



Microsoft Corporation

1601

FCC 15.207:2013

FCC 15.247:2013

Report #: MCSO1668.1



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: July 8, 2013
Microsoft Corporation
Model: 1601

Emissions

Test Description	Specification	Test Method	Pass/Fail
Duty Cycle	FCC 15.247:2013	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2013	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2013	ANSI C63.10:2009	Pass
Power Spectral Density	FCC 15.247:2013	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2013	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
Powerline Conducted Emissions	FCC 15.207:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200629-0

Test Facility

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

Northwest EMC, Inc.
19201 120th Avenue NE Suite 104
Bothell, WA 98011

Phone: (425) 984-6600 Fax: 984-6602

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

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

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

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Hong Kong

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

Vietnam

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

Russia

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

SCOPE

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

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

Measurement Uncertainty

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

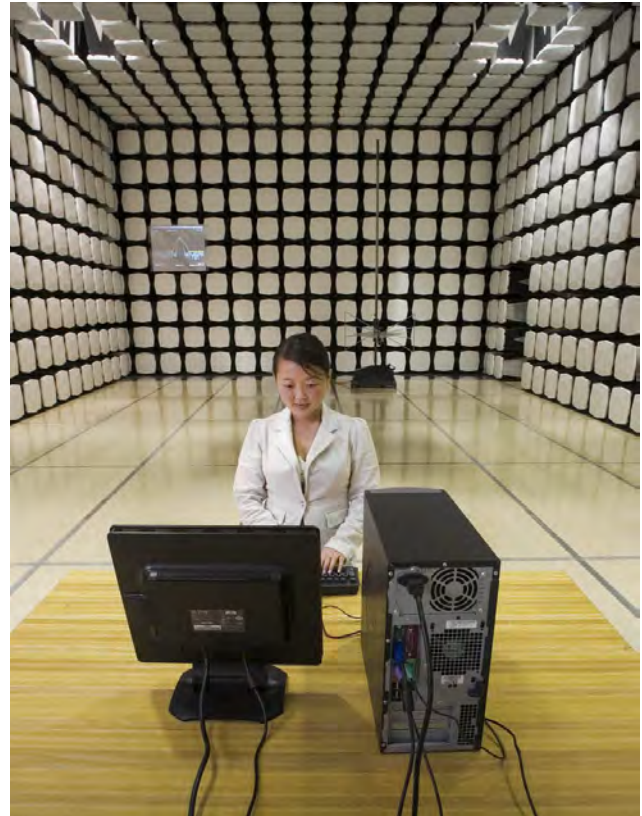
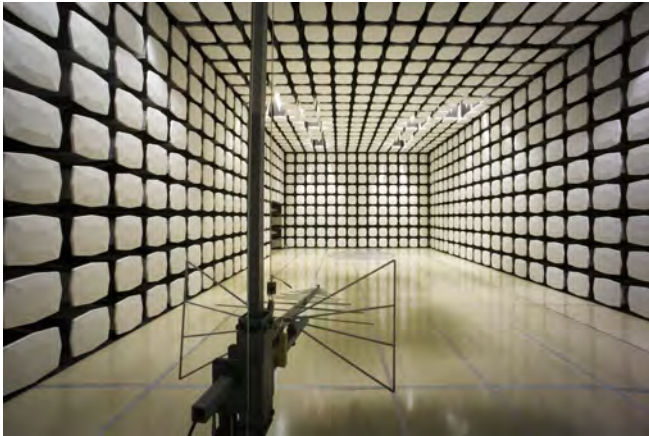
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

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

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05, SU02, SU07 19201 120 th Ave. NE Bothell, WA 98011 (425) 984-6600
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
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0



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:	1601
First Date of Test:	July 2, 2013
Last Date of Test:	July 8, 2013
Receipt Date of Samples:	July 2, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
A hand held computing device with 802.11 a/g/b/n and Bluetooth radios.
Testing Objective:
To demonstrate compliance under FCC 15.247 of the Bluetooth Low Energy portion as a DTS device for operation in the 2.4 GHz bands.

Configuration MCSO1668- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Remote Laptop	Lenovo	4171-53U	R9-N8A80 12/04

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Ethernet	No	0.8m	No	Remote Laptop	USB Ethernet Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1668- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622
Detachable Keyboard	Microsoft Corporation	X865049-001	016967623751

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Headphone	No	1.2m	No	Handheld Computing Device	Ear Buds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Ethernet	No	0.8m	No	Remote Laptop	USB Ethernet Adapter
Display Port	Yes	2.0m	No	Handheld Computing Device	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1668- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622
Detachable Keyboard	Microsoft Corporation	X865049-001	016967623751

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Headphone	No	1.2m	No	Handheld Computing Device	Ear Buds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Ethernet	No	0.8m	No	Remote Laptop	USB Ethernet Adapter
Display Port	Yes	2.0m	No	Handheld Computing Device	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	7/2/2013	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.
2	7/2/2013	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	7/2/2013	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/2/2013	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	7/2/2013	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	7/2/2013	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	7/5/2013	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	7/8/2013	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Duty Cycle

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

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

This test is used to document the operating mode of the supplied radio test software. There is no pass/fail criteria.

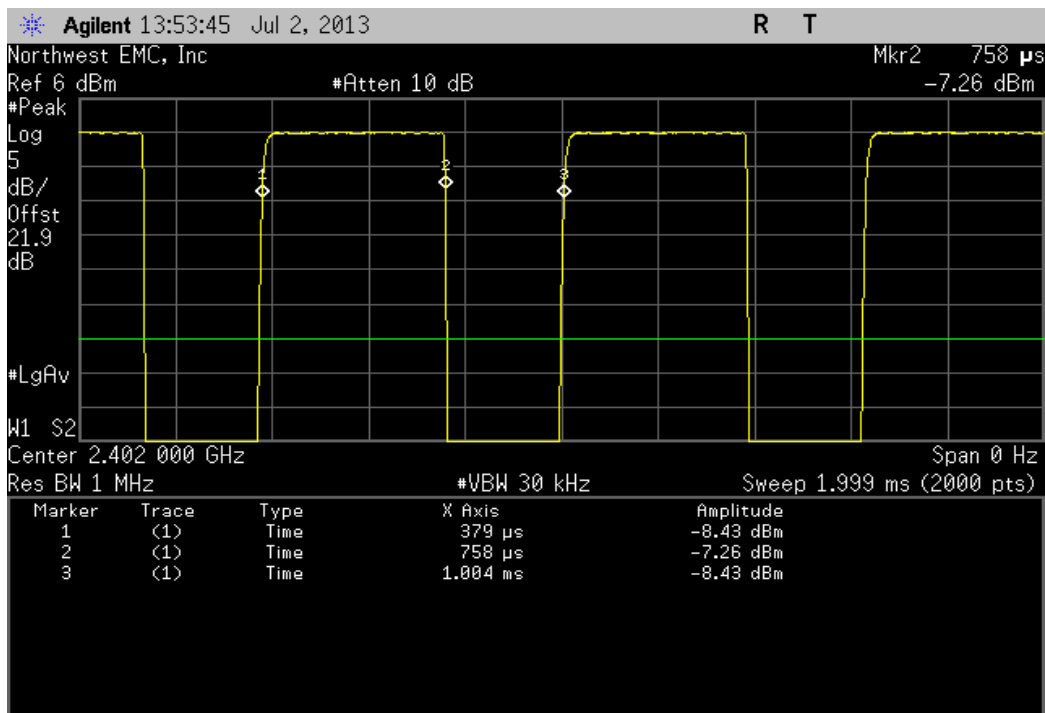


Duty Cycle

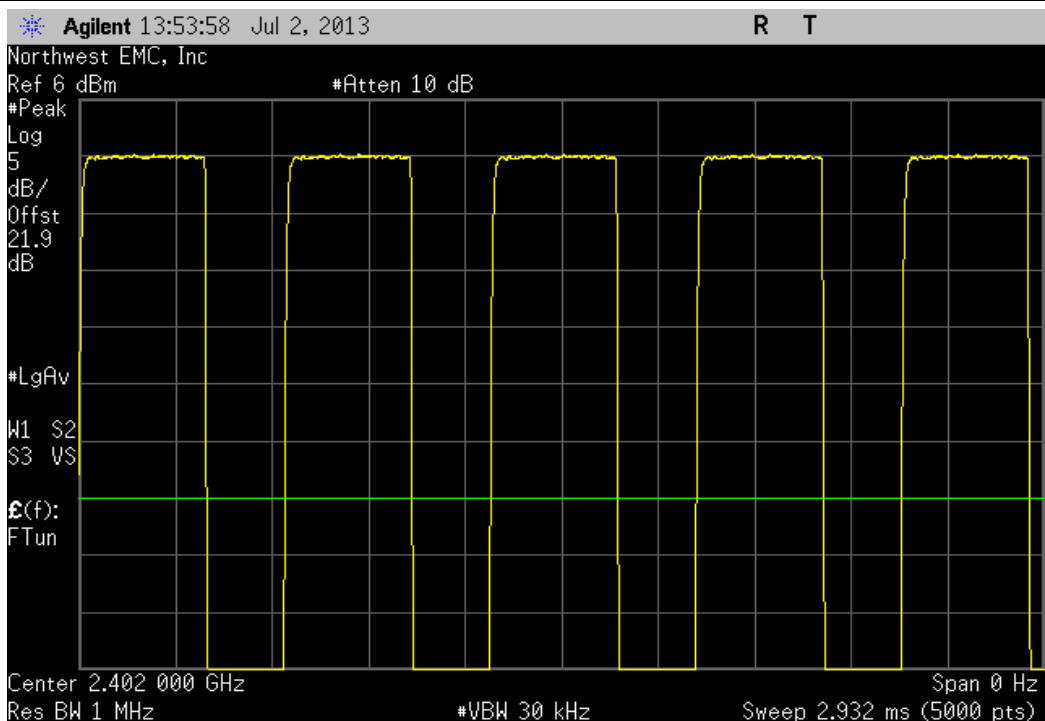
XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCSO1668					
Serial Number: 006079632553		Date: 07/02/13					
Customer: Microsoft Corporation		Temperature: 26°C					
Attendees: None		Humidity: 46%					
Project: None		Barometric Pres.: 1020 mb					
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz					
		Job Site: NC02					
TEST SPECIFICATIONS		Test Method					
FCC 15.247:2013		ANSI C63.10:2009					
COMMENTS							
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	1	Signature <i>Richard Mellroth</i>					
		Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
BLE - Advertising							
	Low Channel, 2402 MHz	379 uS	625 uS	1	60.6	N/A	N/A
	Low Channel, 2402 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel, 2426 MHz	380 uS	626 uS	1	60.7	N/A	N/A
	Mid Channel, 2426 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel, 2480 MHz	379 uS	626 uS	1	60.5	N/A	N/A
	High Channel, 2480 MHz	N/A	N/A	5	N/A	N/A	N/A
BLE - Data							
	Low Channel, 2404 MHz	379 uS	625 uS	1	60.6	N/A	N/A
	Low Channel, 2404 MHz	N/A	N/A	5	N/A	N/A	N/A
	Mid Channel, 2440 MHz	378 uS	624 uS	1	60.6	N/A	N/A
	Mid Channel, 2440 MHz	N/A	N/A	5	N/A	N/A	N/A
	High Channel, 2478 MHz	378 uS	624 uS	1	60.6	N/A	N/A
	High Channel, 2478 MHz	N/A	N/A	5	N/A	N/A	N/A

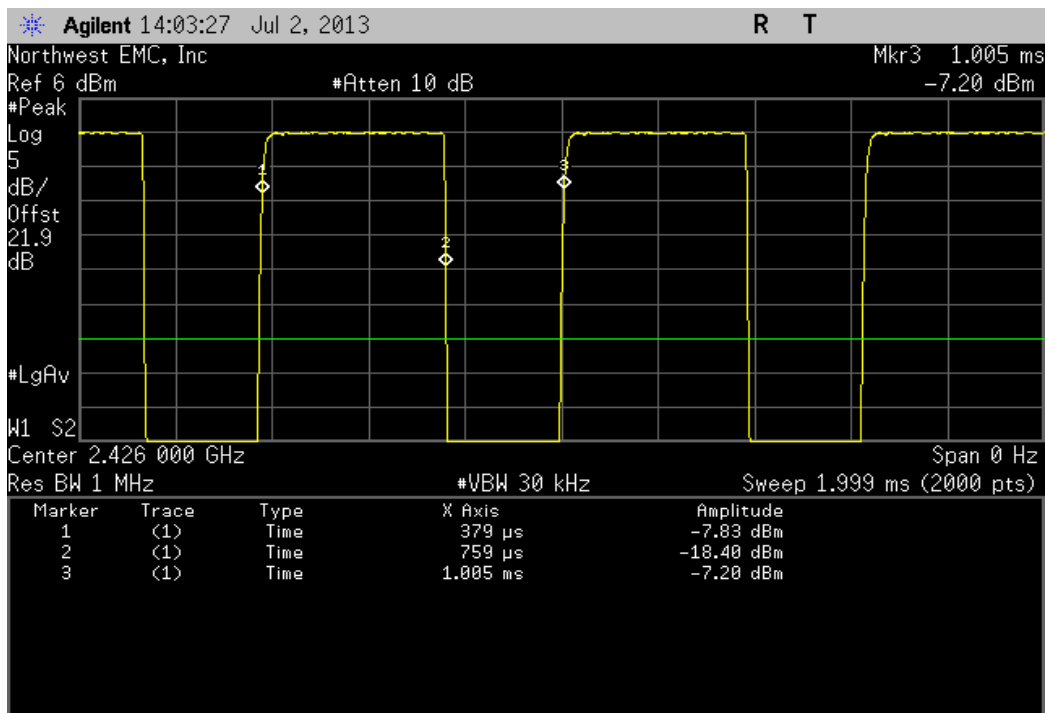
BLE - Advertising, Low Channel, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	379 μ S	625 μ S	1	60.6	N/A	N/A



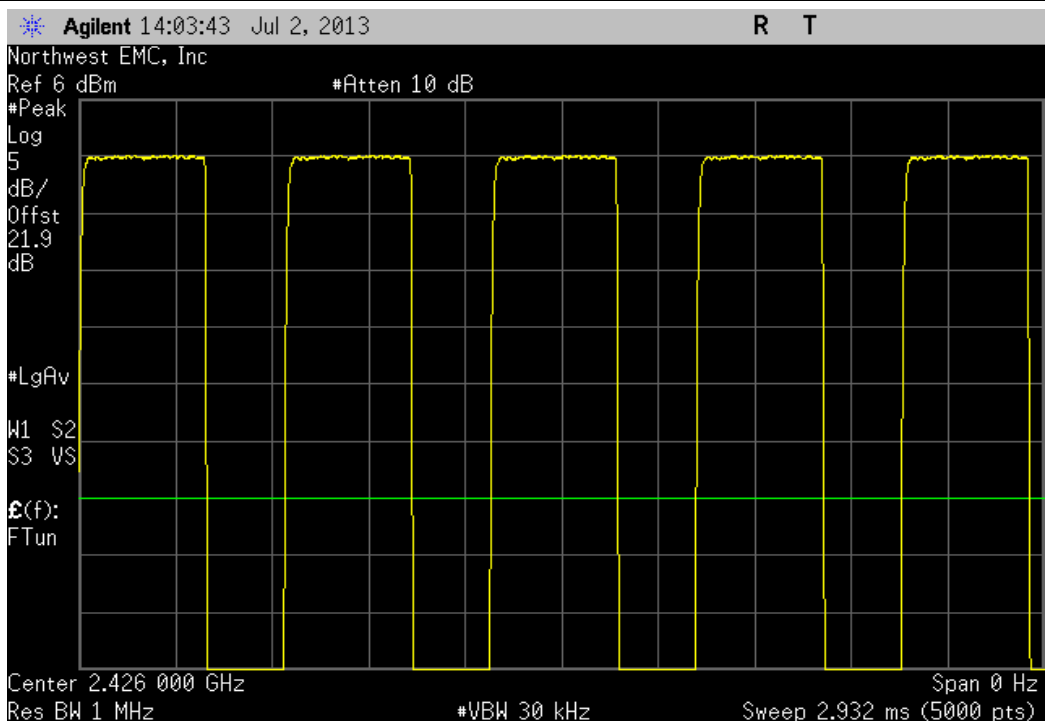
BLE - Advertising, Low Channel, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



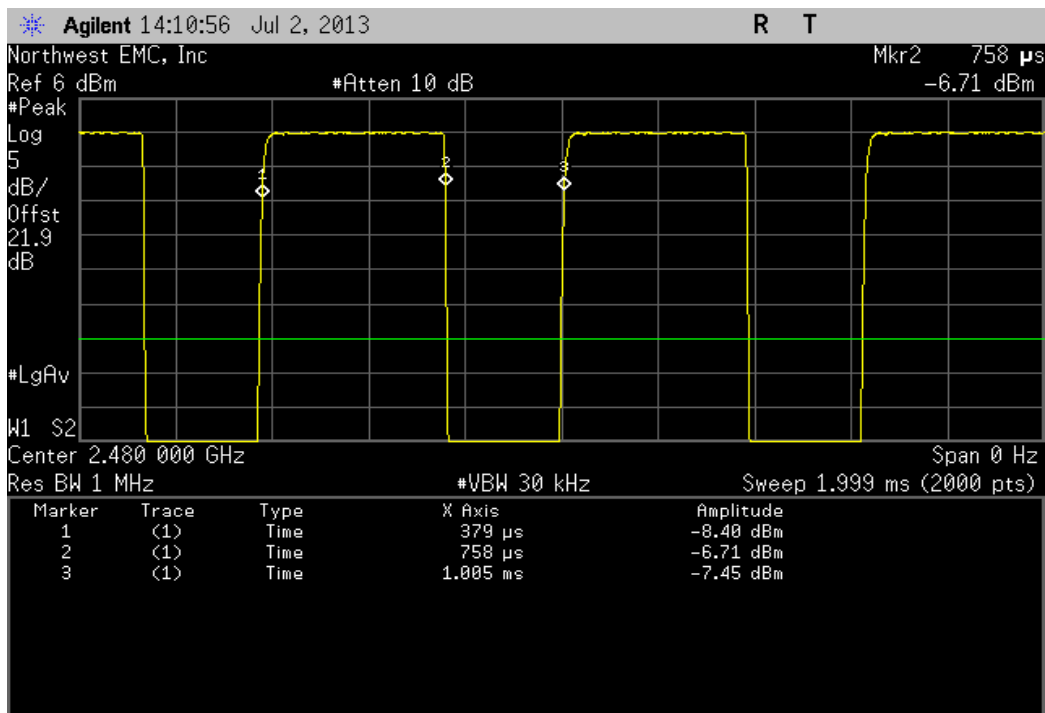
BLE - Advertising, Mid Channel, 2426 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	380 μ S	626 μ S	1	60.7	N/A	N/A



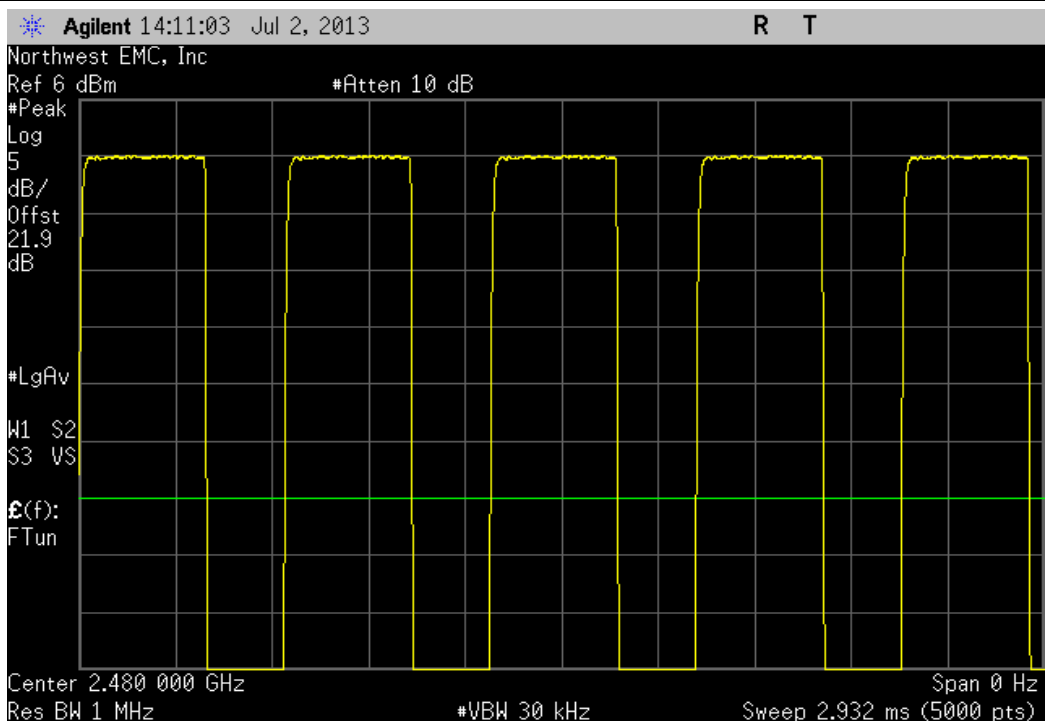
BLE - Advertising, Mid Channel, 2426 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



