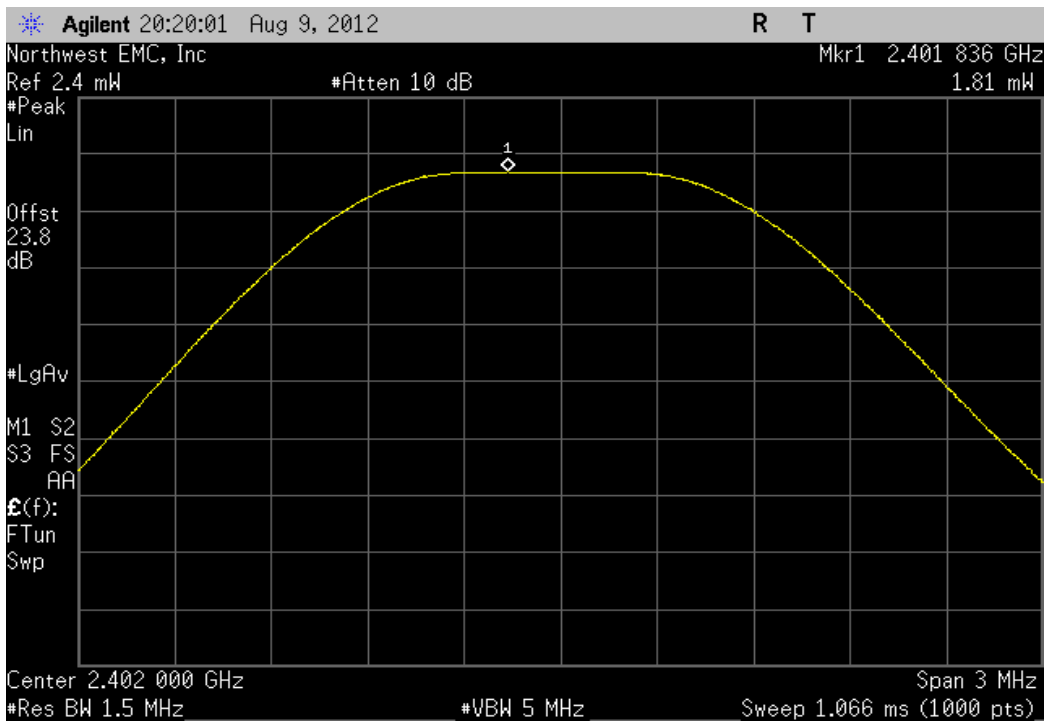
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz			
	Value	Limit	Result
	1.821 mW	< 1 W	Pass



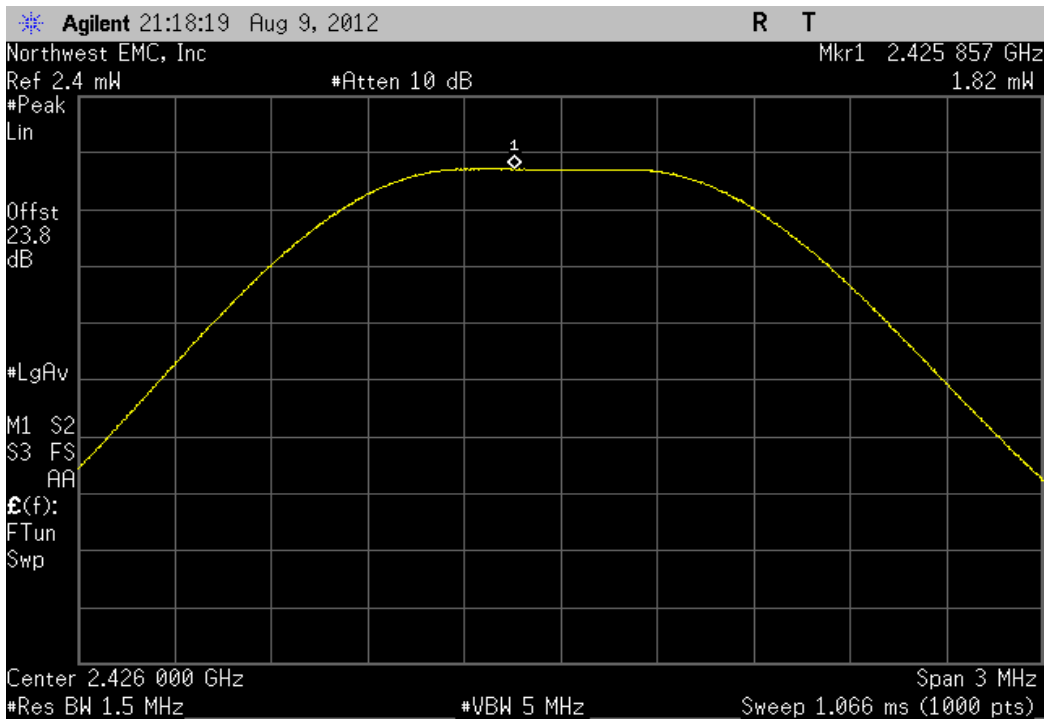
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz			
	Value	Limit	Result
	1.832 mW	< 1 W	Pass



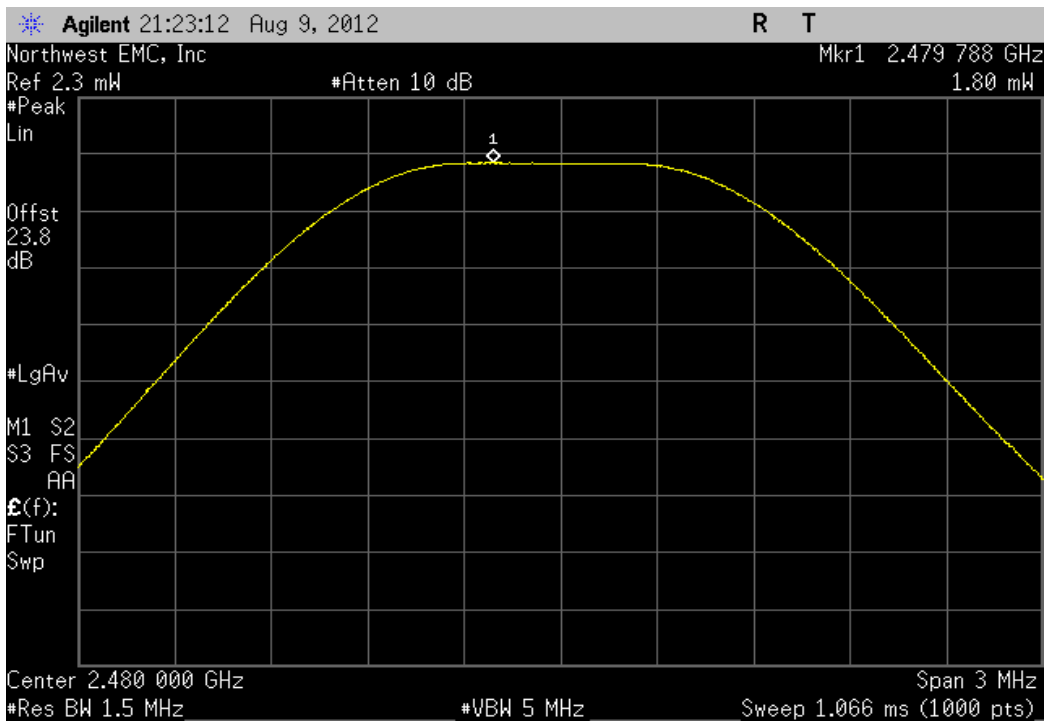
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
	Value	Limit	Result
	1.81 mW	< 1 W	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz			
	Value	Limit	Result
	1.824 mW	< 1 W	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz			
	Value	Limit	Result
	1.801 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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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

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



Band Edge Compliance

XMit 2012.07.31
PsaTx 2012.08.06

EUT: 1516	Work Order: MCSO1601
Serial Number: 000309122652	Date: 08/09/12
Customer: Microsoft Corporation	Temperature: 24°C
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 1016
Tested by: Brandon Hobbs	Power: 12VDC
	Job Site: EV06

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

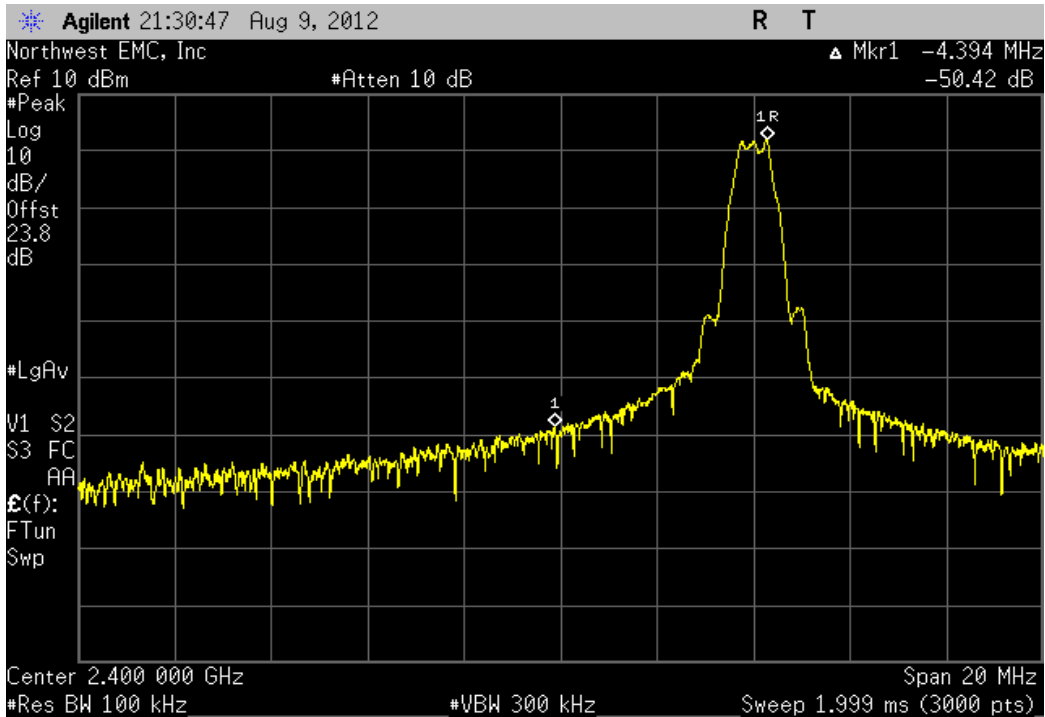
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

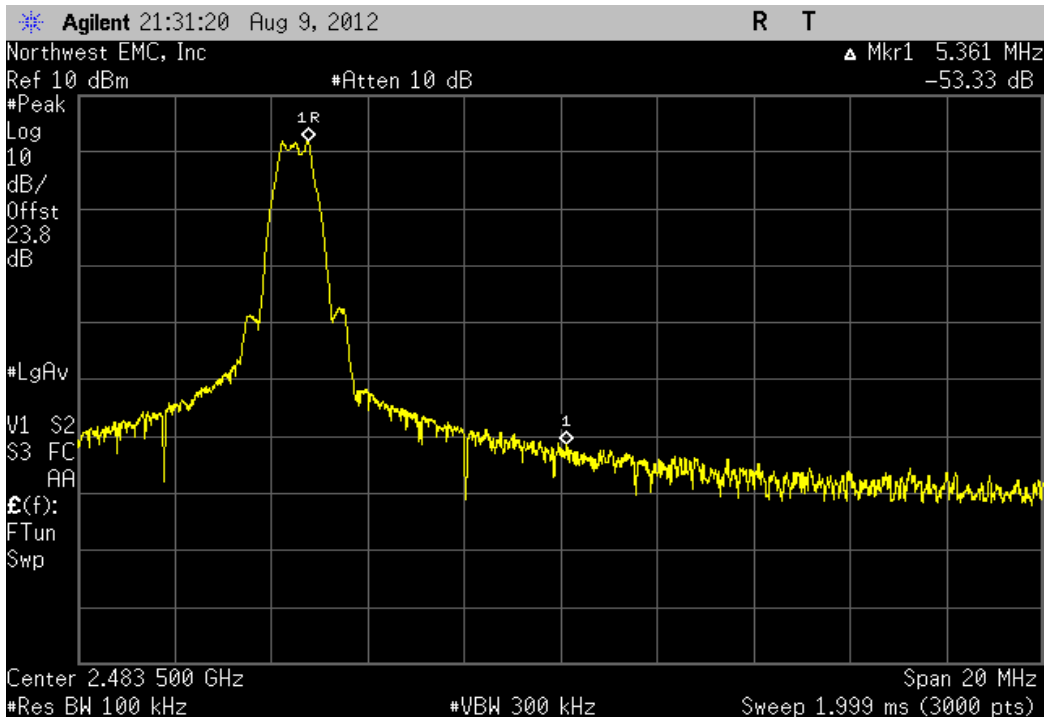
Configuration #	1	<i>Brandon Hobbs</i> Signature
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	Value	Limit	Result
Antenna A, Normal Test Conditions			
BE_LE			
(Data) Low Channel 1, 2404MHz	-50.42 dBc	≤ -20 dBc	Pass
(Data) High Channel 38, 2478MHz	-53.33 dBc	≤ -20 dBc	Pass
(Adv) Low Channel 12, 2402MHz	-44.16 dBc	≤ -20 dBc	Pass
(Adv) High Channel 39, 2480MHz	-50.44 dBc	≤ -20 dBc	Pass

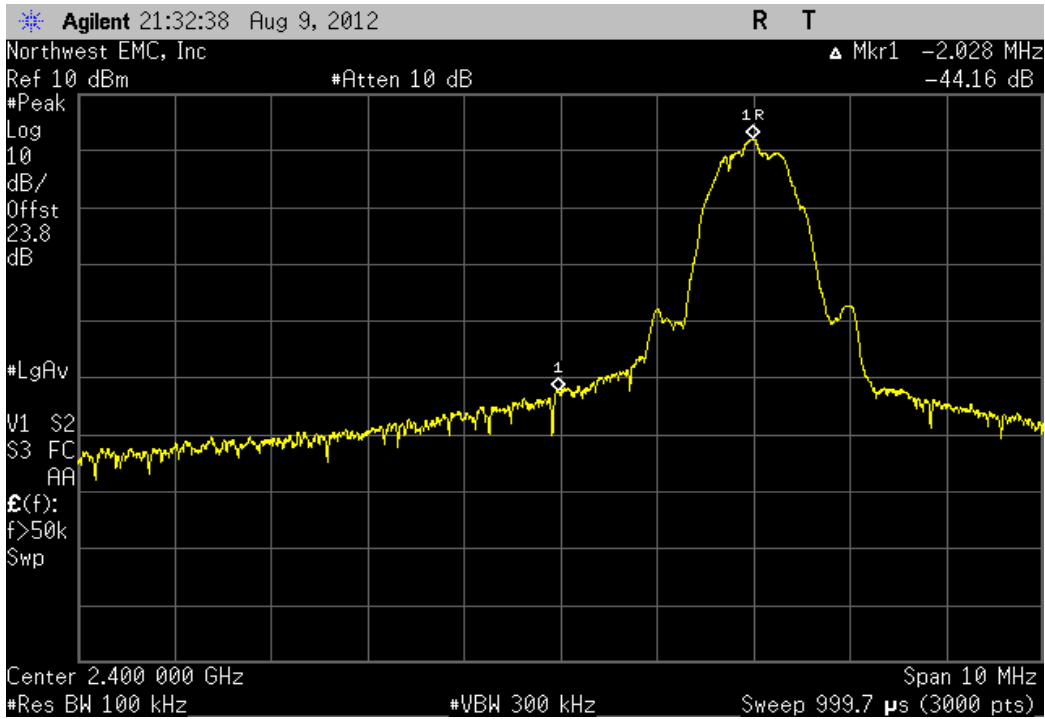
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz			
	Value	Limit	Result
	-50.42 dBc	≤ -20 dBc	Pass



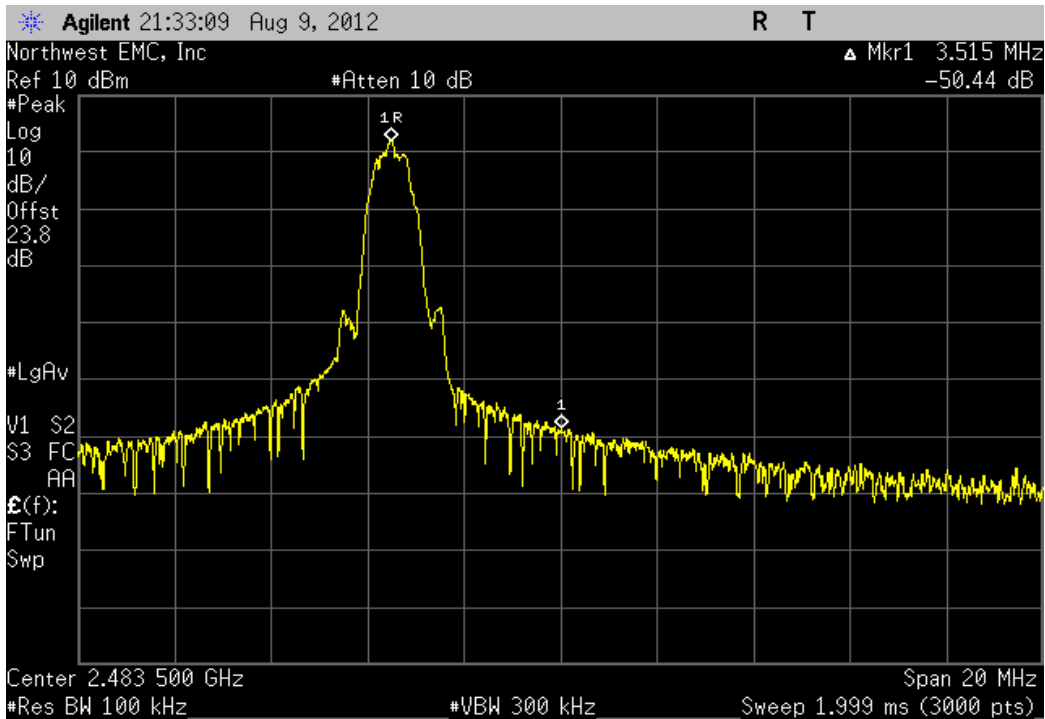
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz			
	Value	Limit	Result
	-53.33 dBc	≤ -20 dBc	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
	Value	Limit	Result
	-44.16 dBc	≤ -20 dBc	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz			
	Value	Limit	Result
	-50.44 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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 2012.07.31
PsaTx 2012.08.06

EUT: 1516	Work Order: MCSO1601
Serial Number: 000309122652	Date: 08/09/12
Customer: Microsoft Corporation	Temperature: 24°C
Attendees: None	Humidity: 41%
Project: None	Barometric Pres.: 1021
Tested by: Brandon Hobbs	Power: 12VDC
	Job Site: EV06

