



**Supra, A Division of UTCFS**

**iBox BT LE**

**FCC 15.247:2013 (DTS)**

**Bluetooth LE Radio**

**Report #: SUPR0100**



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – [www.nwemc.com](http://www.nwemc.com)

California – Minnesota – Oregon – New York – Washington

# CERTIFICATE OF TEST

**Last Date of Test: January 30, 2013**  
**Supra, A Division of UTCFS**  
**Model: iBox BT LE**

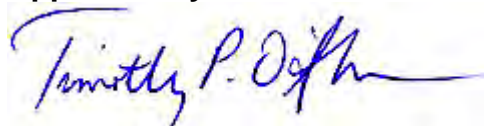
## Emissions

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

## Deviations From Test Standards

None

## Approved By:



Tim O'Shea, Operations Manager



**NVLAP Lab Code: 200630-0**

## Test Facility

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

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

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

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

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

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

# REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

## Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

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## 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

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## Canada

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

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## 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.

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## Australia/New Zealand

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

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## Korea

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

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## Japan

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

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## 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.

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## Singapore

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

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## Hong Kong

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

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## Vietnam

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

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## Russia

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

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## SCOPE

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

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

## Measurement Uncertainty

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

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

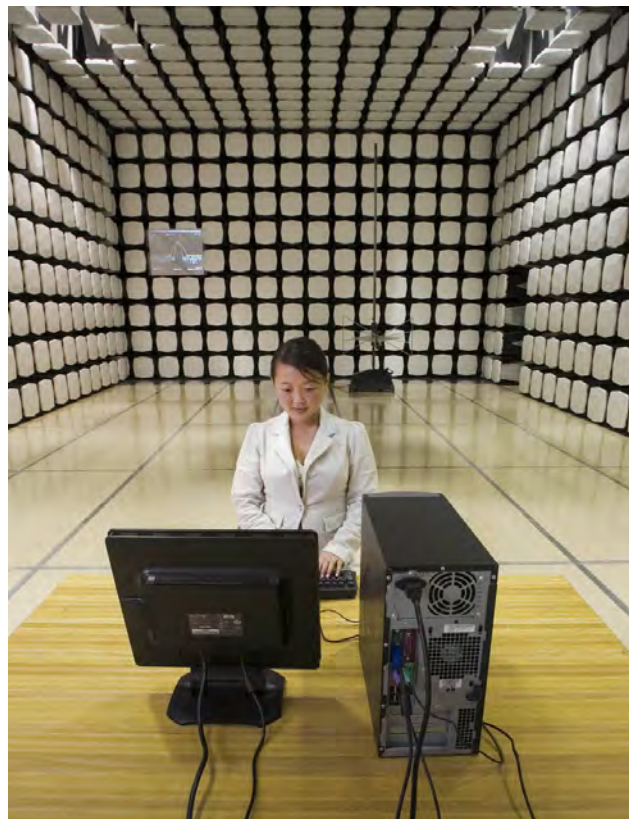
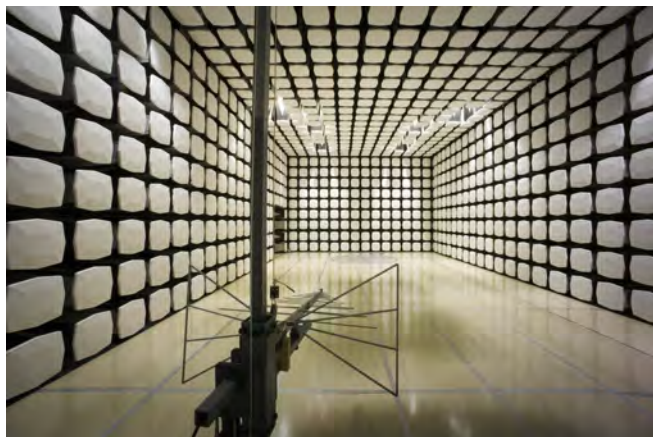
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

<b>Test</b>	<b>+ MU</b>	<b>- MU</b>
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	4.00	-4.00
AC Powerline Conducted Emissions (dB)	2.70	-2.70





<b>Oregon</b> Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	<b>California</b> Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	<b>New York</b> Labs WA01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	<b>Minnesota</b> Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	<b>Washington</b> Labs NC01-05, SU02, SU07 19201 120 <sup>th</sup> Ave. NE Bothell, WA 98011 (425) 984-6600
<b>VCCI</b>				
A-0108	A-0029		A-0109	A-0110
<b>Industry Canada</b>				
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

<b>Company Name:</b>	Supra, A Division of UTCFS
<b>Address:</b>	4001 Fairview Industrial Drive SE
<b>City, State, Zip:</b>	Salem, OR 97302-0167
<b>Test Requested By:</b>	Adam Purdue
<b>Model:</b>	iBox BT LE
<b>First Date of Test:</b>	January 03, 2013
<b>Last Date of Test:</b>	January 30, 2013
<b>Receipt Date of Samples:</b>	January 02, 2013
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage

## Information Provided by the Party Requesting the Test

<b>Functional Description of the EUT (Equipment Under Test):</b>
Bluetooth 4.0 radio module with 1 antenna.
<b>Testing Objective:</b>
To demonstrate compliance to FCC 15.247 DTS requirements for the Bluetooth Low Energy (LE) portion of the radio.

## Configuration SUPR0100- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Lockbox	Supra, A Division of UTCFS	iBox BT LE	50

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
IR Programming Base Power Supply	Elpac	D7-10-01	None
IR Programming Base	Supra, A Division of UTCFS	Non-Traces Programming Base	60001809

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Dell	Latitude E6410	7V0DTM1
Laptop Power Supply	Dell	DA90PE3-00	CN-0WTCDV-48661-05N-443P-A00

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	PA	1.75m	No	IR Programming Base Power Supply	IR Programming Base
Serial Cable	Yes	1.5m	No	IR Programming Base	Serial to USB Adapter
Serial to USB Adapter	Yes	0.1m	No	Laptop PC	Serial Cable
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					



## Configuration SUPR0100- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Lockbox	Supra, A Division of UTCFS	iBox BT LE	45

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
IR Programming Base Power Supply	Elpac	D7-10-01	None
IR Programming Base	Supra, A Division of UTCFS	Non-Traces Programming Base	60001809
Laptop PC	Dell	Latitude E6410	7V0DTM1
Laptop Power Supply	Dell	DA90PE3-00	CN-0WTCDV-48661-05N-443P-A00

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	PA	1.75m	No	IR Programming Base Power Supply	IR Programming Base
Serial Cable	Yes	1.5m	No	IR Programming Base	Serial to USB Adapter
Serial to USB Adapter	Yes	0.1m	No	Laptop PC	Serial Cable
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	1/10/2013	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.
2	1/10/2013	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	1/10/2013	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.
4	1/10/2013	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.
5	1/10/2013	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.
6	1/10/2013	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
7	1/30/2013	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

## Duty Cycle

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

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

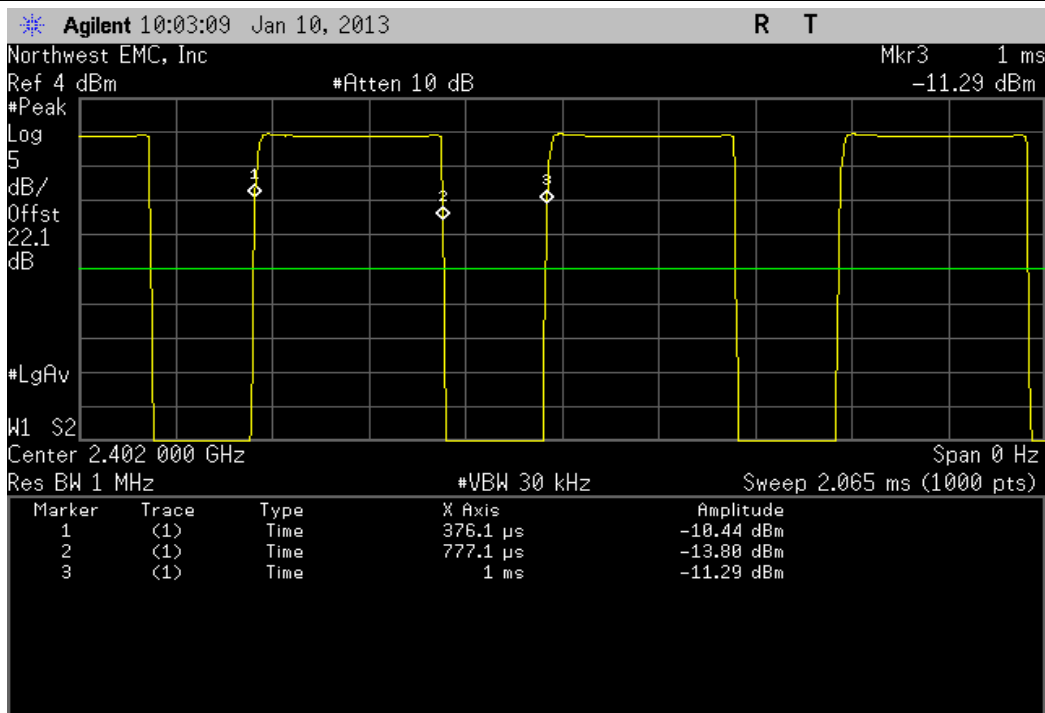
The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum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