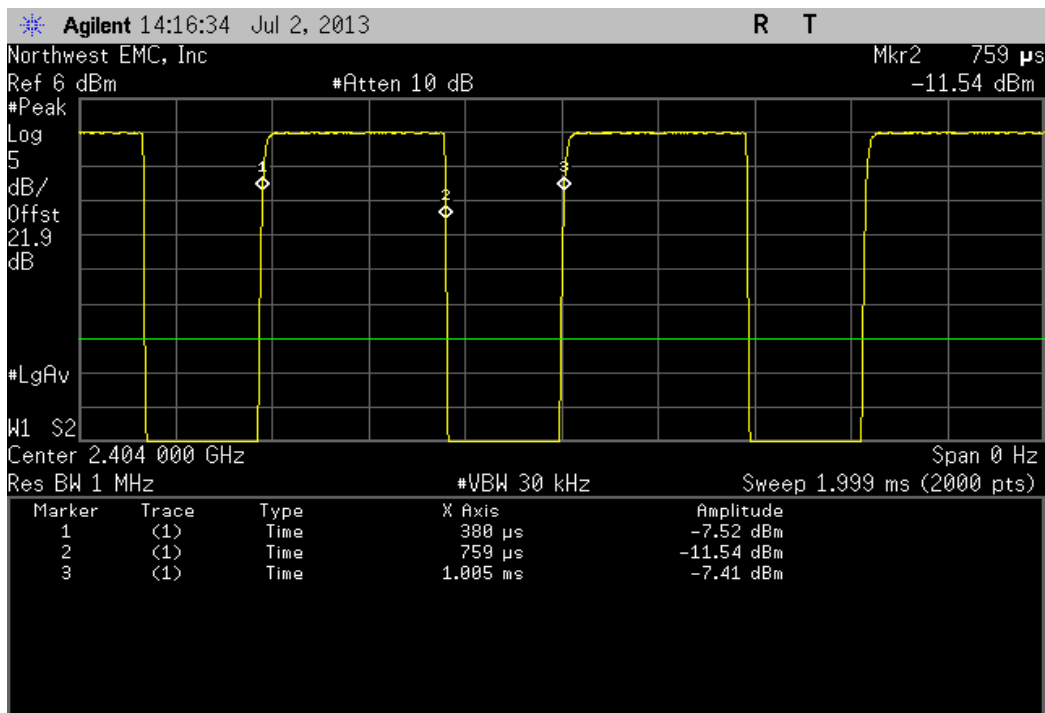
BLE - Advertising, High Channel, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	379 μ S	626 μ S	1	60.5	N/A	N/A



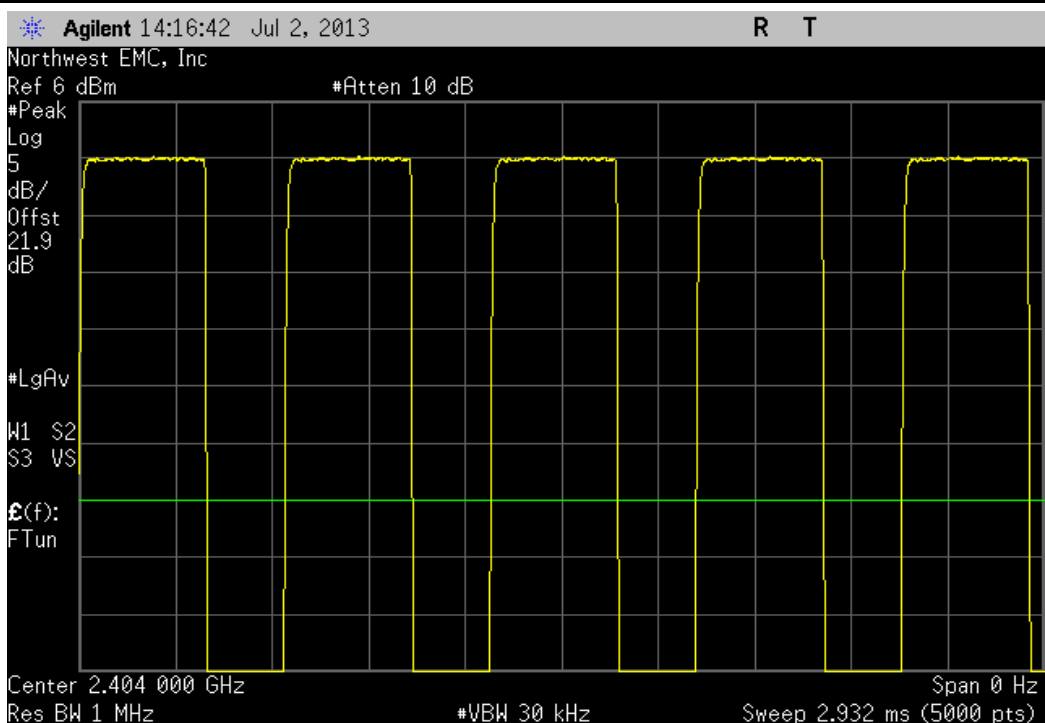
BLE - Advertising, High Channel, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



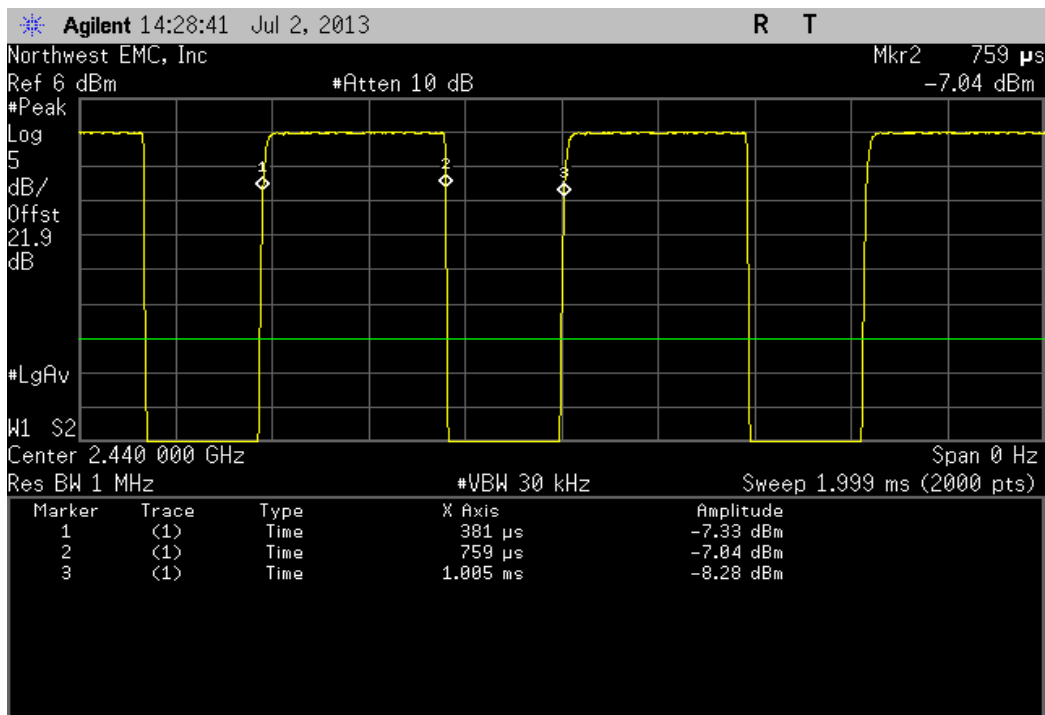
BLE - Data, Low Channel, 2404 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	379 uS	625 uS	1	60.6	N/A	N/A



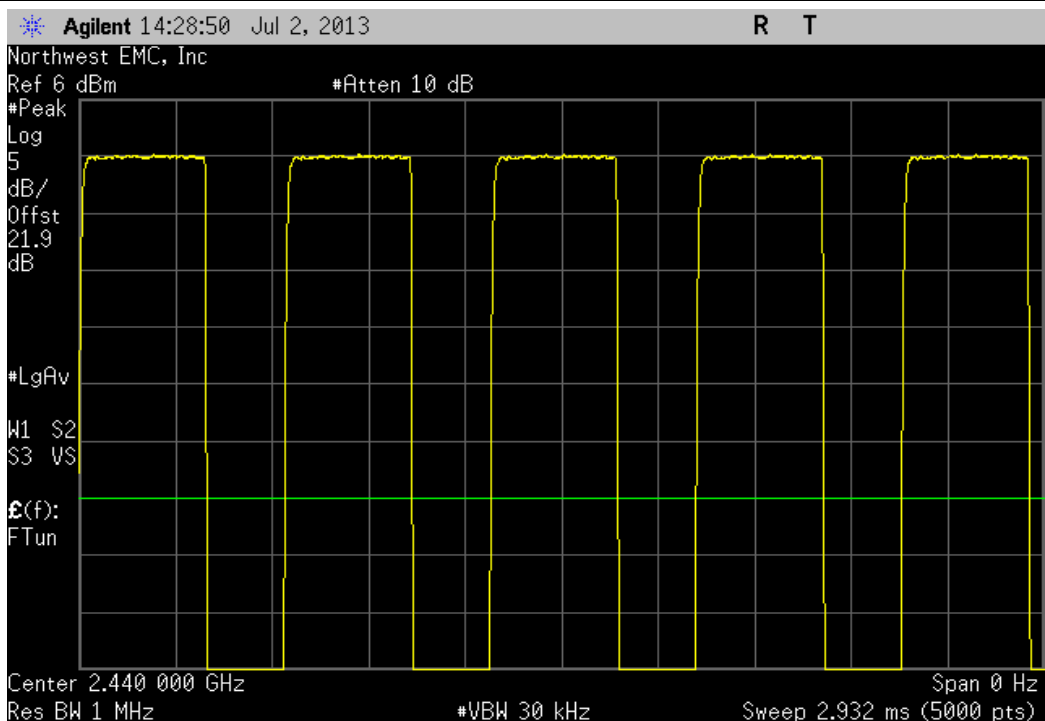
BLE - Data, Low Channel, 2404 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



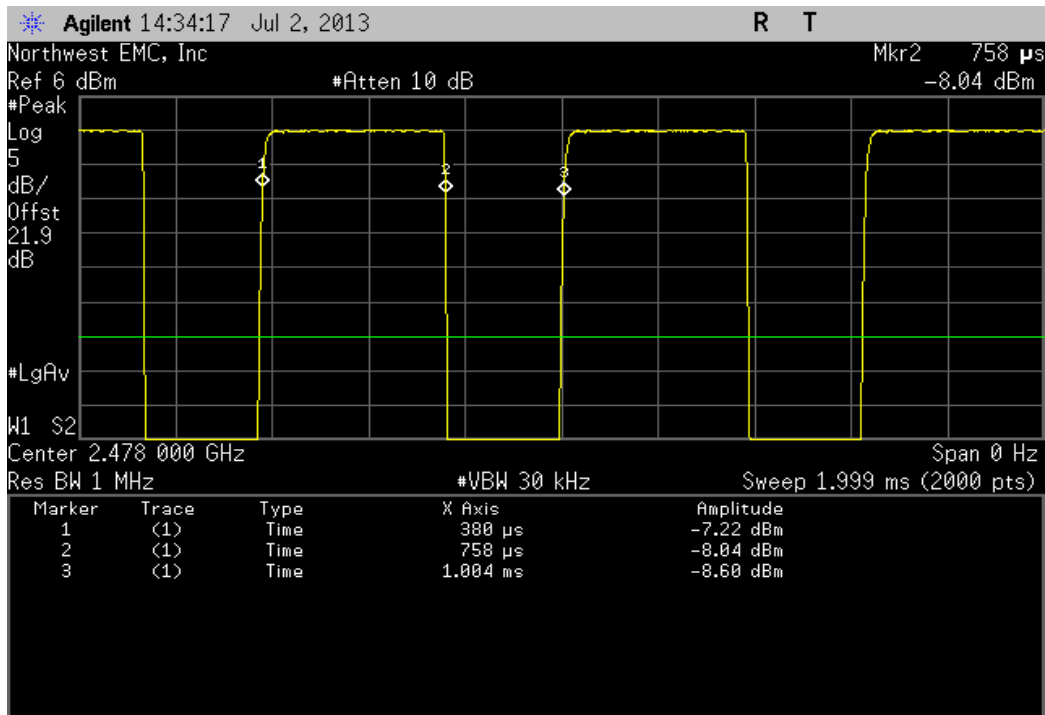
BLE - Data, Mid Channel, 2440 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	378 uS	624 uS	1	60.6	N/A	N/A



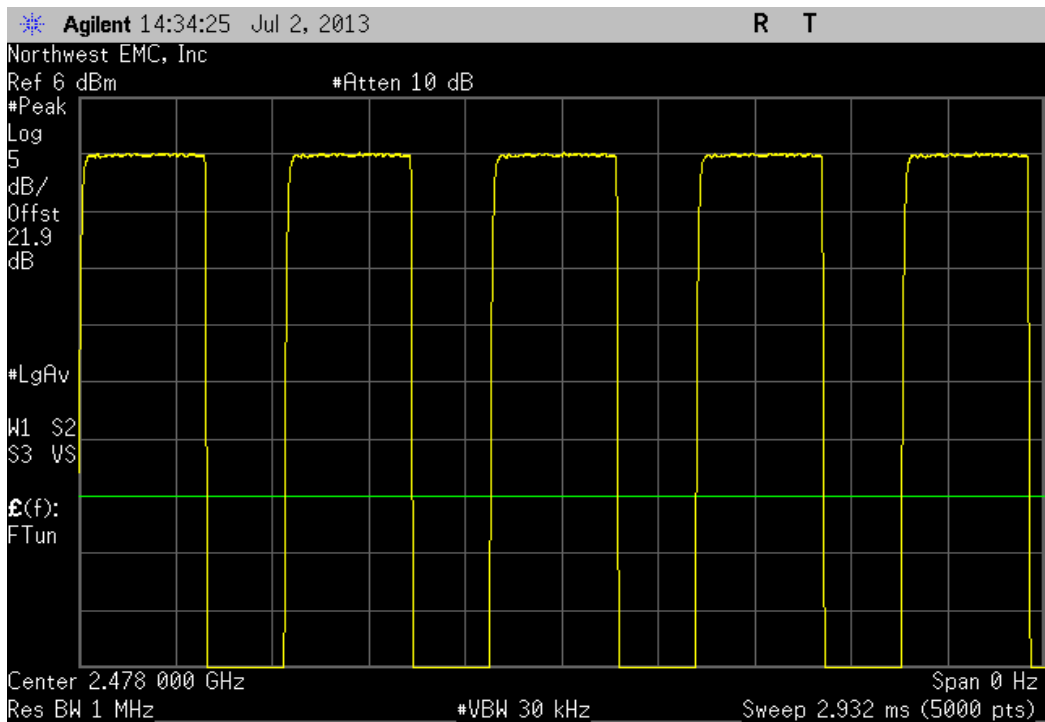
BLE - Data, Mid Channel, 2440 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



BLE - Data, High Channel, 2478 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	378 uS	624 uS	1	60.6	N/A	N/A



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



Occupied Bandwidth

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

The 6dB occupied bandwidth was measured. The 26 dB (99.9%) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.



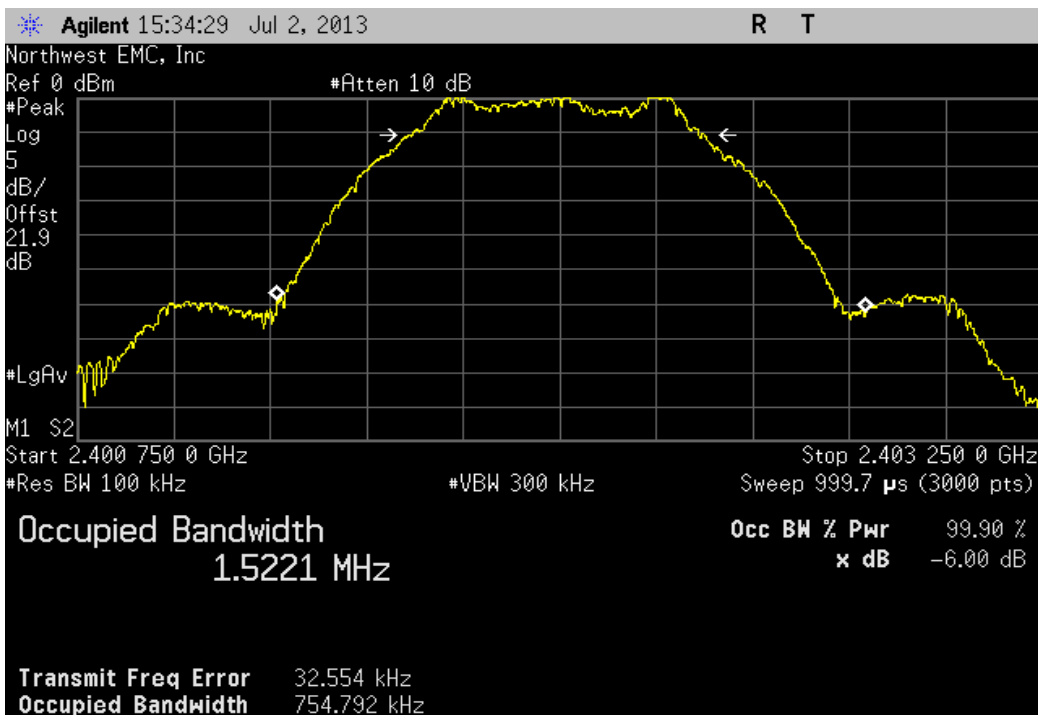
Occupied Bandwidth

XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCSO1668	
Serial Number: 006079632553		Date: 07/02/13	
Customer: Microsoft Corporation		Temperature: 26°C	
Attendees: None		Humidity: 46%	
Project: None		Barometric Pres.: 1020 mb	
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz	
		Job Site: NC02	
TEST SPECIFICATIONS			
FCC 15.247:2013		Test Method	
		ANSI C63.10:2009	
COMMENTS			
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Richard Mellroth</i>	
		Value	Limit
			Result
BLE - Advertising			
Low Channel, 2402 MHz		754.792 kHz	≥ 500 kHz
Mid Channel, 2426 MHz		749.586 kHz	≥ 500 kHz
High Channel, 2480 MHz		763.636 kHz	≥ 500 kHz
BLE - Data			
Low Channel, 2404 MHz		766.508 kHz	≥ 500 kHz
Mid Channel, 2440 MHz		758.948 kHz	≥ 500 kHz
High Channel, 2478 MHz		757.921 kHz	≥ 500 kHz

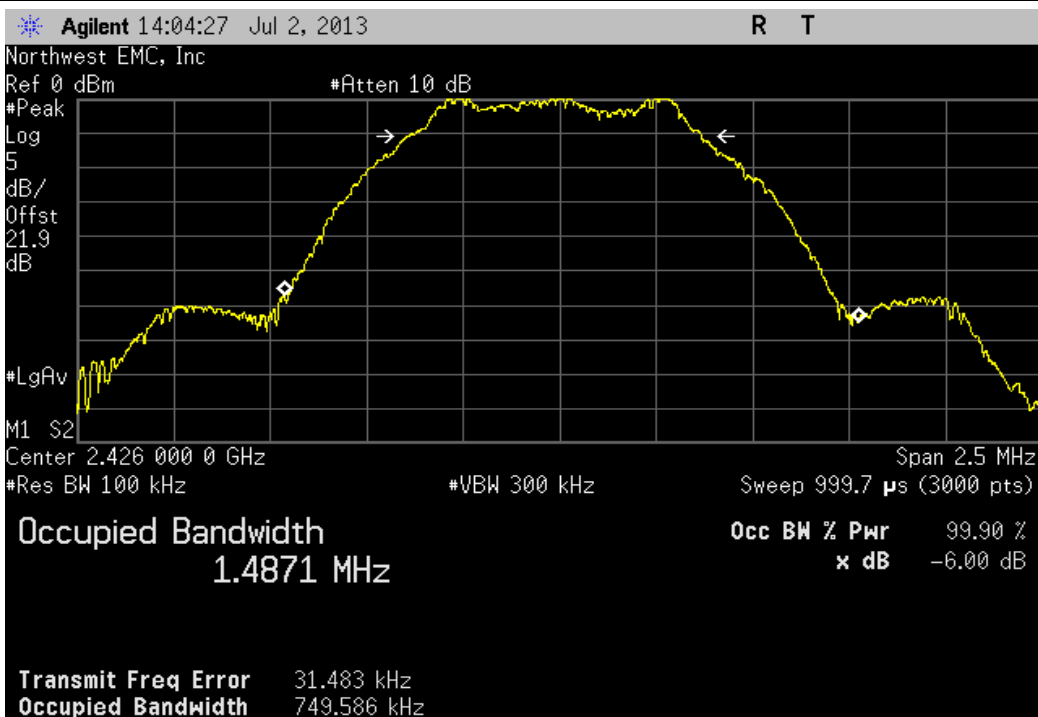
BLE - Advertising, Low Channel, 2402 MHz

				Value	Limit	Result
				754.792 kHz	≥ 500 kHz	Pass



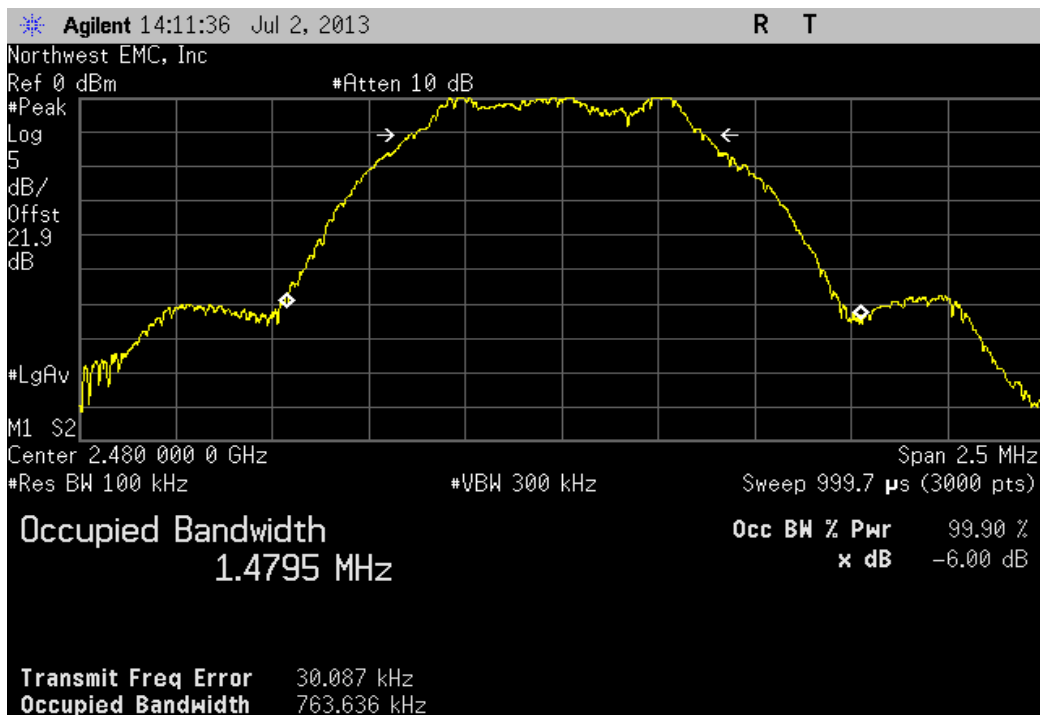
BLE - Advertising, Mid Channel, 2426 MHz