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

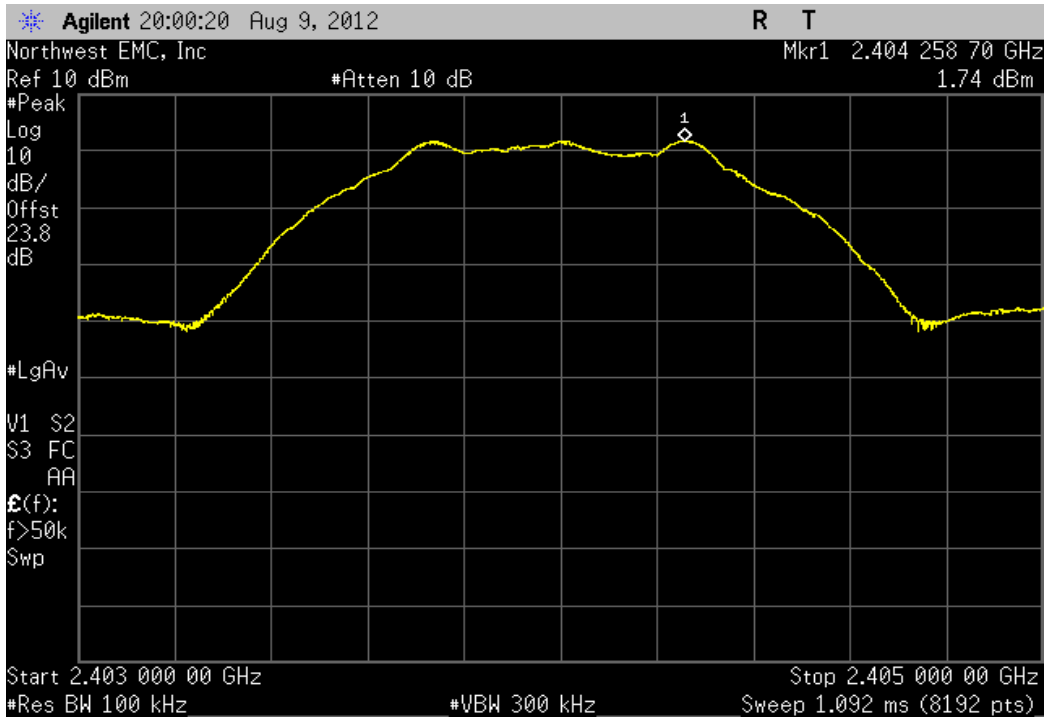
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

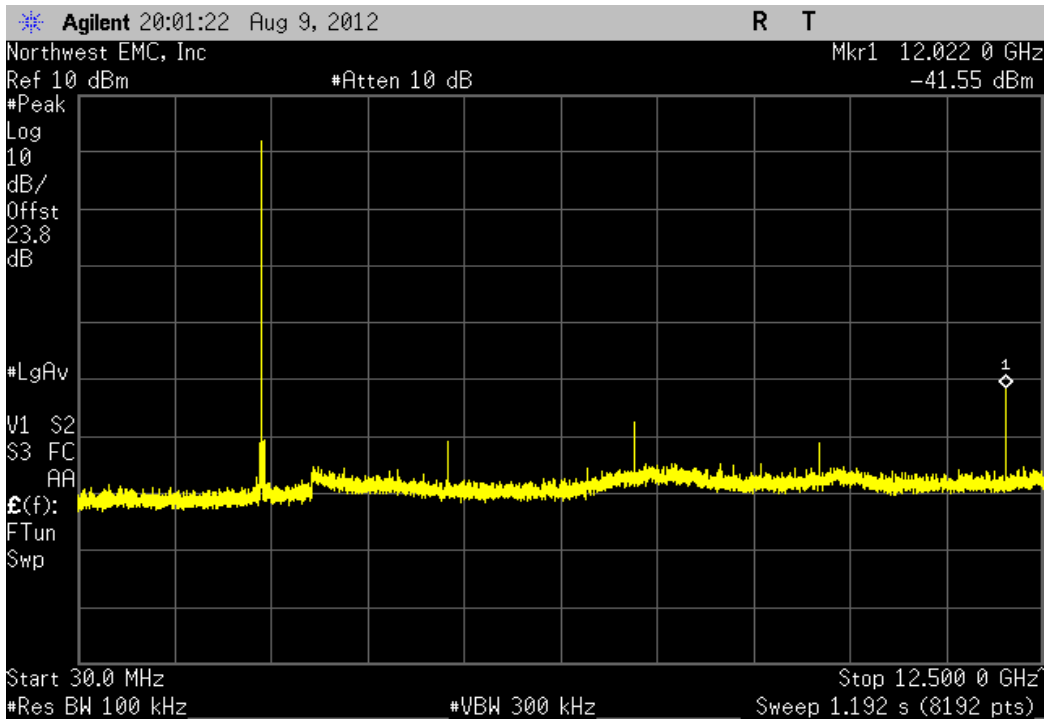
Configuration #	1	Signature <i>Andy Le Polyn</i>
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Antenna A, Normal Test Conditions	Frequency Range	Value	Limit	Result
BE_LE				
(Data) Low Channel 1, 2404MHz	Fundamental	N/A	N/A	N/A
(Data) Low Channel 1, 2404MHz	30 MHz - 12.5 GHz	-43.29 dBc	≤ -20 dBc	Pass
(Data) Low Channel 1, 2404MHz	12.5 GHz - 25 GHz	-52.07 dBc	≤ -20 dBc	Pass
(Data) Mid Channel 20, 2442MHz	Fundamental	N/A	N/A	N/A
(Data) Mid Channel 20, 2442MHz	30 MHz - 12.5 GHz	-44.36 dBc	≤ -20 dBc	Pass
(Data) Mid Channel 20, 2442MHz	12.5 GHz - 25 GHz	-52.81 dBc	≤ -20 dBc	Pass
(Data) High Channel 38, 2478MHz	Fundamental	N/A	N/A	N/A
(Data) High Channel 38, 2478MHz	30 MHz - 12.5 GHz	-43.95 dBc	≤ -20 dBc	Pass
(Data) High Channel 38, 2478MHz	12.5 GHz - 25 GHz	-52.39 dBc	≤ -20 dBc	Pass
(Adv) Low Channel 12, 2402MHz	Fundamental	N/A	N/A	N/A
(Adv) Low Channel 12, 2402MHz	30 MHz - 12.5 GHz	-46.56 dBc	≤ -20 dBc	Pass
(Adv) Low Channel 12, 2402MHz	12.5 GHz - 25 GHz	-53.36 dBc	≤ -20 dBc	Pass
(Adv) Mid Channel 12, 2426MHz	Fundamental	N/A	N/A	N/A
(Adv) Mid Channel 12, 2426MHz	30 MHz - 12.5 GHz	-45.73 dBc	≤ -20 dBc	Pass
(Adv) Mid Channel 12, 2426MHz	12.5 GHz - 25 GHz	-52.68 dBc	≤ -20 dBc	Pass
(Adv) High Channel 39, 2480MHz	Fundamental	N/A	N/A	N/A
(Adv) High Channel 39, 2480MHz	30 MHz - 12.5 GHz	-45.98 dBc	≤ -20 dBc	Pass
(Adv) High Channel 39, 2480MHz	12.5 GHz - 25 GHz	-52.9 dBc	≤ -20 dBc	Pass

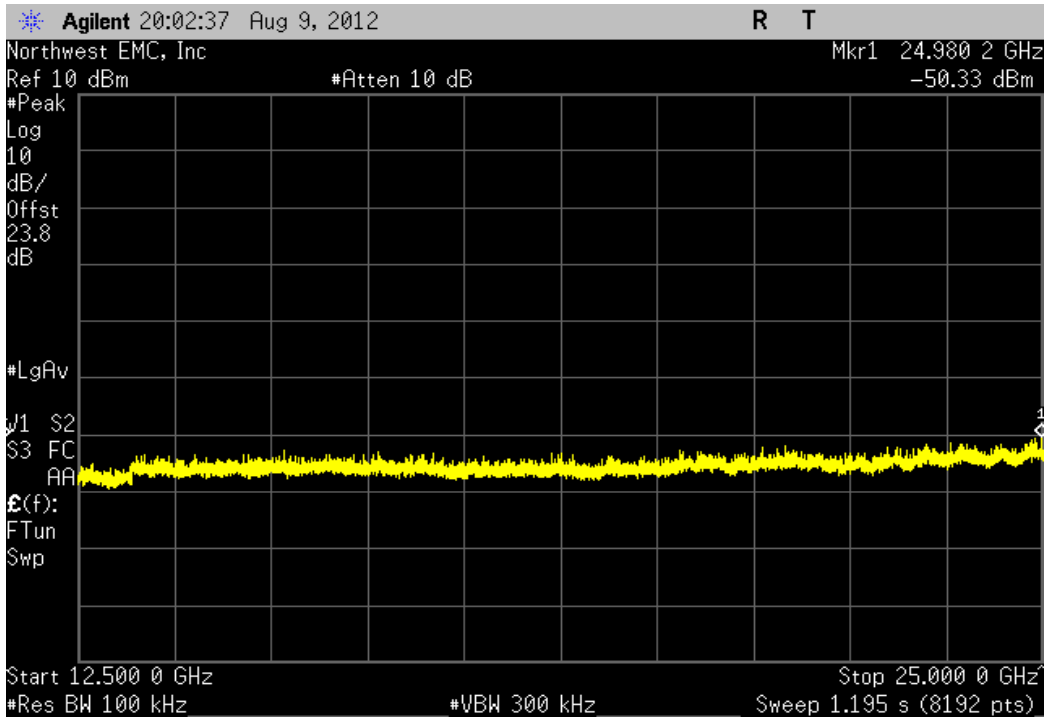
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



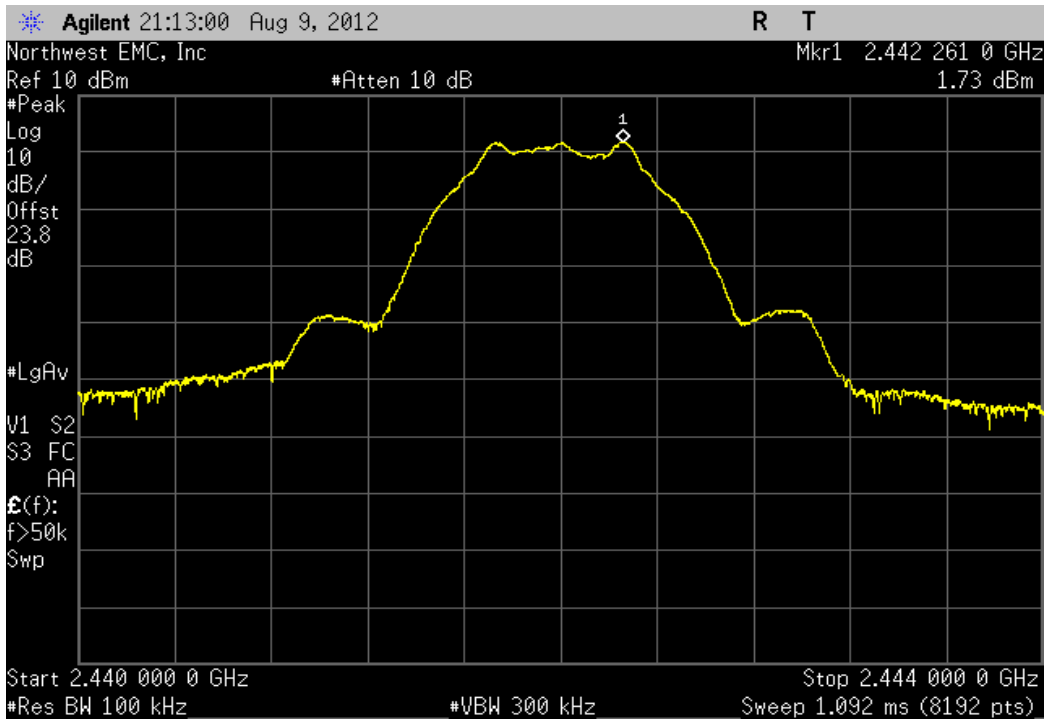
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-43.29 dBc	≤ -20 dBc	Pass



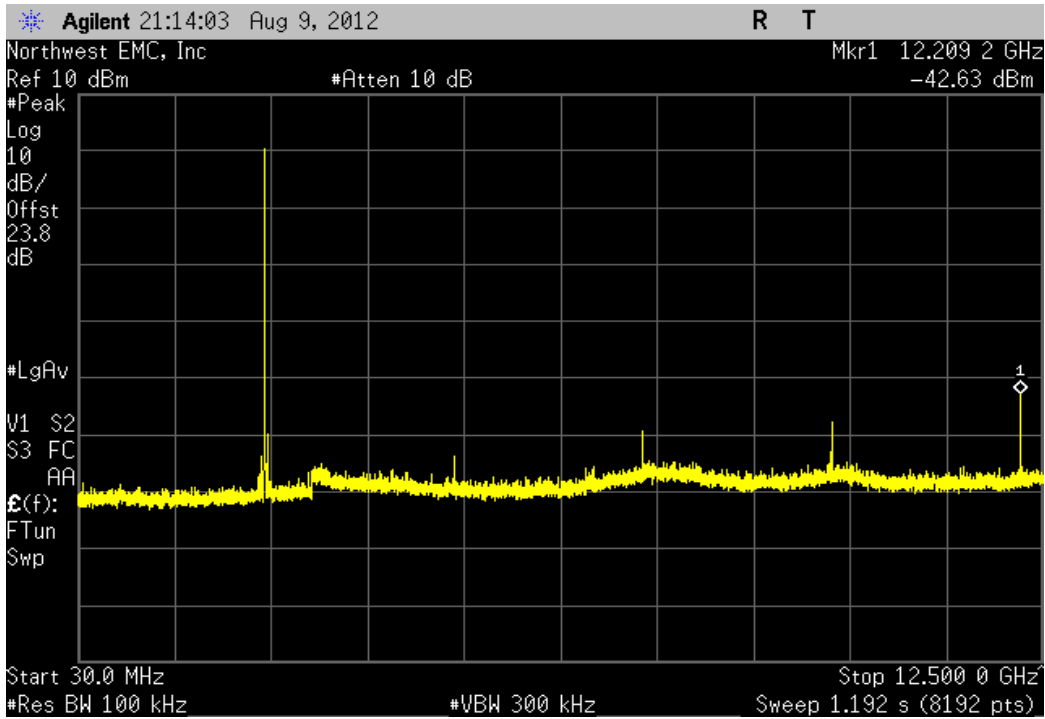
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.07 dBc	≤ -20 dBc	Pass



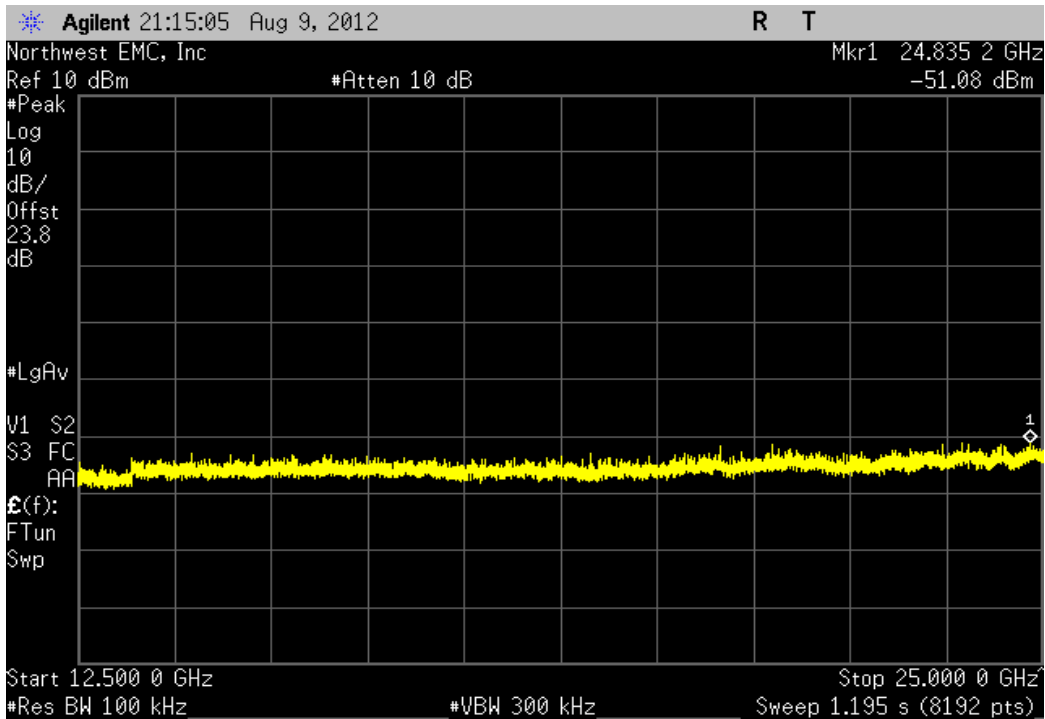
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



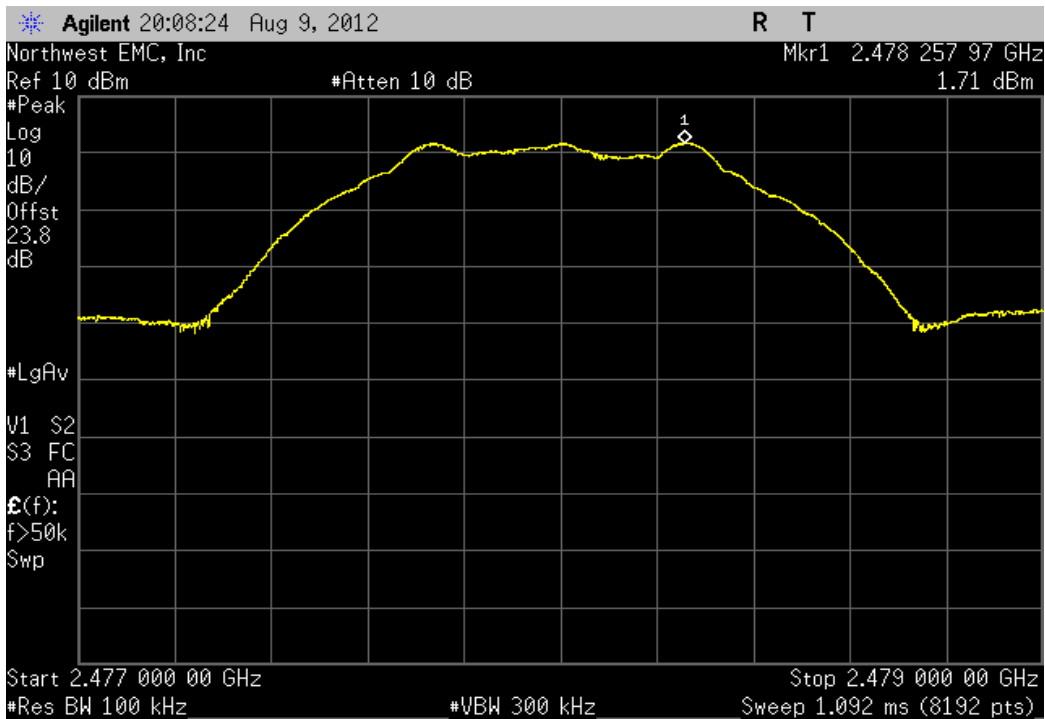
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-44.36 dBc	≤ -20 dBc	Pass