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

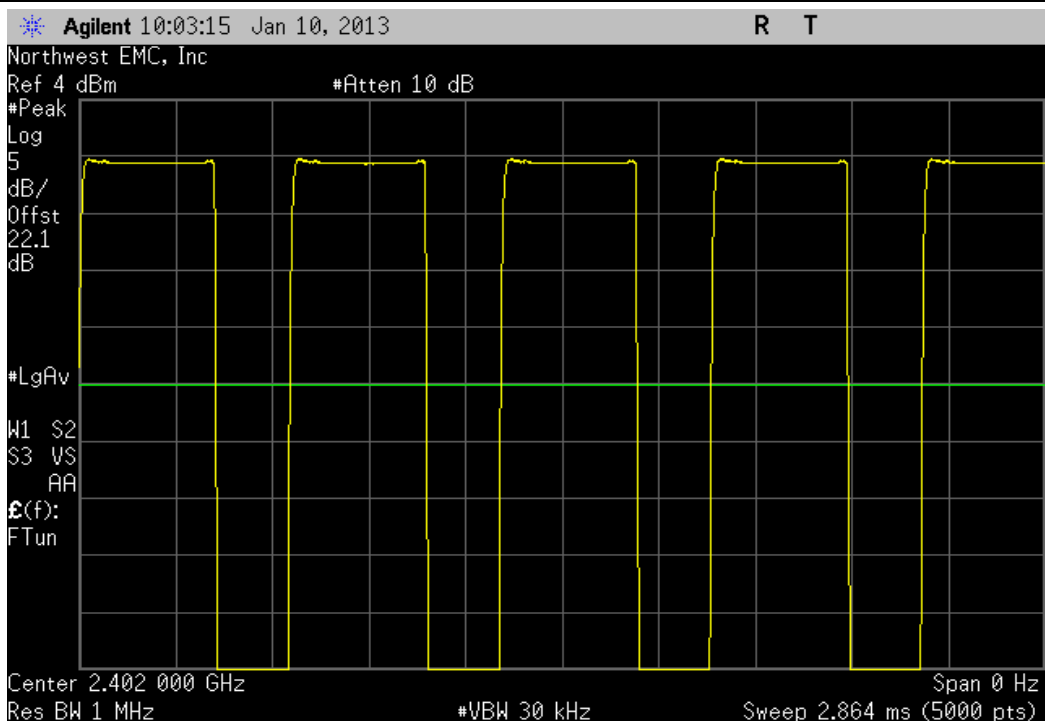
If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.



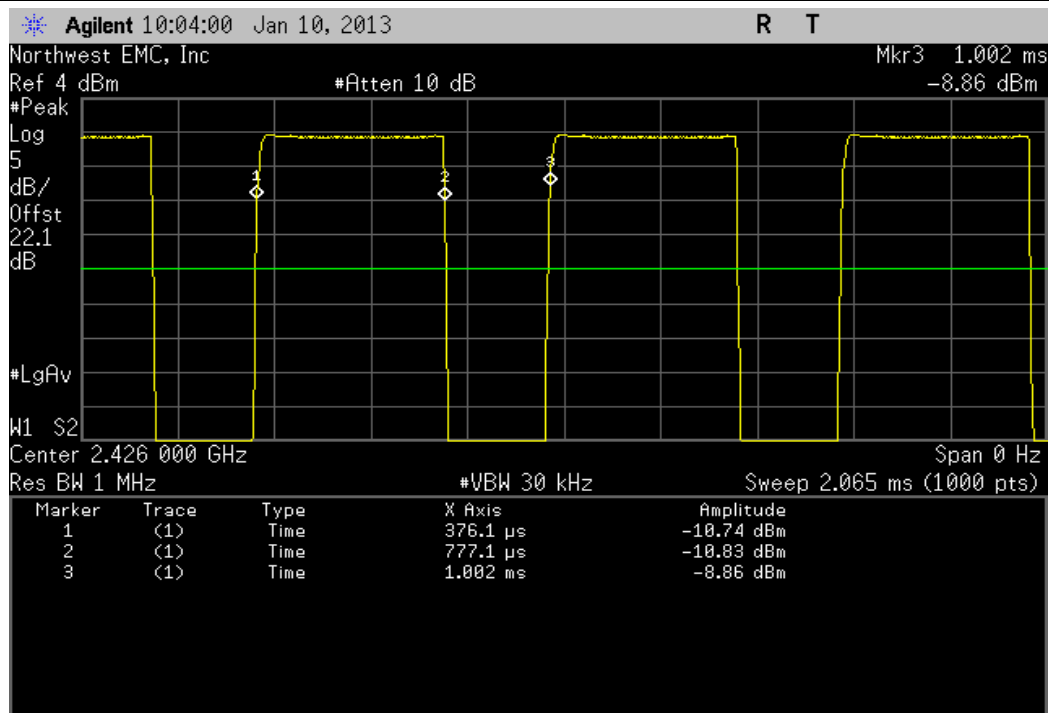
BLE - Advertising, Low Channel, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	401 uS	624.2 uS	1	64.2	N/A	N/A



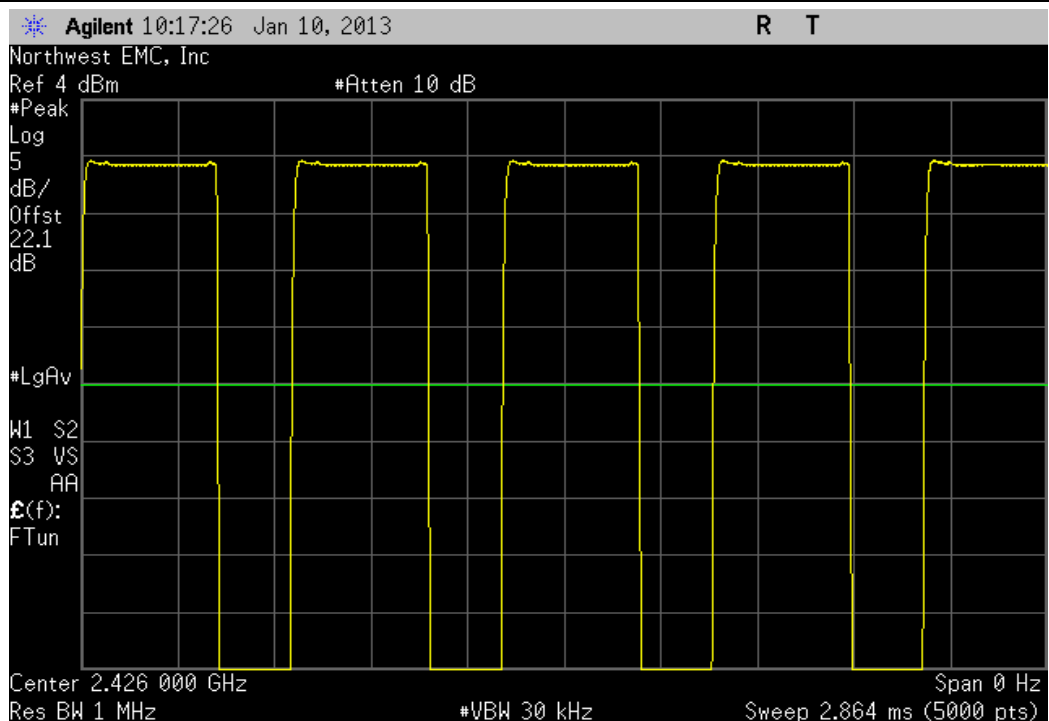
BLE - Advertising, Low Channel, 2402 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



BLE - Advertising, Mid Channel, 2426 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	401 uS	626.2 uS	1	64	N/A	N/A

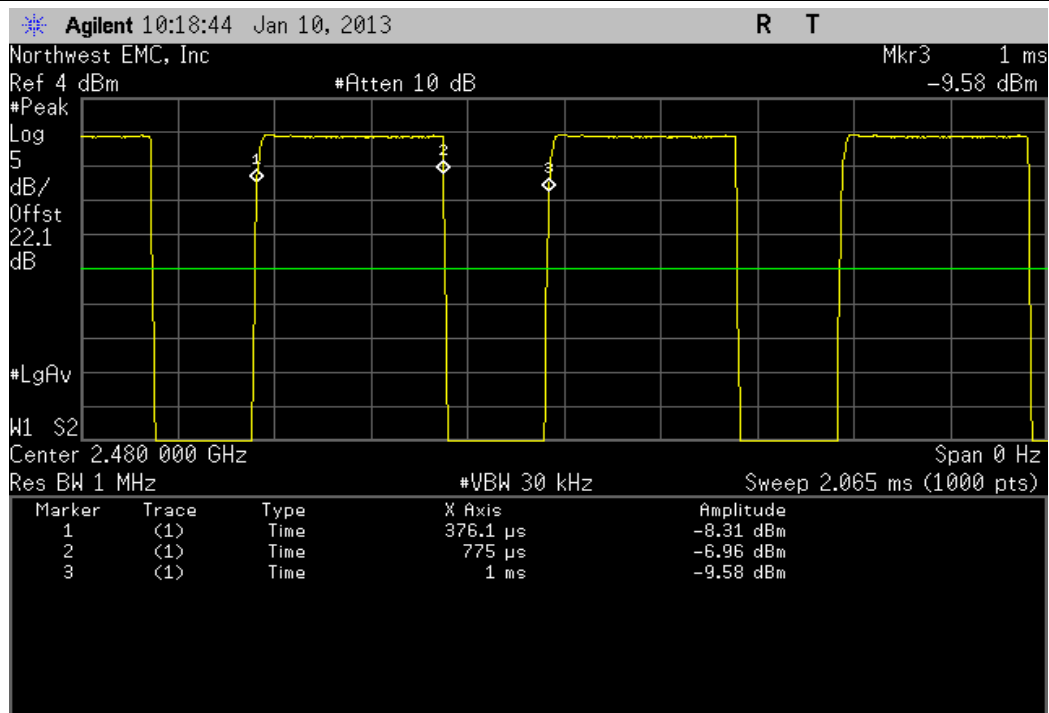


BLE - Advertising, Mid Channel, 2426 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A