				Value	Limit	Result
				749.586 kHz	≥ 500 kHz	Pass



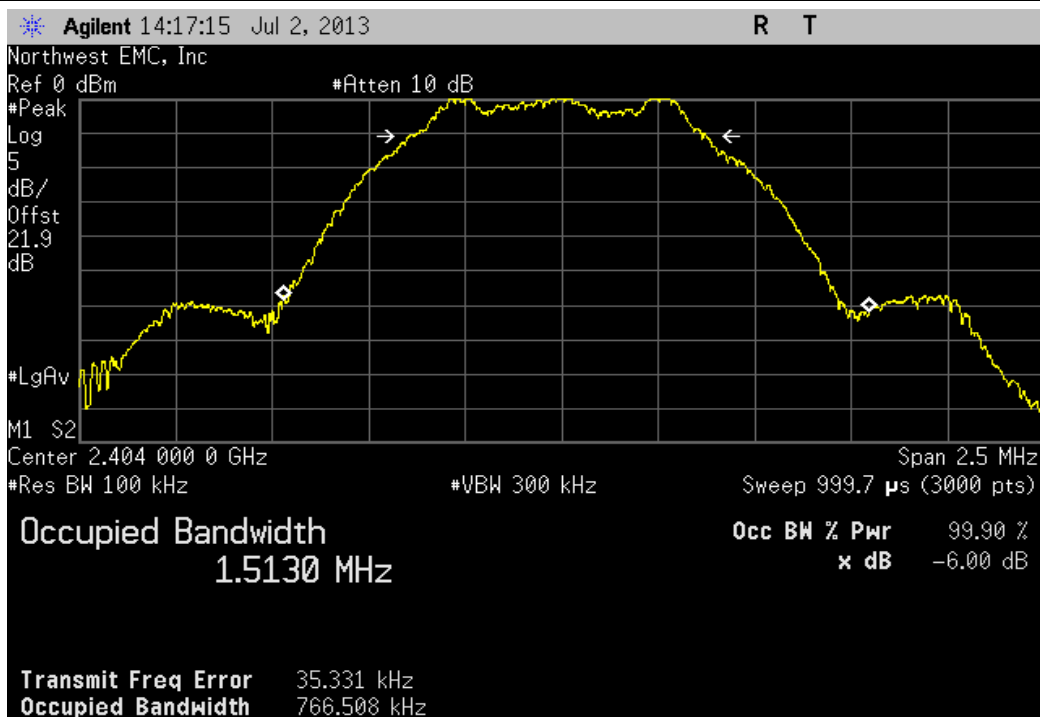
BLE - Advertising, High Channel, 2480 MHz

				Value	Limit	Result
				763.636 kHz	≥ 500 kHz	Pass



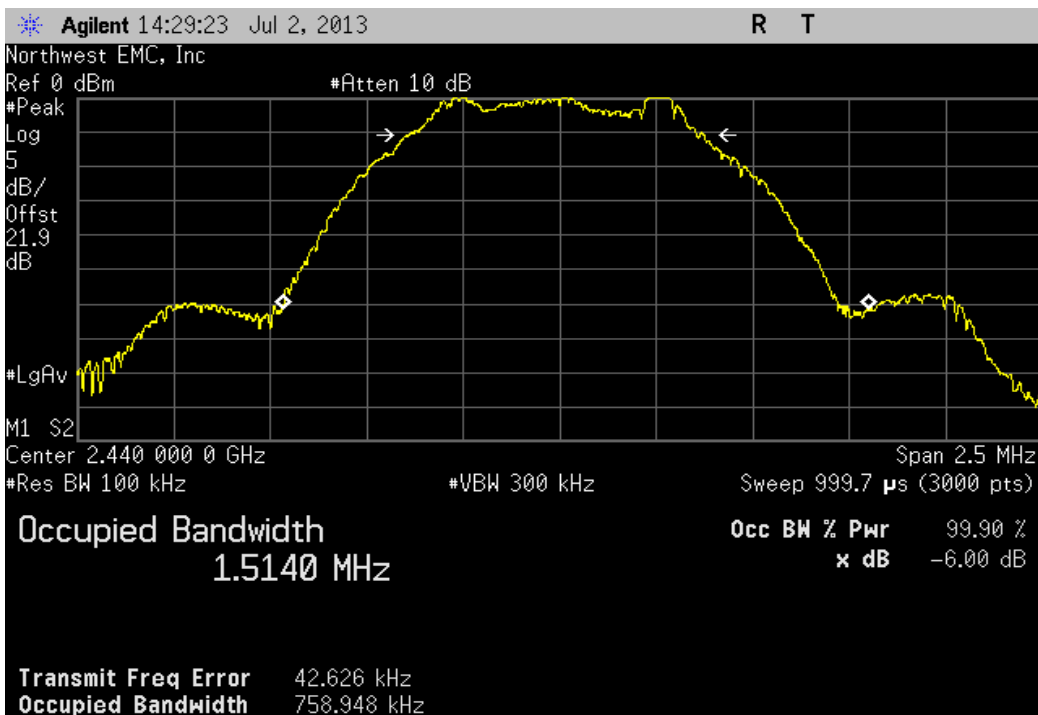
BLE - Data, Low Channel, 2404 MHz

				Value	Limit	Result
				766.508 kHz	≥ 500 kHz	Pass



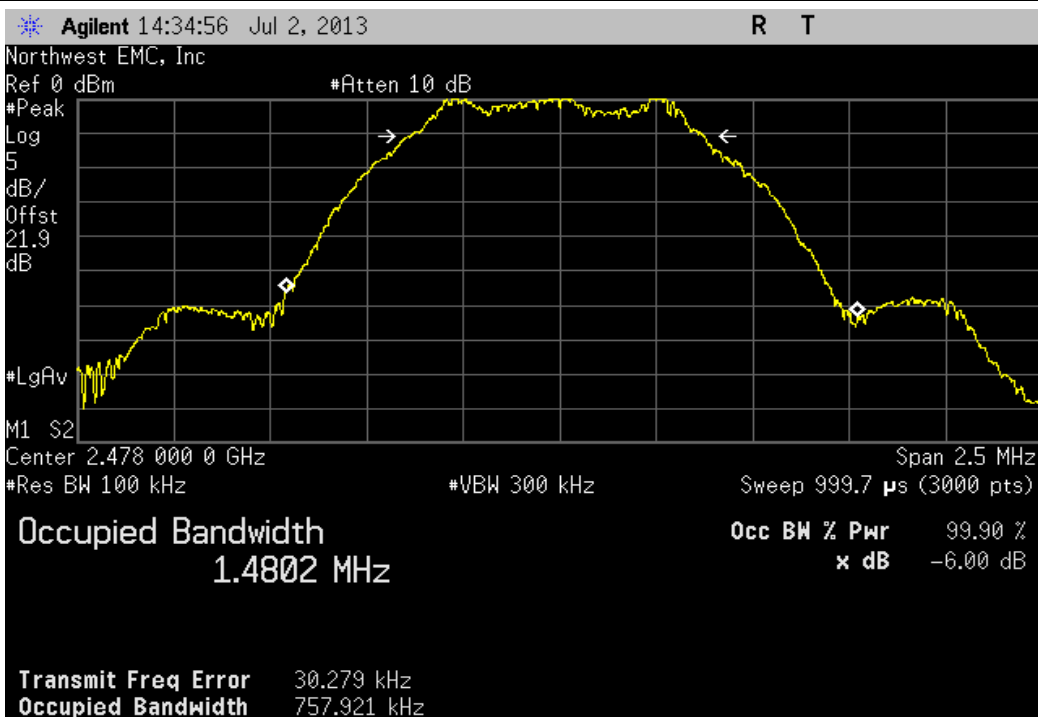
BLE - Data, Mid Channel, 2440 MHz

				Value	Limit	Result
				758.948 kHz	≥ 500 kHz	Pass



BLE - Data, High Channel, 2478 MHz

				Value	Limit	Result
				757.921 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
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

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

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

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



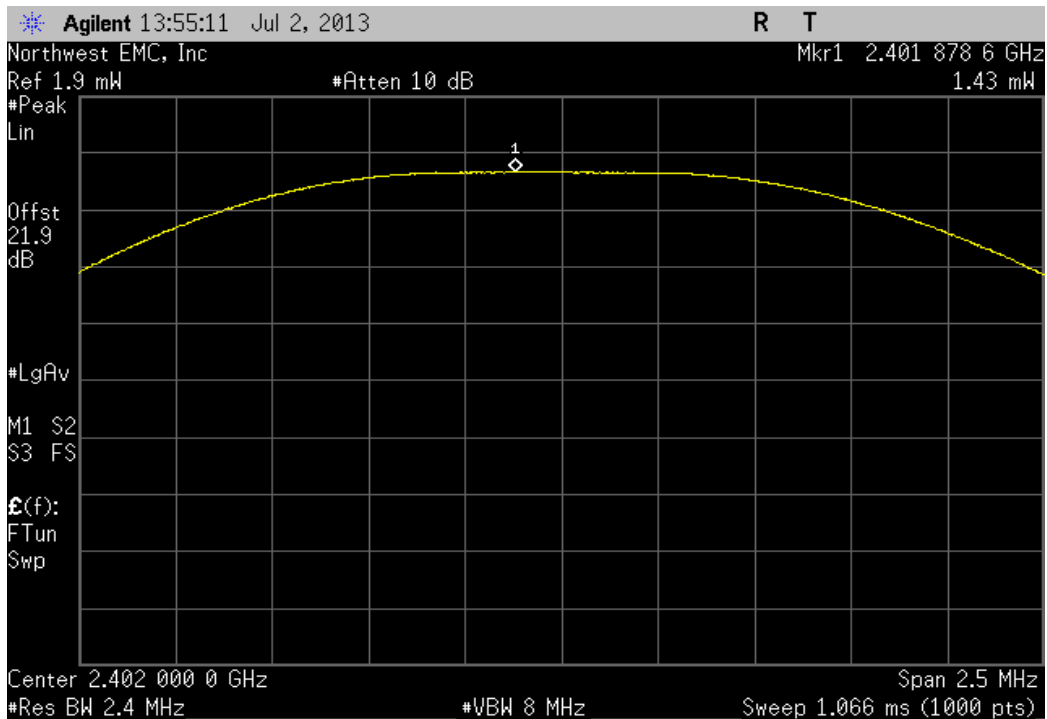
Output Power

XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCSO1668	
Serial Number: 006079632553		Date: 07/02/13	
Customer: Microsoft Corporation		Temperature: 26°C	
Attendees: None		Humidity: 46%	
Project: None		Barometric Pres.: 1020 mb	
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz	
		Job Site: NC02	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Rodney Le Pellego</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		1.431 mW	< 1 W
Mid Channel, 2426 MHz		1.421 mW	< 1 W
High Channel, 2480 MHz		1.422 mW	< 1 W
BLE - Data			
Low Channel, 2404 MHz		1.428 mW	< 1 W
Mid Channel, 2440 MHz		1.425 mW	< 1 W
High Channel, 2478 MHz		1.421 mW	< 1 W

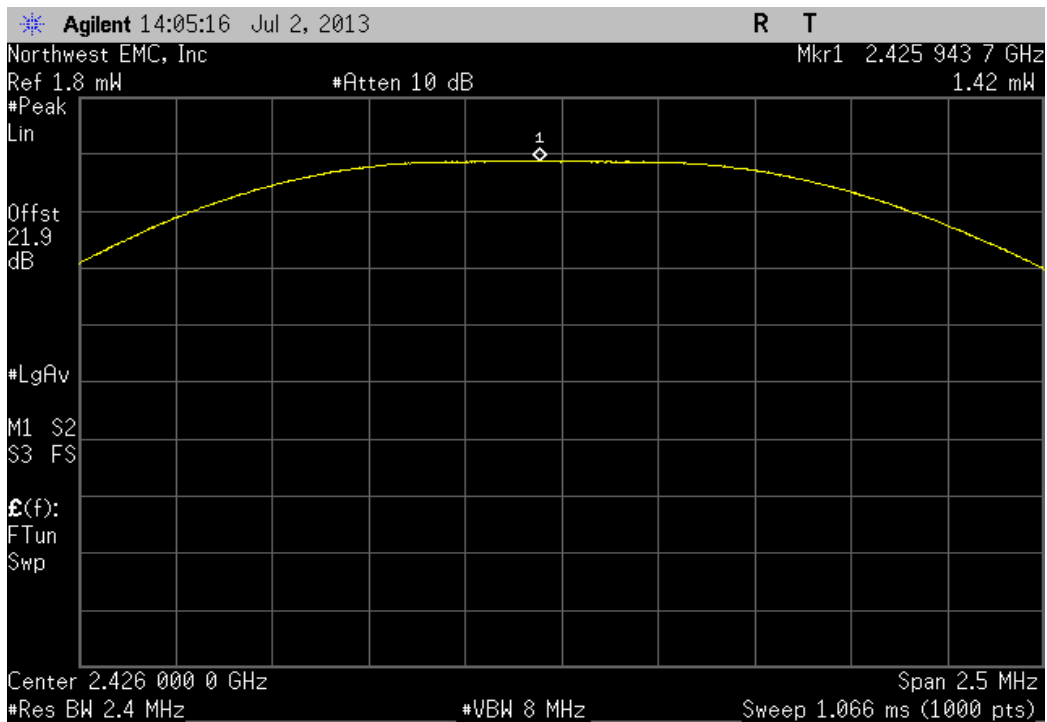
BLE - Advertising, Low Channel, 2402 MHz

Value	Limit	Result
1.431 mW	< 1 W	Pass



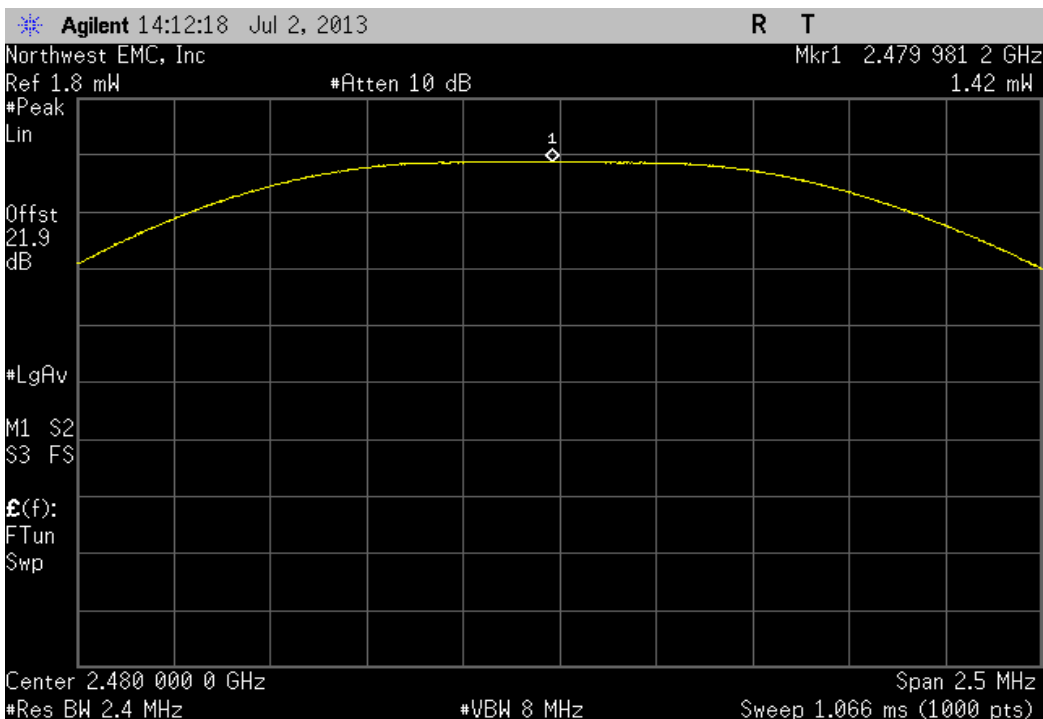
BLE - Advertising, Mid Channel, 2426 MHz

Value	Limit	Result
1.421 mW	< 1 W	Pass



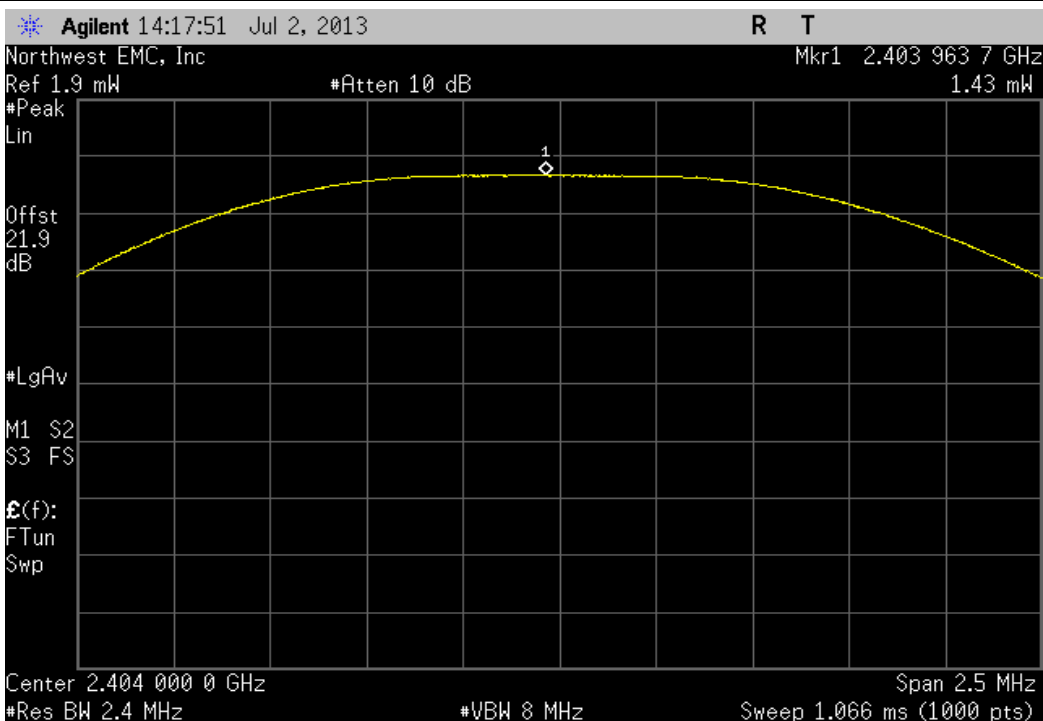
BLE - Advertising, High Channel, 2480 MHz

Value	Limit	Result
1.422 mW	< 1 W	Pass



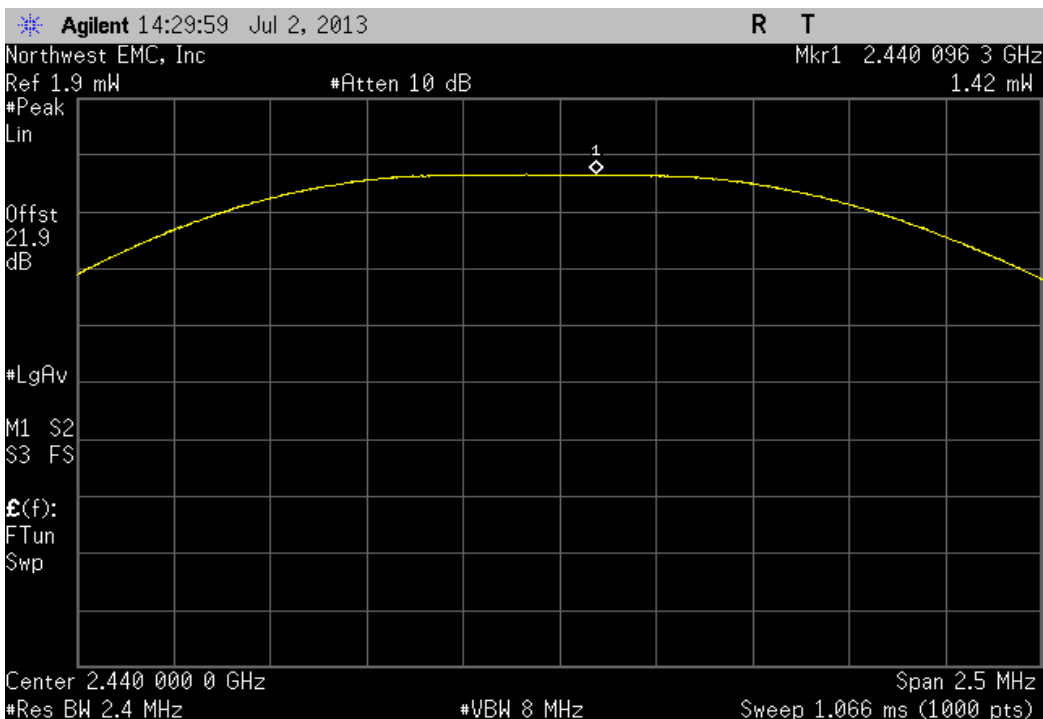
BLE - Data, Low Channel, 2404 MHz

Value	Limit	Result
1.428 mW	< 1 W	Pass



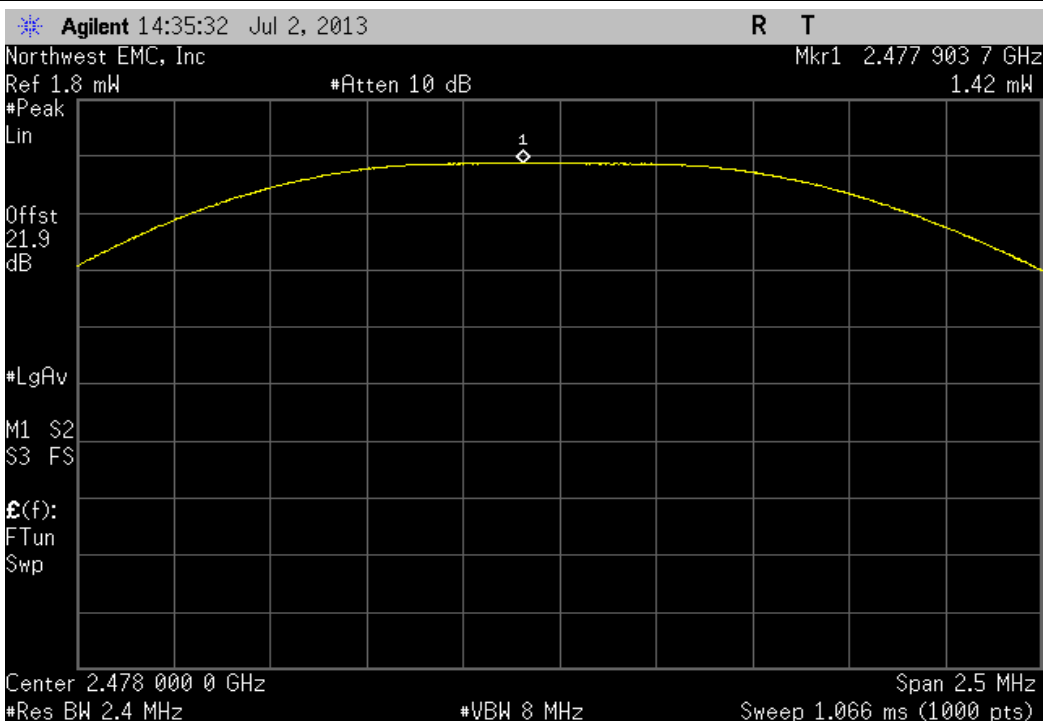
BLE - Data, Mid Channel, 2440 MHz

				Value	Limit	Result
				1.425 mW	< 1 W	Pass



BLE - Data, High Channel, 2478 MHz

				Value	Limit	Result
				1.421 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
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

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.