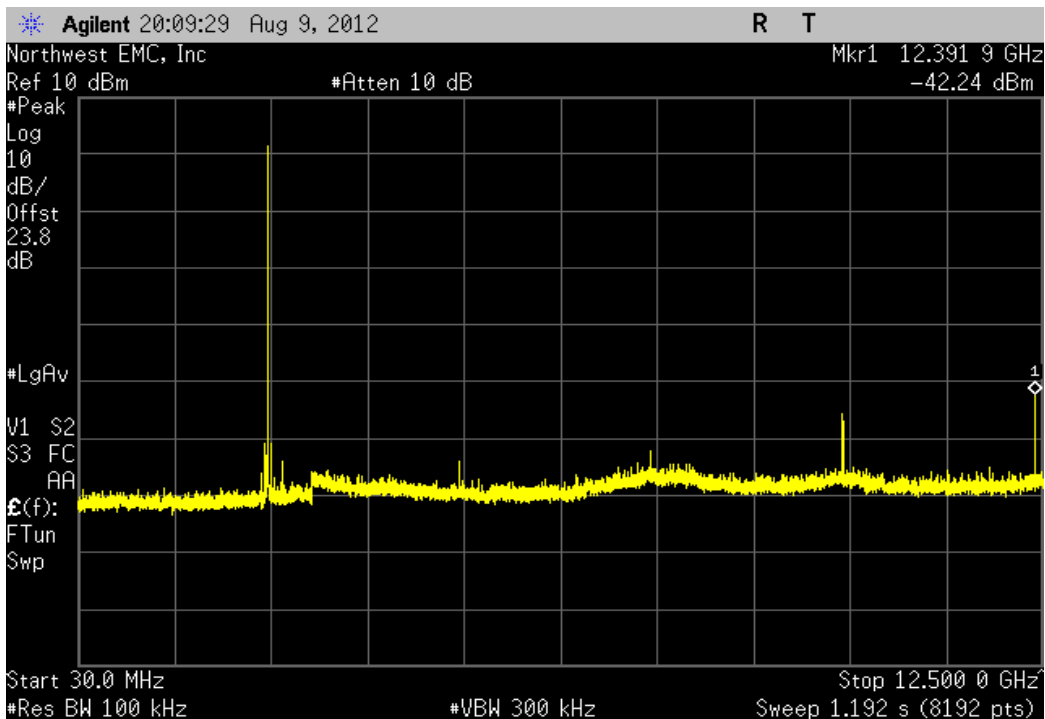
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.81 dBc	≤ -20 dBc	Pass



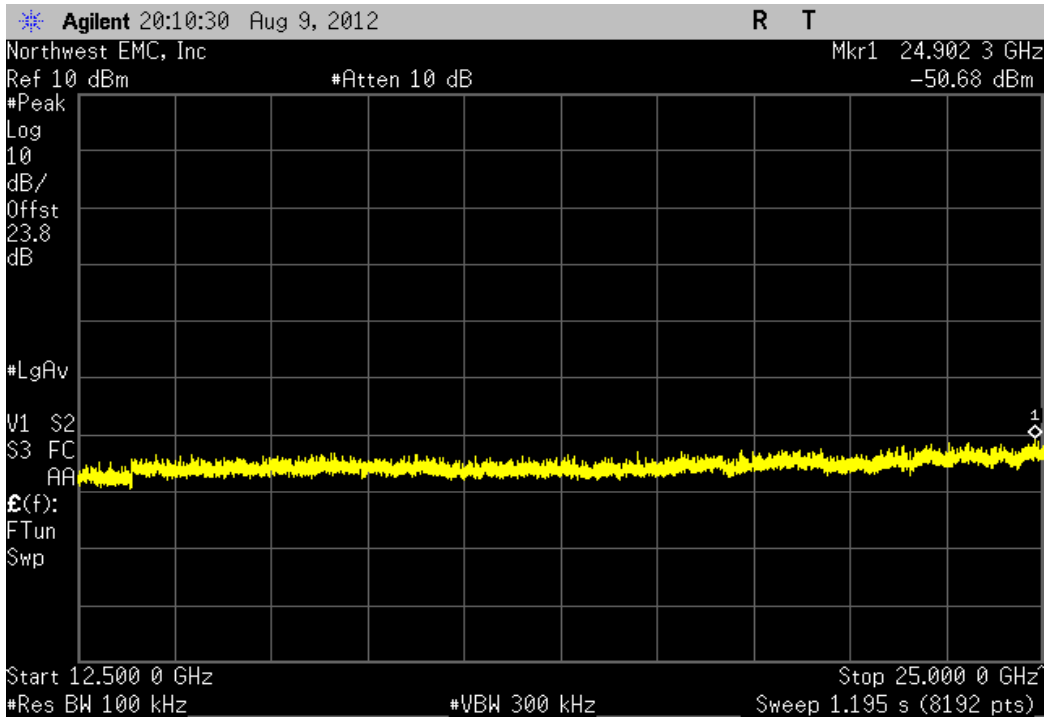
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



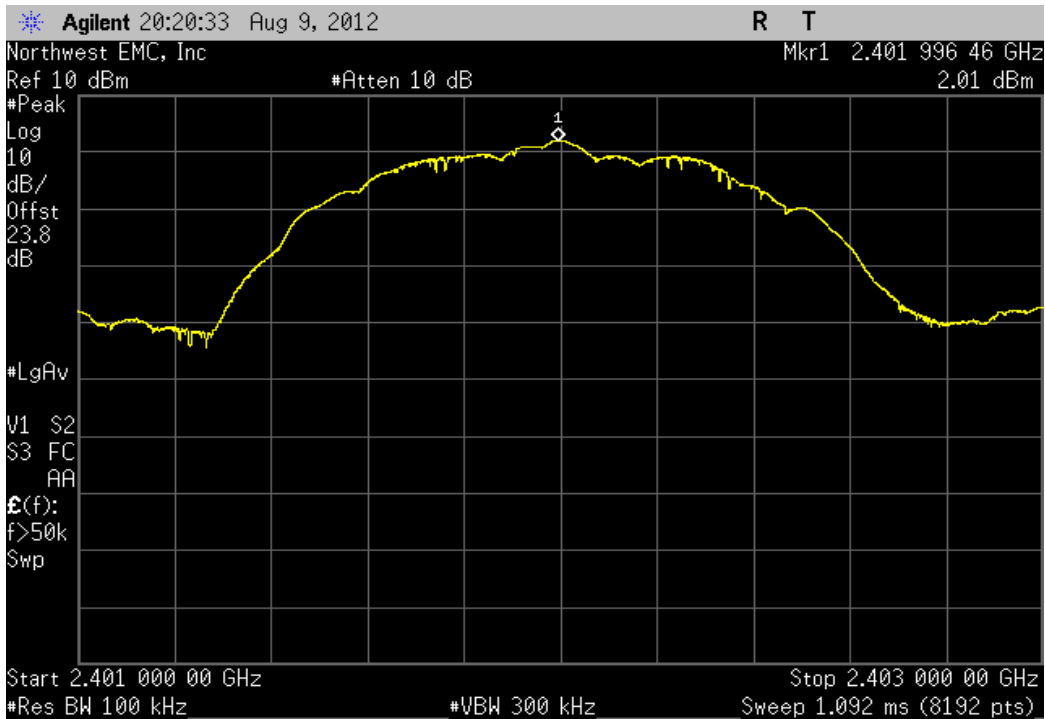
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-43.95 dBc	≤ -20 dBc	Pass



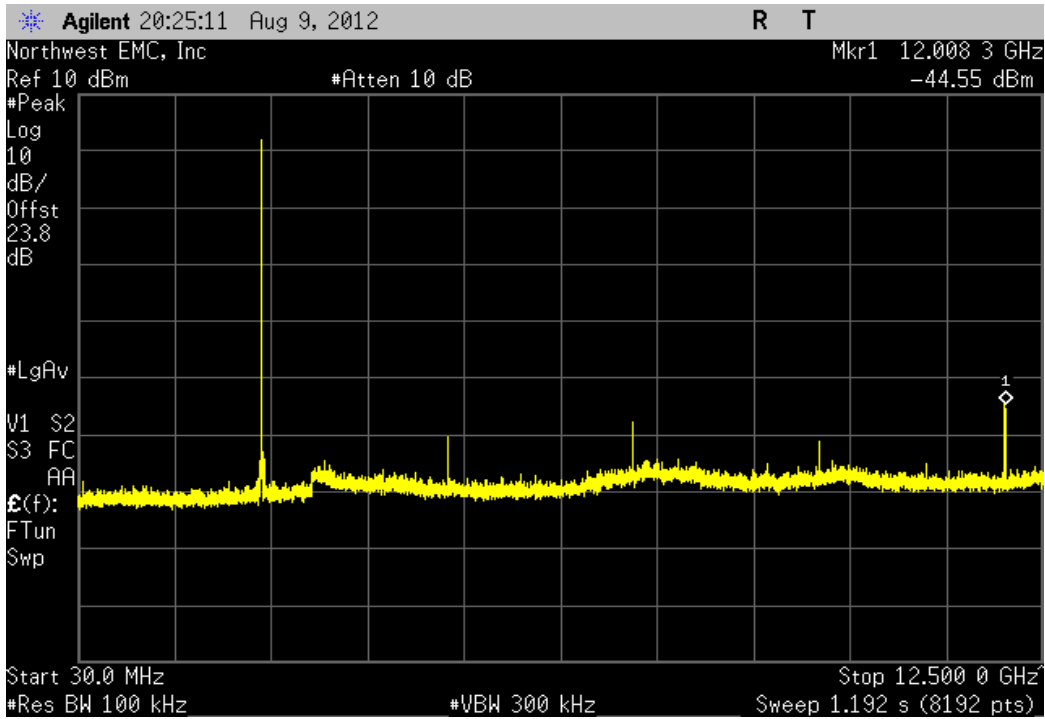
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.39 dBc	≤ -20 dBc	Pass



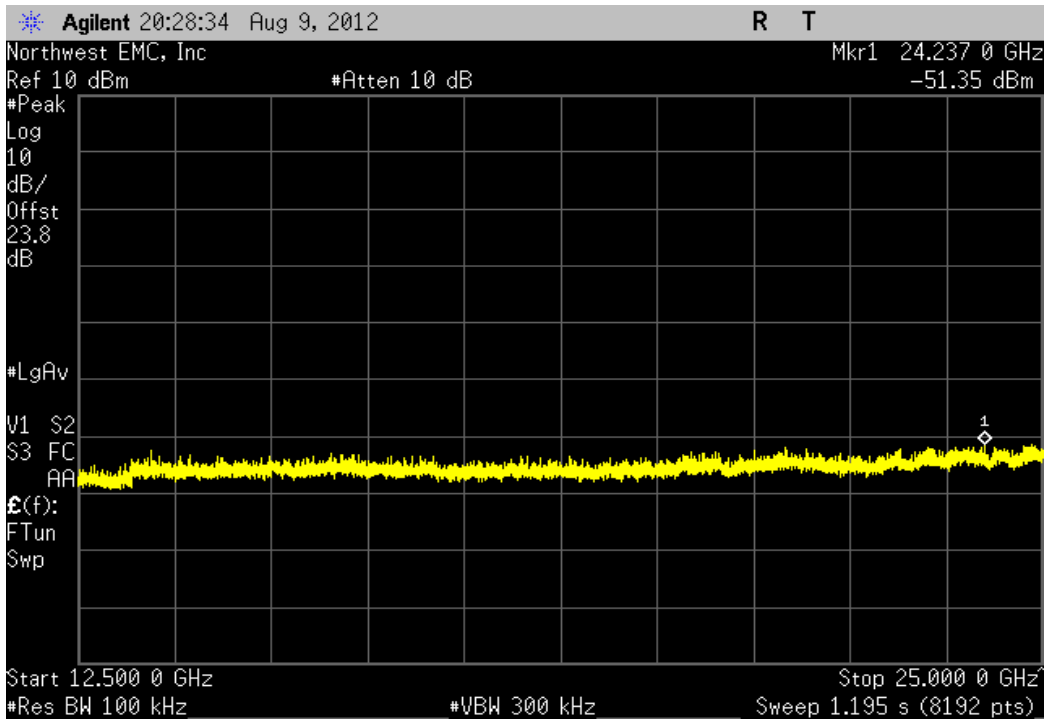
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



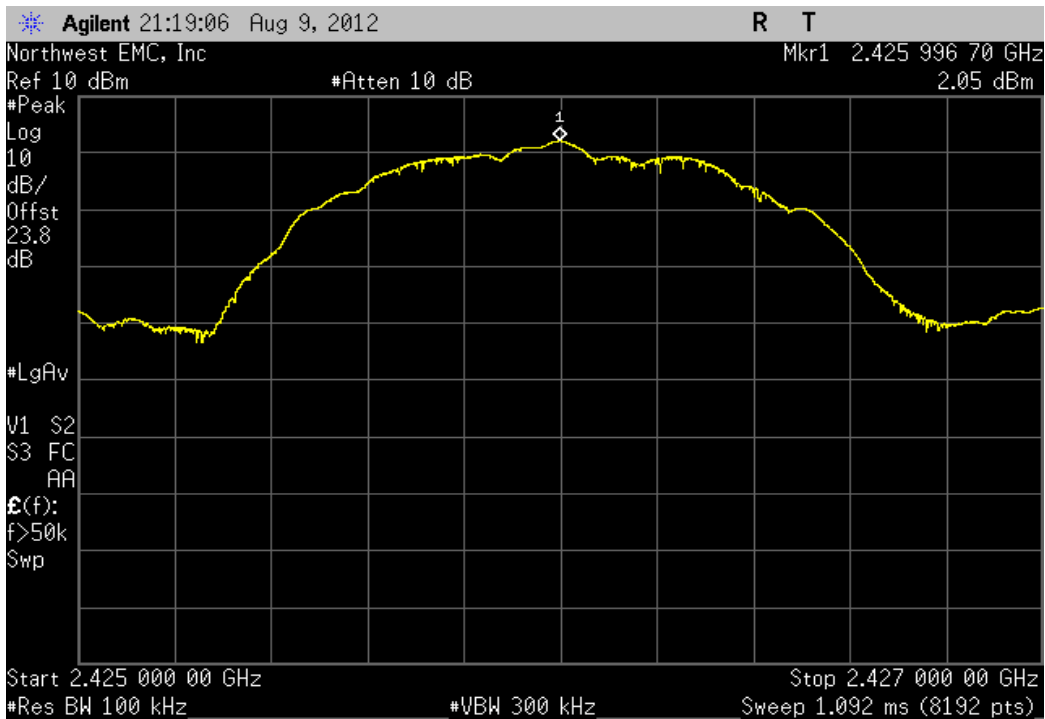
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-46.56 dBc	≤ -20 dBc	Pass



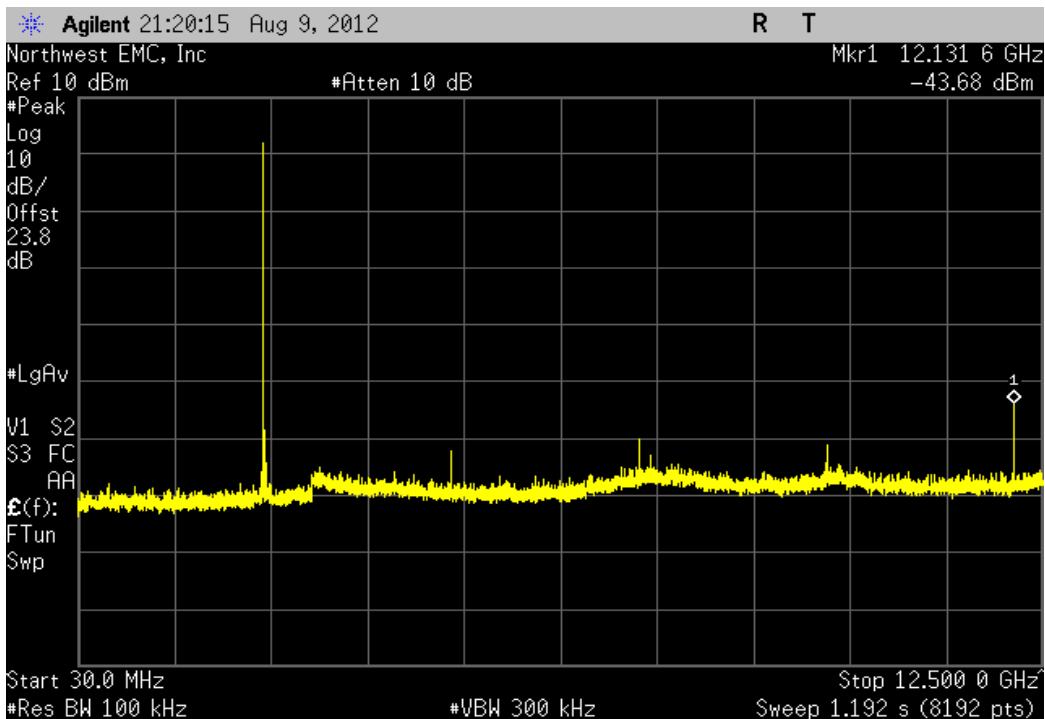
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-53.36 dBc	≤ -20 dBc	Pass



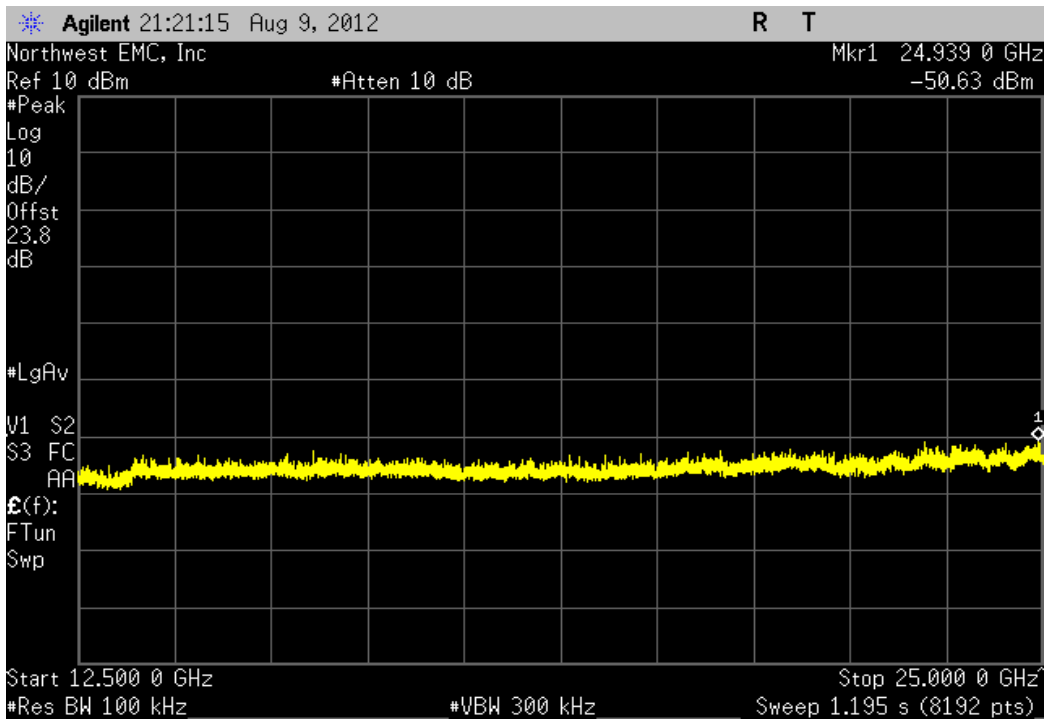
Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