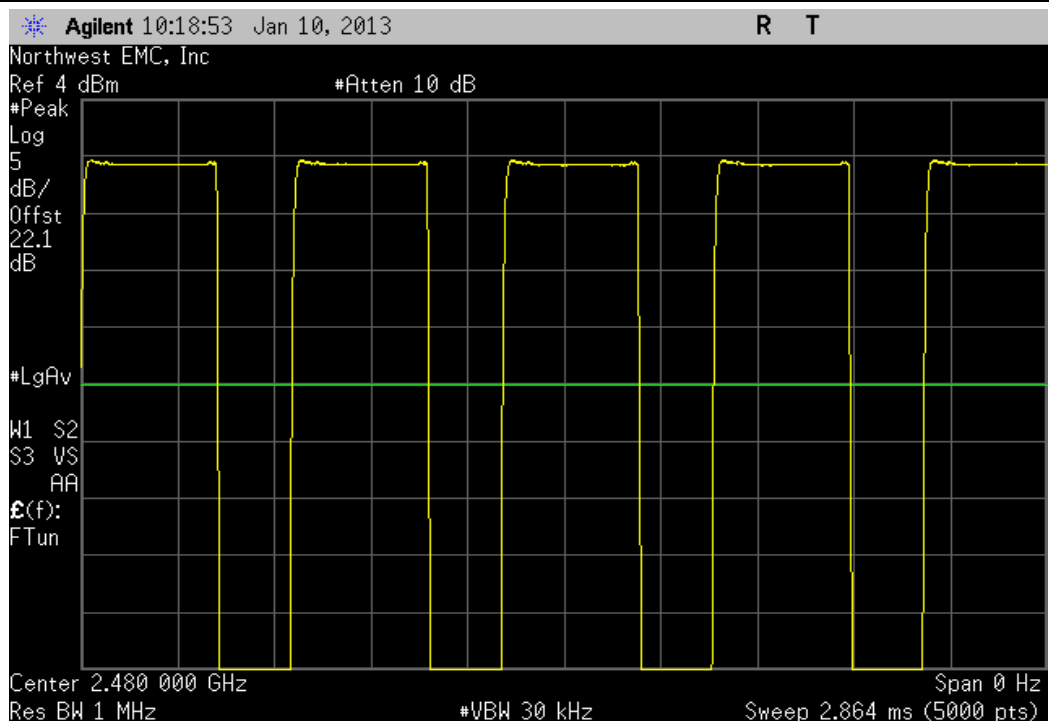




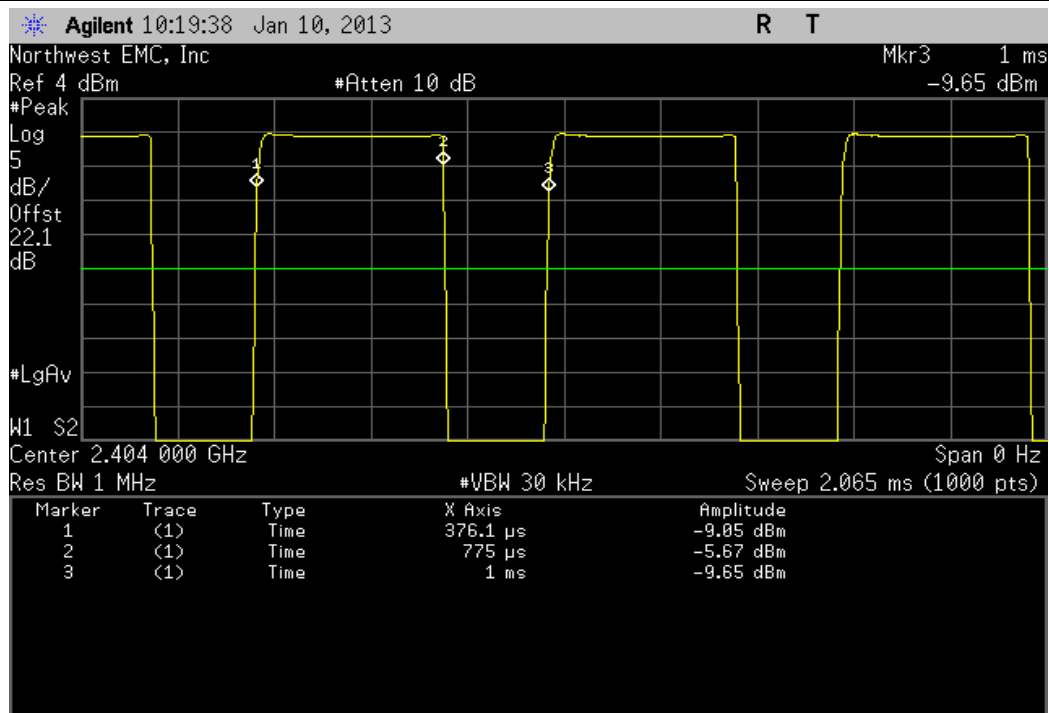
BLE - Advertising, High Channel, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	398.9 uS	624.2 uS	1	63.9	N/A	N/A



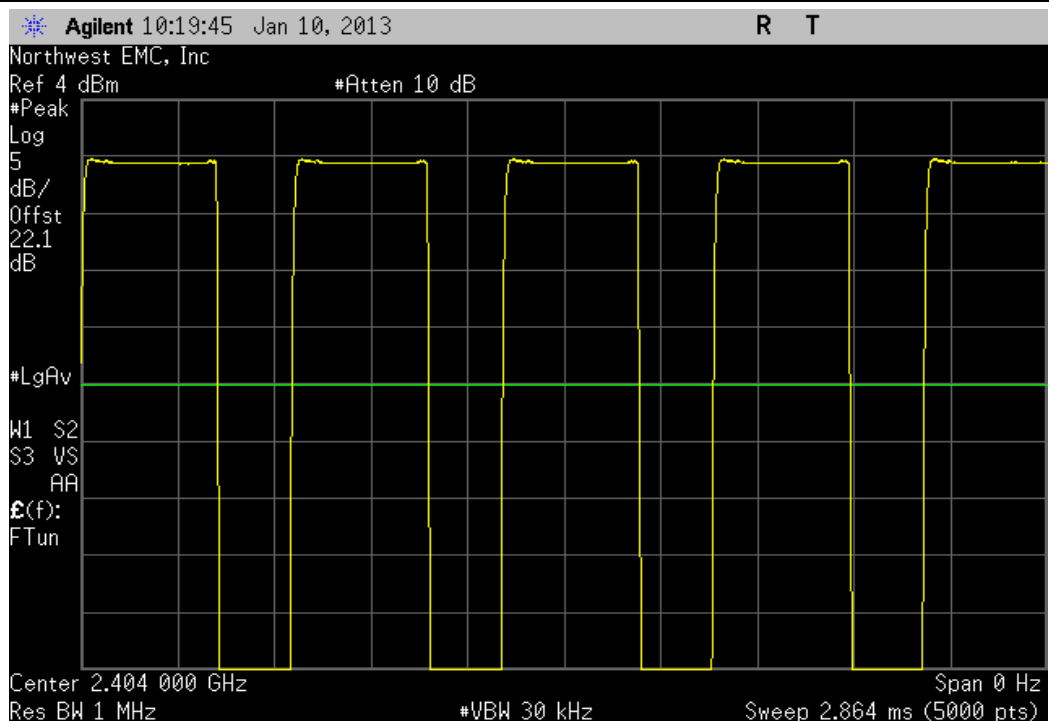
BLE - Advertising, High Channel, 2480 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



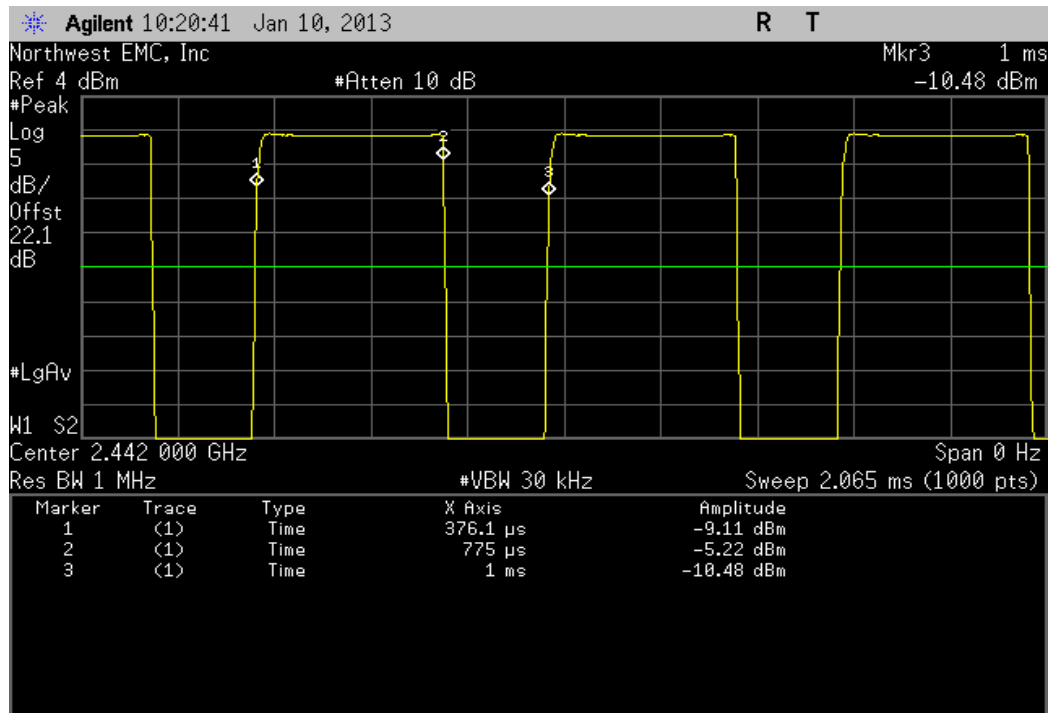
BLE - Data, Low Channel, 2404 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	398.9 uS	624.2 uS	1	63.9	N/A	N/A