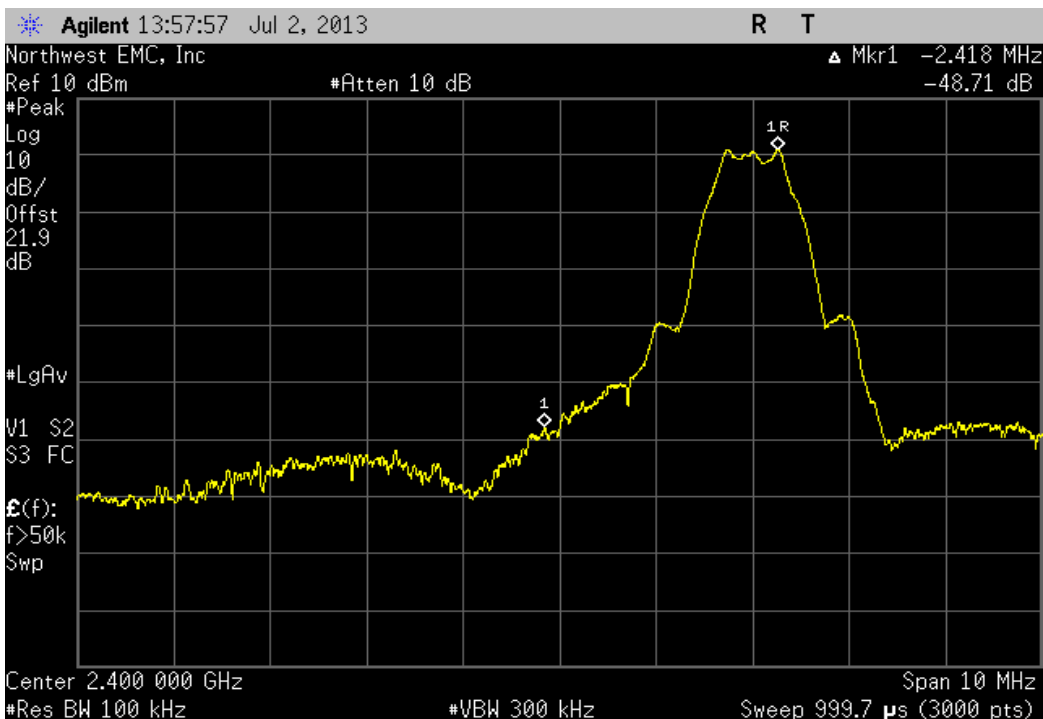
Band Edge Compliance

XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCSO1668	
Serial Number: 006079632553		Date: 07/02/13	
Customer: Microsoft Corporation		Temperature: 26°C	
Attendees: None		Humidity: 46%	
Project: None		Barometric Pres.: 1020 mb	
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz	
		Job Site: NC02	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Richard Mellroth</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		-48.71 dBc	≤ -20 dBc
High Channel, 2480 MHz		-50.91 dBc	≤ -20 dBc
BLE - Data			
Low Channel, 2404 MHz		-53.11 dBc	≤ -20 dBc
High Channel, 2478 MHz		-55.01 dBc	≤ -20 dBc

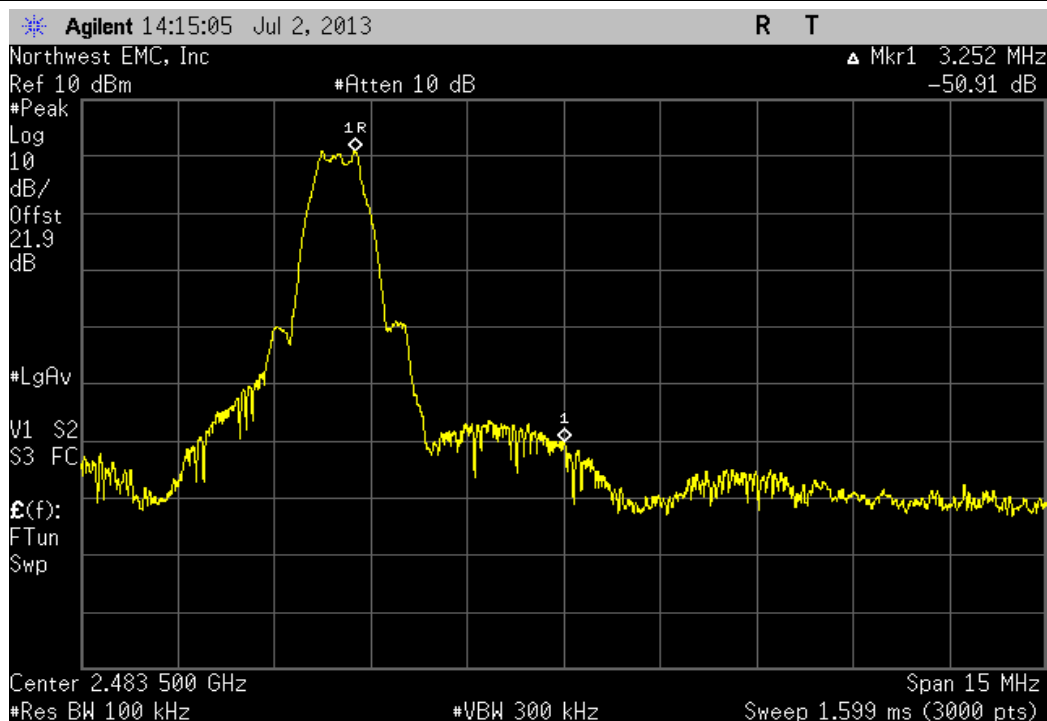
BLE - Advertising, Low Channel, 2402 MHz

Value	Limit	Result
-48.71 dBc	≤ -20 dBc	Pass



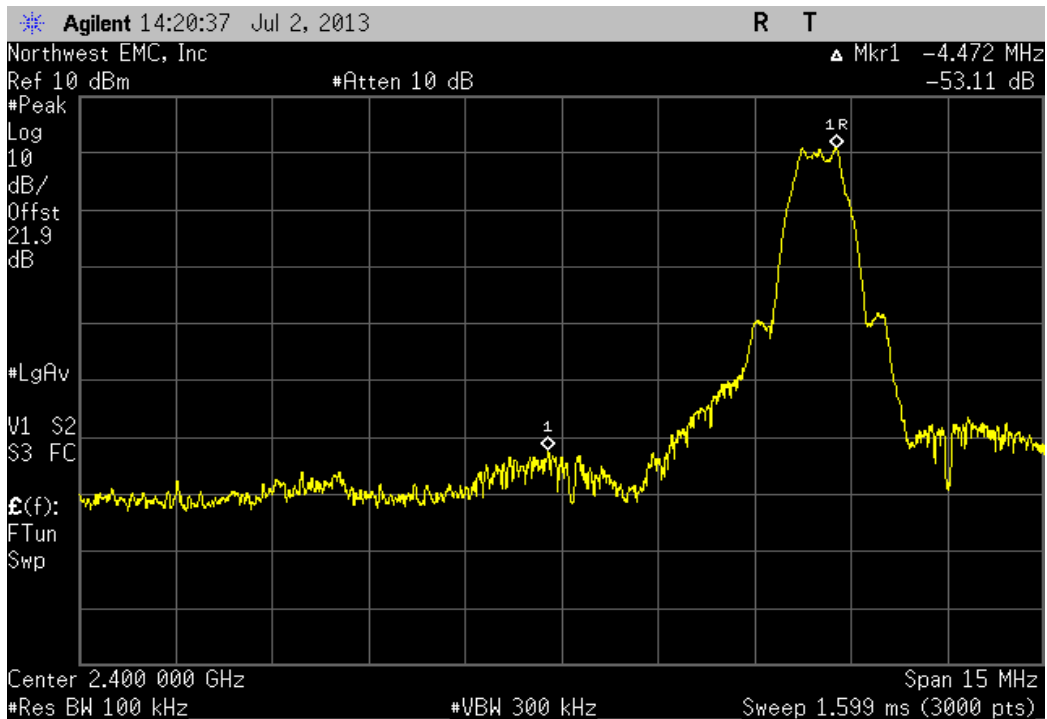
BLE - Advertising, High Channel, 2480 MHz

Value	Limit	Result
-50.91 dBc	≤ -20 dBc	Pass



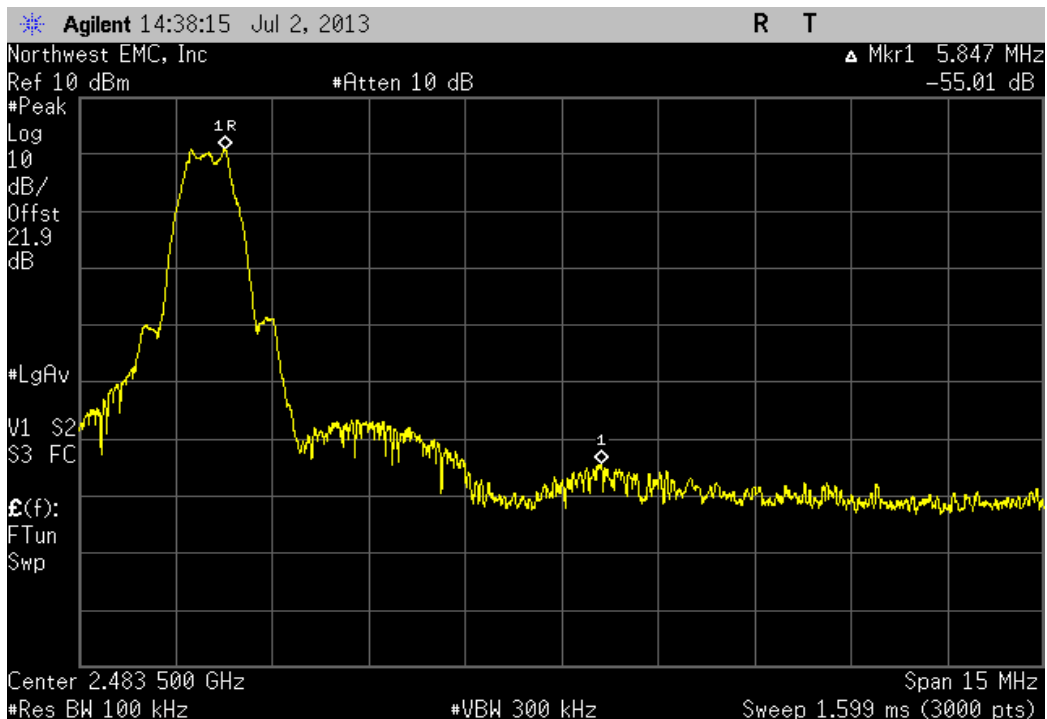
BLE - Data, Low Channel, 2404 MHz

Value	Limit	Result
-53.11 dBc	≤ -20 dBc	Pass



BLE - Data, High Channel, 2478 MHz

Value	Limit	Result
-55.01 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
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

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.

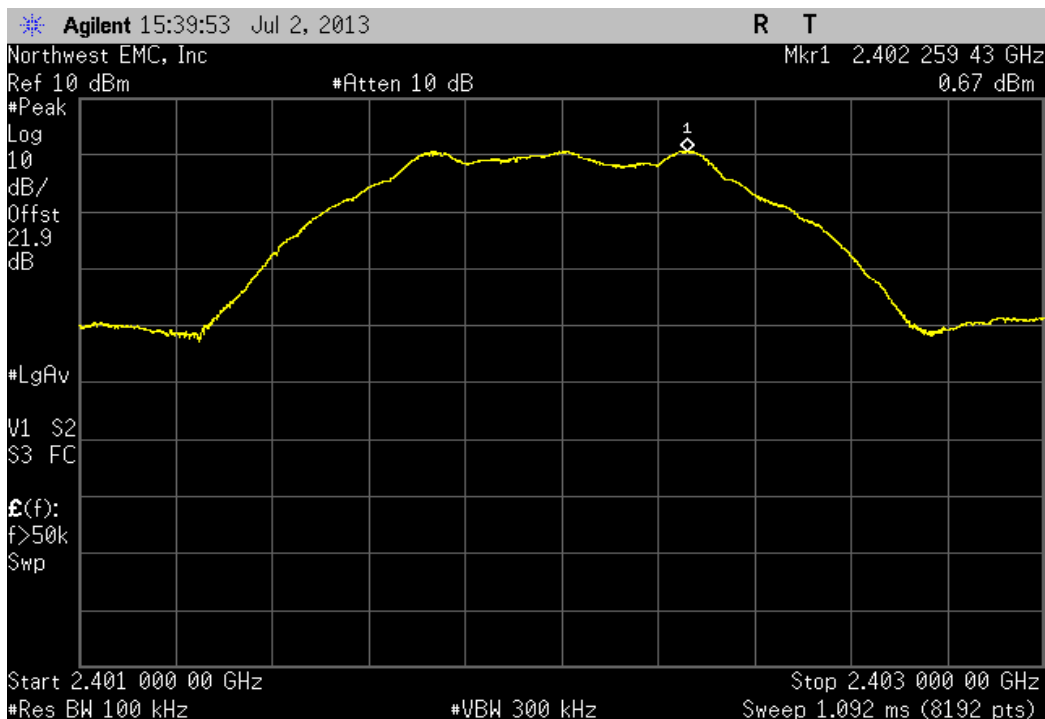


Spurious Conducted Emissions

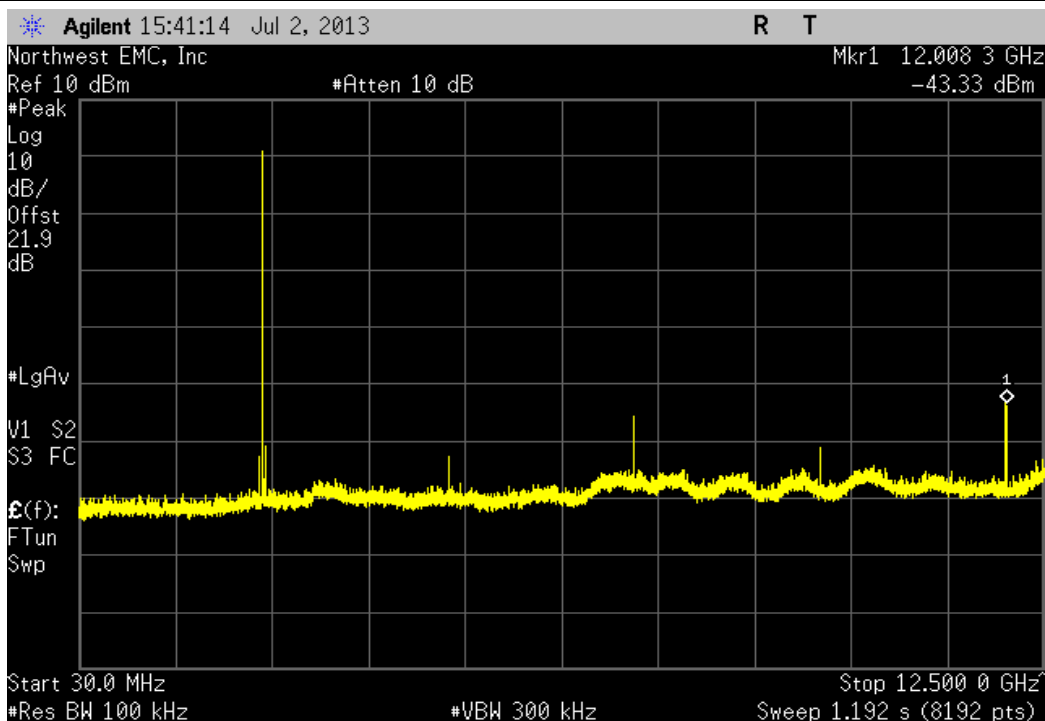
XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCS01668			
Serial Number: 006079632553		Date: 07/02/13			
Customer: Microsoft Corporation		Temperature: 26°C			
Attendees: None		Humidity: 46%			
Project: None		Barometric Pres.: 1020 mb			
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz			
		Job Site: NC02			
TEST SPECIFICATIONS		Test Method			
FCC 15.247:2013		ANSI C63.10:2009			
COMMENTS					
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	1	Signature <i>Richard Mellroth</i>			
		Frequency Range	Value	Limit	Result
BLE - Advertising					
	Low Channel, 2402 MHz	Fundamental	N/A	N/A	N/A
	Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-44 dBc	≤ -20 dBc	Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-50.2 dBc	≤ -20 dBc	Pass
	Mid Channel, 2426 MHz	Fundamental	N/A	N/A	N/A
	Mid Channel, 2426 MHz	30 MHz - 12.5 GHz	-45.26 dBc	≤ -20 dBc	Pass
	Mid Channel, 2426 MHz	12.5 GHz - 25 GHz	-49.92 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz	Fundamental	N/A	N/A	N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	-46.07 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	-50.08 dBc	≤ -20 dBc	Pass
BLE - Data					
	Low Channel, 2404 MHz	Fundamental	N/A	N/A	N/A
	Low Channel, 2404 MHz	30 MHz - 12.5 GHz	-43.9 dBc	≤ -20 dBc	Pass
	Low Channel, 2404 MHz	12.5 GHz - 25 GHz	-49.76 dBc	≤ -20 dBc	Pass
	Mid Channel, 2440 MHz	Fundamental	N/A	N/A	N/A
	Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	-45.52 dBc	≤ -20 dBc	Pass
	Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	-50.15 dBc	≤ -20 dBc	Pass
	High Channel, 2478 MHz	Fundamental	N/A	N/A	N/A
	High Channel, 2478 MHz	30 MHz - 12.5 GHz	-46.18 dBc	≤ -20 dBc	Pass
	High Channel, 2478 MHz	12.5 GHz - 25 GHz	-49.51 dBc	≤ -20 dBc	Pass

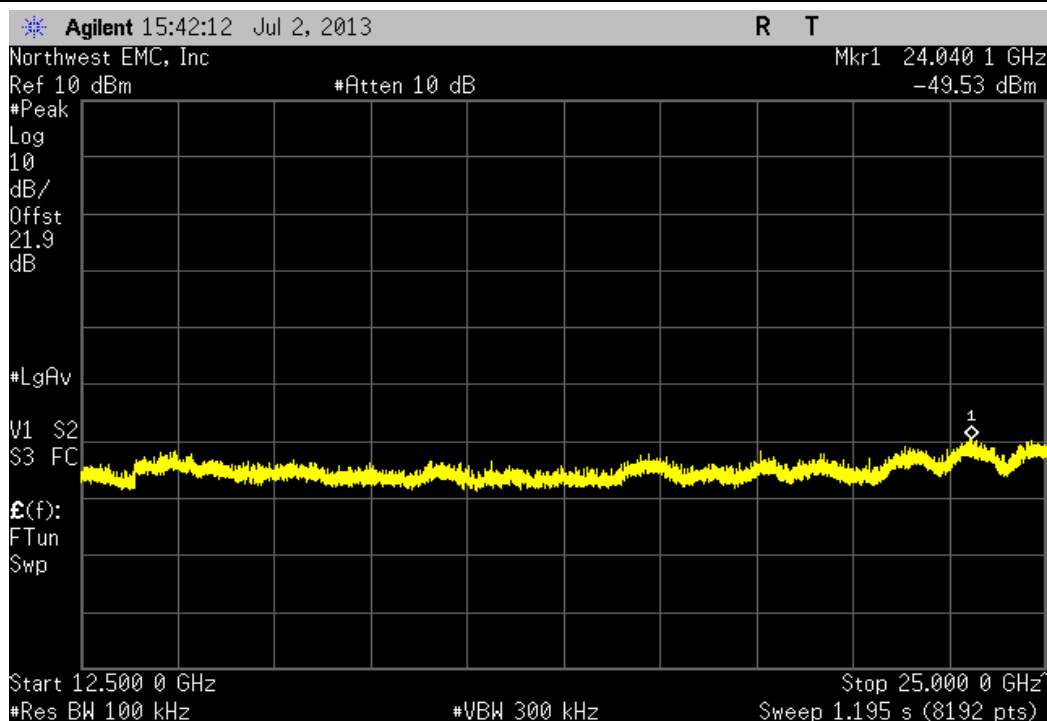
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