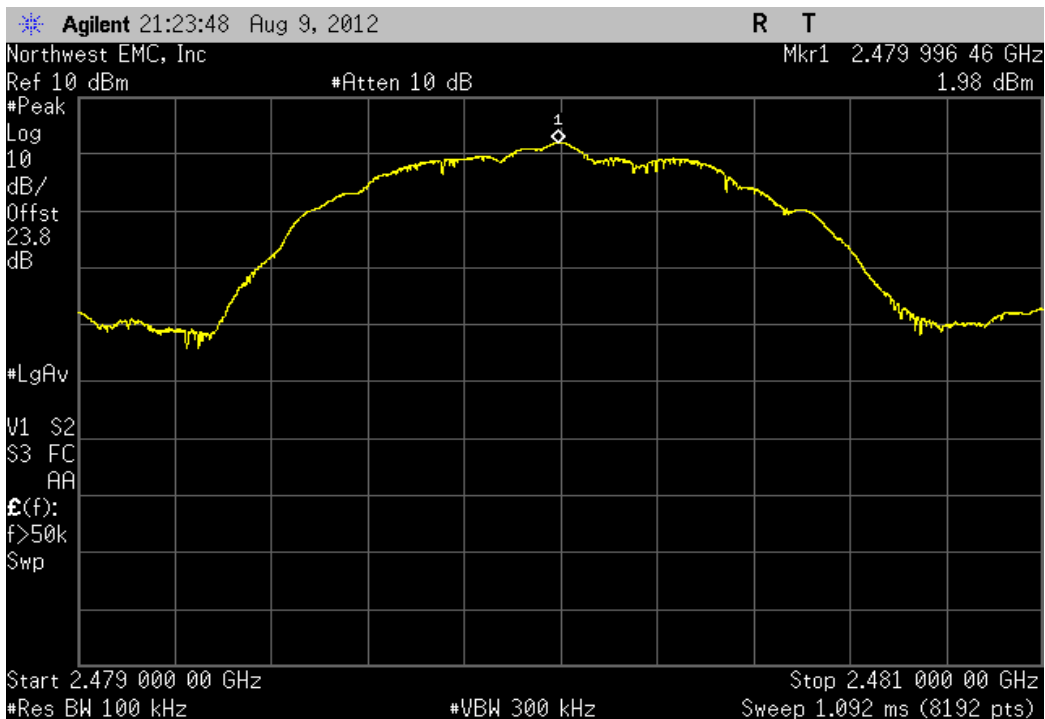
Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-45.73 dBc	≤ -20 dBc	Pass



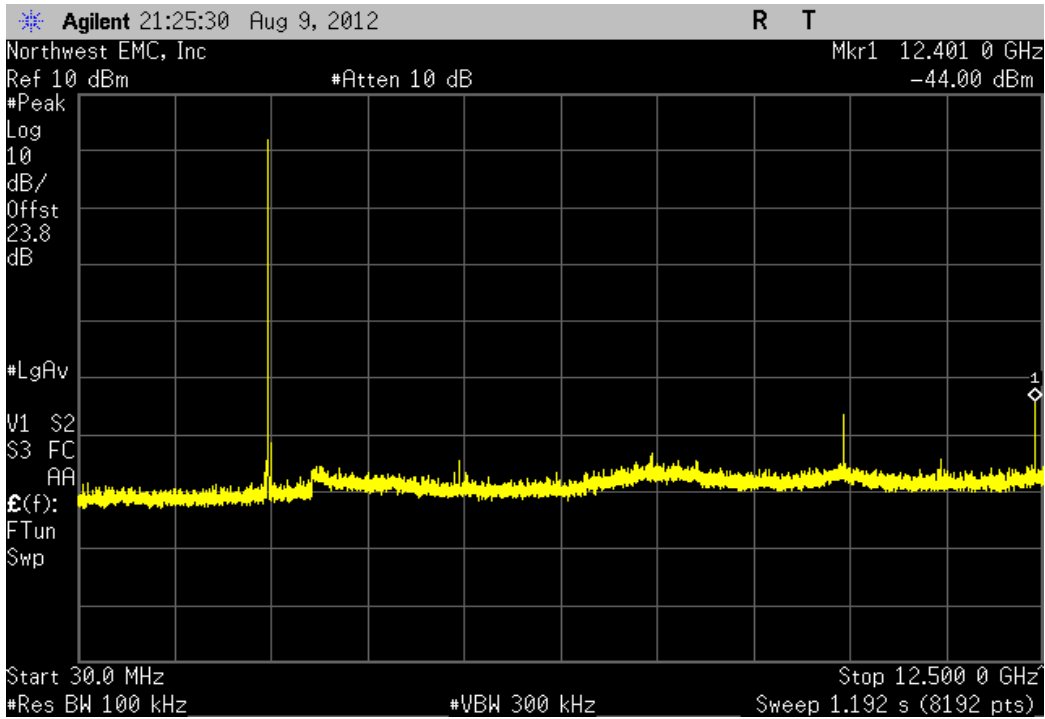
Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.68 dBc	≤ -20 dBc	Pass



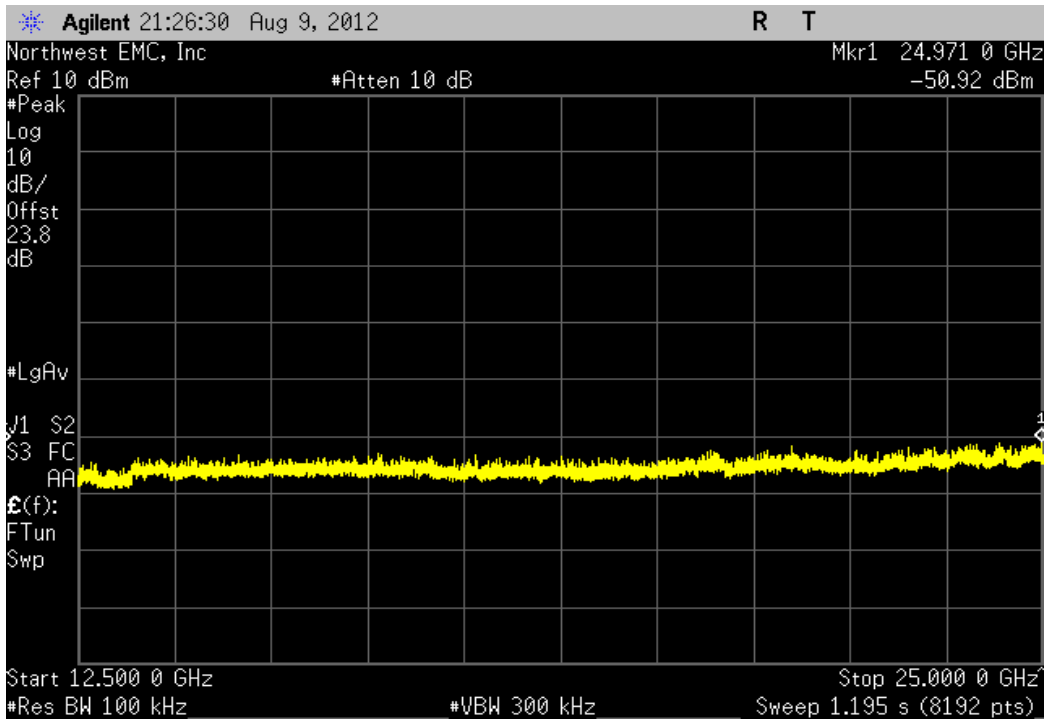
Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz			
Frequency Range	Value	Limit	Result
Fundamental	N/A	N/A	N/A



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz			
Frequency Range	Value	Limit	Result
30 MHz - 12.5 GHz	-45.98 dBc	≤ -20 dBc	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz			
Frequency Range	Value	Limit	Result
12.5 GHz - 25 GHz	-52.9 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
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 'N'	Coaxicom	66702 5910-6	ATZ	3/21/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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

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

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

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

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



Power Spectral Density

EUT: 1516	Work Order: MCSO1601
Serial Number: 000309122652	Date: 08/09/12
Customer: Microsoft Corporation	Temperature: 24°C
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 1016
Tested by: Brandon Hobbs	Power: 12VDC
	Job Site: EV06

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

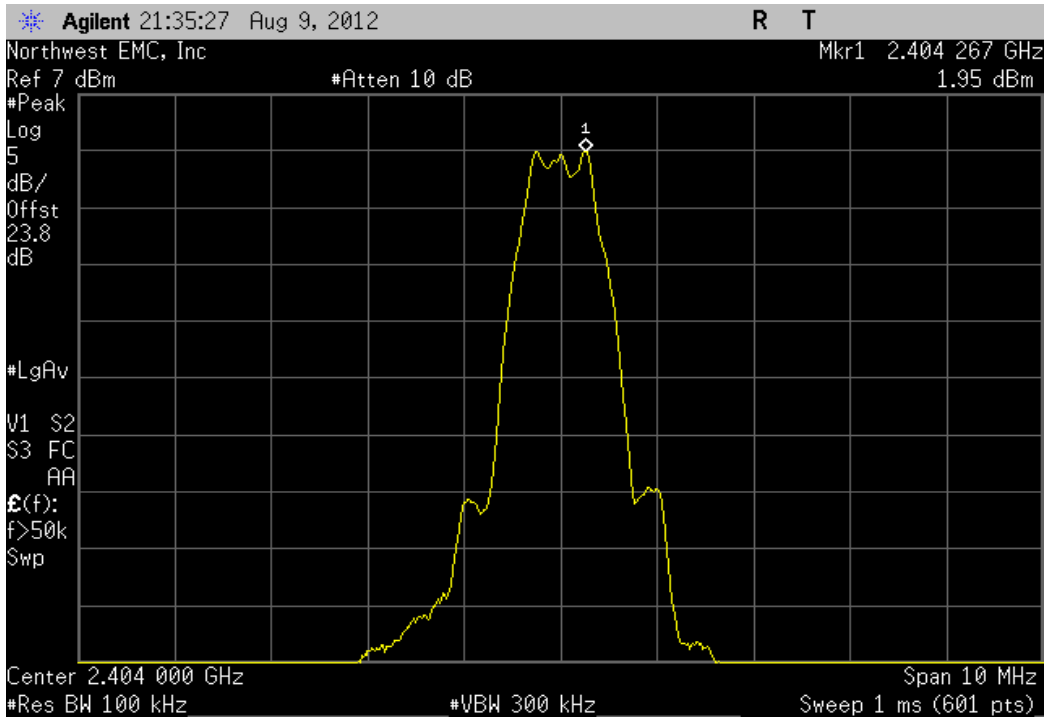
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
None

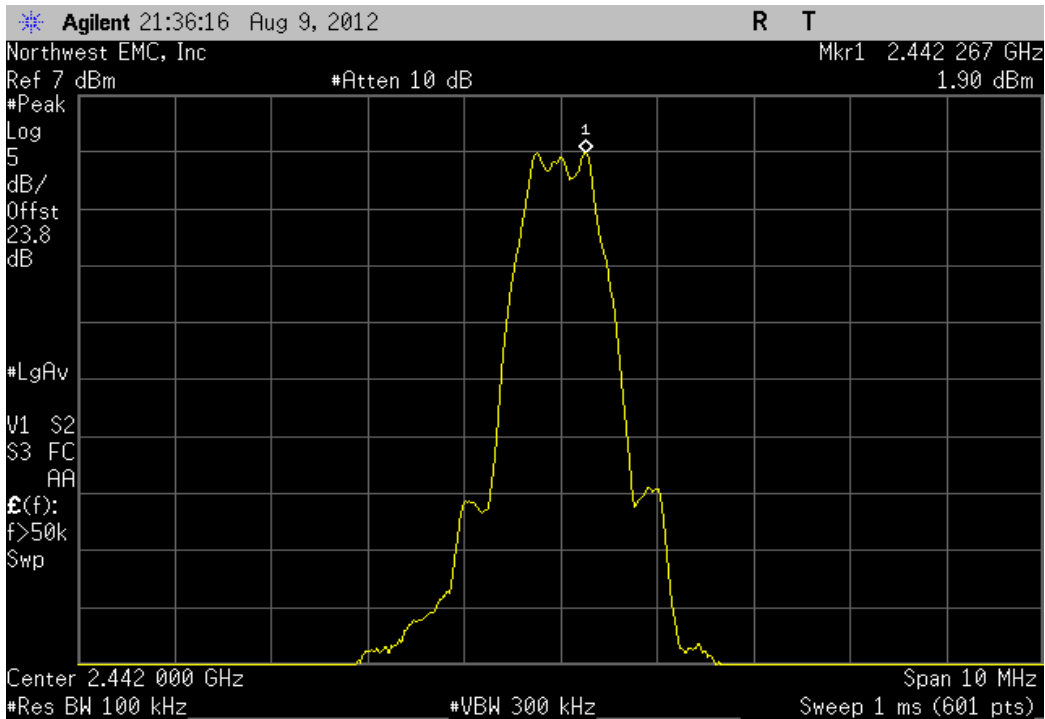
Configuration #	1	Signature <i>Paul Le Polign</i>
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	Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
Antenna A, Normal Test Conditions					
BE_LE					
(Data) Low Channel 1, 2404MHz	1.946	-15.2	-13.254	8	Pass
(Data) Mid Channel 20, 2442MHz	1.905	-15.2	-13.295	8	Pass
(Data) High Channel 38, 2478MHz	1.932	-15.2	-13.268	8	Pass
(Adv) Low Channel 12, 2402MHz	2.056	-15.2	-13.144	8	Pass
(Adv) Mid Channel 12, 2426MHz	2.098	-15.2	-13.102	8	Pass
(Adv) High Channel 39, 2480MHz	2.057	-15.2	-13.143	8	Pass

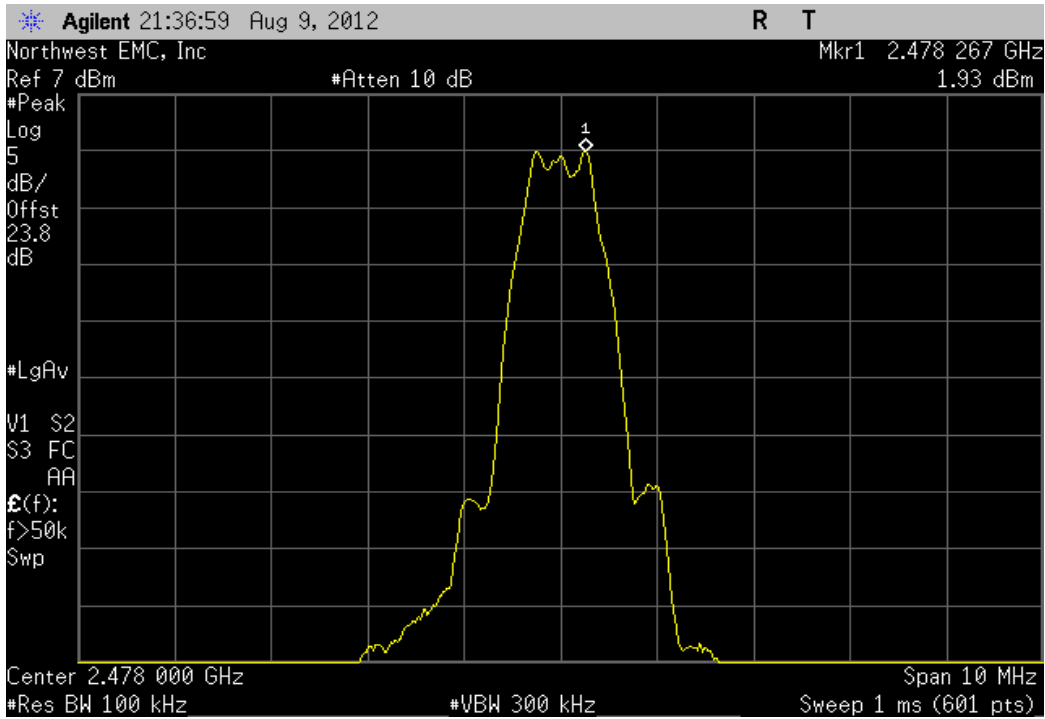
Antenna A, Normal Test Conditions , BE_LE, (Data) Low Channel 1, 2404MHz						
	Value	dBm/100kHz	Value	Limit		
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.946	-15.2	-13.254	8	Pass	



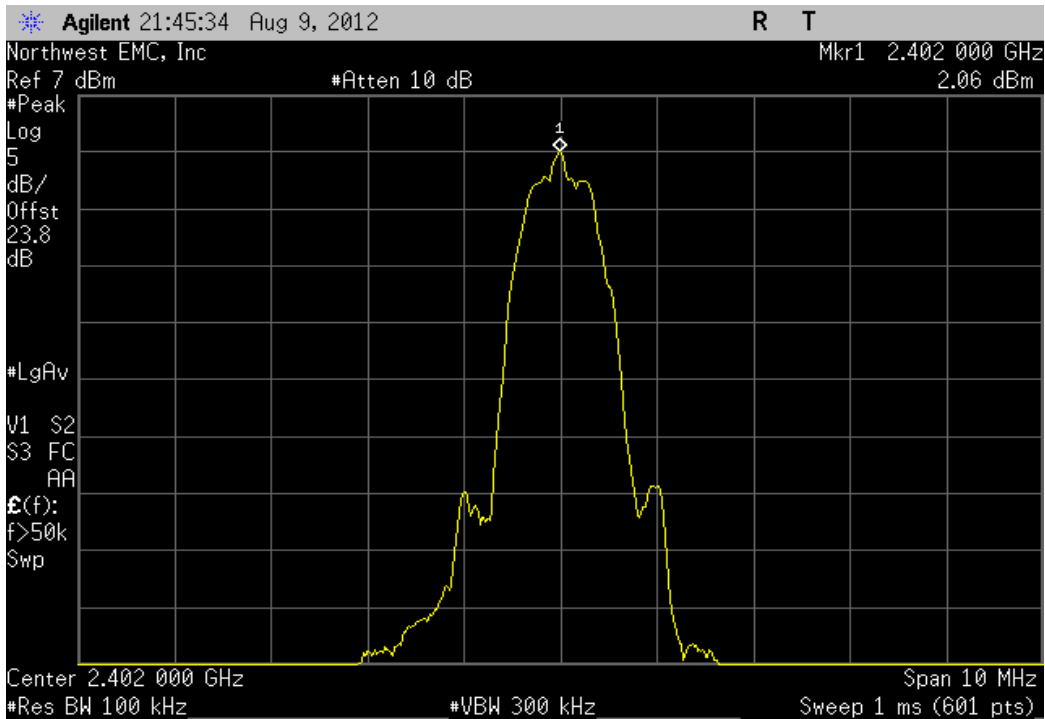
Antenna A, Normal Test Conditions , BE_LE, (Data) Mid Channel 20, 2442MHz						
	Value	dBm/100kHz	Value	Limit		
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.905	-15.2	-13.295	8	Pass	