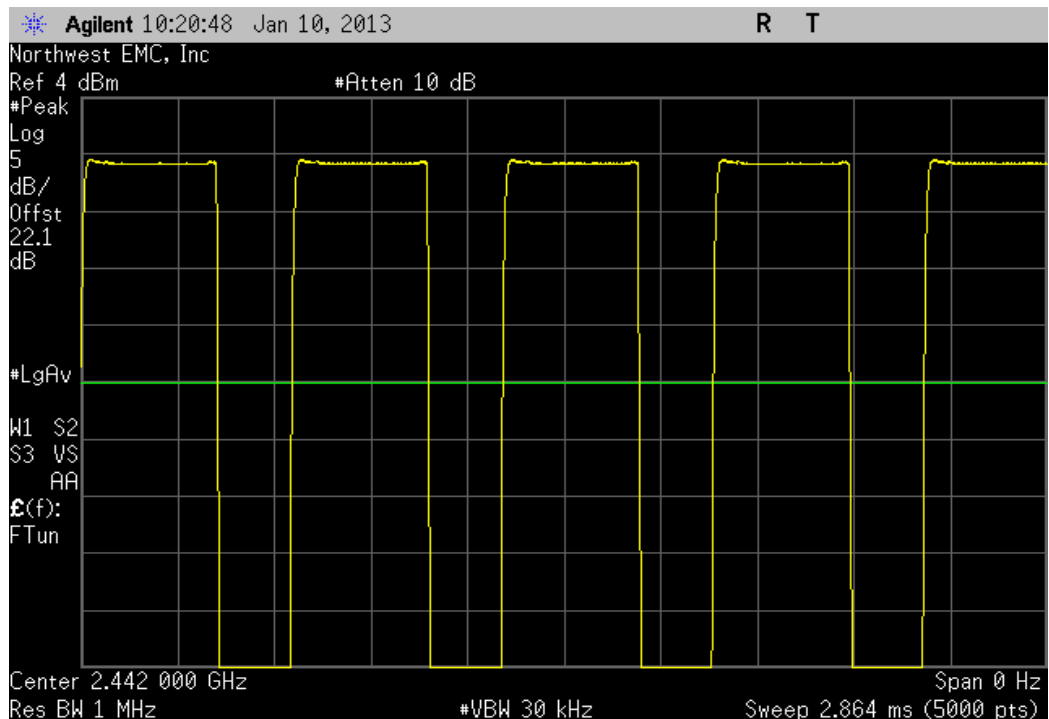
BLE - Data, Low Channel, 2404 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



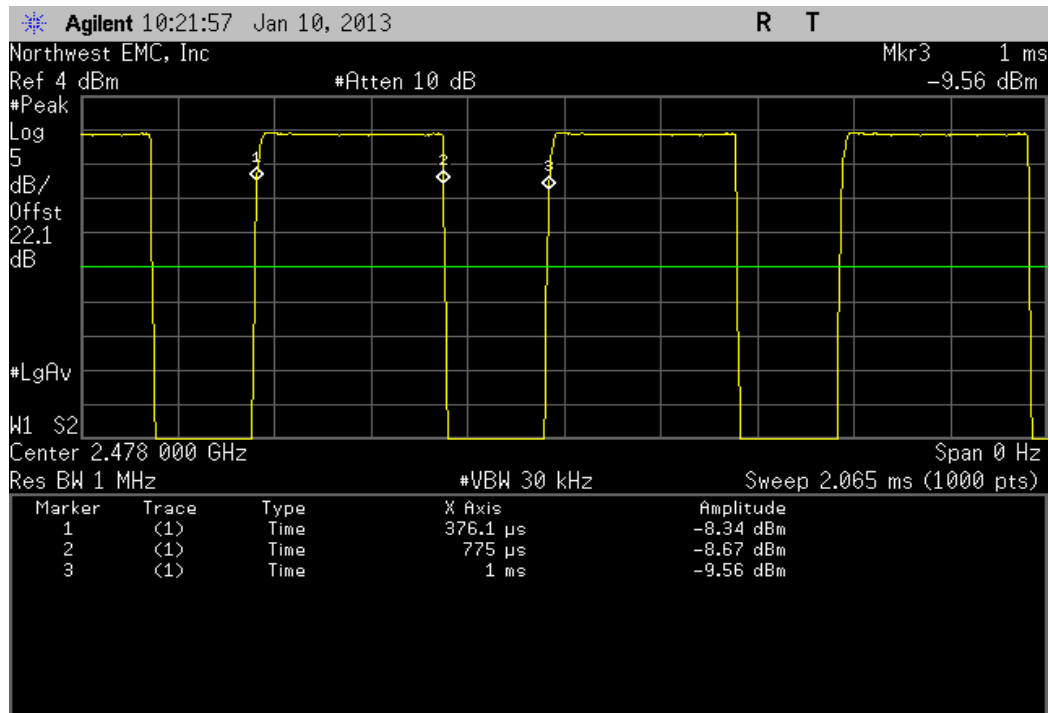
BLE - Data, Mid Channel, 2442 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	398.9 uS	624.2 uS	1	63.9	N/A	N/A



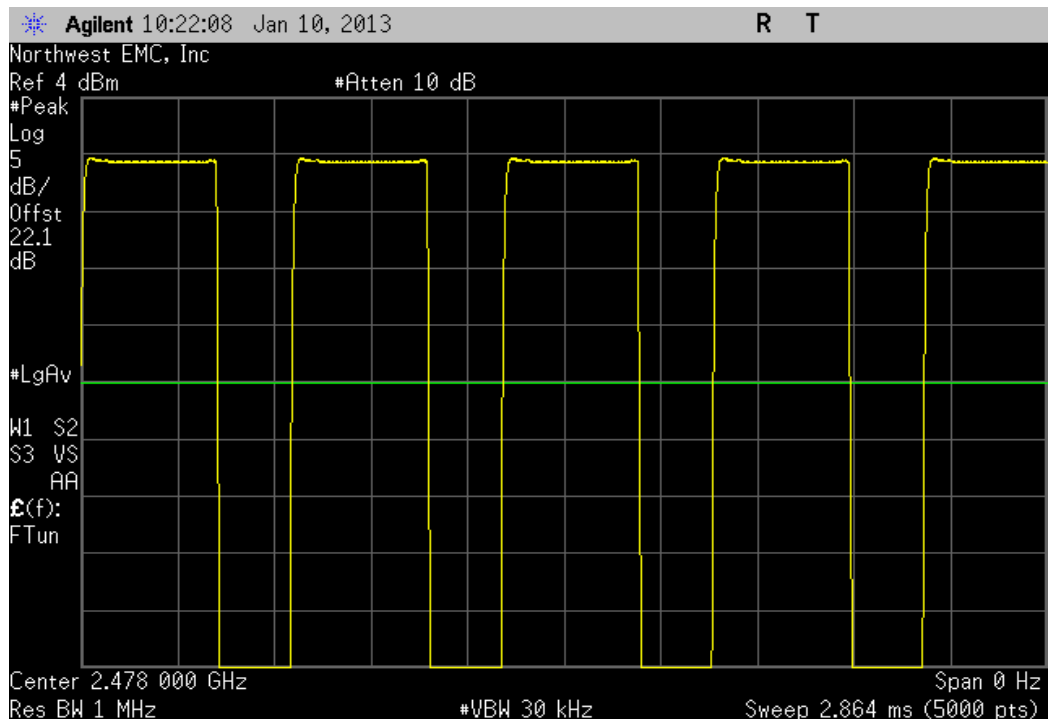
BLE - Data, Mid Channel, 2442 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	N/A	N/A	5	N/A	N/A	N/A



BLE - Data, High Channel, 2478 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	398.9 uS	624.2 uS	1	63.9	N/A	N/A