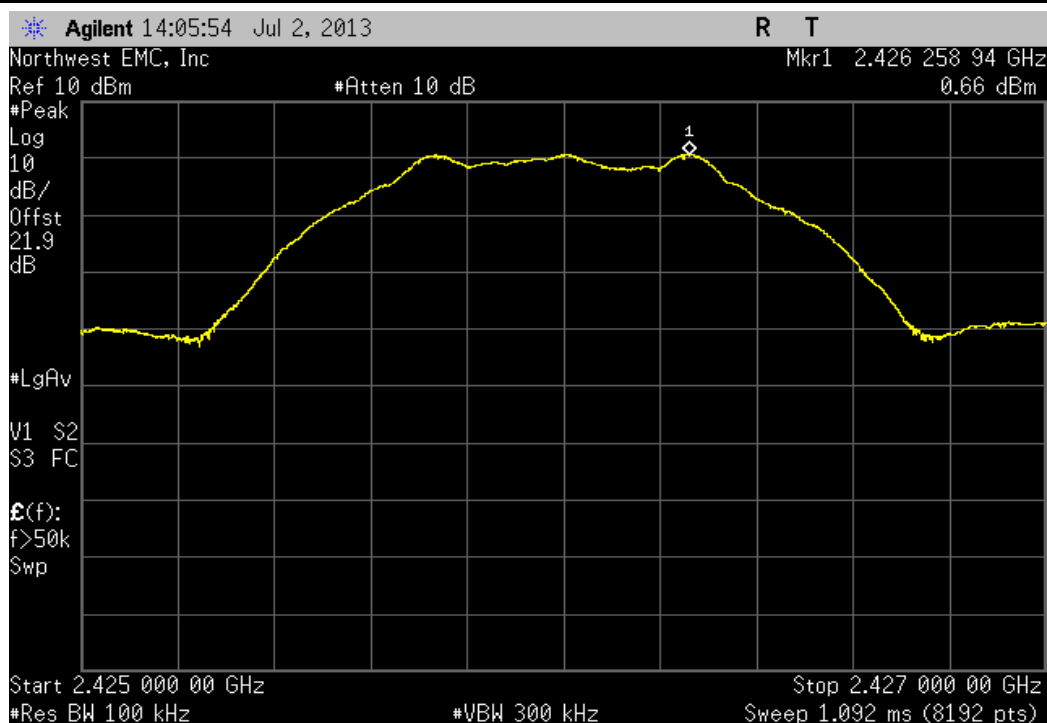
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-44 dBc	≤ -20 dBc	Pass	



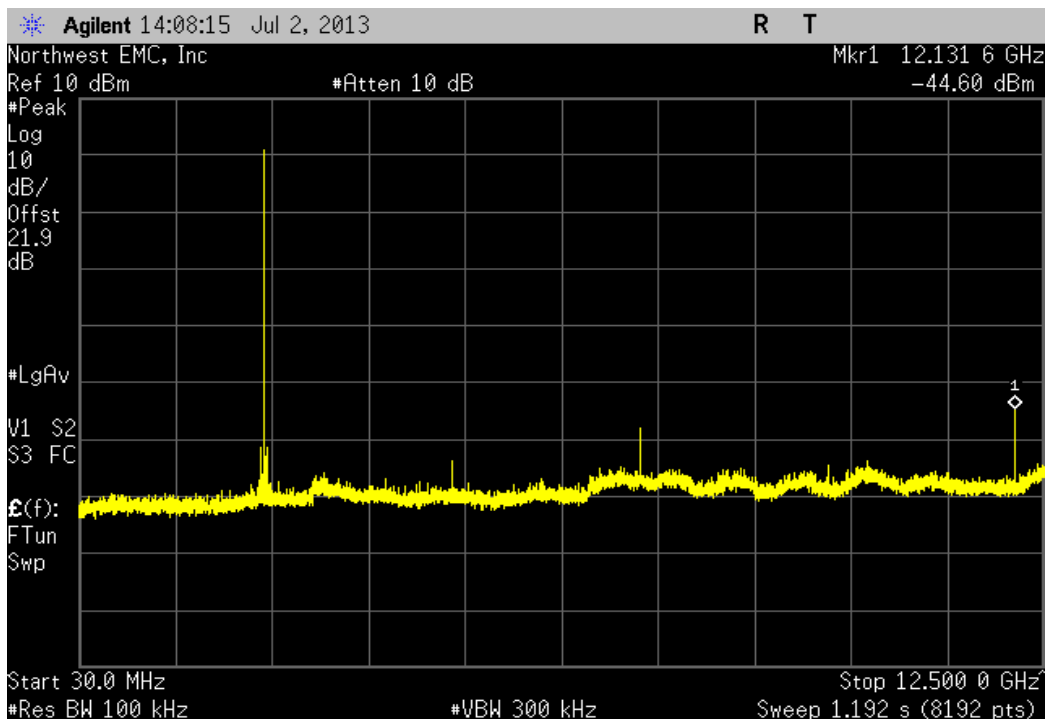
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50.2 dBc	≤ -20 dBc	Pass	



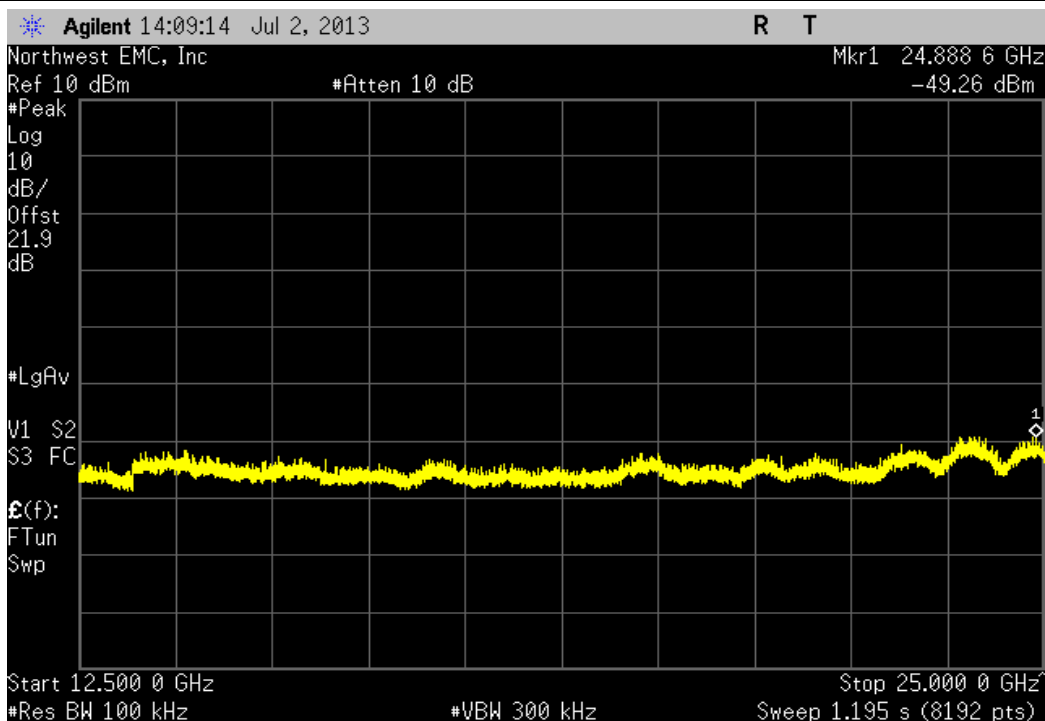
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



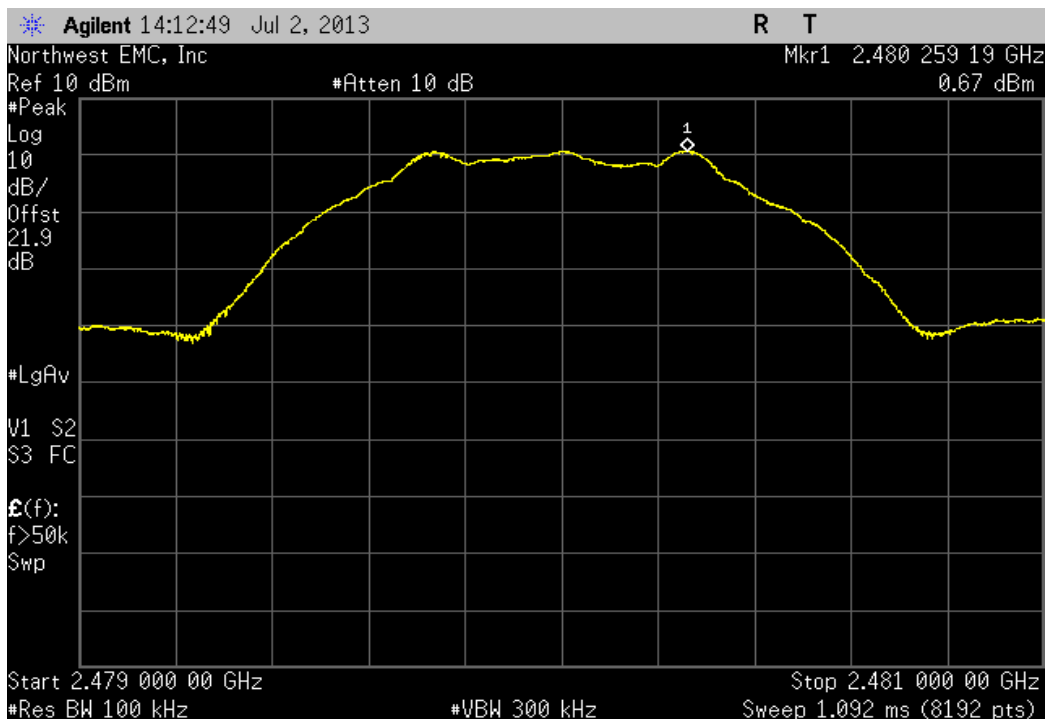
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-45.26 dBc	≤ -20 dBc	Pass	



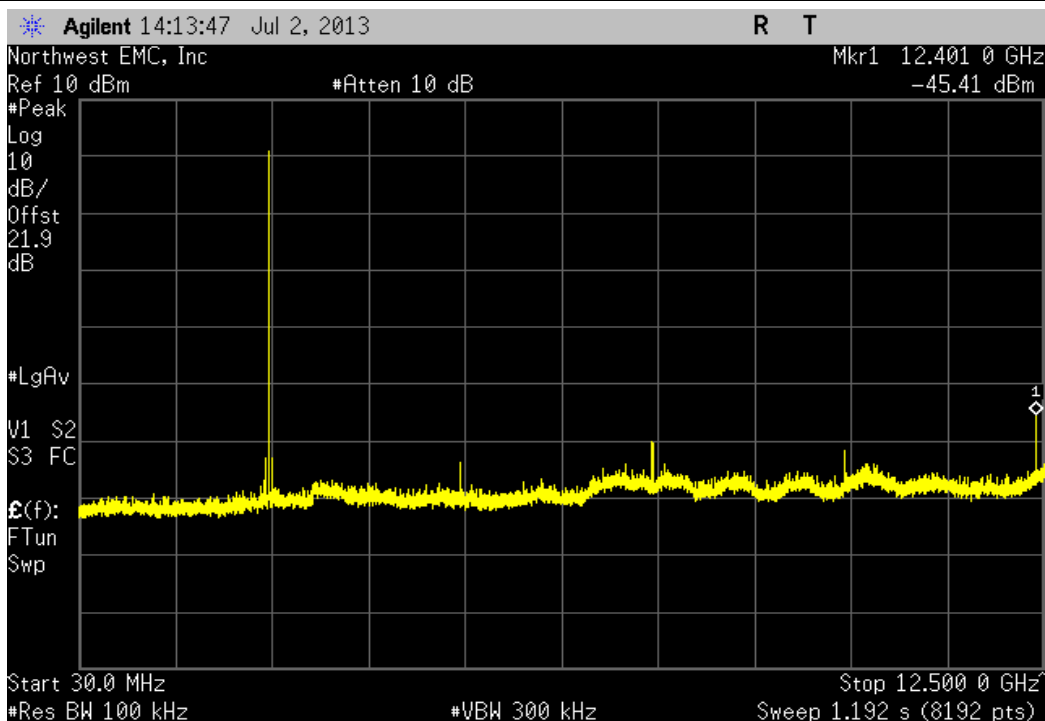
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-49.92 dBc	≤ -20 dBc	Pass	



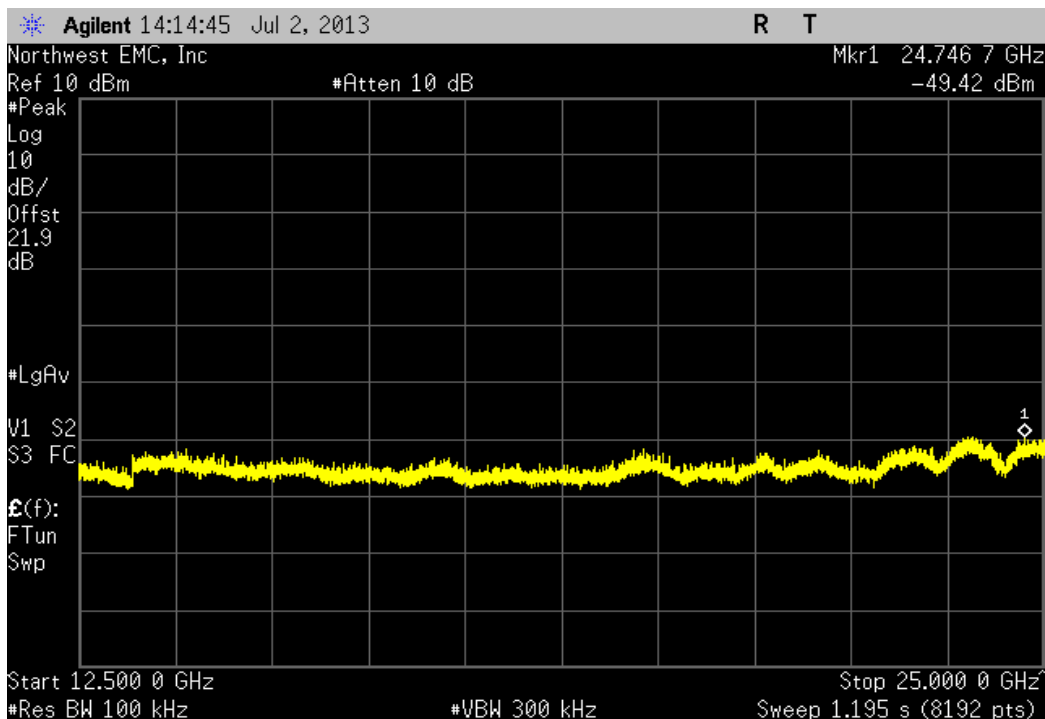
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



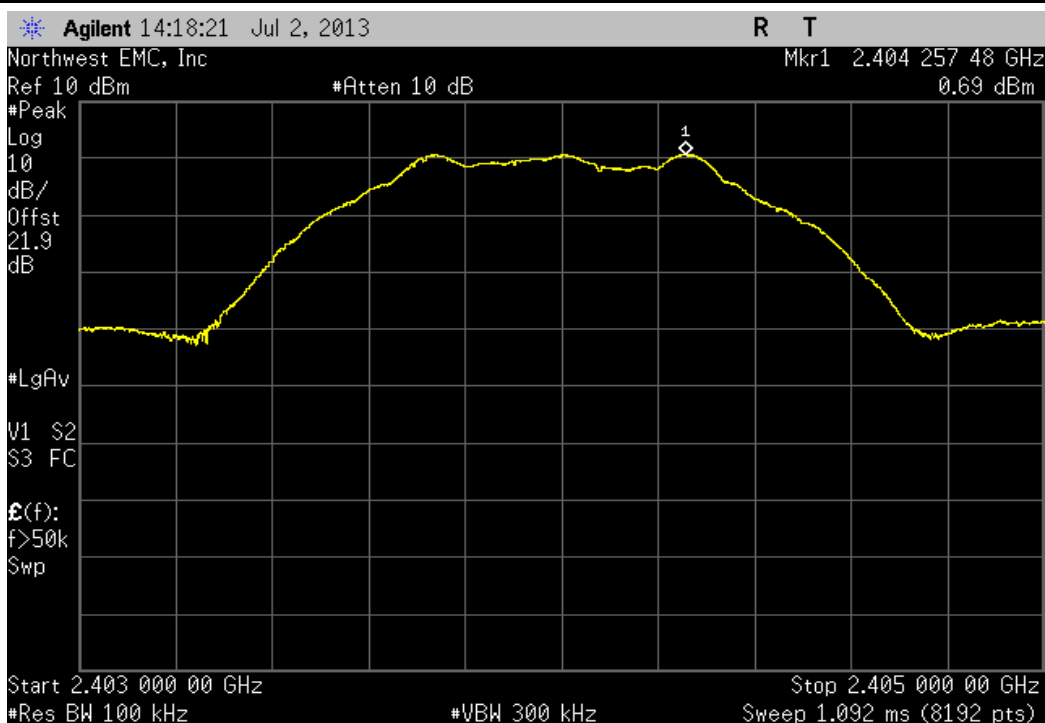
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-46.07 dBc	≤ -20 dBc	Pass	



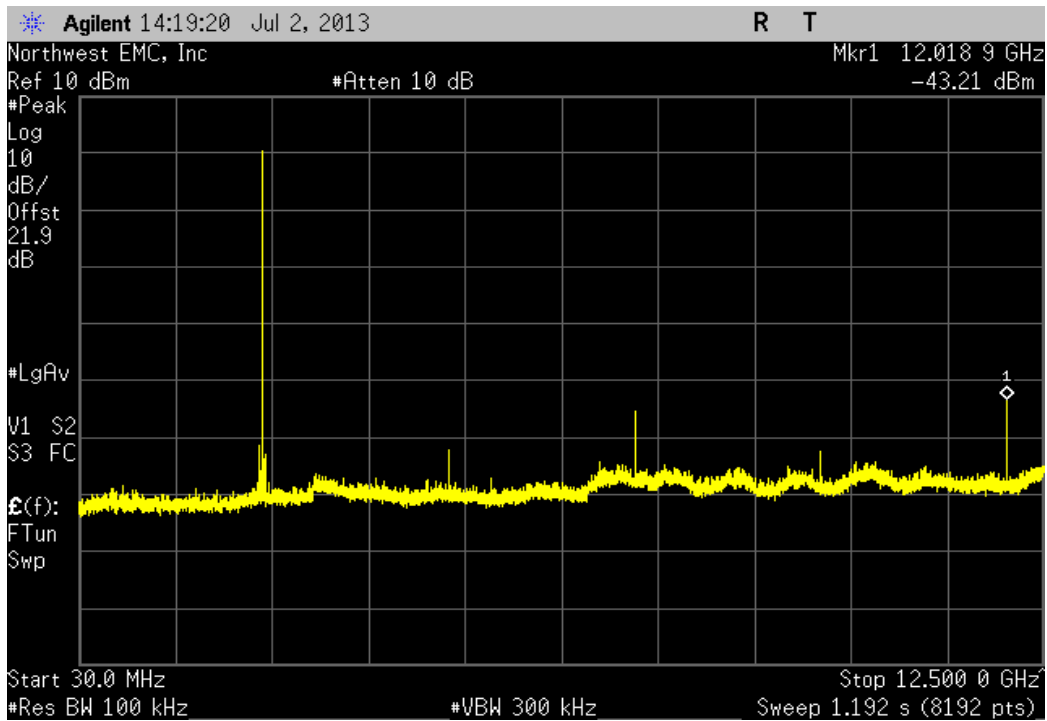
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50.08 dBc	≤ -20 dBc	Pass	



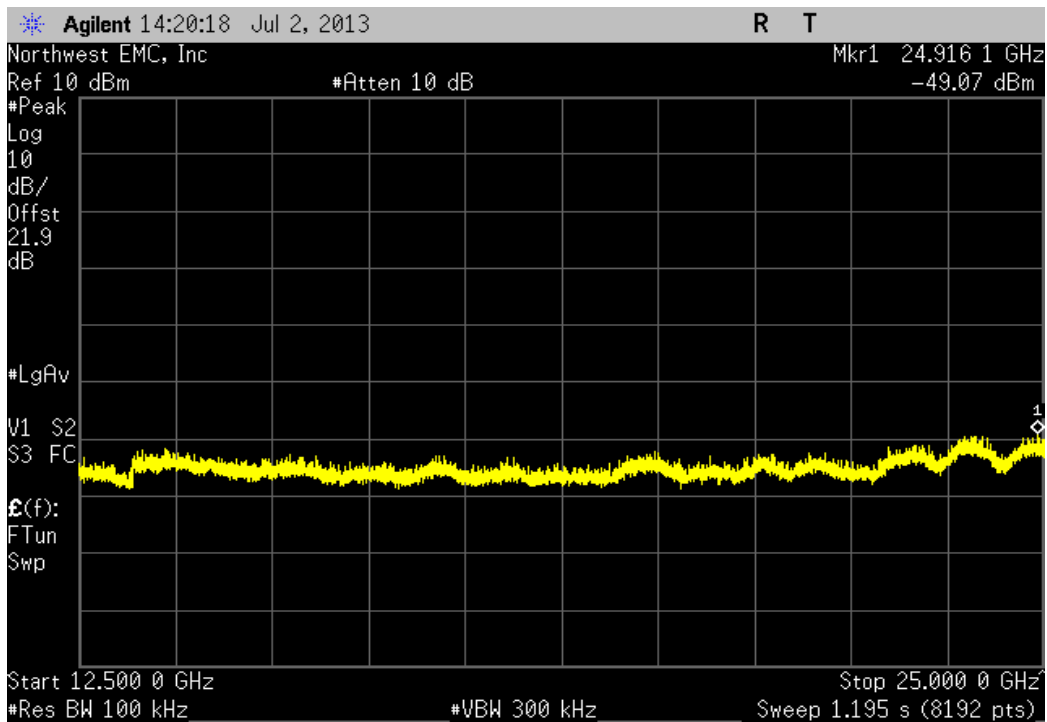
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