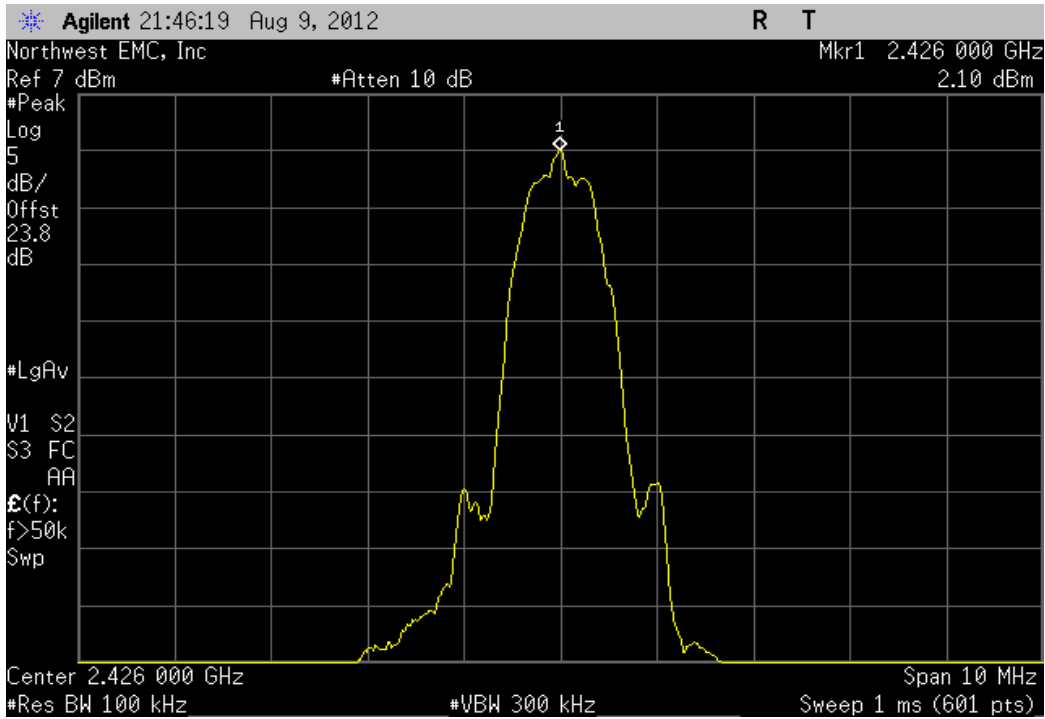
Antenna A, Normal Test Conditions , BE_LE, (Data) High Channel 38, 2478MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	1.932	-15.2	-13.268	8	Pass



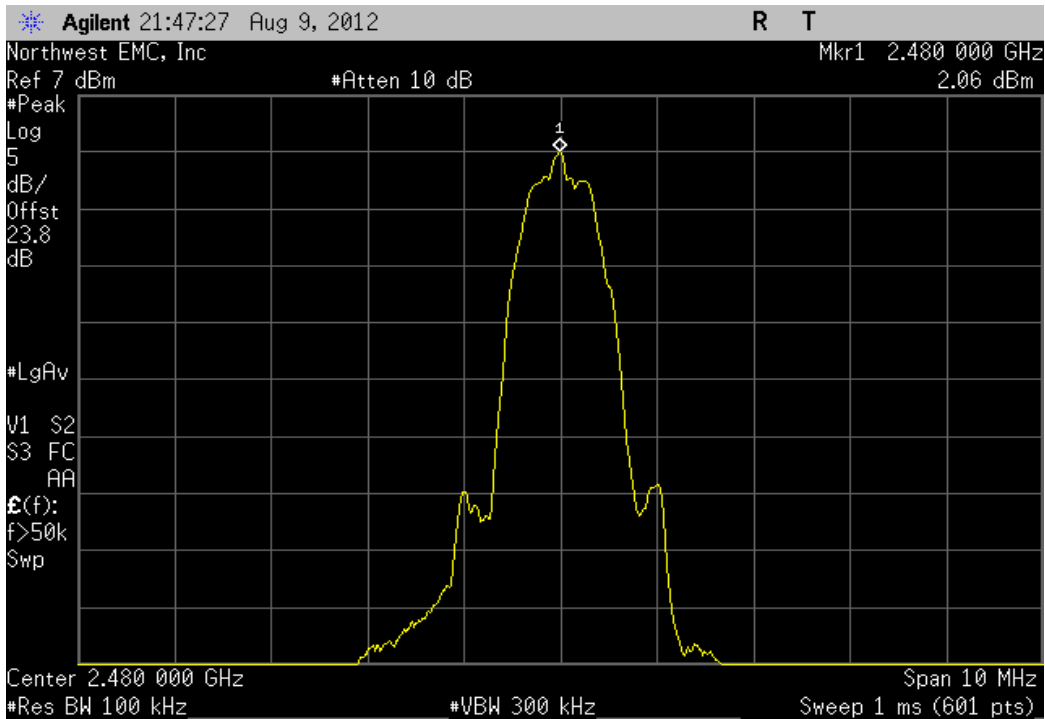
Antenna A, Normal Test Conditions , BE_LE, (Adv) Low Channel 12, 2402MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	2.056	-15.2	-13.144	8	Pass



Antenna A, Normal Test Conditions , BE_LE, (Adv) Mid Channel 12, 2426MHz						
	Value	dBm/100kHz	Value	Limit		
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	2.098	-15.2	-13.102	8	Pass	



Antenna A, Normal Test Conditions , BE_LE, (Adv) High Channel 39, 2480MHz						
	Value	dBm/100kHz	Value	Limit		
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	2.057	-15.2	-13.143	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.

MODES OF OPERATION

Transmitting Bluetooth Low Energy, Data mode , High Channel 38
Transmitting Bluetooth Low Energy, Data mode , Mid Channel 20
Transmitting Bluetooth Low Energy, Data mode , Low Channel 1
Transmitting Bluetooth Low Energy, Advertising mode , High Channel 39
Transmitting Bluetooth Low Energy, Advertising mode , Mid Channel 12
Transmitting Bluetooth Low Energy, Advertising mode , Low Channel 0

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1608 - 3

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
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
LISN	Solar	9252-50-R-24-BNC	LIR	11/4/2011	12 mo
LISN	Solar	9252-50-R-24-BNC	LIP	4/16/2012	12 mo

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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



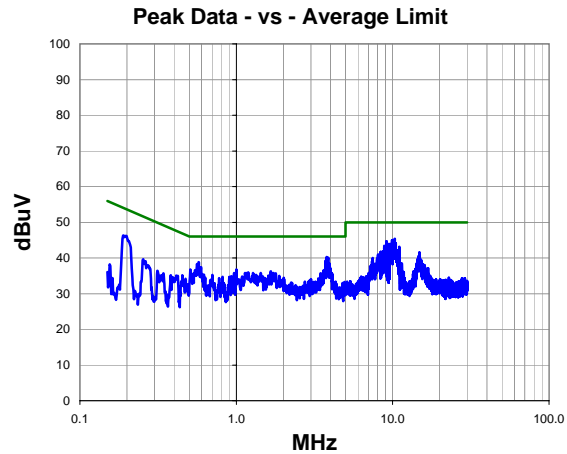
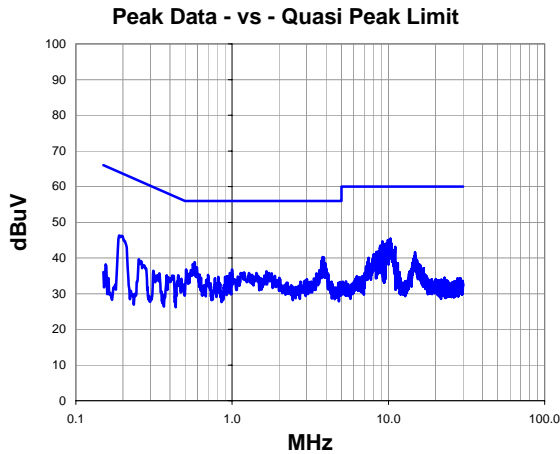
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516			Tested by: Rod Peloquin
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , Low Channel 0			
Deviations:	No deviations.			
Comments:	None			

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

Run #	11	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.300	24.4	21.0	45.4	60.0	-14.6
10.020	24.0	21.0	45.0	60.0	-15.0
9.920	23.9	21.0	44.9	60.0	-15.1
9.140	23.7	20.9	44.6	60.0	-15.4
10.080	23.4	21.0	44.4	60.0	-15.6
3.784	19.7	20.6	40.3	56.0	-15.7
9.220	23.2	20.9	44.1	60.0	-15.9
10.470	23.1	21.0	44.1	60.0	-15.9
3.864	19.5	20.6	40.1	56.0	-15.9
9.600	23.0	21.0	44.0	60.0	-16.0
9.650	22.9	21.0	43.9	60.0	-16.1
9.560	22.6	21.0	43.6	60.0	-16.4
9.480	22.6	21.0	43.6	60.0	-16.4
8.850	22.5	20.9	43.4	60.0	-16.6
3.736	18.7	20.6	39.3	56.0	-16.7
11.040	22.1	21.0	43.1	60.0	-16.9
9.270	21.9	20.9	42.8	60.0	-17.2
0.575	18.5	20.3	38.8	56.0	-17.2
9.420	21.7	21.0	42.7	60.0	-17.3
3.936	18.0	20.6	38.6	56.0	-17.4

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.300	24.4	21.0	45.4	50.0	-4.6
10.020	24.0	21.0	45.0	50.0	-5.0
9.920	23.9	21.0	44.9	50.0	-5.1
9.140	23.7	20.9	44.6	50.0	-5.4
10.080	23.4	21.0	44.4	50.0	-5.6
3.784	19.7	20.6	40.3	46.0	-5.7
9.220	23.2	20.9	44.1	50.0	-5.9
10.470	23.1	21.0	44.1	50.0	-5.9
3.864	19.5	20.6	40.1	46.0	-5.9
9.600	23.0	21.0	44.0	50.0	-6.0
9.650	22.9	21.0	43.9	50.0	-6.1
9.560	22.6	21.0	43.6	50.0	-6.4
9.480	22.6	21.0	43.6	50.0	-6.4
8.850	22.5	20.9	43.4	50.0	-6.6
3.736	18.7	20.6	39.3	46.0	-6.7
11.040	22.1	21.0	43.1	50.0	-6.9
9.270	21.9	20.9	42.8	50.0	-7.2
0.575	18.5	20.3	38.8	46.0	-7.2
9.420	21.7	21.0	42.7	50.0	-7.3
3.936	18.0	20.6	38.6	46.0	-7.4



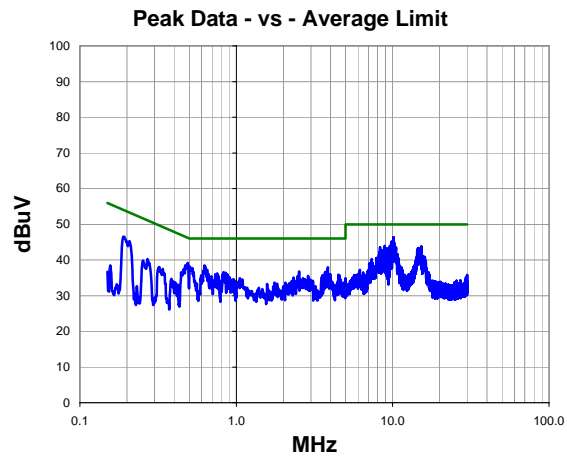
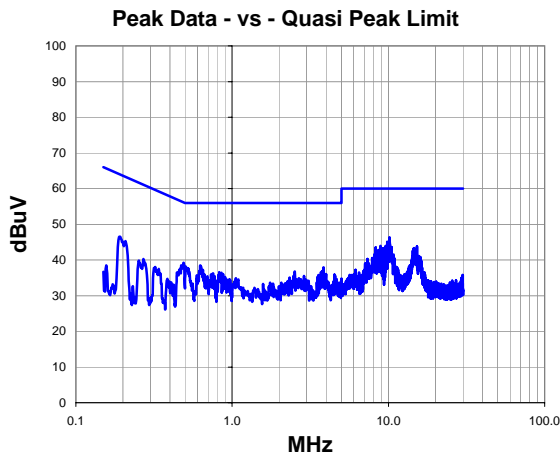
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Peloquin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , Low Channel 0			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
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Run #	12	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.140	25.4	21.0	46.4	60.0	-13.6
9.850	24.1	21.0	45.1	60.0	-14.9
10.010	23.9	21.0	44.9	60.0	-15.1
10.210	23.8	21.0	44.8	60.0	-15.2
9.980	23.5	21.0	44.5	60.0	-15.5
9.620	23.0	21.0	44.0	60.0	-16.0
8.890	23.0	20.9	43.9	60.0	-16.1
9.750	22.9	21.0	43.9	60.0	-16.1
15.240	22.5	21.3	43.8	60.0	-16.2
10.390	22.6	21.0	43.6	60.0	-16.4
8.300	22.7	20.8	43.5	60.0	-16.5
10.500	22.5	21.0	43.5	60.0	-16.5
9.460	22.4	21.0	43.4	60.0	-16.6
14.610	22.1	21.2	43.3	60.0	-16.7
9.560	22.3	21.0	43.3	60.0	-16.7
9.080	22.3	20.9	43.2	60.0	-16.8
9.000	22.3	20.9	43.2	60.0	-16.8
9.340	22.2	21.0	43.2	60.0	-16.8
14.480	21.9	21.2	43.1	60.0	-16.9
0.488	18.9	20.3	39.2	56.2	-17.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.140	25.4	21.0	46.4	50.0	-3.6
9.850	24.1	21.0	45.1	50.0	-4.9
10.010	23.9	21.0	44.9	50.0	-5.1
10.210	23.8	21.0	44.8	50.0	-5.2
9.980	23.5	21.0	44.5	50.0	-5.5
9.620	23.0	21.0	44.0	50.0	-6.0
8.890	23.0	20.9	43.9	50.0	-6.1
9.750	22.9	21.0	43.9	50.0	-6.1
15.240	22.5	21.3	43.8	50.0	-6.2
10.390	22.6	21.0	43.6	50.0	-6.4
8.300	22.7	20.8	43.5	50.0	-6.5
10.500	22.5	21.0	43.5	50.0	-6.5
9.460	22.4	21.0	43.4	50.0	-6.6
14.610	22.1	21.2	43.3	50.0	-6.7
9.560	22.3	21.0	43.3	50.0	-6.7
9.080	22.3	20.9	43.2	50.0	-6.8
9.000	22.3	20.9	43.2	50.0	-6.8
9.340	22.2	21.0	43.2	50.0	-6.8
14.480	21.9	21.2	43.1	50.0	-6.9
0.488	18.9	20.3	39.2	46.2	-7.0



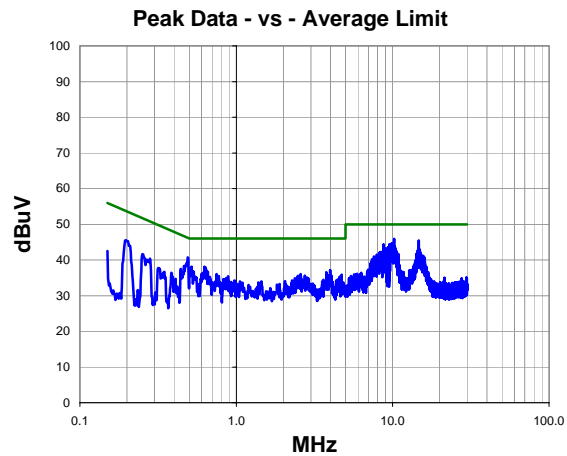
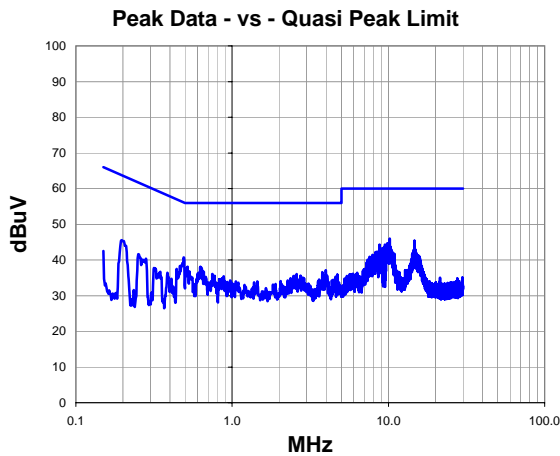
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Pelouin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , Mid Channel 12			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
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Run #	13	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.200	24.9	21.0	45.9	60.0	-14.1
14.690	24.1	21.2	45.3	60.0	-14.7
9.980	23.6	21.0	44.6	60.0	-15.4
9.840	23.6	21.0	44.6	60.0	-15.4
0.490	20.4	20.3	40.7	56.2	-15.5
8.760	23.4	20.9	44.3	60.0	-15.7
9.530	23.3	21.0	44.3	60.0	-15.7
9.700	22.9	21.0	43.9	60.0	-16.1
10.310	22.7	21.0	43.7	60.0	-16.3
9.550	22.6	21.0	43.6	60.0	-16.4
9.350	22.5	21.0	43.5	60.0	-16.5
10.240	22.4	21.0	43.4	60.0	-16.6
10.360	22.3	21.0	43.3	60.0	-16.7
9.010	22.3	20.9	43.2	60.0	-16.8
9.610	22.2	21.0	43.2	60.0	-16.8
14.900	21.6	21.3	42.9	60.0	-17.1
14.520	21.5	21.2	42.7	60.0	-17.3
9.060	21.8	20.9	42.7	60.0	-17.3
8.960	21.8	20.9	42.7	60.0	-17.3
10.470	21.7	21.0	42.7	60.0	-17.3

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.200	24.9	21.0	45.9	50.0	-4.1
14.690	24.1	21.2	45.3	50.0	-4.7
9.980	23.6	21.0	44.6	50.0	-5.4
9.840	23.6	21.0	44.6	50.0	-5.4
0.490	20.4	20.3	40.7	46.2	-5.5
8.760	23.4	20.9	44.3	50.0	-5.7
9.530	23.3	21.0	44.3	50.0	-5.7
9.700	22.9	21.0	43.9	50.0	-6.1
10.310	22.7	21.0	43.7	50.0	-6.3
9.550	22.6	21.0	43.6	50.0	-6.4
9.350	22.5	21.0	43.5	50.0	-6.5
10.240	22.4	21.0	43.4	50.0	-6.6
10.360	22.3	21.0	43.3	50.0	-6.7
9.010	22.3	20.9	43.2	50.0	-6.8
9.610	22.2	21.0	43.2	50.0	-6.8
14.900	21.6	21.3	42.9	50.0	-7.1
14.520	21.5	21.2	42.7	50.0	-7.3
9.060	21.8	20.9	42.7	50.0	-7.3
8.960	21.8	20.9	42.7	50.0	-7.3
10.470	21.7	21.0	42.7	50.0	-7.3