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



## Occupied Bandwidth

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

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

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

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



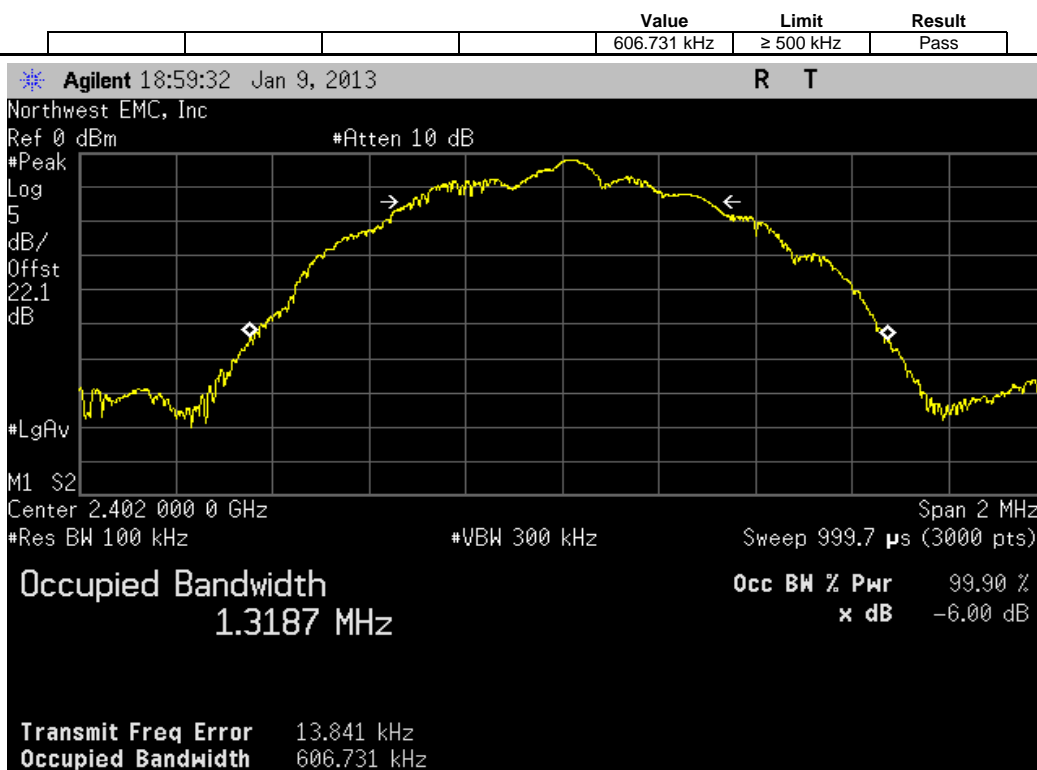
## Occupied Bandwidth

XMit 2012.09.20  
PsaTx 2012.11.16

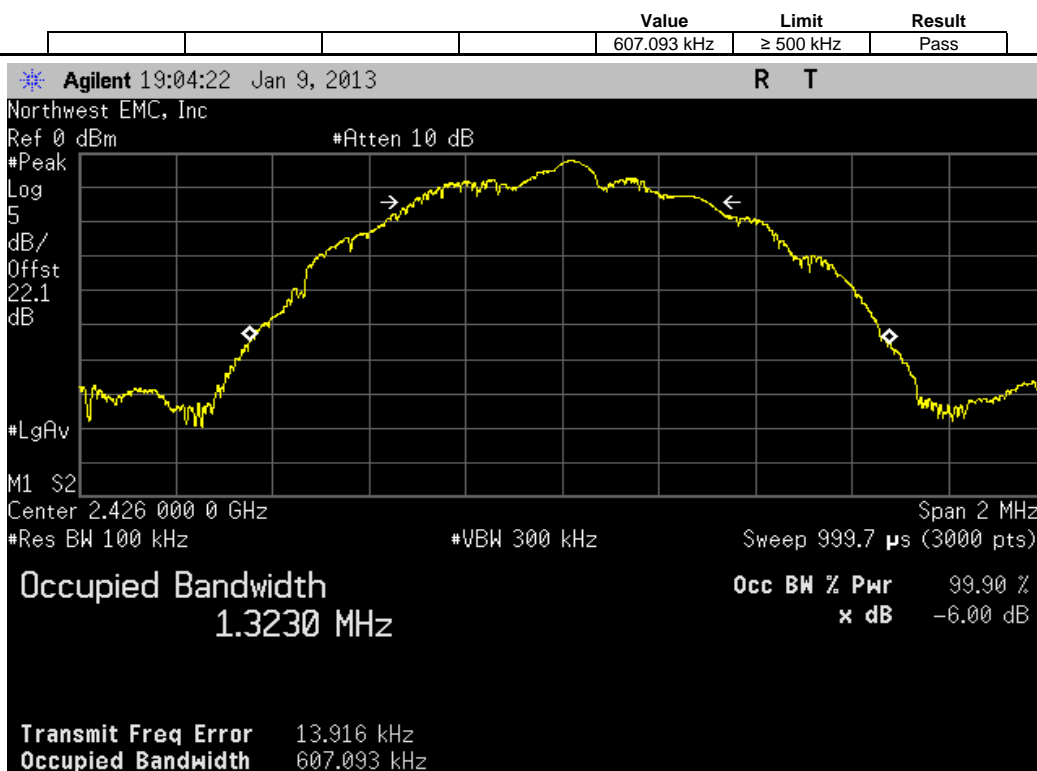
EUT: iBox BT LE		Work Order: SUPR0100	
Serial Number: 50		Date: 01/10/13	
Customer: Supra, A Division of UTCFS		Temperature: 22.6°C	
Attendees: None		Humidity: 31%	
Project: None		Barometric Pres.: 1019	
Tested by: Brandon Hobbs and Rod Peloquin		Power: EUT Battery	
		Job Site: EV06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Brandon Hobbs</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		606.731 kHz	≥ 500 kHz
Mid Channel, 2426 MHz		607.093 kHz	≥ 500 kHz
High Channel, 2480 MHz		608.028 kHz	≥ 500 kHz
BLE - Data			
Low Channel, 2404 MHz		605.539 kHz	≥ 500 kHz
Mid Channel, 2442 MHz		601.599 kHz	≥ 500 kHz
High Channel, 2478 MHz		601.94 kHz	≥ 500 kHz



BLE - Advertising, Low Channel, 2402 MHz

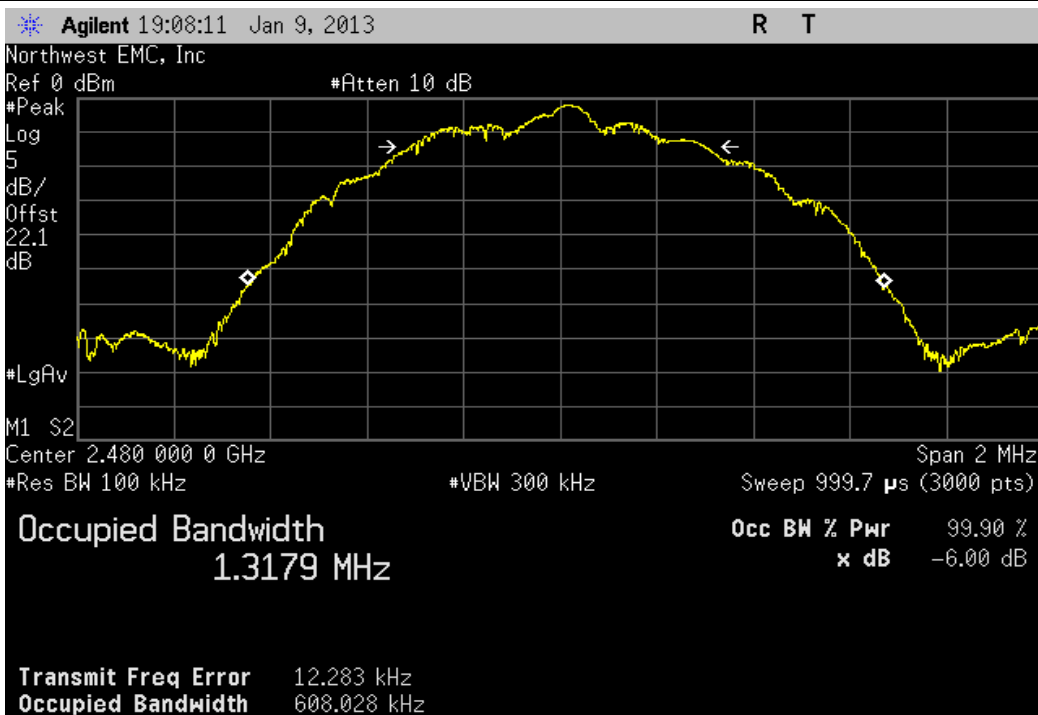


BLE - Advertising, Mid Channel, 2426 MHz



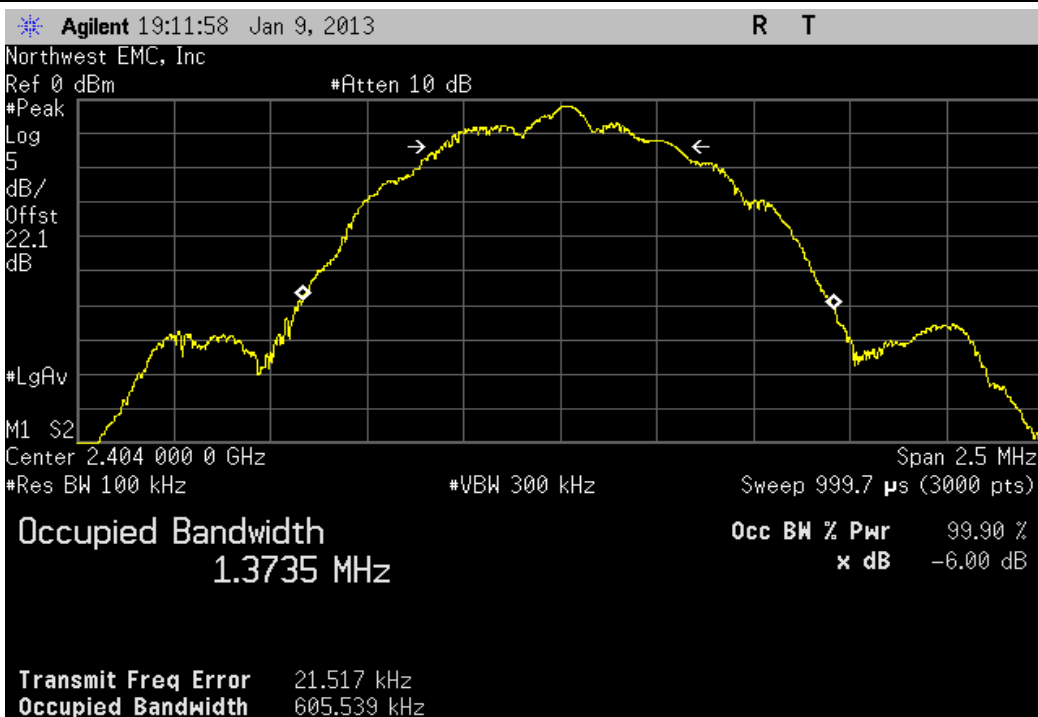
BLE - Advertising, High Channel, 2480 MHz