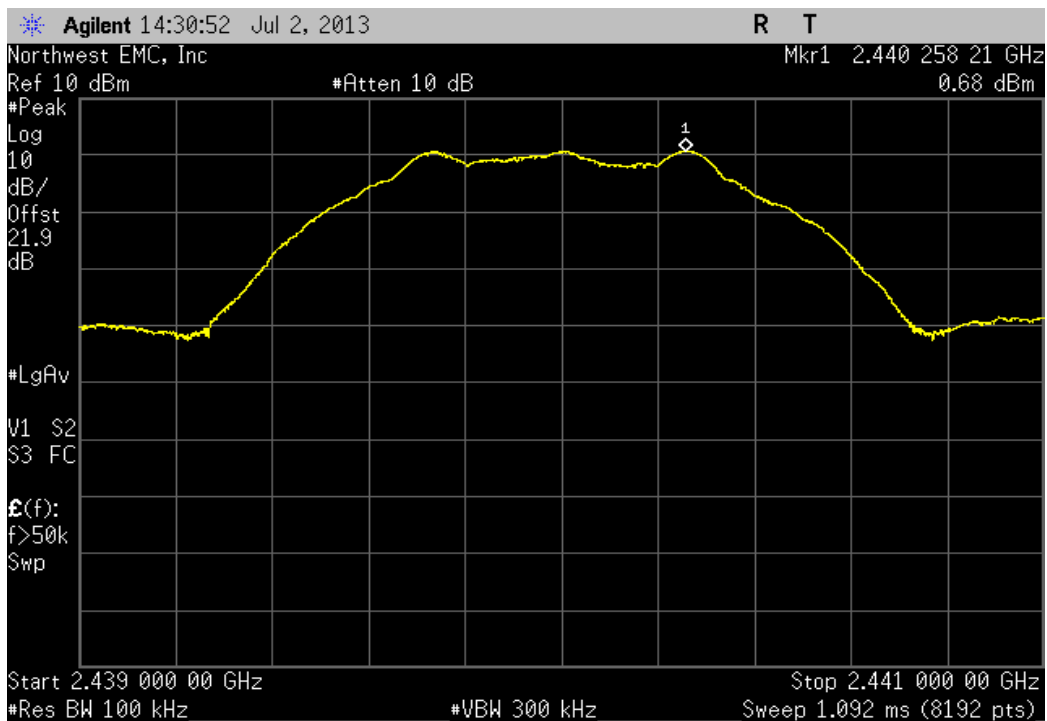
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-43.9 dBc	≤ -20 dBc	Pass	



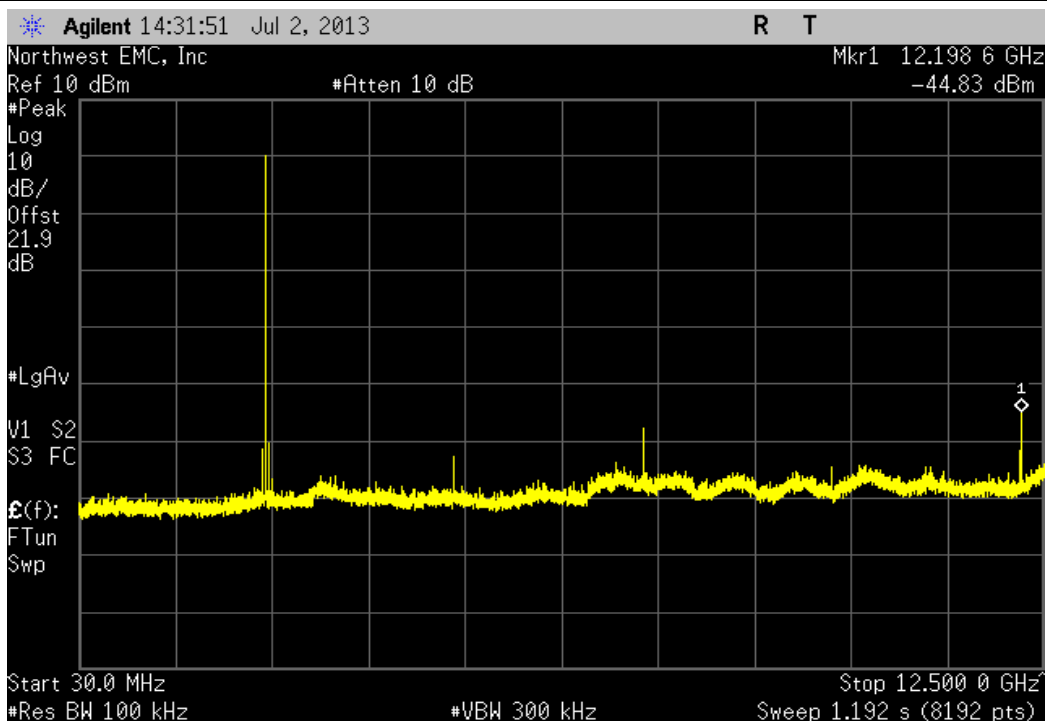
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-49.76 dBc	≤ -20 dBc	Pass	



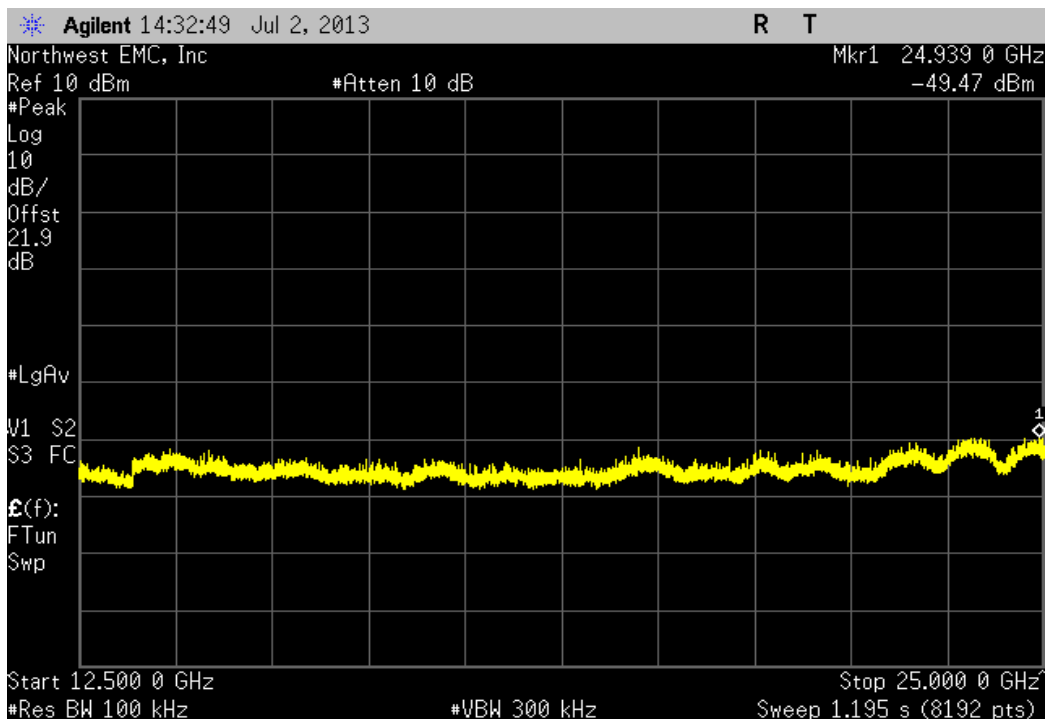
BLE - Data, Mid Channel, 2440 MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



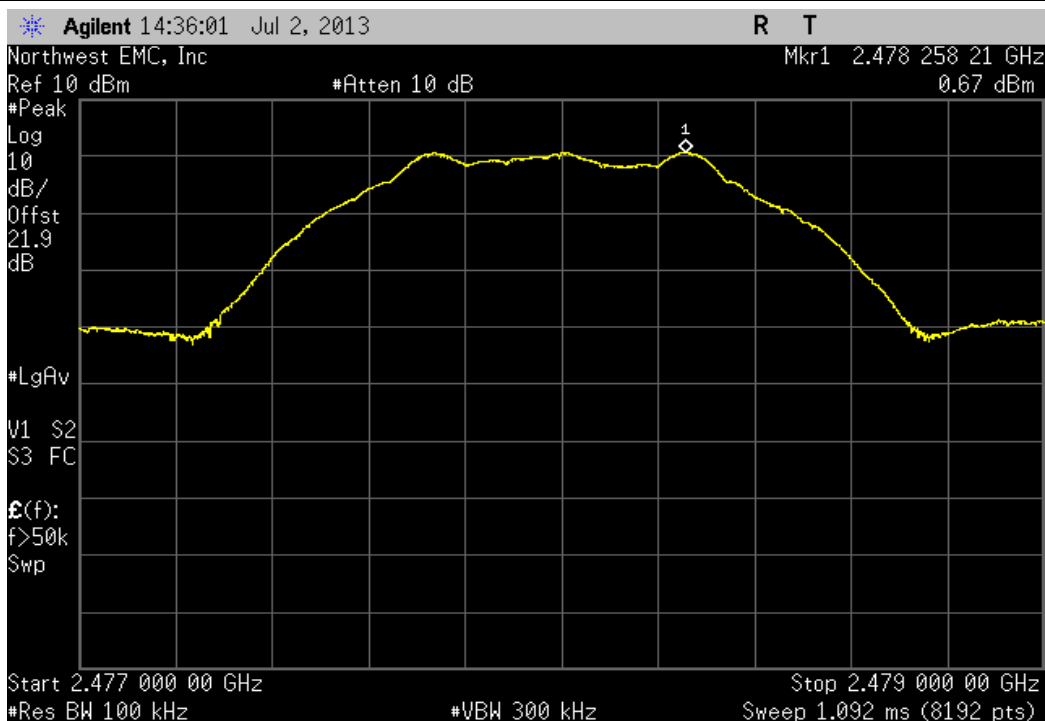
BLE - Data, Mid Channel, 2440 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-45.52 dBc	≤ -20 dBc	Pass



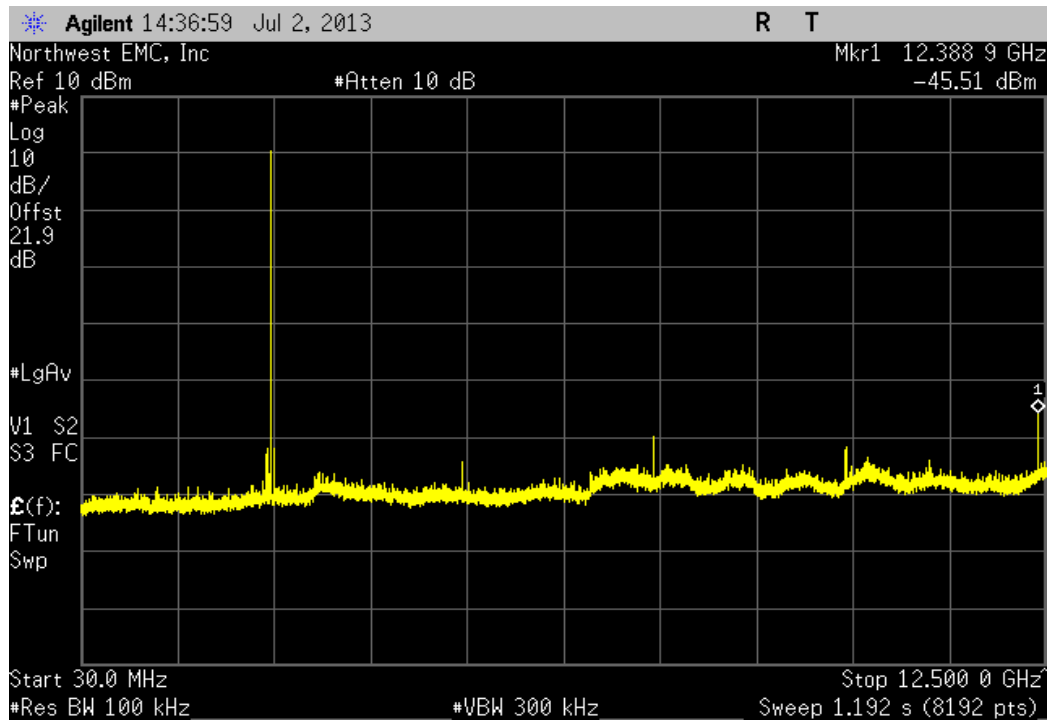
BLE - Data, Mid Channel, 2440 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50.15 dBc	≤ -20 dBc	Pass	



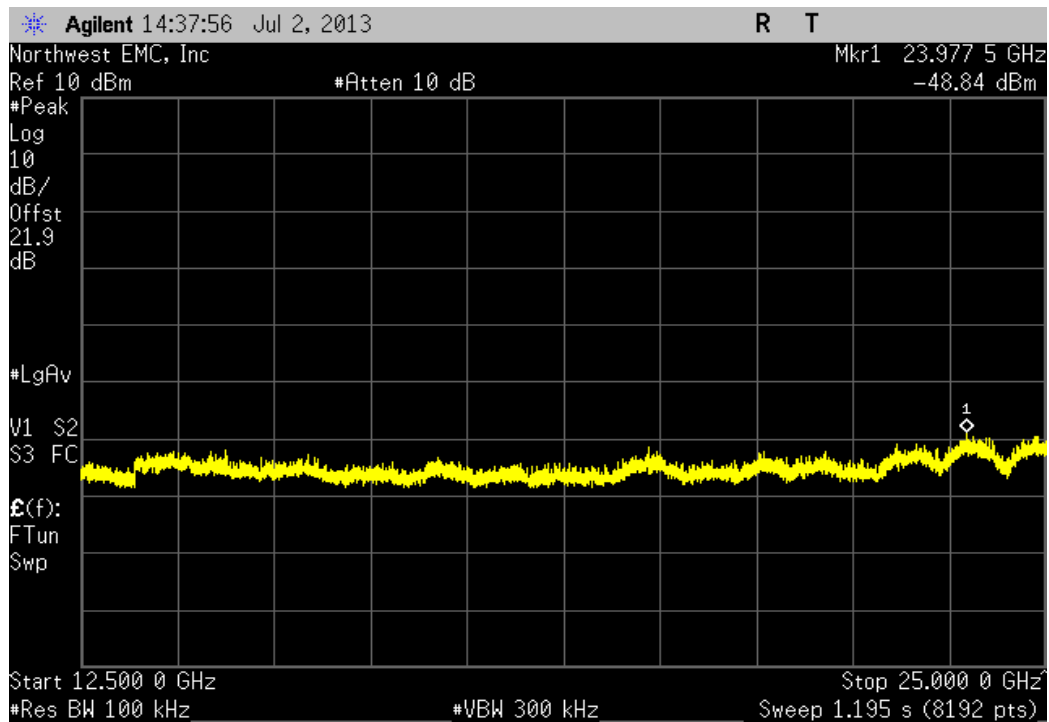
BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-46.18 dBc	≤ -20 dBc	Pass	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-49.51 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
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

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:

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

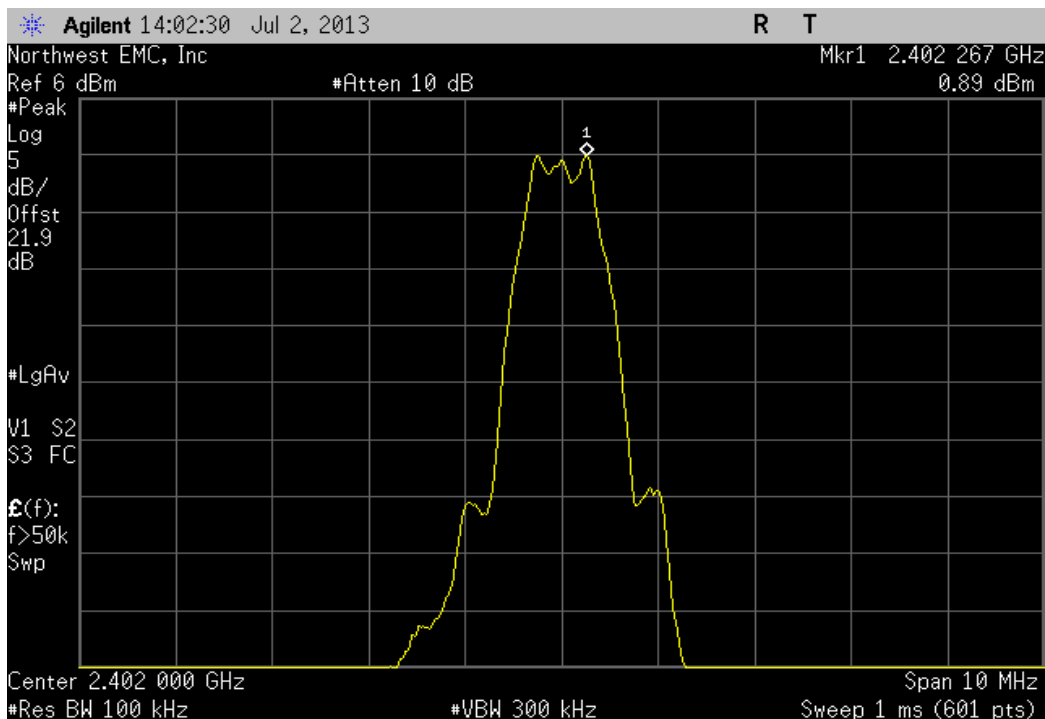


Power Spectral Density

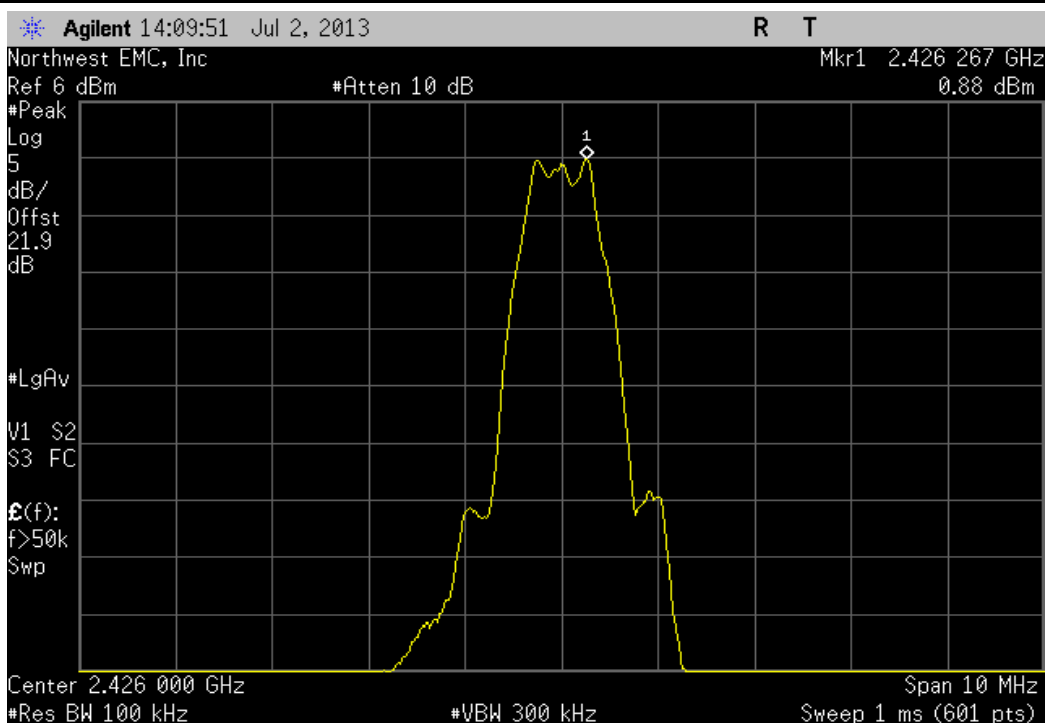
XMit 2013.02.28
PsaTx 2013.06.07

EUT: 1601		Work Order: MCSO1668				
Serial Number: 006079632553		Date: 07/02/13				
Customer: Microsoft Corporation		Temperature: 26°C				
Attendees: None		Humidity: 46%				
Project: None		Barometric Pres.: 1020 mb				
Tested by: Richard Mellroth, Rod Peloquin		Power: 120 VAC / 60Hz				
		Job Site: NC02				
TEST SPECIFICATIONS		Test Method				
FCC 15.247:2013		ANSI C63.10:2009				
COMMENTS						
Adapter cable loss of 0.75dB added to analyzer reference level offset. EUT power setting in control software were set to Power Class: 2, and Power Level: 4						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1	Signature <i>Richard Mellroth</i>				
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
BLE - Advertising						
	Low Channel, 2402 MHz	0.889	-15.2	-14.311	8	Pass
	Mid Channel, 2426 MHz	0.879	-15.2	-14.321	8	Pass
	High Channel, 2480 MHz	0.882	-15.2	-14.318	8	Pass
BLE - Data						
	Low Channel, 2404 MHz	0.893	-15.2	-14.307	8	Pass
	Mid Channel, 2440 MHz	0.892	-15.2	-14.308	8	Pass
	High Channel, 2478 MHz	0.893	-15.2	-14.307	8	Pass

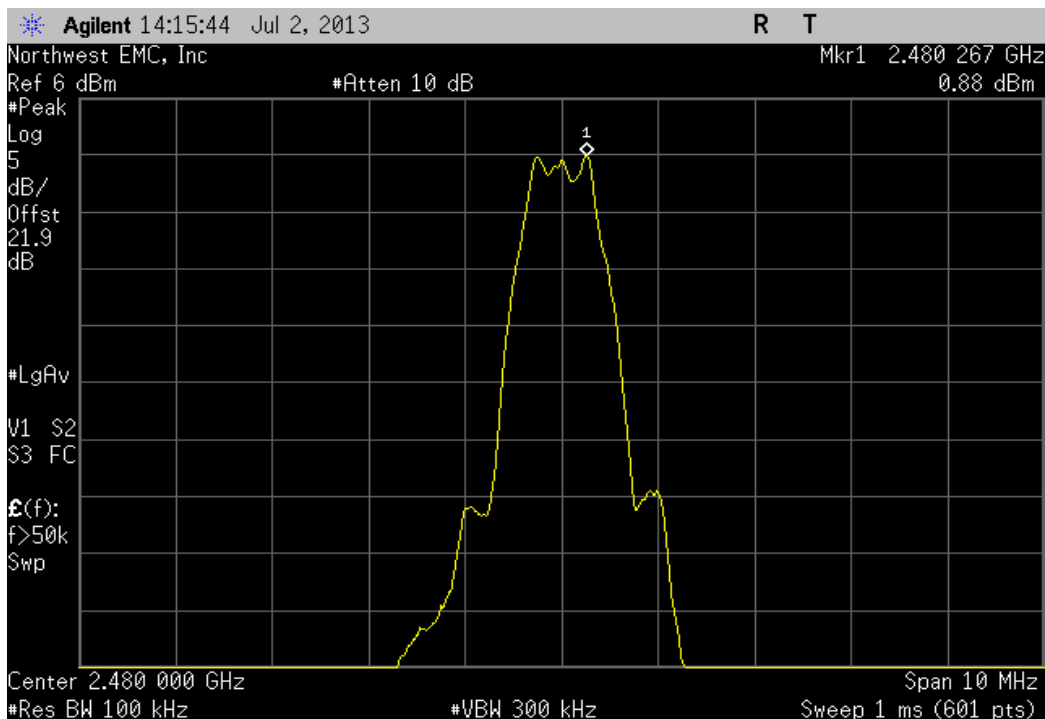
BLE - Advertising, Low Channel, 2402 MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	0.889	-15.2	-14.311	8	Pass