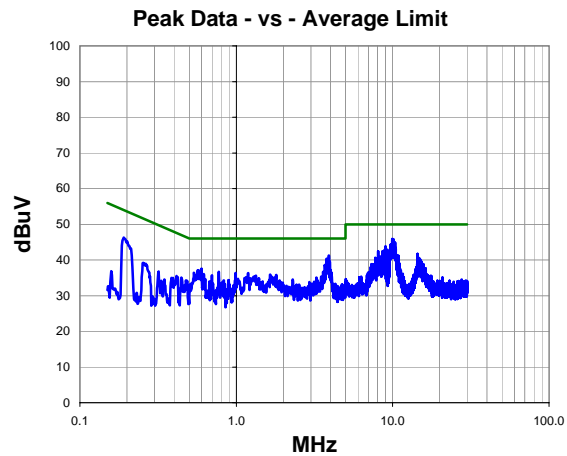
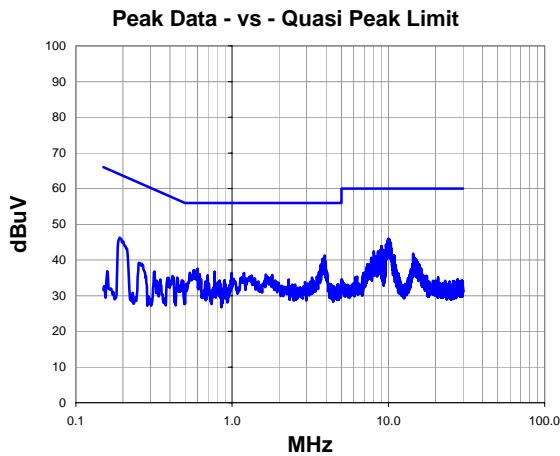
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Peloquin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , Mid Channel 12			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
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Run #	14	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.960	24.9	21.0	45.9	60.0	-14.1
10.110	24.8	21.0	45.8	60.0	-14.2
9.930	24.5	21.0	45.5	60.0	-14.5
3.912	20.7	20.6	41.3	56.0	-14.7
10.370	23.8	21.0	44.8	60.0	-15.2
3.784	19.8	20.6	40.4	56.0	-15.6
10.290	23.2	21.0	44.2	60.0	-15.8
9.650	23.2	21.0	44.2	60.0	-15.8
3.888	19.4	20.6	40.0	56.0	-16.0
9.020	22.9	20.9	43.8	60.0	-16.2
3.968	19.0	20.6	39.6	56.0	-16.4
10.460	22.1	21.0	43.1	60.0	-16.9
3.760	18.5	20.6	39.1	56.0	-16.9
8.920	22.0	20.9	42.9	60.0	-17.1
9.280	21.9	20.9	42.8	60.0	-17.2
8.960	21.8	20.9	42.7	60.0	-17.3
9.090	21.7	20.9	42.6	60.0	-17.4
3.696	18.0	20.6	38.6	56.0	-17.4
8.080	21.6	20.8	42.4	60.0	-17.6
8.770	21.5	20.9	42.4	60.0	-17.6

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.960	24.9	21.0	45.9	50.0	-4.1
10.110	24.8	21.0	45.8	50.0	-4.2
9.930	24.5	21.0	45.5	50.0	-4.5
3.912	20.7	20.6	41.3	46.0	-4.7
10.370	23.8	21.0	44.8	50.0	-5.2
3.784	19.8	20.6	40.4	46.0	-5.6
10.290	23.2	21.0	44.2	50.0	-5.8
9.650	23.2	21.0	44.2	50.0	-5.8
3.888	19.4	20.6	40.0	46.0	-6.0
9.020	22.9	20.9	43.8	50.0	-6.2
3.968	19.0	20.6	39.6	46.0	-6.4
10.460	22.1	21.0	43.1	50.0	-6.9
3.760	18.5	20.6	39.1	46.0	-6.9
8.920	22.0	20.9	42.9	50.0	-7.1
9.280	21.9	20.9	42.8	50.0	-7.2
8.960	21.8	20.9	42.7	50.0	-7.3
9.090	21.7	20.9	42.6	50.0	-7.4
3.696	18.0	20.6	38.6	46.0	-7.4
8.080	21.6	20.8	42.4	50.0	-7.6
8.770	21.5	20.9	42.4	50.0	-7.6

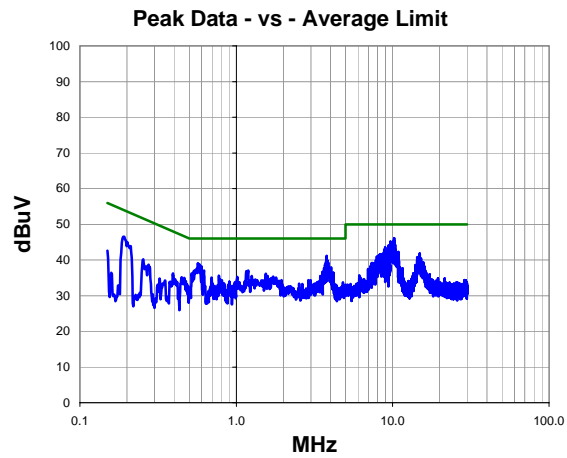
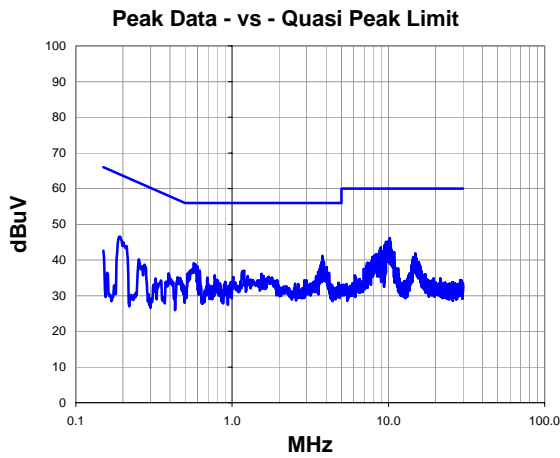


AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Pelouin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , High Channel 39			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
Run #	15	Line:	High Line
Ext. Attenuation:	20	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.210	25.1	21.0	46.1	60.0	-13.9
10.100	24.4	21.0	45.4	60.0	-14.6
10.140	24.3	21.0	45.3	60.0	-14.7
10.260	24.2	21.0	45.2	60.0	-14.8
10.010	24.2	21.0	45.2	60.0	-14.8
3.784	20.6	20.6	41.2	56.0	-14.8
9.660	24.1	21.0	45.1	60.0	-14.9
9.950	23.4	21.0	44.4	60.0	-15.6
9.760	23.3	21.0	44.3	60.0	-15.7
9.600	23.3	21.0	44.3	60.0	-15.7
10.360	23.2	21.0	44.2	60.0	-15.8
9.410	23.1	21.0	44.1	60.0	-15.9
3.816	19.4	20.6	40.0	56.0	-16.0
8.950	22.6	20.9	43.5	60.0	-16.5
3.744	18.9	20.6	39.5	56.0	-16.5
9.720	22.4	21.0	43.4	60.0	-16.6
9.470	22.3	21.0	43.3	60.0	-16.7
0.568	18.8	20.3	39.1	56.0	-16.9
8.830	22.0	20.9	42.9	60.0	-17.1
10.430	21.8	21.0	42.8	60.0	-17.2

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.210	25.1	21.0	46.1	50.0	-3.9
10.100	24.4	21.0	45.4	50.0	-4.6
10.140	24.3	21.0	45.3	50.0	-4.7
10.260	24.2	21.0	45.2	50.0	-4.8
10.010	24.2	21.0	45.2	50.0	-4.8
3.784	20.6	20.6	41.2	46.0	-4.8
9.660	24.1	21.0	45.1	50.0	-4.9
9.950	23.4	21.0	44.4	50.0	-5.6
9.760	23.3	21.0	44.3	50.0	-5.7
9.600	23.3	21.0	44.3	50.0	-5.7
10.360	23.2	21.0	44.2	50.0	-5.8
9.410	23.1	21.0	44.1	50.0	-5.9
3.816	19.4	20.6	40.0	46.0	-6.0
8.950	22.6	20.9	43.5	50.0	-6.5
3.744	18.9	20.6	39.5	46.0	-6.5
9.720	22.4	21.0	43.4	50.0	-6.6
9.470	22.3	21.0	43.3	50.0	-6.7
0.568	18.8	20.3	39.1	46.0	-6.9
8.830	22.0	20.9	42.9	50.0	-7.1
10.430	21.8	21.0	42.8	50.0	-7.2



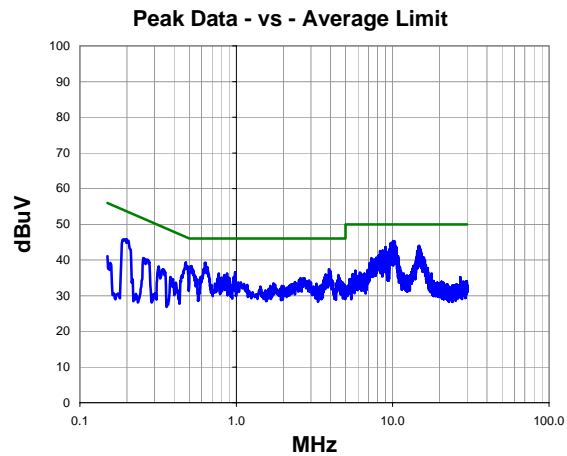
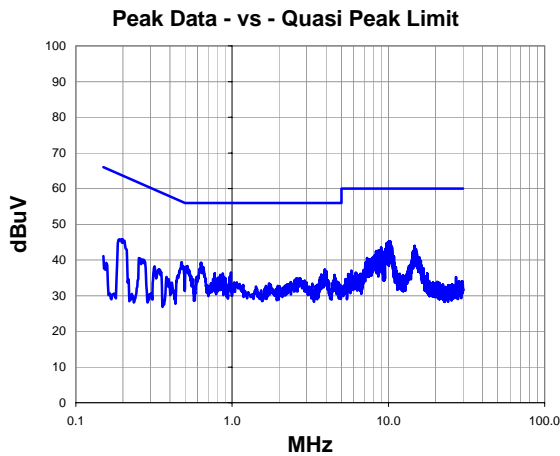
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by: Rod Pelouin		
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Advertising mode , High Channel 39			
Deviations:	No deviations.			
Comments:	None			

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

Run #	16	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.090	24.3	21.0	45.3	60.0	-14.7
10.310	24.1	21.0	45.1	60.0	-14.9
10.010	24.1	21.0	45.1	60.0	-14.9
9.720	23.8	21.0	44.8	60.0	-15.2
9.770	23.5	21.0	44.5	60.0	-15.5
9.870	23.3	21.0	44.3	60.0	-15.7
10.390	23.1	21.0	44.1	60.0	-15.9
14.750	22.7	21.2	43.9	60.0	-16.1
14.680	22.6	21.2	43.8	60.0	-16.2
9.000	22.7	20.9	43.6	60.0	-16.4
10.570	22.5	21.0	43.5	60.0	-16.5
10.430	22.4	21.0	43.4	60.0	-16.6
0.636	18.9	20.3	39.2	56.0	-16.8
9.590	22.2	21.0	43.2	60.0	-16.8
14.810	21.9	21.2	43.1	60.0	-16.9
0.475	19.1	20.3	39.4	56.4	-17.0
15.020	21.7	21.3	43.0	60.0	-17.0
8.940	21.9	20.9	42.8	60.0	-17.2
8.620	21.7	20.9	42.6	60.0	-17.4
14.420	21.3	21.2	42.5	60.0	-17.5

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.090	24.3	21.0	45.3	50.0	-4.7
10.310	24.1	21.0	45.1	50.0	-4.9
10.010	24.1	21.0	45.1	50.0	-4.9
9.720	23.8	21.0	44.8	50.0	-5.2
9.770	23.5	21.0	44.5	50.0	-5.5
9.870	23.3	21.0	44.3	50.0	-5.7
10.390	23.1	21.0	44.1	50.0	-5.9
14.750	22.7	21.2	43.9	50.0	-6.1
14.680	22.6	21.2	43.8	50.0	-6.2
9.000	22.7	20.9	43.6	50.0	-6.4
10.570	22.5	21.0	43.5	50.0	-6.5
10.430	22.4	21.0	43.4	50.0	-6.6
0.636	18.9	20.3	39.2	46.0	-6.8
9.590	22.2	21.0	43.2	50.0	-6.8
14.810	21.9	21.2	43.1	50.0	-6.9
0.475	19.1	20.3	39.4	46.4	-7.0
15.020	21.7	21.3	43.0	50.0	-7.0
8.940	21.9	20.9	42.8	50.0	-7.2
8.620	21.7	20.9	42.6	50.0	-7.4
14.420	21.3	21.2	42.5	50.0	-7.5



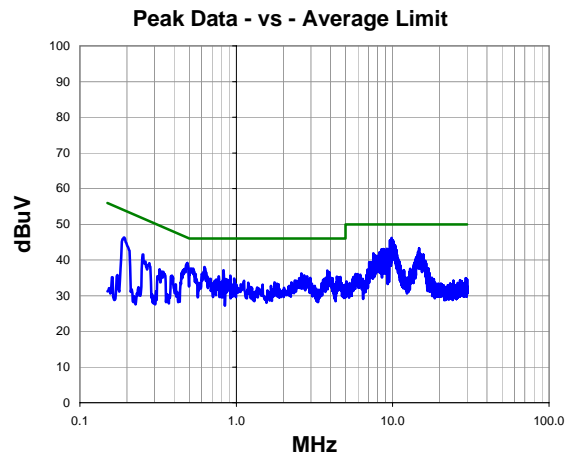
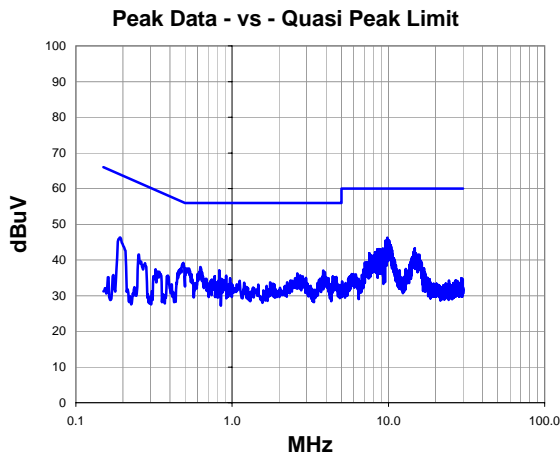
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Peloquin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , Low Channel 1			
Deviations:	No deviations.			
Comments:	None			

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

Run #	17	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.830	25.2	21.0	46.2	60.0	-13.8
9.980	24.5	21.0	45.5	60.0	-14.5
9.620	24.5	21.0	45.5	60.0	-14.5
10.100	24.4	21.0	45.4	60.0	-14.6
10.040	24.0	21.0	45.0	60.0	-15.0
10.190	23.5	21.0	44.5	60.0	-15.5
10.350	23.1	21.0	44.1	60.0	-15.9
9.770	23.1	21.0	44.1	60.0	-15.9
10.390	22.7	21.0	43.7	60.0	-16.3
14.740	22.0	21.2	43.2	60.0	-16.8
9.190	22.2	20.9	43.1	60.0	-16.9
8.710	22.2	20.9	43.1	60.0	-16.9
9.330	22.1	21.0	43.1	60.0	-16.9
8.820	22.1	20.9	43.0	60.0	-17.0
0.487	18.9	20.3	39.2	56.2	-17.0
8.500	22.1	20.9	43.0	60.0	-17.0
10.570	21.8	21.0	42.8	60.0	-17.2
9.020	21.8	20.9	42.7	60.0	-17.3
8.940	21.8	20.9	42.7	60.0	-17.3
10.450	21.6	21.0	42.6	60.0	-17.4

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.830	25.2	21.0	46.2	50.0	-3.8
9.980	24.5	21.0	45.5	50.0	-4.5
9.620	24.5	21.0	45.5	50.0	-4.5
10.100	24.4	21.0	45.4	50.0	-4.6
10.040	24.0	21.0	45.0	50.0	-5.0
10.190	23.5	21.0	44.5	50.0	-5.5
10.350	23.1	21.0	44.1	50.0	-5.9
9.770	23.1	21.0	44.1	50.0	-5.9
10.390	22.7	21.0	43.7	50.0	-6.3
14.740	22.0	21.2	43.2	50.0	-6.8
9.190	22.2	20.9	43.1	50.0	-6.9
8.710	22.2	20.9	43.1	50.0	-6.9
9.330	22.1	21.0	43.1	50.0	-6.9
8.820	22.1	20.9	43.0	50.0	-7.0
0.487	18.9	20.3	39.2	46.2	-7.0
8.500	22.1	20.9	43.0	50.0	-7.0
10.570	21.8	21.0	42.8	50.0	-7.2
9.020	21.8	20.9	42.7	50.0	-7.3
8.940	21.8	20.9	42.7	50.0	-7.3
10.450	21.6	21.0	42.6	50.0	-7.4

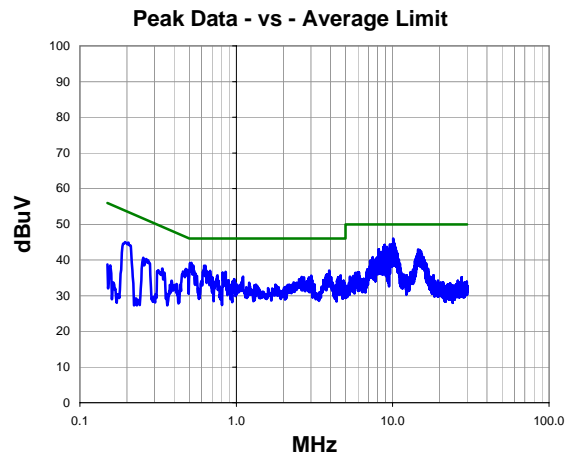
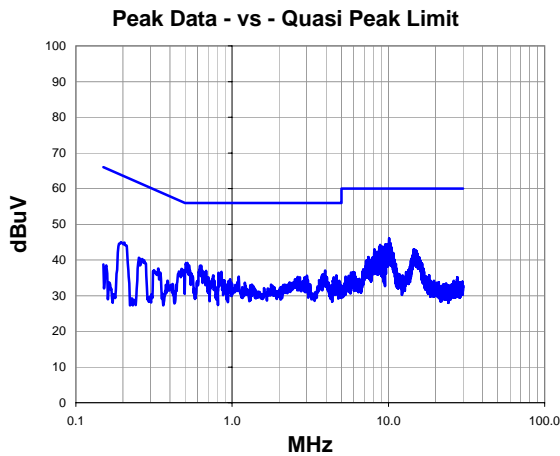


AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by: Rod Pelouin		
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , Low Channel 1			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
Run #	18	Line:	Neutral
Ext. Attenuation:	20	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.100	25.0	21.0	46.0	60.0	-14.0
10.290	23.7	21.0	44.7	60.0	-15.3
10.000	23.5	21.0	44.5	60.0	-15.5
9.600	23.4	21.0	44.4	60.0	-15.6
8.880	23.3	20.9	44.2	60.0	-15.8
9.830	23.0	21.0	44.0	60.0	-16.0
9.690	23.0	21.0	44.0	60.0	-16.0
8.740	22.8	20.9	43.7	60.0	-16.3
9.190	22.7	20.9	43.6	60.0	-16.4
10.450	22.5	21.0	43.5	60.0	-16.5
10.390	22.2	21.0	43.2	60.0	-16.8
0.516	18.9	20.3	39.2	56.0	-16.8
8.950	22.2	20.9	43.1	60.0	-16.9
14.530	21.7	21.2	42.9	60.0	-17.1
8.150	22.1	20.8	42.9	60.0	-17.1
9.540	21.9	21.0	42.9	60.0	-17.1
8.120	22.0	20.8	42.8	60.0	-17.2
8.720	21.9	20.9	42.8	60.0	-17.2
14.900	21.5	21.3	42.8	60.0	-17.2
10.520	21.7	21.0	42.7	60.0	-17.3

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.100	25.0	21.0	46.0	50.0	-4.0
10.290	23.7	21.0	44.7	50.0	-5.3
10.000	23.5	21.0	44.5	50.0	-5.5
9.600	23.4	21.0	44.4	50.0	-5.6
8.880	23.3	20.9	44.2	50.0	-5.8
9.830	23.0	21.0	44.0	50.0	-6.0
9.690	23.0	21.0	44.0	50.0	-6.0
8.740	22.8	20.9	43.7	50.0	-6.3
9.190	22.7	20.9	43.6	50.0	-6.4
10.450	22.5	21.0	43.5	50.0	-6.5
10.390	22.2	21.0	43.2	50.0	-6.8
0.516	18.9	20.3	39.2	46.0	-6.8
8.950	22.2	20.9	43.1	50.0	-6.9
14.530	21.7	21.2	42.9	50.0	-7.1
8.150	22.1	20.8	42.9	50.0	-7.1
9.540	21.9	21.0	42.9	50.0	-7.1
8.120	22.0	20.8	42.8	50.0	-7.2
8.720	21.9	20.9	42.8	50.0	-7.2
14.900	21.5	21.3	42.8	50.0	-7.2
10.520	21.7	21.0	42.7	50.0	-7.3



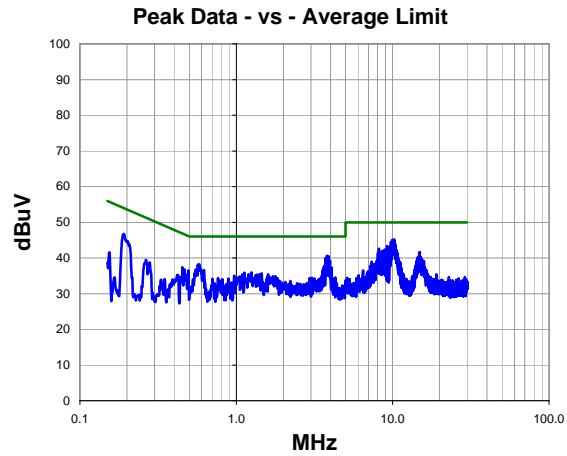
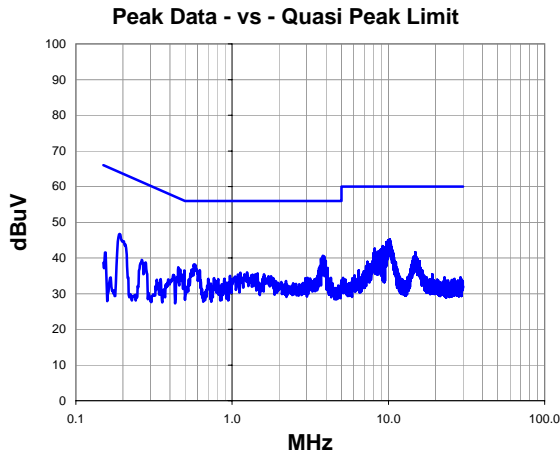
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Peloquin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , Mid Channel 20			
Deviations:	No deviations.			
Comments:	None			

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

Run #	19	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.200	24.2	21.0	45.2	60.0	-14.8
10.000	24.0	21.0	45.0	60.0	-15.0
10.250	23.8	21.0	44.8	60.0	-15.2
3.808	20.1	20.6	40.7	56.0	-15.3
9.740	23.5	21.0	44.5	60.0	-15.5
3.888	19.9	20.6	40.5	56.0	-15.5
10.300	23.3	21.0	44.3	60.0	-15.7
3.712	19.3	20.6	39.9	56.0	-16.1
10.370	22.8	21.0	43.8	60.0	-16.2
9.850	22.6	21.0	43.6	60.0	-16.4
3.904	19.0	20.6	39.6	56.0	-16.4
9.210	22.4	20.9	43.3	60.0	-16.7
9.590	22.2	21.0	43.2	60.0	-16.8
10.450	22.0	21.0	43.0	60.0	-17.0
9.480	21.8	21.0	42.8	60.0	-17.2
0.191	26.4	20.4	46.8	64.0	-17.3
9.270	21.8	20.9	42.7	60.0	-17.3
8.180	21.8	20.8	42.6	60.0	-17.4
9.550	21.6	21.0	42.6	60.0	-17.4
8.940	21.4	20.9	42.3	60.0	-17.7

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.200	24.2	21.0	45.2	50.0	-4.8
10.000	24.0	21.0	45.0	50.0	-5.0
10.250	23.8	21.0	44.8	50.0	-5.2
3.808	20.1	20.6	40.7	46.0	-5.3
9.740	23.5	21.0	44.5	50.0	-5.5
3.888	19.9	20.6	40.5	46.0	-5.5
10.300	23.3	21.0	44.3	50.0	-5.7
3.712	19.3	20.6	39.9	46.0	-6.1
10.370	22.8	21.0	43.8	50.0	-6.2
9.850	22.6	21.0	43.6	50.0	-6.4
3.904	19.0	20.6	39.6	46.0	-6.4
9.210	22.4	20.9	43.3	50.0	-6.7
9.590	22.2	21.0	43.2	50.0	-6.8
10.450	22.0	21.0	43.0	50.0	-7.0
9.480	21.8	21.0	42.8	50.0	-7.2
0.191	26.4	20.4	46.8	54.0	-7.3
9.270	21.8	20.9	42.7	50.0	-7.3
8.180	21.8	20.8	42.6	50.0	-7.4
9.550	21.6	21.0	42.6	50.0	-7.4
8.940	21.4	20.9	42.3	50.0	-7.7

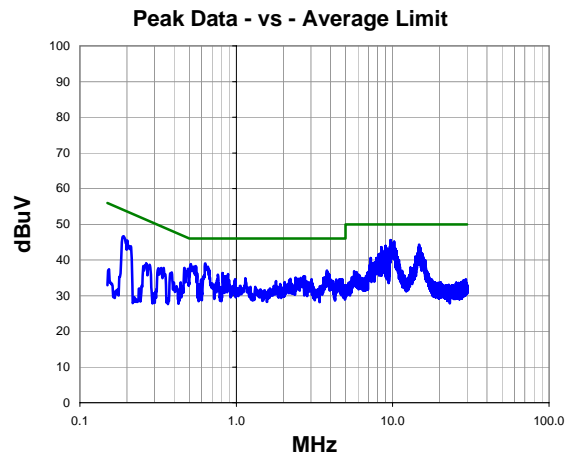
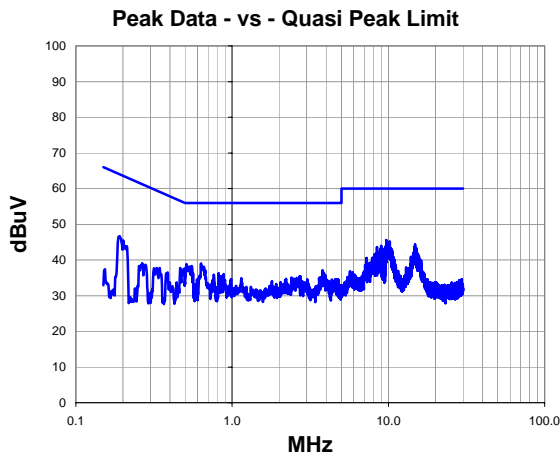


AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516			Tested by: Rod Peloquin
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , Mid Channel 20			
Deviations:	No deviations.			
Comments:	None			

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



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.700	24.6	21.0	45.6	60.0	-14.4
10.210	24.1	21.0	45.1	60.0	-14.9
10.110	23.9	21.0	44.9	60.0	-15.1
9.870	23.6	21.0	44.6	60.0	-15.4
14.790	23.1	21.2	44.3	60.0	-15.7
10.000	23.2	21.0	44.2	60.0	-15.8
8.990	23.0	20.9	43.9	60.0	-16.1
9.610	22.8	21.0	43.8	60.0	-16.2
9.660	22.6	21.0	43.6	60.0	-16.4
8.460	22.7	20.8	43.5	60.0	-16.5
14.650	22.3	21.2	43.5	60.0	-16.5
15.110	22.0	21.3	43.3	60.0	-16.7
10.260	22.2	21.0	43.2	60.0	-16.8
9.220	22.2	20.9	43.1	60.0	-16.9
8.950	22.2	20.9	43.1	60.0	-16.9
9.400	22.1	21.0	43.1	60.0	-16.9
9.080	22.1	20.9	43.0	60.0	-17.0
0.633	18.7	20.3	39.0	56.0	-17.0
9.470	22.0	21.0	43.0	60.0	-17.0
0.512	18.5	20.3	38.8	56.0	-17.2

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
9.700	24.6	21.0	45.6	50.0	-4.4
10.210	24.1	21.0	45.1	50.0	-4.9
10.110	23.9	21.0	44.9	50.0	-5.1
9.870	23.6	21.0	44.6	50.0	-5.4
14.790	23.1	21.2	44.3	50.0	-5.7
10.000	23.2	21.0	44.2	50.0	-5.8
8.990	23.0	20.9	43.9	50.0	-6.1
9.610	22.8	21.0	43.8	50.0	-6.2
9.660	22.6	21.0	43.6	50.0	-6.4
8.460	22.7	20.8	43.5	50.0	-6.5
14.650	22.3	21.2	43.5	50.0	-6.5
15.110	22.0	21.3	43.3	50.0	-6.7
10.260	22.2	21.0	43.2	50.0	-6.8
9.220	22.2	20.9	43.1	50.0	-6.9
8.950	22.2	20.9	43.1	50.0	-6.9
9.400	22.1	21.0	43.1	50.0	-6.9
9.080	22.1	20.9	43.0	50.0	-7.0
0.633	18.7	20.3	39.0	46.0	-7.0
9.470	22.0	21.0	43.0	50.0	-7.0
0.512	18.5	20.3	38.8	46.0	-7.2



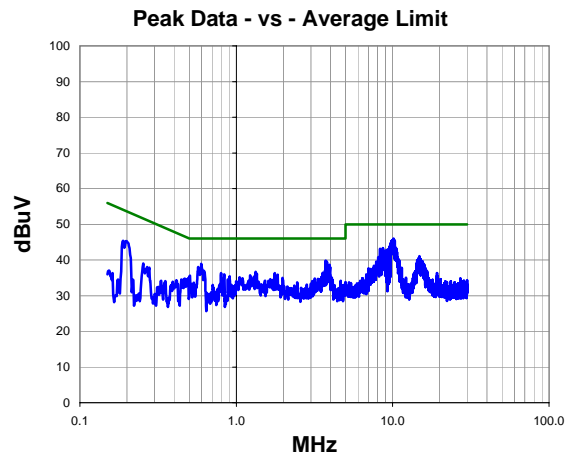
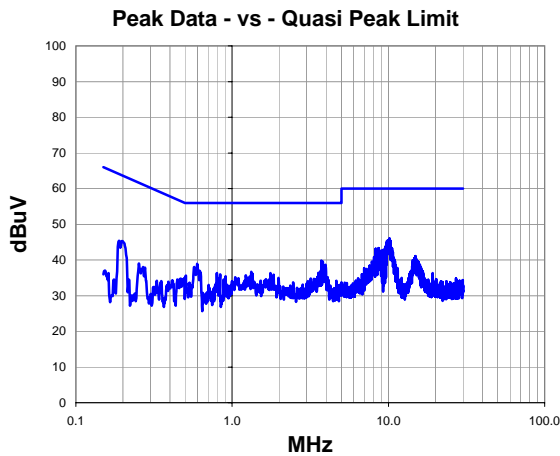
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Pelouin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , High Channel 38			
Deviations:	No deviations.			
Comments:	None			

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

Run #	21	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit					
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.150	25.0	21.0	46.0	60.0	-14.0
10.320	24.4	21.0	45.4	60.0	-14.6
9.920	24.4	21.0	45.4	60.0	-14.6
9.880	24.4	21.0	45.4	60.0	-14.6
9.680	23.7	21.0	44.7	60.0	-15.3
3.728	19.3	20.6	39.9	56.0	-16.1
9.540	22.8	21.0	43.8	60.0	-16.2
3.768	19.1	20.6	39.7	56.0	-16.3
10.380	22.6	21.0	43.6	60.0	-16.4
8.660	22.4	20.9	43.3	60.0	-16.7
8.290	22.3	20.8	43.1	60.0	-16.9
0.597	18.6	20.3	38.9	56.0	-17.1
9.480	21.9	21.0	42.9	60.0	-17.1
9.270	21.9	20.9	42.8	60.0	-17.2
9.630	21.8	21.0	42.8	60.0	-17.2
9.060	21.8	20.9	42.7	60.0	-17.3
3.952	18.1	20.6	38.7	56.0	-17.3
8.860	21.6	20.9	42.5	60.0	-17.5
3.984	17.4	20.6	38.0	56.0	-18.0
9.200	20.7	20.9	41.6	60.0	-18.4

Peak Data - vs - Average Limit					
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.150	25.0	21.0	46.0	50.0	-4.0
10.320	24.4	21.0	45.4	50.0	-4.6
9.920	24.4	21.0	45.4	50.0	-4.6
9.880	24.4	21.0	45.4	50.0	-4.6
9.680	23.7	21.0	44.7	50.0	-5.3
3.728	19.3	20.6	39.9	46.0	-6.1
9.540	22.8	21.0	43.8	50.0	-6.2
3.768	19.1	20.6	39.7	46.0	-6.3
10.380	22.6	21.0	43.6	50.0	-6.4
8.660	22.4	20.9	43.3	50.0	-6.7
8.290	22.3	20.8	43.1	50.0	-6.9
0.597	18.6	20.3	38.9	46.0	-7.1
9.480	21.9	21.0	42.9	50.0	-7.1
9.270	21.9	20.9	42.8	50.0	-7.2
9.630	21.8	21.0	42.8	50.0	-7.2
9.060	21.8	20.9	42.7	50.0	-7.3
3.952	18.1	20.6	38.7	46.0	-7.3
8.860	21.6	20.9	42.5	50.0	-7.5
3.984	17.4	20.6	38.0	46.0	-8.0
9.200	20.7	20.9	41.6	50.0	-8.4



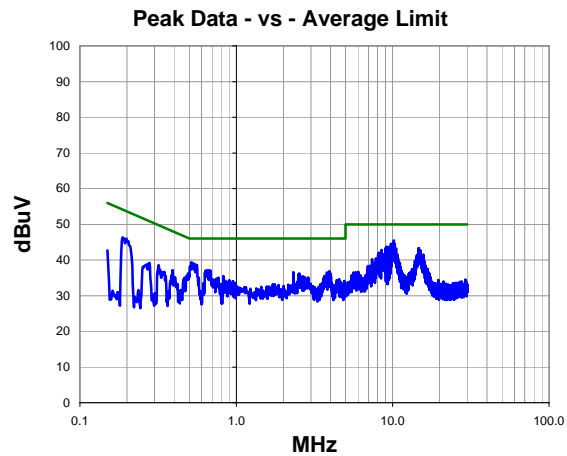
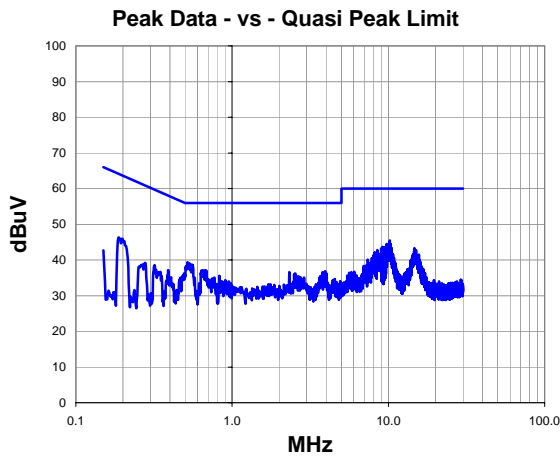
AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2012.05.07
PSA-ESCI Version 2011.12.21

Work Order:	MCSO1608	Date:	08/08/12	<i>Rodney Le Pelouin</i>
Project:	None	Temperature:	24 °C	
Job Site:	EV01	Humidity:	46% RH	
Serial Number:	215622952	Barometric Pres.:	1022.1 mbar	
EUT:	1516	Tested by:	Rod Pelouin	
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth Low Energy, Data mode , High Channel 38			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	FCC 15.207:2012	Test Method	ANSI C63.10:2009
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Run #	22	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.190	24.5	21.0	45.5	60.0	-14.5
10.300	23.5	21.0	44.5	60.0	-15.5
10.150	23.5	21.0	44.5	60.0	-15.5
10.090	23.5	21.0	44.5	60.0	-15.5
9.750	23.5	21.0	44.5	60.0	-15.5
9.870	23.3	21.0	44.3	60.0	-15.7
9.850	22.7	21.0	43.7	60.0	-16.3
9.140	22.7	20.9	43.6	60.0	-16.4
9.410	22.6	21.0	43.6	60.0	-16.4
9.490	22.5	21.0	43.5	60.0	-16.5
0.517	19.1	20.3	39.4	56.0	-16.6
14.700	22.1	21.2	43.3	60.0	-16.7
9.560	22.3	21.0	43.3	60.0	-16.7
9.000	22.3	20.9	43.2	60.0	-16.8
10.500	22.2	21.0	43.2	60.0	-16.8
9.350	22.0	21.0	43.0	60.0	-17.0
8.510	21.9	20.9	42.8	60.0	-17.2
15.010	21.4	21.3	42.7	60.0	-17.3
14.860	21.3	21.3	42.6	60.0	-17.4
9.620	21.2	21.0	42.2	60.0	-17.8