				Value	Limit	Result
				608.028 kHz	≥ 500 kHz	Pass

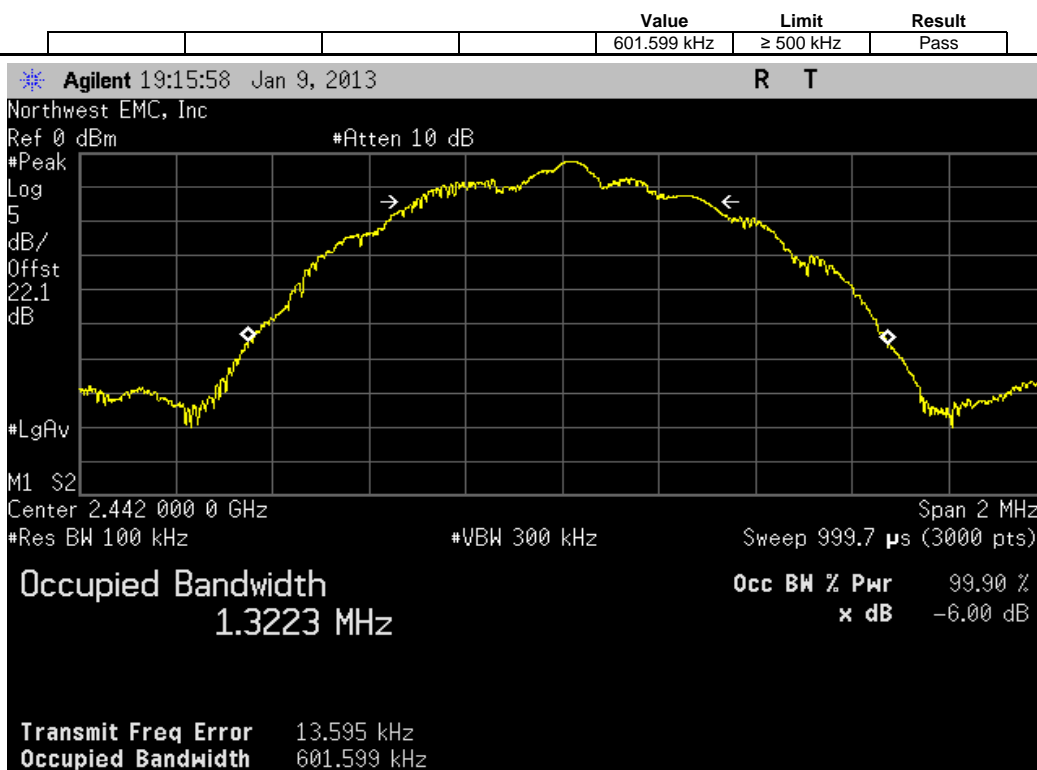


BLE - Data, Low Channel, 2404 MHz

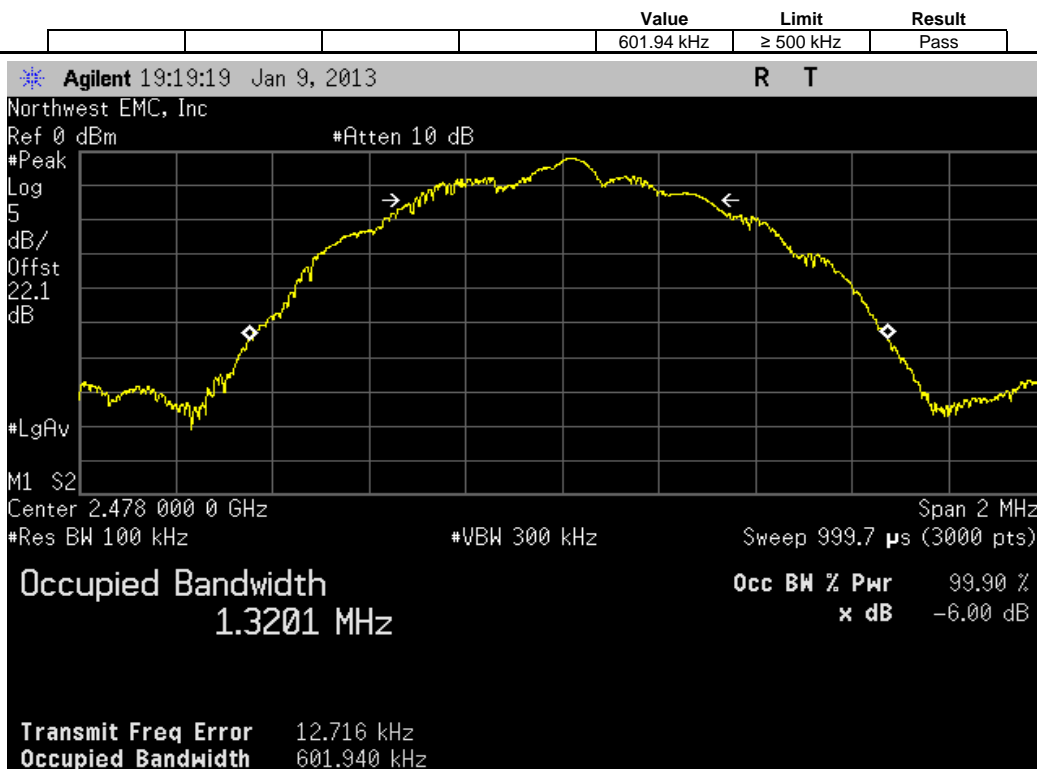
				Value	Limit	Result
				605.539 kHz	≥ 500 kHz	Pass



BLE - Data, Mid Channel, 2442 MHz



BLE - Data, High Channel, 2478 MHz



## 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
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Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

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

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

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

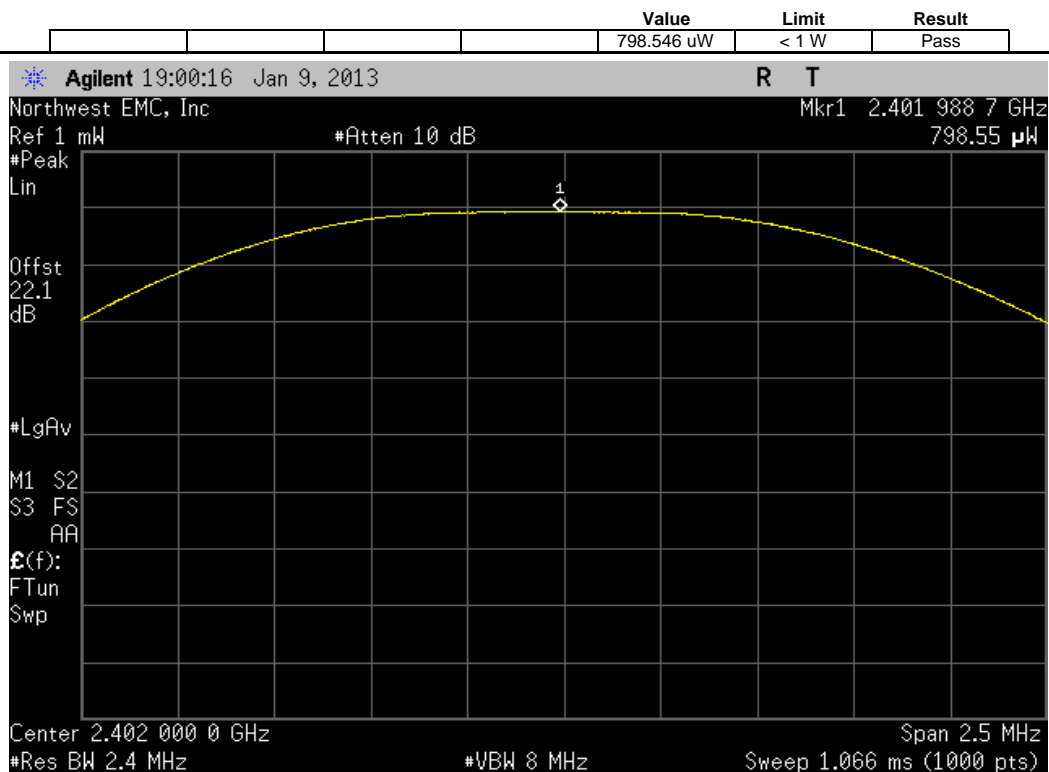


## Output Power

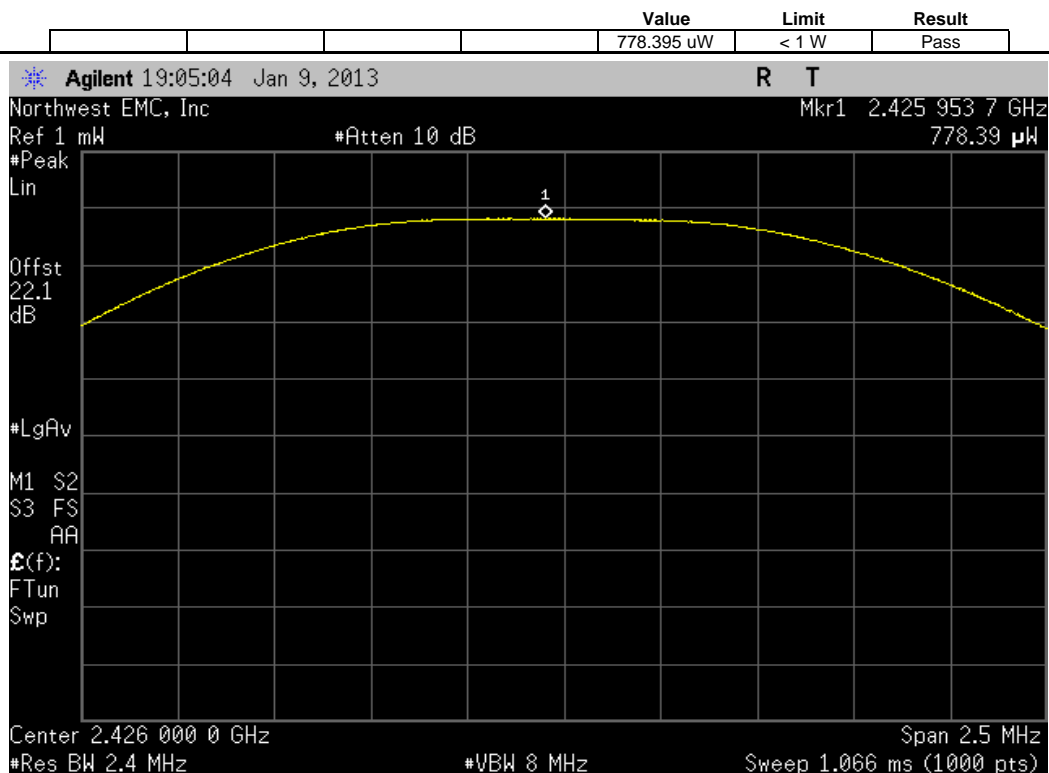
XMit 2012.07.31  
PsaTx 2012.11.16

EUT: iBox BT LE		Work Order: SUPR0100	
Serial Number: 50		Date: 01/10/13	
Customer: Supra, A Division of UTCFS		Temperature: 22.6°C	
Attendees: None		Humidity: 31%	
Project: None		Barometric Pres.: 1019	
Tested by: Brandon Hobbs and Rod Peloquin		Power: EUT Battery	
		Job Site: EV06	
TEST SPECIFICATIONS			
FCC 15.247:2013		Test Method	
		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Brandon Hobbs</i>	
		Value	Limit
			Result
BLE - Advertising			
Low Channel, 2402 MHz		798.546 uW	< 1 W
Mid Channel, 2426 MHz		778.395 uW	< 1 W
High Channel, 2480 MHz		782.528 uW	< 1 W
BLE - Data			
Low Channel, 2404 MHz		802.602 uW	< 1 W
Mid Channel, 2442 MHz		760.151 uW	< 1 W
High Channel, 2478 MHz		788.315 uW	< 1 W