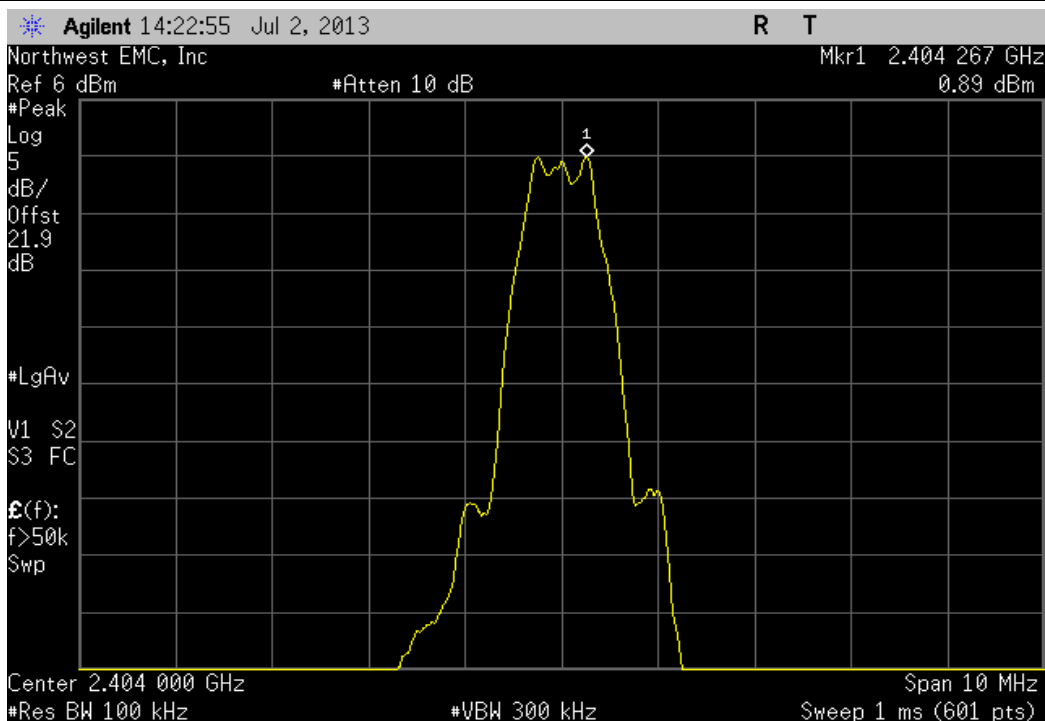
BLE - Advertising, Mid Channel, 2426 MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	0.879	-15.2	-14.321	8	Pass



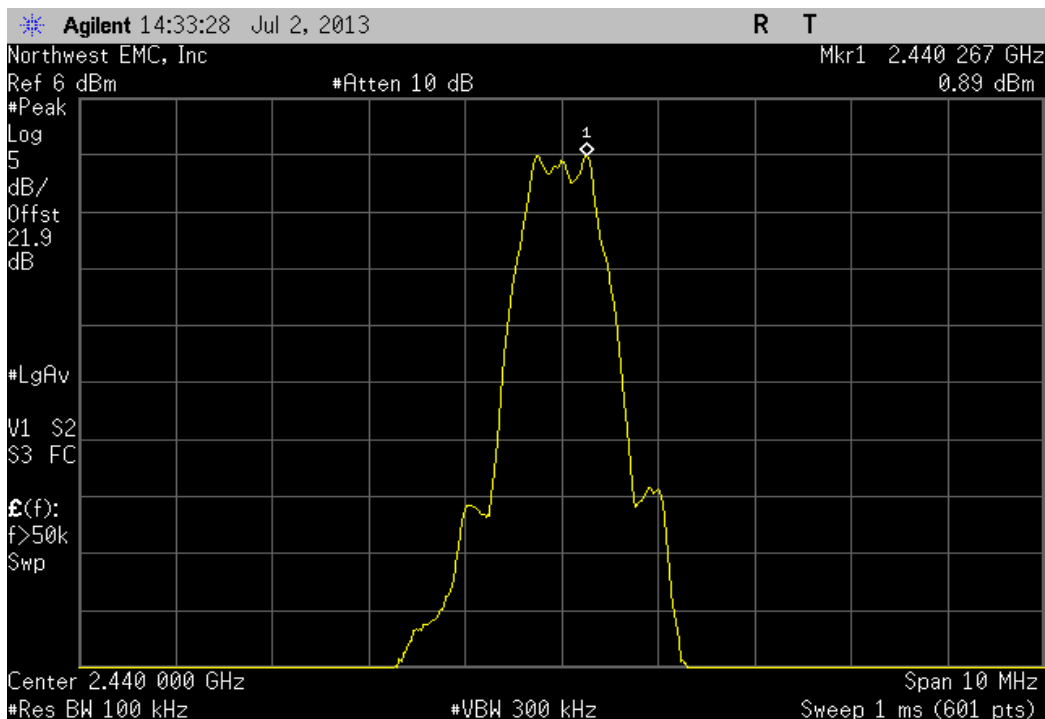
BLE - Advertising, High Channel, 2480 MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	0.882	-15.2	-14.318	8	Pass



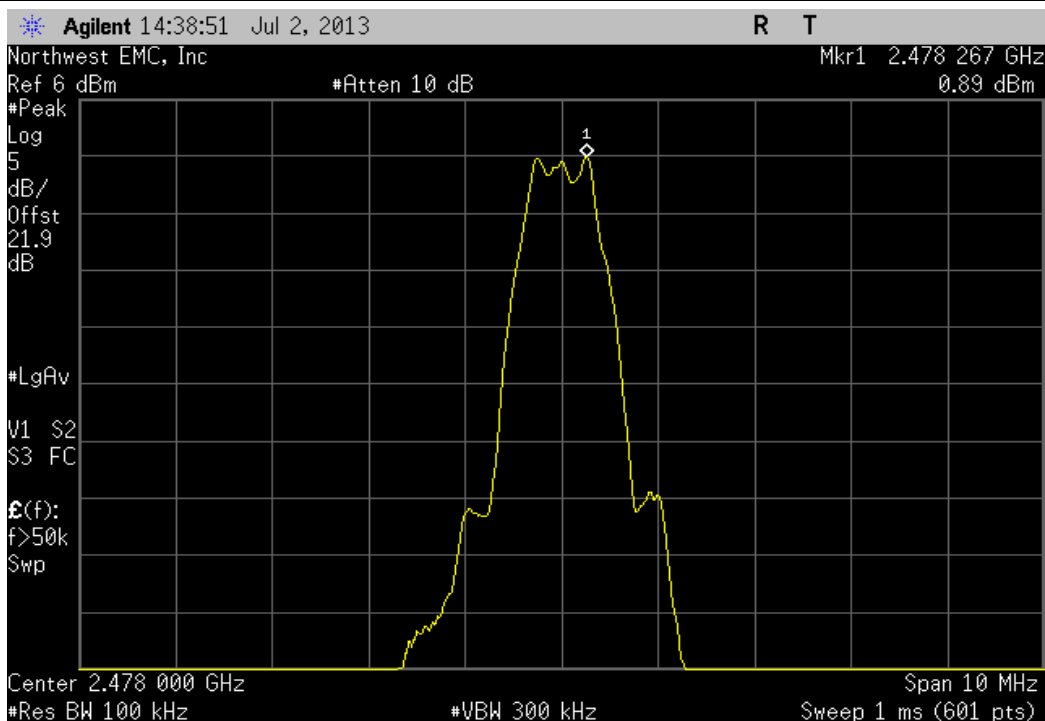
BLE - Data, Low Channel, 2404 MHz					
	Value	dBm/100kHz	Value	Limit	Result
	dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	
	0.893	-15.2	-14.307	8	Pass



BLE - Data, Mid Channel, 2440 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz			
	0.892	-15.2	-14.308	8	Pass



BLE - Data, High Channel, 2478 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz			
	0.893	-15.2	-14.307	8	Pass



SPURIOUS RADIATED EMISSIONS

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

MODES OF OPERATION

Low Channel, Advertisement Mode

Mid Channel, Advertisement Mode

High Channel, Advertisement Mode

Low Channel, Data Mode

Mid Channel, Data Mode

High Channel, Data Mode

POWER SETTINGS INVESTIGATED

120 VAC / 60Hz

CONFIGURATIONS INVESTIGATED

MCSO1668 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 25 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT


Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	12/14/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	12/14/2012	12 mo
HP Filter	Micro-Tronics	HPM50111	HHI	1/18/2013	24 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	1/18/2013	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	12/13/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAB	12/13/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	7/10/2013	12 mo
Attenuator, 'N'	S.M. Electronics	SA3N-20	REG	1/17/2013	12 mo
NC01 Cables	N/A	Standard Gain Horn Cable	NC3	12/14/2012	12 mo
NC01 Cables	N/A	3115 Horn Cable	NC2	12/13/2012	12 mo
NC01 Cables	N/A	Bilog Cables	NC1	12/13/2012	12 mo
Cable I	N/A	Standard Gain Horn Cable	SUM	7/10/2013	12 mo
Antenna, Horn	EMCO	3160-08	AHO	NCR	0 mo
Antenna, Horn	EMCO	3160-07	AHP	NCR	0 mo
Antenna, Horn	EMCO	3115	AHM	6/19/2012	24 mo
Antenna, Horn	ETS	3160-09	AIY	NCR	0 mo
Antenna, Biconilog	EMCO	3142	AXJ	5/16/2012	36 mo
Spectrum Analyzer	Agilent	E4440A	AAW	2/21/2013	24 mo

MEASUREMENT BANDWIDTHS

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

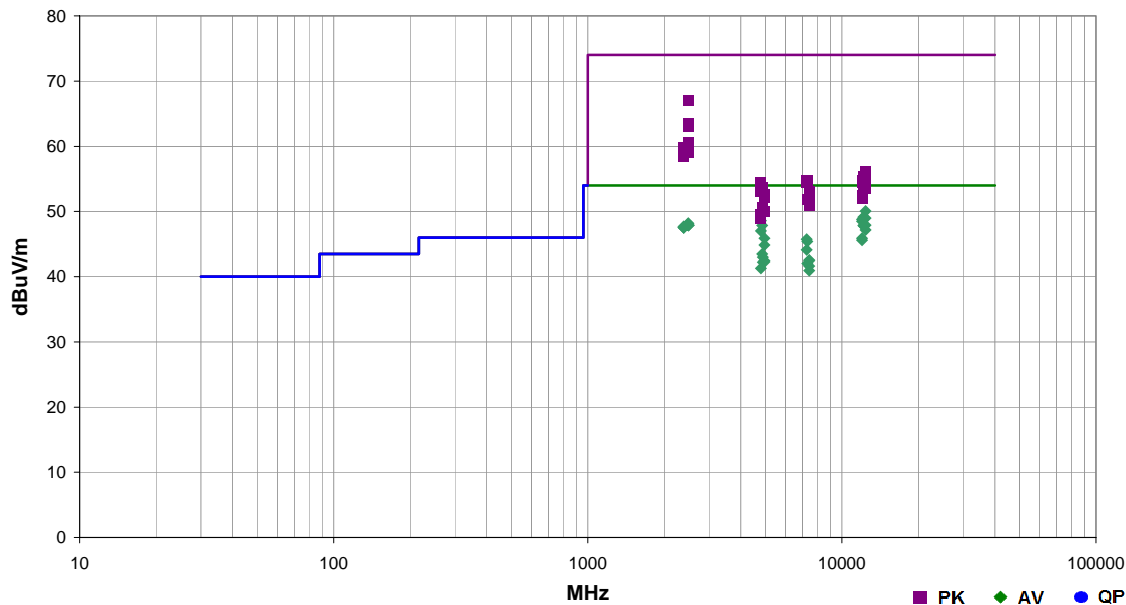
TEST DESCRIPTION

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

Work Order:	MCSO1668	Date:	07/05/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	47% RH	
Serial Number:	6079632553	Barometric Pres.:	1017 mbar	
EUT:		1601		
Configuration:	2			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	120 VAC / 60Hz			
Operating Mode:	Continuous transmit, Bluetooth DTS			
Deviations:	None			
Comments:	See comments in the below table for transmit channel, frequency, mode, and EUT orientation information.			

Test Specifications	Test Method
FCC 15.209:2013	ANSI C63.10:2009

Run #	15	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12398.820	53.0	-2.9	1.2	307.0	3.0	0.0	Vert	AV	0.0	50.1	54.0	-3.9	High Ch. (2480 MHz), Adv, EUT Side
12128.820	52.3	-3.2	1.2	308.0	3.0	0.0	Vert	AV	0.0	49.1	54.0	-4.9	Mid Ch. (2426 MHz), Adv, EUT Side
12388.820	51.9	-2.9	1.2	320.0	3.0	0.0	Vert	AV	0.0	49.0	54.0	-5.0	High Ch. (2478 MHz), LE, EUT Side
12018.780	52.0	-3.2	1.2	309.0	3.0	0.0	Vert	AV	0.0	48.8	54.0	-5.2	Low Ch. (2404 MHz), LE, EUT Side
4803.767	40.4	8.2	1.1	7.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	Low Ch. (2402 MHz), Adv, EUT Side
12008.780	51.7	-3.2	1.2	308.0	3.0	0.0	Vert	AV	0.0	48.5	54.0	-5.5	Low Ch. (2402 MHz), Adv, EUT Side
2483.503	29.7	-1.5	1.2	282.0	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch. (2480 MHz), Adv, EUT Flat
2485.373	29.6	-1.5	1.2	270.0	3.0	20.0	Horz	AV	0.0	48.1	54.0	-5.9	High Ch. (2478 MHz), LE, EUT Side
2485.353	29.4	-1.5	1.2	198.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch. (2478 MHz), LE, EUT Flat
2485.293	29.4	-1.5	1.2	181.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Side
2485.247	29.4	-1.5	1.2	99.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch. (2478 MHz), LE, EUT Vert
2485.260	29.4	-1.5	1.2	195.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Side
2484.750	29.4	-1.5	1.9	195.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2478 MHz), LE, EUT Vert
2483.820	29.4	-1.5	2.8	252.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2478 MHz), LE, EUT Flat
2483.727	29.4	-1.5	1.2	305.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Vert
2483.653	29.4	-1.5	1.2	276.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Vert
2483.543	29.4	-1.5	1.2	176.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch. (2478 MHz), LE, EUT Side
2483.507	29.4	-1.5	2.9	293.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Flat
12398.840	50.8	-2.9	1.3	269.0	3.0	0.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch. (2480 MHz), Adv, EUT Side
12198.840	51.0	-3.1	1.2	307.0	3.0	0.0	Vert	AV	0.0	47.9	54.0	-6.1	Mid Ch. (2440 MHz), LE, EUT Side
4851.817	39.6	8.3	1.1	8.0	3.0	0.0	Horz	AV	0.0	47.9	54.0	-6.1	Mid Ch. (2426 MHz), Adv, EUT Side
12128.780	51.0	-3.2	1.1	269.0	3.0	0.0	Horz	AV	0.0	47.8	54.0	-6.2	Mid Ch. (2426 MHz), Adv, EUT Side
12198.760	50.9	-3.1	1.1	271.0	3.0	0.0	Horz	AV	0.0	47.8	54.0	-6.2	Mid Ch. (2440 MHz), LE, EUT Side
2389.400	29.4	-1.8	1.2	350.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	Low Ch. (2404 MHz), LE, EUT Side
2388.743	29.4	-1.8	1.2	169.0	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	Low Ch. (2404 MHz), LE, EUT Flat
2388.410	29.4	-1.8	1.2	321.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	Low Ch. (2402 MHz), Adv, EUT Side
2388.197	29.4	-1.8	1.2	41.0	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	Low Ch. (2402 MHz), Adv, EUT Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.697	29.3	-1.8	1.2	202.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	Low Ch. (2404 MHz), LE, EUT Side
2388.997	29.3	-1.8	1.2	129.0	3.0	20.0	Vert	AV	0.0	47.5	54.0	-6.5	Low Ch. (2402 MHz), Adv, EUT Flat
2388.957	29.3	-1.8	1.2	208.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	Low Ch. (2404 MHz), LE, EUT Vert
2388.903	29.3	-1.8	1.2	352.0	3.0	20.0	Vert	AV	0.0	47.5	54.0	-6.5	Low Ch. (2404 MHz), LE, EUT Vert
2388.483	29.3	-1.8	1.2	336.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	Low Ch. (2402 MHz), Adv, EUT Flat
2388.430	29.3	-1.8	1.2	190.0	3.0	20.0	Vert	AV	0.0	47.5	54.0	-6.5	Low Ch. (2402 MHz), Adv, EUT Vert
2388.170	29.3	-1.8	1.2	338.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	Low Ch. (2402 MHz), Adv, EUT Vert
2388.040	29.3	-1.8	1.2	43.0	3.0	20.0	Vert	AV	0.0	47.5	54.0	-6.5	Low Ch. (2404 MHz), LE, EUT Flat
12388.780	50.1	-2.9	1.2	266.0	3.0	0.0	Horz	AV	0.0	47.2	54.0	-6.8	High Ch. (2426 MHz), LE, EUT Side
2483.510	48.5	-1.5	1.2	282.0	3.0	20.0	Vert	PK	0.0	67.0	74.0	-7.0	High Ch. (2480 MHz), Adv, EUT Flat
4807.842	38.8	8.2	1.3	36.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Low Ch. (2404 MHz), LE, EUT Side
12008.780	49.1	-3.2	1.2	272.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	Low Ch. (2402 MHz), Adv, EUT Side
4959.925	37.3	8.6	1.2	22.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	High Ch. (2480 MHz), Adv, EUT Side
7277.367	33.6	12.1	1.2	271.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	Mid Ch. (2426 MHz), Adv, EUT Side
12018.780	48.8	-3.2	1.2	269.0	3.0	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Low Ch. (2404 MHz), LE, EUT Side
7319.325	33.0	12.4	1.1	296.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch. (2440 MHz), LE, EUT Side
4955.900	36.3	8.6	1.2	3.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	High Ch. (2478 MHz), LE, EUT Side
7277.342	32.0	12.1	1.2	0.0	3.0	0.0	Vert	AV	0.0	44.1	54.0	-9.9	Mid Ch. (2426 MHz), Adv, EUT Side
2484.967	45.0	-1.5	1.2	270.0	3.0	20.0	Horz	PK	0.0	63.5	74.0	-10.5	High Ch. (2478 MHz), LE, EUT Side
4851.817	35.2	8.3	1.2	306.0	3.0	0.0	Vert	AV	0.0	43.5	54.0	-10.5	Mid Ch. (2426 MHz), Adv, EUT Side
4879.875	34.7	8.3	1.2	3.0	3.0	0.0	Horz	AV	0.0	43.0	54.0	-11.0	Mid Ch. (2440 MHz), LE, EUT Side
2483.527	44.5	-1.5	1.2	276.0	3.0	20.0	Horz	PK	0.0	63.0	74.0	-11.0	High Ch. (2480 MHz), Adv, EUT Vert
7439.408	29.6	12.9	1.2	295.0	3.0	0.0	Horz	AV	0.0	42.5	54.0	-11.5	High Ch. (2480 MHz), Adv, EUT Side
4956.017	33.9	8.6	1.2	346.0	3.0	0.0	Vert	AV	0.0	42.5	54.0	-11.5	High Ch. (2478 MHz), LE, EUT Side
7433.433	29.5	12.9	1.2	295.0	3.0	0.0	Horz	AV	0.0	42.4	54.0	-11.6	High Ch. (2478 MHz), LE, EUT Side
4959.967	33.7	8.6	1.2	346.0	3.0	0.0	Vert	AV	0.0	42.3	54.0	-11.7	High Ch. (2480 MHz), Adv, EUT Side
4879.900	33.9	8.3	1.2	309.0	3.0	0.0	Vert	AV	0.0	42.2	54.0	-11.8	Mid Ch. (2440 MHz), LE, EUT Side
7319.450	29.6	12.4	1.2	305.0	3.0	0.0	Vert	AV	0.0	42.0	54.0	-12.0	Mid Ch. (2440 MHz), LE, EUT Side
7433.317	28.7	12.9	1.2	299.0	3.0	0.0	Vert	AV	0.0	41.6	54.0	-12.4	High Ch. (2478 MHz), LE, EUT Side
4803.925	33.1	8.2	1.2	307.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	Low Ch. (2402 MHz), Adv, EUT Side
7439.258	28.0	12.9	1.2	34.0	3.0	0.0	Vert	AV	0.0	40.9	54.0	-13.1	High Ch. (2480 MHz), Adv, EUT Side
2483.610	42.0	-1.5	1.2	181.0	3.0	20.0	Vert	PK	0.0	60.5	74.0	-13.5	High Ch. (2480 MHz), Adv, EUT Side
4807.850	32.2	8.2	1.2	240.0	3.0	0.0	Vert	AV	0.0	40.4	54.0	-13.6	Low Ch. (2404 MHz), LE, EUT Side
2485.050	41.4	-1.5	1.9	195.0	3.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch. (2478 MHz), LE, EUT Vert
2389.577	41.6	-1.8	1.2	321.0	3.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	Low Ch. (2402 MHz), Adv, EUT Side
2484.850	41.3	-1.5	2.9	293.0	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch. (2480 MHz), Adv, EUT Flat
2484.667	41.0	-1.5	1.2	195.0	3.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	High Ch. (2480 MHz), Adv, EUT Side
2483.553	41.0	-1.5	1.2	176.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch. (2478 MHz), LE, EUT Side
2484.027	40.8	-1.5	1.2	305.0	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch. (2480 MHz), Adv, EUT Vert
2389.917	40.9	-1.8	1.2	43.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch. (2404 MHz), LE, EUT Flat
2389.157	40.9	-1.8	1.2	350.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch. (2404 MHz), LE, EUT Side
2388.330	40.9	-1.8	1.2	336.0	3.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	Low Ch. (2402 MHz), Adv, EUT Flat
2484.760	40.6	-1.5	2.8	252.0	3.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	High Ch. (2478 MHz), LE, EUT Flat
2483.680	40.6	-1.5	1.2	198.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch. (2478 MHz), LE, EUT Flat
2389.397	40.8	-1.8	1.2	202.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch. (2404 MHz), LE, EUT Side
2483.710	40.5	-1.5	1.2	99.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	High Ch. (2478 MHz), LE, EUT Vert
2389.327	40.7	-1.8	1.2	338.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	Low Ch. (2402 MHz), Adv, EUT Vert
2388.227	40.7	-1.8	1.2	190.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	Low Ch. (2402 MHz), Adv, EUT Vert
2388.103	40.7	-1.8	1.2	352.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	Low Ch. (2404 MHz), LE, EUT Vert
2389.993	40.4	-1.8	1.2	129.0	3.0	20.0	Vert	PK	0.0	58.6	74.0	-15.4	Low Ch. (2402 MHz), Adv, EUT Flat
2389.157	40.4	-1.8	1.2	41.0	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	Low Ch. (2402 MHz), Adv, EUT Side
2388.050	40.4	-1.8	1.2	208.0	3.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	Low Ch. (2404 MHz), LE, EUT Flat
2388.583	40.1	-1.8	1.2	169.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	Low Ch. (2404 MHz), LE, EUT Vert
12401.380	59.0	-2.9	1.2	307.0	3.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	High Ch. (2480 MHz), Adv, EUT Side
12131.210	58.5	-3.2	1.2	308.0	3.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	Mid Ch. (2426 MHz), Adv, EUT Side
12391.330	58.1	-2.9	1.2	320.0	3.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	High Ch. (2478 MHz), LE, EUT Side
7321.083	42.4	12.4	1.1	296.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	Mid Ch. (2440 MHz), LE, EUT Side
12021.370	58.0	-3.2	1.2	309.0	3.0	0.0	Vert	PK	0.0	54.8	74.0	-19.2	Low Ch. (2404 MHz), LE, EUT Side
7277.067	42.6	12.1	1.2	271.0	3.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	Mid Ch. (2426 MHz), Adv, EUT Side
12008.680	57.7	-3.2	1.2	308.0	3.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	Low Ch. (2402 MHz), Adv, EUT Side
7277.208	42.3	12.1	1.2	0.0	3.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	Mid Ch. (2426 MHz), Adv, EUT Side
4803.700	46.2	8.2	1.1	7.0	3.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	Low Ch. (2402 MHz), Adv, EUT Side
12201.360	57.4	-3.1	1.1	271.0	3.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Mid Ch. (2440 MHz), LE, EUT Side
12128.670	57.4	-3.2	1.1	269.0	3.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Mid Ch. (2426 MHz), Adv, EUT Side
12401.370	57.0	-2.9	1.3	269.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	High Ch. (2480 MHz), Adv, EUT Side
12198.690	57.2	-3.1	1.2	307.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Mid Ch. (2440 MHz), LE, EUT Side
4851.783	45.5	8.3	1.1	8.0	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	Mid Ch. (2426 MHz), Adv, EUT Side
12391.330	56.5	-2.9	1.2	266.0	3.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	High Ch. (2478 MHz), LE, EUT Side
7433.158	40.1	12.9	1.2	295.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	High Ch. (2478 MHz), LE, EUT Side
4807.625	44.8	8.2	1.3	36.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	Low Ch. (2404 MHz), LE, EUT Side
7434.817	39.9	12.9	1.2	299.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	High Ch. (2478 MHz), LE, EUT Side
4959.750	44.1	8.6	1.2	22.0	3.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	High Ch. (2480 MHz), Adv, EUT Side
12008.780	55.7	-3.2	1.2	272.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	Low Ch. (2402 MHz), Adv, EUT Side
7440.450	39.5	12.9	1.2	295.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	High Ch. (2480 MHz), Adv, EUT Side
4956.592	43.5	8.6	1.2	3.0	3.0	0.0	Horz	PK	0.0	52.1	74.0	-21.9	High Ch. (2478 MHz), LE, EUT Side
12018.770	55.2	-3.2	1.2	269.0	3.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Low Ch. (2404 MHz), LE, EUT Side
7318.800	39.4	12.4	1.2	305.0	3.0	0.0	Vert	PK	0.0	51.8	74.0	-22.2	Mid Ch. (2440 MHz), LE, EUT Side
7439.658	38.0	12.9	1.2	34.0	3.0	0.0	Vert	PK	0.0	50.9	74.0	-23.1	High Ch. (2480 MHz), Adv, EUT Side
4851.367	42.4	8.3	1.2	306.0	3.0	0.0	Vert	PK	0.0	50.7	74.0	-23.3	Mid Ch. (2426 MHz), Adv, EUT Side
4880.633	42.3	8.3	1.2	3.0	3.0	0.0	Horz	PK	0.0	50.6	74.0	-23.4	Mid Ch. (2440 MHz), LE, EUT Side
4960.733	41.5	8.6	1.2	346.0	3.0	0.0	Vert	PK	0.0	50.1	74.0	-23.9	High Ch. (2480 MHz), Adv, EUT Side
4955.458	41.5	8.6	1.2	346.0	3.0	0.0	Vert	PK	0.0	50.1	74.0	-23.9	High Ch. (2478 MHz), LE, EUT Side
4880.517	41.7	8.3	1.2	309.0	3.0	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Mid Ch. (2440 MHz), LE, EUT Side
4804.717	41.3	8.2	1.2	307.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	Low Ch. (2402 MHz), Adv, EUT Side
4807.575	40.8	8.2	1.2	240.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Low Ch. (2404 MHz), LE, EUT Side