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
10.190	24.5	21.0	45.5	50.0	-4.5
10.300	23.5	21.0	44.5	50.0	-5.5
10.150	23.5	21.0	44.5	50.0	-5.5
10.090	23.5	21.0	44.5	50.0	-5.5
9.750	23.5	21.0	44.5	50.0	-5.5
9.870	23.3	21.0	44.3	50.0	-5.7
9.850	22.7	21.0	43.7	50.0	-6.3
9.140	22.7	20.9	43.6	50.0	-6.4
9.410	22.6	21.0	43.6	50.0	-6.4
9.490	22.5	21.0	43.5	50.0	-6.5
0.517	19.1	20.3	39.4	46.0	-6.6
14.700	22.1	21.2	43.3	50.0	-6.7
9.560	22.3	21.0	43.3	50.0	-6.7
9.000	22.3	20.9	43.2	50.0	-6.8
10.500	22.2	21.0	43.2	50.0	-6.8
9.350	22.0	21.0	43.0	50.0	-7.0
8.510	21.9	20.9	42.8	50.0	-7.2
15.010	21.4	21.3	42.7	50.0	-7.3
14.860	21.3	21.3	42.6	50.0	-7.4
9.620	21.2	21.0	42.2	50.0	-7.8

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 Advertising, Low, Mid, and High Channels (CH 0 - 2402 MHz, CH12 - 2426 MHz and CH39 - 2480 MHz)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1608 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 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
Cable	ESM Cable Corp.	KMKM-72	EVY	9/12/2011	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/12/2011	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	7/6/2012	24 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Low Pass Filter 0-1000 MHz	Micro-Tronics	LPM50004	LFD	7/6/2012	24 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3142	AXJ	5/16/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12 mo

MEASUREMENT BANDWIDTHS

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


MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

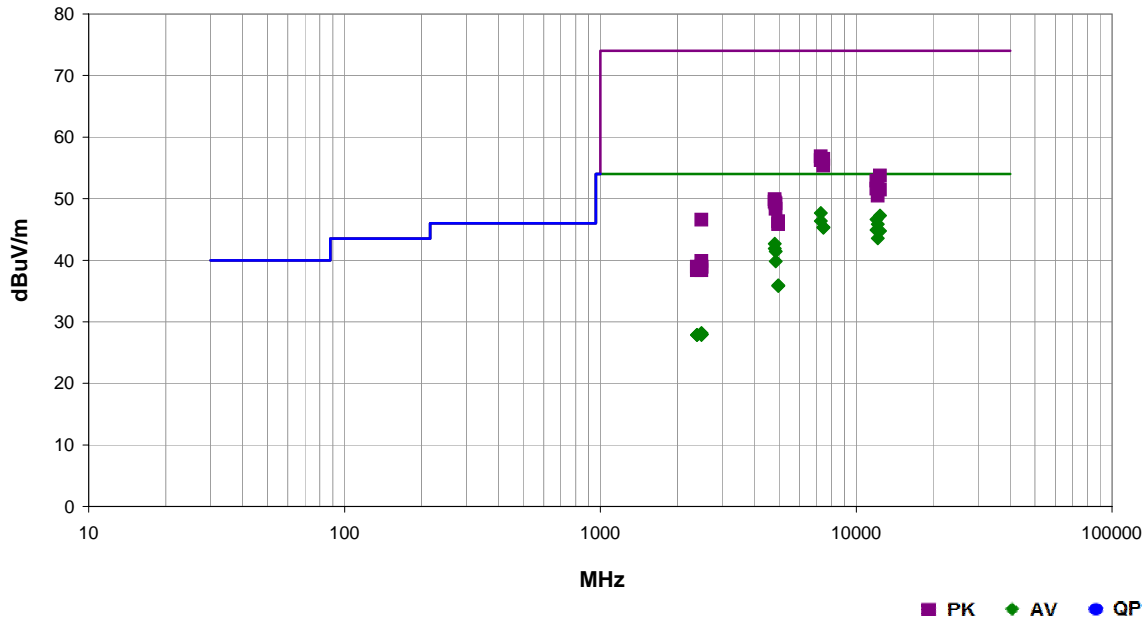
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify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

SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1608	Date:	08/04/12	
Project:	None	Temperature:	24.37 °C	
Job Site:	EV01	Humidity:	41.66% RH	
Serial Number:	364122652	Barometric Pres.:	1011 mbar	
EUT:	1516	Tested by: Mark Baytan		
Configuration:	1			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE Advertising, Low, Mid, and High Channels (CH 0, CH12 and CH39)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.247:2012	ANSI C63.10:2009

Run #	25	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 (m)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dB)	Spec. Limit (dB)	Compared to Spec. (dB)	Comments
7277.767	28.9	18.8	1.0	303.0	3.0	0.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Side, Mid Channel
12399.250	49.7	-2.4	1.1	219.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	EUT Side, High Channel
12009.230	51.5	-4.9	1.0	225.0	3.0	0.0	Vert	AV	0.0	46.6	54.0	-7.4	EUT Side, Low Channel
7277.640	27.6	18.8	1.3	74.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	EUT Side, Mid Channel
12129.200	50.0	-4.1	1.0	208.0	3.0	0.0	Vert	AV	0.0	45.9	54.0	-8.1	EUT Side, Mid Channel
7438.040	25.9	19.5	1.0	52.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	EUT Side, High Channel
7439.707	25.8	19.5	1.0	347.0	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	EUT Side, High Channel
12009.130	49.8	-4.9	1.0	214.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	EUT Side, Low Channel
12399.140	47.2	-2.4	1.2	202.0	3.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	EUT Side, High Channel
12129.170	47.7	-4.1	1.0	106.0	3.0	0.0	Horz	AV	0.0	43.6	54.0	-10.4	EUT Side, Mid Channel
4804.002	32.5	10.2	1.0	230.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	EUT Side, Low Channel
4804.048	31.7	10.2	1.0	120.0	3.0	0.0	Vert	AV	0.0	41.9	54.0	-12.1	EUT Side, Low Channel
4852.067	31.1	10.3	1.0	207.0	3.0	0.0	Horz	AV	0.0	41.4	54.0	-12.6	EUT Side, Mid Channel
4851.920	29.5	10.3	1.0	75.0	3.0	0.0	Vert	AV	0.0	39.8	54.0	-14.2	EUT Side, Mid Channel
7277.287	38.1	18.8	1.0	303.0	3.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	EUT Side, Mid Channel
7440.073	37.0	19.5	1.0	347.0	3.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	EUT Side, High Channel
7277.660	37.5	18.8	1.3	74.0	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	EUT Side, Mid Channel
4959.273	25.2	10.7	1.0	126.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	EUT Side, High Channel
4958.807	25.1	10.7	1.6	151.0	3.0	0.0	Horz	AV	0.0	35.8	54.0	-18.2	EUT Side, High Channel
7440.053	35.9	19.5	1.0	52.0	3.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	EUT Side, High Channel
12399.830	56.2	-2.4	1.1	219.0	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	EUT Side, High Channel
12008.790	57.8	-4.9	1.0	225.0	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	EUT Side, Low Channel

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (')	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (')	Spec. Limit (')	Compared to Spec. (dB)	Comments
12130.040	56.5	-4.1	1.0	208.0	3.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	EUT Side, Mid Channel
12010.000	56.5	-4.9	1.0	214.0	3.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	EUT Side, Low Channel
12398.800	53.9	-2.4	1.2	202.0	3.0	0.0	Vert	PK	0.0	51.5	74.0	-22.5	EUT Side, High Channel
12129.770	54.6	-4.1	1.0	106.0	3.0	0.0	Horz	PK	0.0	50.5	74.0	-23.5	EUT Side, Mid Channel
4804.082	39.7	10.2	1.0	230.0	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	EUT Side, Low Channel
4803.935	39.3	10.2	1.0	120.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	EUT Side, Low Channel
4851.420	38.9	10.3	1.0	207.0	3.0	0.0	Horz	PK	0.0	49.2	74.0	-24.8	EUT Side, Mid Channel
4851.740	38.0	10.3	1.0	75.0	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	EUT Side, Mid Channel
2483.500	26.3	1.9	1.0	359.0	3.0	0.0	Horz	AV	0.0	28.2	54.0	-25.8	EUT Side, High Channel
2483.500	26.1	1.9	1.0	25.0	3.0	0.0	Horz	AV	0.0	28.0	54.0	-26.0	EUT Horz, High Channel
2483.500	26.1	1.9	2.2	205.0	3.0	0.0	Vert	AV	0.0	28.0	54.0	-26.0	EUT Side, High Channel
2483.500	26.1	1.9	1.9	129.0	3.0	0.0	Vert	AV	0.0	28.0	54.0	-26.0	EUT Horz, High Channel
2483.500	26.1	1.9	1.0	131.0	3.0	0.0	Horz	AV	0.0	28.0	54.0	-26.0	EUT Vert, High Channel
2483.500	26.0	1.9	1.0	289.0	3.0	0.0	Vert	AV	0.0	27.9	54.0	-26.1	EUT Vert, High Channel
2389.500	26.3	1.5	1.0	141.0	3.0	0.0	Vert	AV	0.0	27.8	54.0	-26.2	EUT Side, Low Channel
2389.500	26.3	1.5	1.0	200.0	3.0	0.0	Horz	AV	0.0	27.8	54.0	-26.2	EUT Side, Low Channel
2483.500	44.7	1.9	1.0	359.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	EUT Side, High Channel
4959.973	35.6	10.7	1.6	151.0	3.0	0.0	Horz	PK	0.0	46.3	74.0	-27.7	EUT Side, High Channel
4959.100	35.1	10.7	1.0	126.0	3.0	0.0	Vert	PK	0.0	45.8	74.0	-28.2	EUT Side, High Channel
2483.500	38.0	1.9	1.0	289.0	3.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	EUT Horz, High Channel
2483.500	37.1	1.9	2.2	205.0	3.0	0.0	Vert	PK	0.0	39.0	74.0	-35.0	EUT Side, High Channel
2483.500	37.1	1.9	1.0	131.0	3.0	0.0	Horz	PK	0.0	39.0	74.0	-35.0	EUT Vert, High Channel
2389.500	37.4	1.5	1.0	200.0	3.0	0.0	Horz	PK	0.0	38.9	74.0	-35.1	EUT Side, Low Channel
2483.500	37.0	1.9	1.0	25.0	3.0	0.0	Horz	PK	0.0	38.9	74.0	-35.1	EUT Horz, High Channel
2483.500	36.5	1.9	1.9	129.0	3.0	0.0	Vert	PK	0.0	38.4	74.0	-35.6	EUT Vert, High Channel
2389.500	36.8	1.5	1.0	141.0	3.0	0.0	Vert	PK	0.0	38.3	74.0	-35.7	EUT Side, Low Channel

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 Data mode, Low, Mid, and High Channels (CH 1 - 2404 MHz, CH20 - 2442 MHz, and CH38 - 2478 MHz)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1608 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 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
Cable	ESM Cable Corp.	KMKM-72	EVY	9/12/2011	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/12/2011	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	7/6/2012	24 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Low Pass Filter 0-1000 MHz	Micro-Tronics	LPM50004	LFD	7/6/2012	24 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3142	AXJ	5/16/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12 mo

MEASUREMENT BANDWIDTHS

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

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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

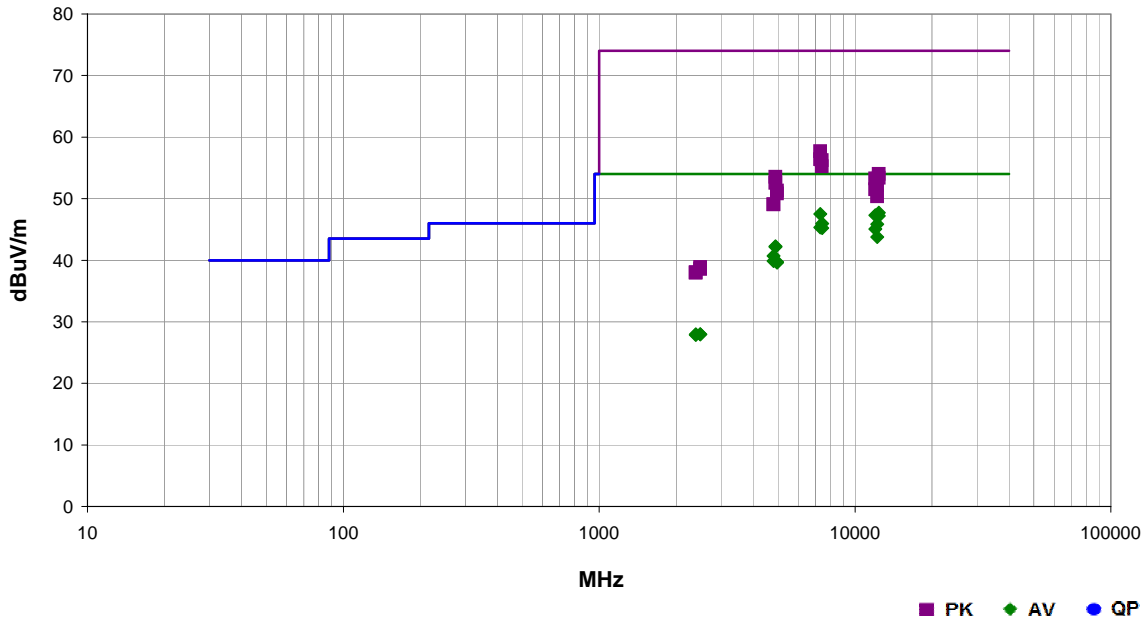


SPURIOUS RADIATED EMISSIONS

Work Order:	MCSO1608	Date:	08/04/12
Project:	None	Temperature:	24.37 °C
Job Site:	EV01	Humidity:	41.66% RH
Serial Number:	364122652	Barometric Pres.:	1011 mbar
EUT:	1516	Tested by: Mark Baytan	
Configuration:	1		
Customer:	Microsoft Corporation		
Attendees:	None		
EUT Power:	110VAC60Hz		
Operating Mode:	Transmitting Bluetooth LE Data, Low, Mid, and High Channels (CH 1, CH20, and CH38)		
Deviations:	None		
Comments:	None		

Test Specifications	FCC 15.247:2012	Test Method	ANSI C63.10:2009
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Run #	26	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 (m)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dB)	Spec. Limit (dB)	Compared to Spec. (dB)	Comments
12388.790	50.2	-2.5	1.0	266.0	3.0	0.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Side, High Channel
7325.300	28.5	19.0	1.3	222.0	3.0	0.0	Horz	AV	0.0	47.5	54.0	-6.5	EUT Side, Mid Channel
12018.800	52.1	-4.8	1.0	218.0	3.0	0.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT Side, Low Channel
12388.790	49.7	-2.5	1.3	221.0	3.0	0.0	Horz	AV	0.0	47.2	54.0	-6.8	EUT Side, High Channel
7433.287	26.5	19.4	1.0	98.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	EUT Side, High Channel
12208.790	49.5	-3.6	1.3	208.0	3.0	0.0	Vert	AV	0.0	45.9	54.0	-8.1	EUT Side, Mid Channel
7325.140	26.3	19.0	1.0	107.0	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	EUT Side, Mid Channel
7434.333	25.8	19.4	3.0	62.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	EUT Side, High Channel
12018.800	49.9	-4.8	1.0	98.0	3.0	0.0	Horz	AV	0.0	45.1	54.0	-8.9	EUT Side, Low Channel
12208.790	47.4	-3.6	1.2	188.0	3.0	0.0	Horz	AV	0.0	43.8	54.0	-10.2	EUT Side, Mid Channel
4882.107	31.8	10.4	1.0	201.0	3.0	0.0	Vert	AV	0.0	42.2	54.0	-11.8	EUT Side, Mid Channel
4882.933	31.7	10.4	1.0	55.0	3.0	0.0	Horz	AV	0.0	42.1	54.0	-11.9	EUT Side, Mid Channel
4807.767	30.5	10.2	2.1	85.0	3.0	0.0	Horz	AV	0.0	40.7	54.0	-13.3	EUT Side, Low Channel
4807.807	29.7	10.2	1.0	137.0	3.0	0.0	Vert	AV	0.0	39.9	54.0	-14.1	EUT Side, Low Channel
4954.387	29.0	10.7	1.0	149.0	3.0	0.0	Vert	AV	0.0	39.7	54.0	-14.3	EUT Side, High Channel
4954.420	28.9	10.7	1.0	320.0	3.0	0.0	Horz	AV	0.0	39.6	54.0	-14.4	EUT Side, High Channel
7325.367	38.7	19.0	1.3	222.0	3.0	0.0	Horz	PK	0.0	57.7	74.0	-16.3	EUT Side, Mid Channel
7325.167	37.4	19.0	1.0	107.0	3.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	EUT Side, Mid Channel
7432.553	36.8	19.4	1.0	98.0	3.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	EUT Side, High Channel
7432.667	35.8	19.4	3.0	62.0	3.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	EUT Side, High Channel
12389.790	56.5	-2.5	1.0	266.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	EUT Side, High Channel
4882.120	43.1	10.4	1.0	55.0	3.0	0.0	Horz	PK	0.0	53.5	74.0	-20.5	EUT Side, Mid Channel

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (')	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (')	Spec. Limit (')	Compared to Spec. (dB)	Comments
12389.830	55.9	-2.5	1.3	221.0	3.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	EUT Side, High Channel
12018.740	58.1	-4.8	1.0	218.0	3.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	EUT Side, Low Channel
4882.140	42.1	10.4	1.0	201.0	3.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	EUT Side, Mid Channel
12209.930	55.8	-3.6	1.3	208.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	EUT Side, Mid Channel
12019.930	56.3	-4.8	1.0	98.0	3.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	EUT Side, Low Channel
4957.027	40.6	10.7	1.0	320.0	3.0	0.0	Horz	PK	0.0	51.3	74.0	-22.7	EUT Side, High Channel
4955.147	40.1	10.7	1.0	149.0	3.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	EUT Side, High Channel
12208.760	54.0	-3.6	1.2	188.0	3.0	0.0	Horz	PK	0.0	50.4	74.0	-23.6	EUT Side, Mid Channel
4807.600	38.9	10.2	1.0	137.0	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	EUT Side, Low Channel
4807.547	38.9	10.2	2.1	85.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	EUT Side, Low Channel
2483.500	26.1	1.9	2.3	119.0	3.0	0.0	Vert	AV	0.0	28.0	54.0	-26.0	EUT Side, High Channel
2483.500	26.1	1.9	1.0	167.0	3.0	0.0	Horz	AV	0.0	28.0	54.0	-26.0	EUT Side, High Channel
2389.500	26.4	1.5	2.4	127.0	3.0	0.0	Horz	AV	0.0	27.9	54.0	-26.1	EUT Side, Low Channel
2389.500	26.3	1.5	1.0	27.0	3.0	0.0	Vert	AV	0.0	27.8	54.0	-26.2	EUT Side, Low Channel
2483.500	37.0	1.9	2.3	119.0	3.0	0.0	Vert	PK	0.0	38.9	74.0	-35.1	EUT Side, High Channel
2483.500	36.7	1.9	1.0	167.0	3.0	0.0	Horz	PK	0.0	38.6	74.0	-35.4	EUT Side, High Channel
2389.500	36.5	1.5	2.4	127.0	3.0	0.0	Horz	PK	0.0	38.0	74.0	-36.0	EUT Side, Low Channel
2389.500	36.4	1.5	1.0	27.0	3.0	0.0	Vert	PK	0.0	37.9	74.0	-36.1	EUT Side, Low Channel