BLE - Advertising, Low Channel, 2402 MHz



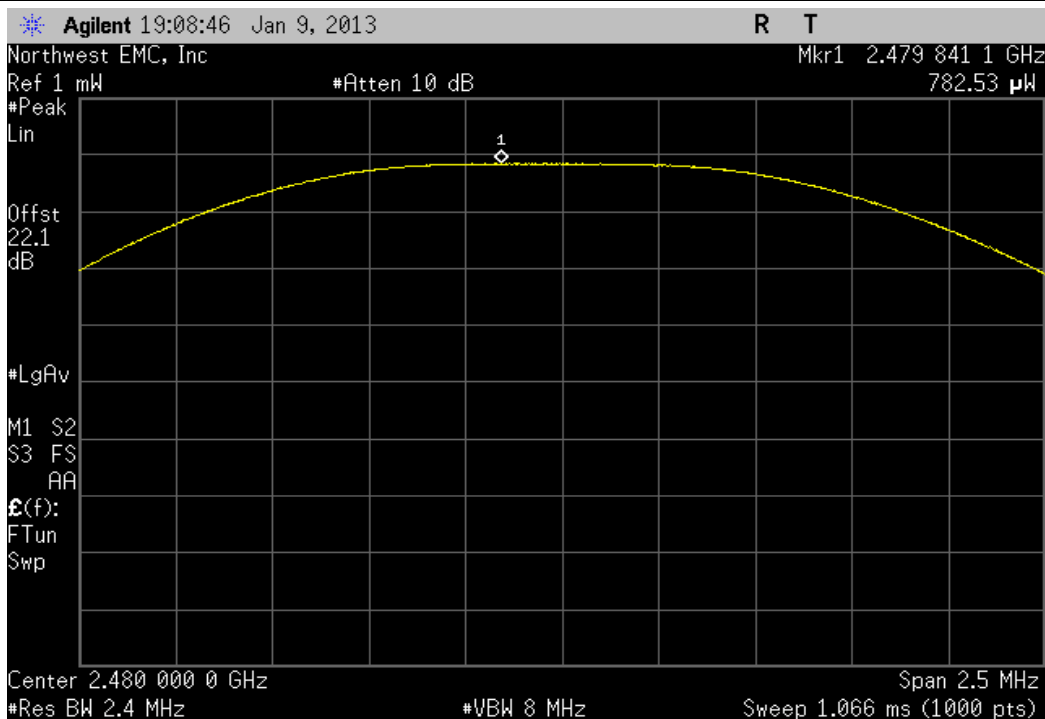
BLE - Advertising, Mid Channel, 2426 MHz





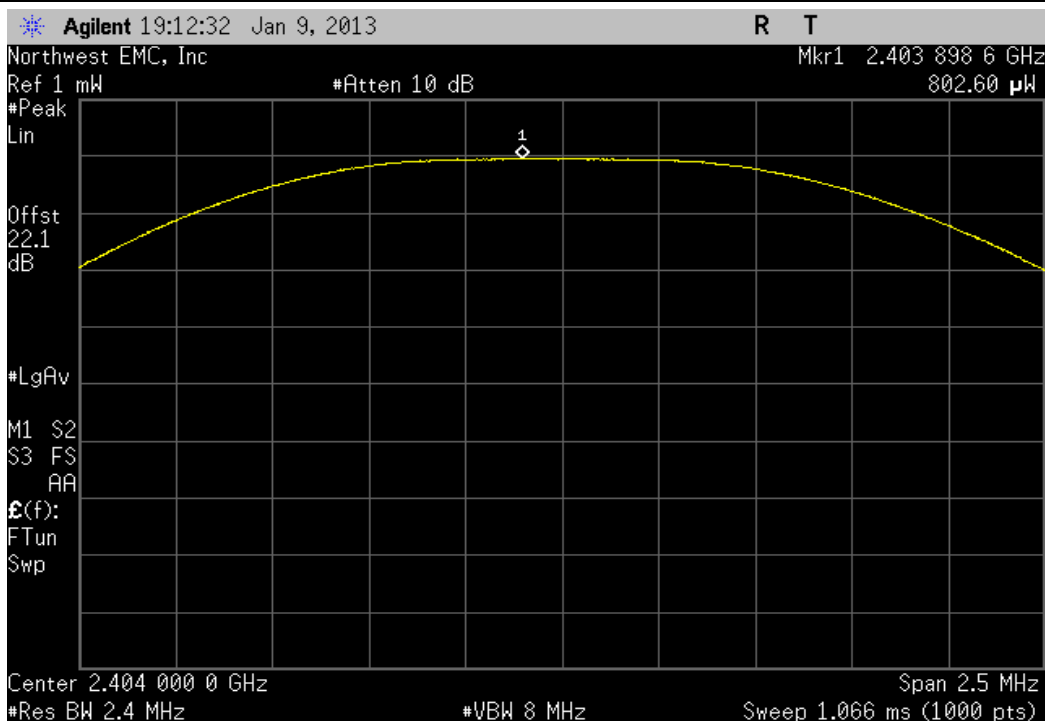
BLE - Advertising, High Channel, 2480 MHz

	Value	Limit	Result
	782.528 uW	< 1 W	Pass

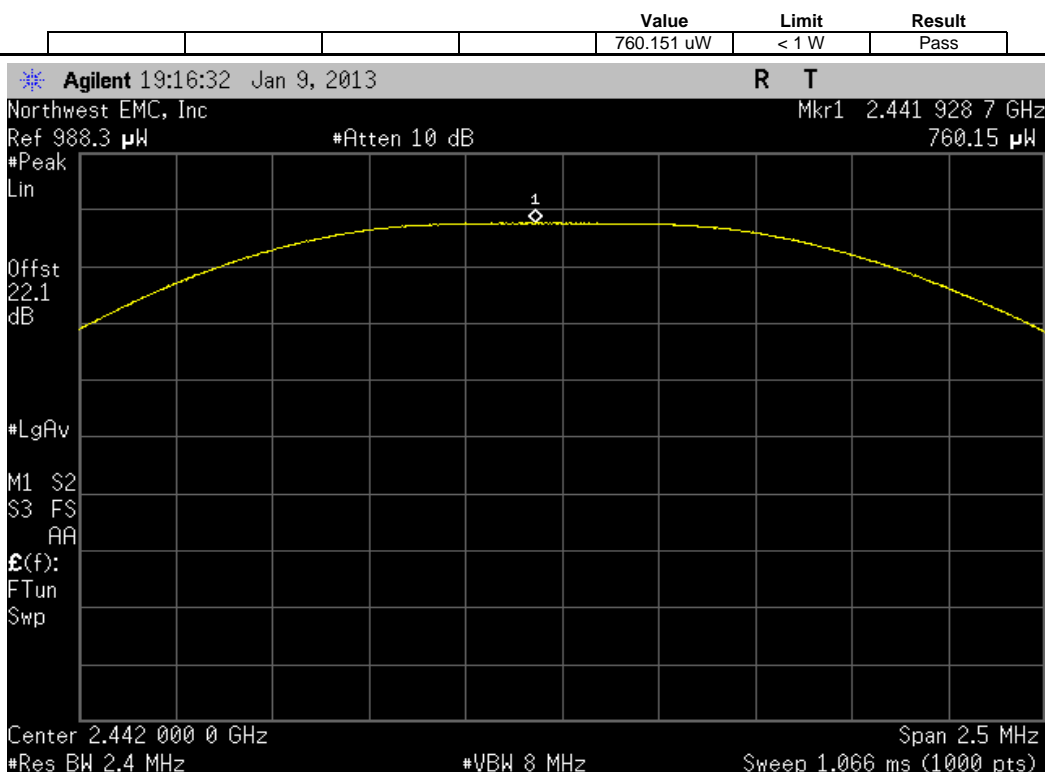


BLE - Data, Low Channel, 2404 MHz

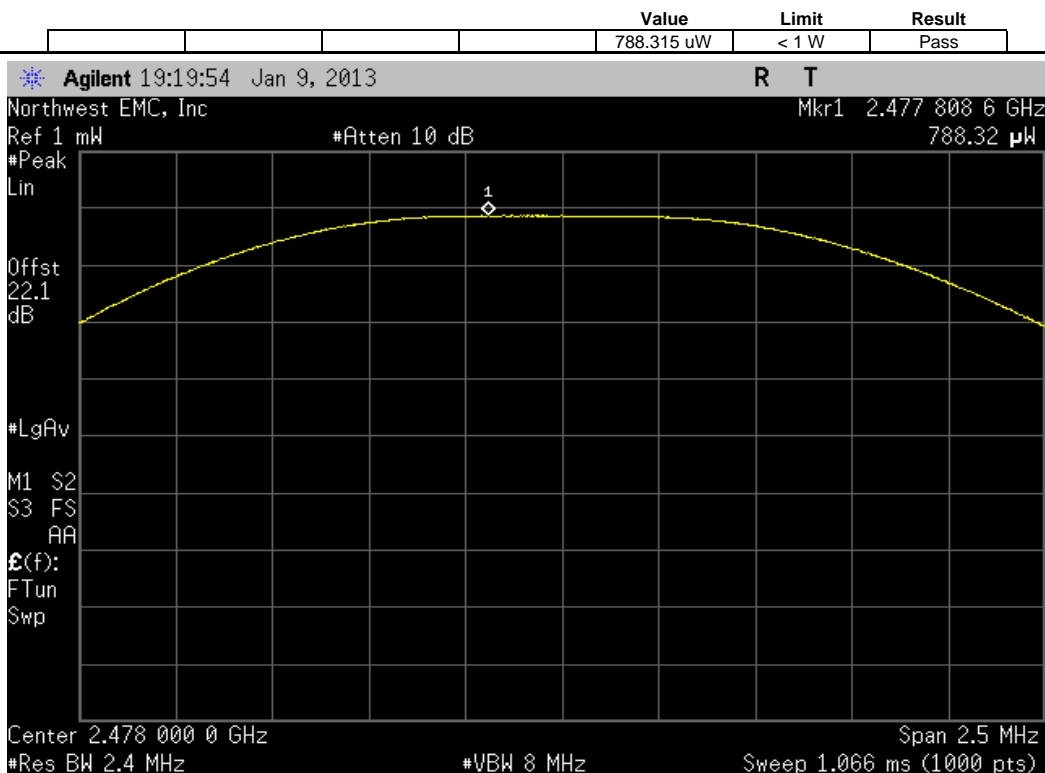
	Value	Limit	Result
	802.602 uW	< 1 W	Pass