Powerline Conducted Emissions

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

MODES OF OPERATION

Transmitting Bluetooth LE

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1668 - 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	HHF	2/1/2012	24 mo
NC01 Cables	N/A	Conducted / NF Probe Cable	NC4	12/14/2012	12 mo
LISN	Solar	9252-50-R-24-BNC	LIM	1/16/2013	12 mo
Receiver	Rohde & Schwarz	ESCI	ARE	5/30/2013	12 mo


MEASUREMENT BANDWIDTHS

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

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

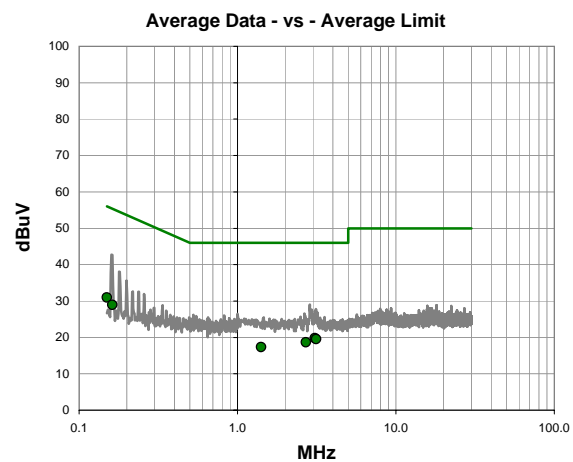
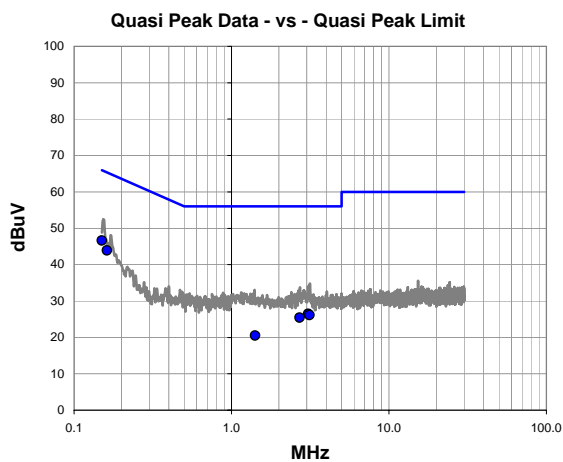
TEST DESCRIPTION

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

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, Low Channel 2402 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	52	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.3	20.3	46.6	66.0	-19.4
0.162	23.6	20.3	43.9	65.4	-21.4
3.076	6.1	20.4	26.5	56.0	-29.5
3.140	5.7	20.4	26.1	56.0	-29.9
2.708	5.0	20.4	25.4	56.0	-30.6
1.412	0.2	20.3	20.5	56.0	-35.5

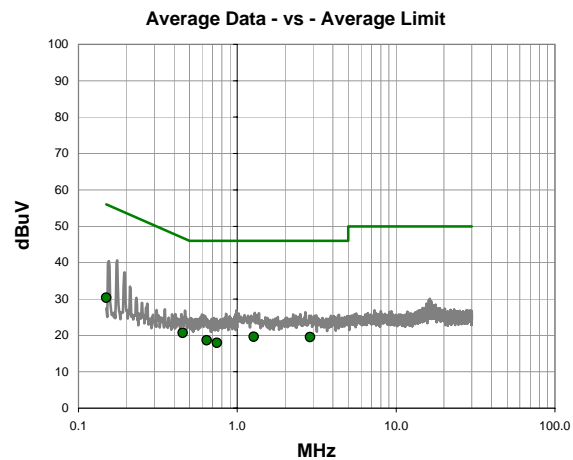
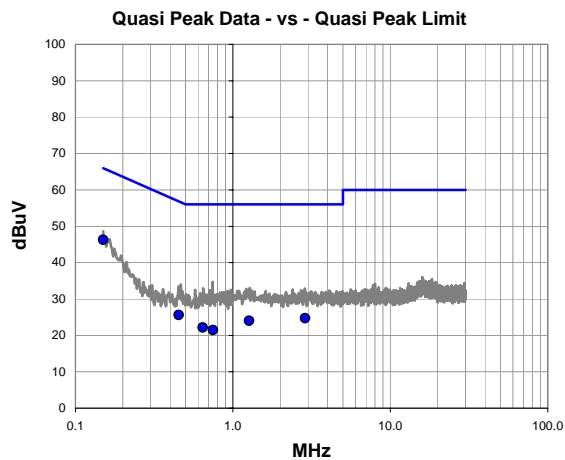
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.7	20.3	31.0	56.0	-25.0
3.076	-0.6	20.4	19.8	46.0	-26.2
0.162	8.6	20.3	28.9	55.4	-26.4
3.140	-0.9	20.4	19.5	46.0	-26.5
2.708	-1.7	20.4	18.7	46.0	-27.3
1.412	-3.0	20.3	17.3	46.0	-28.7

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, Low Channel 2402 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	53	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.0	20.3	46.3	66.0	-19.7
0.454	5.3	20.3	25.6	56.8	-31.2
2.876	4.3	20.4	24.7	56.0	-31.3
1.268	3.7	20.3	24.0	56.0	-32.0
0.644	1.9	20.2	22.1	56.0	-33.9
0.747	1.2	20.3	21.5	56.0	-34.6

Average Data - vs - Average Limit

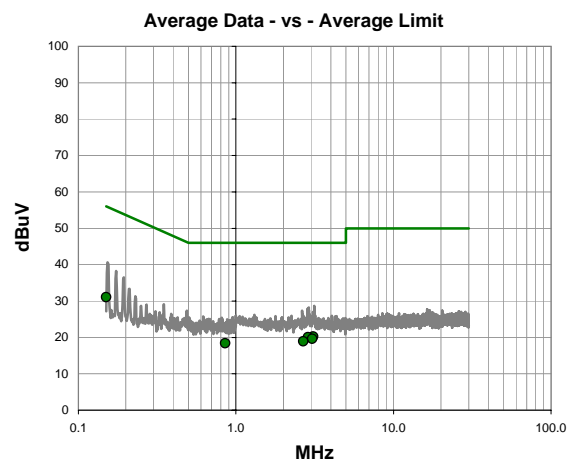
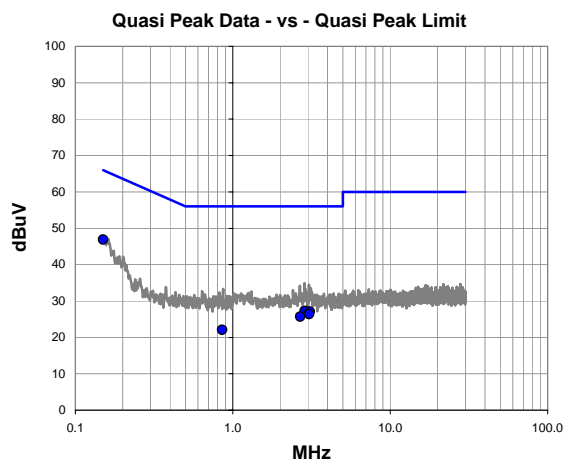
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.1	20.3	30.4	56.0	-25.6
0.454	0.4	20.3	20.7	46.8	-26.1
1.268	-0.7	20.3	19.6	46.0	-26.4
2.876	-0.9	20.4	19.5	46.0	-26.5
0.644	-1.6	20.2	18.6	46.0	-27.4
0.747	-2.3	20.3	18.0	46.0	-28.1

Powerline Conducted Emissions

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, Mid Channel 2426 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	54	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.6	20.3	46.9	66.0	-19.1
2.868	6.9	20.4	27.3	56.0	-28.7
3.096	6.7	20.4	27.1	56.0	-28.9
3.060	6.0	20.4	26.4	56.0	-29.6
2.684	5.3	20.4	25.7	56.0	-30.3
0.855	1.8	20.3	22.1	56.0	-33.9

Average Data - vs - Average Limit

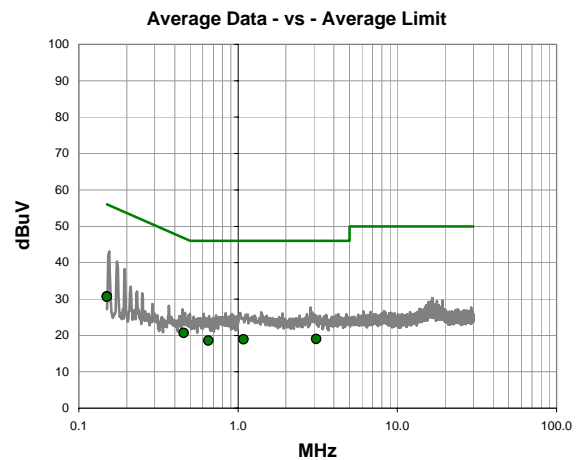
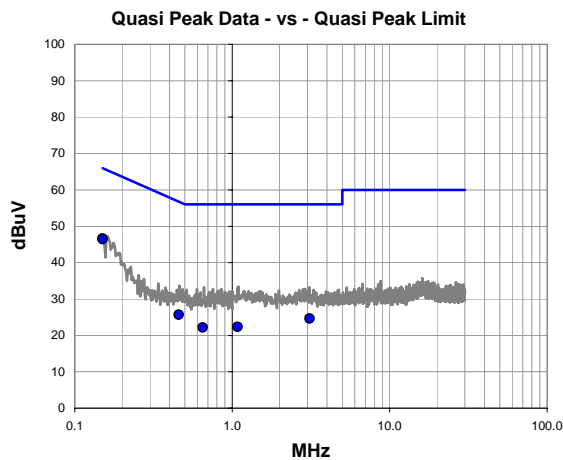
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.8	20.3	31.1	56.0	-24.9
3.096	-0.2	20.4	20.2	46.0	-25.8
2.868	-0.3	20.4	20.1	46.0	-25.9
3.060	-0.8	20.4	19.6	46.0	-26.4
2.684	-1.5	20.4	18.9	46.0	-27.1
0.855	-1.9	20.3	18.4	46.0	-27.6

Powerline Conducted Emissions

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, Mid Channel 2426 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	55	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.3	20.3	46.6	66.0	-19.4
0.150	26.2	20.3	46.5	66.0	-19.5
0.457	5.4	20.3	25.7	56.7	-31.1
3.104	4.2	20.4	24.6	56.0	-31.4
1.084	2.1	20.3	22.4	56.0	-33.6
0.650	1.9	20.2	22.1	56.0	-33.9

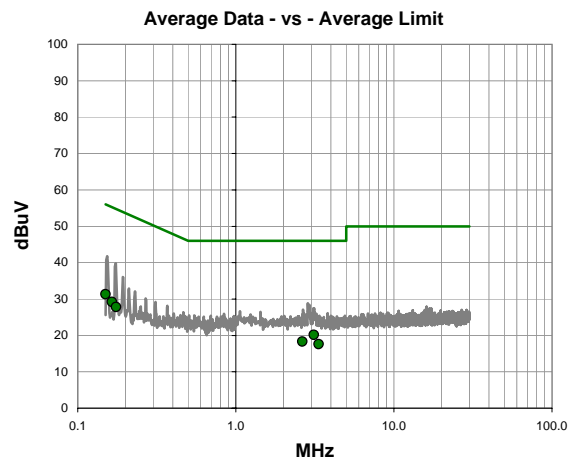
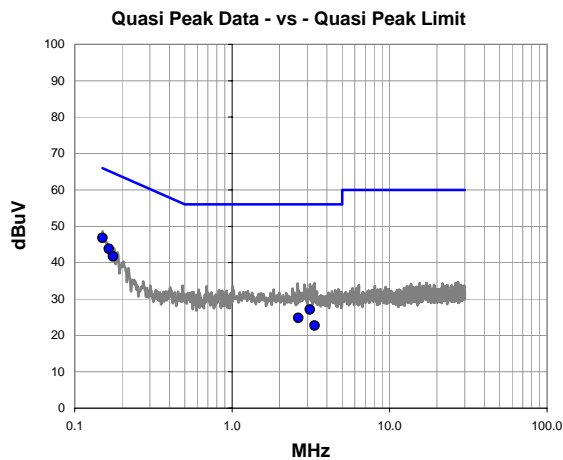
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.4	20.3	30.7	56.0	-25.3
0.150	10.3	20.3	30.6	56.0	-25.4
0.457	0.4	20.3	20.7	46.7	-26.1
3.104	-1.4	20.4	19.0	46.0	-27.0
1.084	-1.4	20.3	18.9	46.0	-27.1
0.650	-1.7	20.2	18.5	46.0	-27.5

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, High Channel 2480 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	56	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.5	20.3	46.8	66.0	-19.2
0.165	23.5	20.3	43.8	65.2	-21.4
0.175	21.3	20.4	41.7	64.7	-23.1
3.116	6.7	20.4	27.1	56.0	-28.9
2.638	4.4	20.4	24.8	56.0	-31.2
3.344	2.3	20.4	22.7	56.0	-33.3

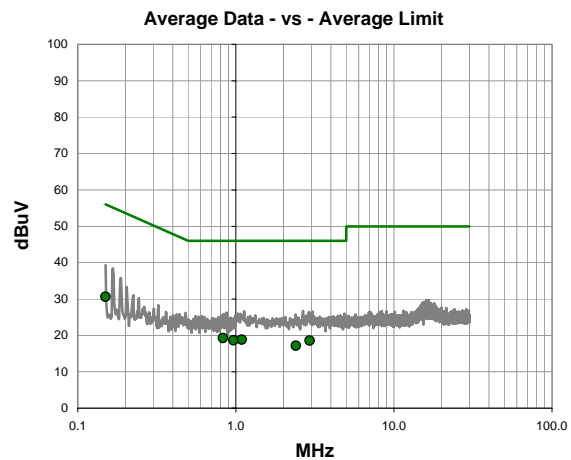
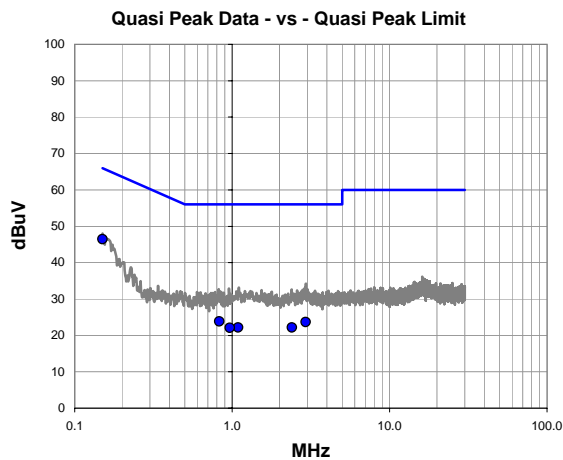
Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	11.0	20.3	31.3	56.0	-24.7
3.116	-0.3	20.4	20.1	46.0	-25.9
0.165	8.9	20.3	29.2	55.2	-26.0
0.175	7.4	20.4	27.8	54.7	-27.0
2.638	-2.1	20.4	18.3	46.0	-27.7
3.344	-2.8	20.4	17.6	46.0	-28.4

Work Order:	MCSO1668	Date:	07/08/13	
Project:	None	Temperature:	23 °C	
Job Site:	NC05	Humidity:	49% RH	
Serial Number:	6079632553	Barometric Pres.:	1018 mbar	
EUT:	1601			
Configuration:	3			
Customer:	Microsoft Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth LE			
Deviations:	None			
Comments:	DTS Advertising, High Channel 2480 MHz			

Test Specifications	Test Method
FCC 15.207:2013	ANSI C63.10:2009

Run #	57	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	26.2	20.3	46.5	66.0	-19.5
0.829	3.6	20.3	23.9	56.0	-32.1
2.932	3.3	20.4	23.7	56.0	-32.3
1.092	1.9	20.3	22.2	56.0	-33.8
2.404	1.8	20.4	22.2	56.0	-33.8
0.968	1.8	20.3	22.1	56.0	-33.9

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.3	20.3	30.6	56.0	-25.4
0.829	-1.0	20.3	19.3	46.0	-26.7
1.092	-1.5	20.3	18.8	46.0	-27.2
0.968	-1.6	20.3	18.7	46.0	-27.3
2.932	-1.8	20.4	18.6	46.0	-27.4
2.404	-3.2	20.4	17.2	46.0	-28.8