BLE - Data, Mid Channel, 2442 MHz



BLE - Data, High Channel, 2478 MHz



## Band Edge Compliance

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

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

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

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

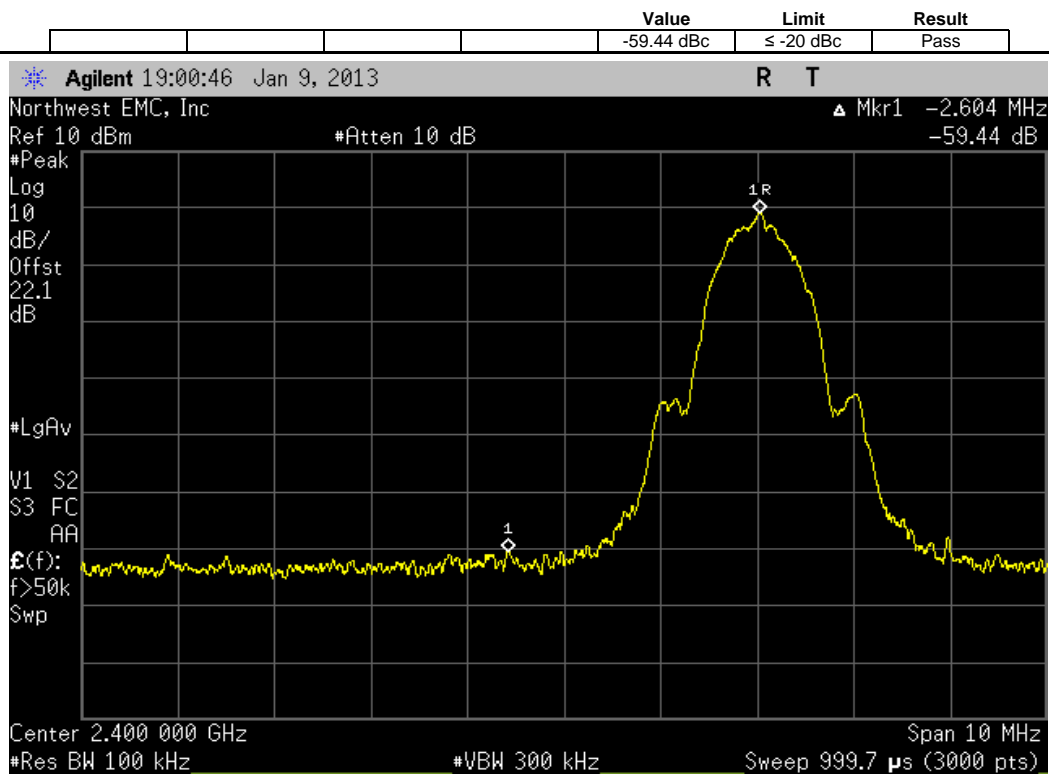


## Band Edge Compliance

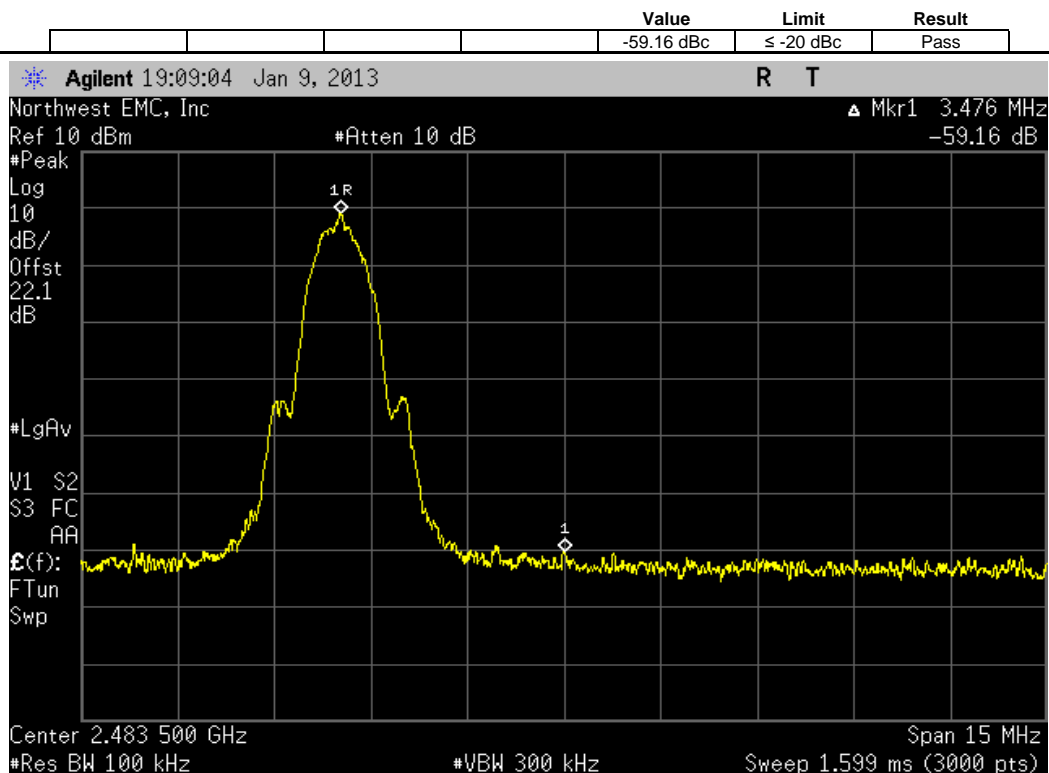
XMit 2012.09.20  
PsaTx 2012.11.16

EUT: iBox BT LE		Work Order: SUPR0100	
Serial Number: 50		Date: 01/10/13	
Customer: Supra, A Division of UTCFS		Temperature: 22.6°C	
Attendees: None		Humidity: 31%	
Project: None		Barometric Pres.: 1019	
Tested by: Brandon Hobbs and Rod Peloquin		Power: EUT Battery	
Job Site: EV06		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Brandon Hobbs</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		-59.44 dBc	≤ -20 dBc
High Channel, 2480 MHz		-59.16 dBc	≤ -20 dBc
BLE - Data			
Low Channel, 2404 MHz		-60.24 dBc	≤ -20 dBc
High Channel, 2478 MHz		-58.19 dBc	≤ -20 dBc

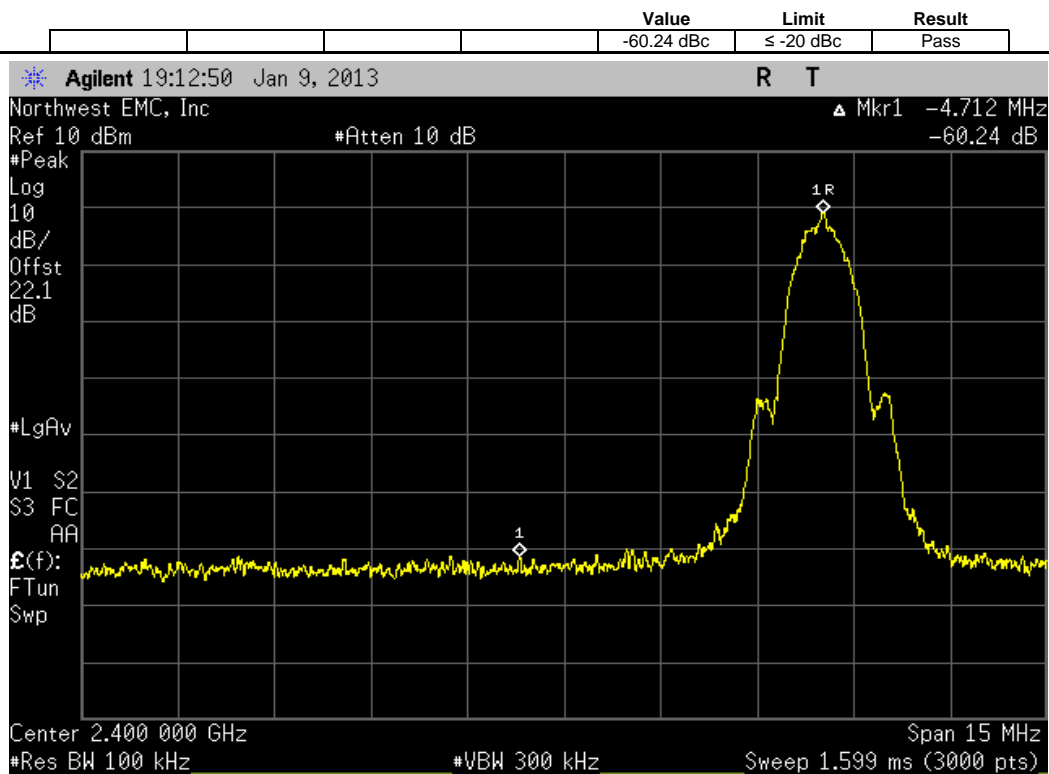
BLE - Advertising, Low Channel, 2402 MHz



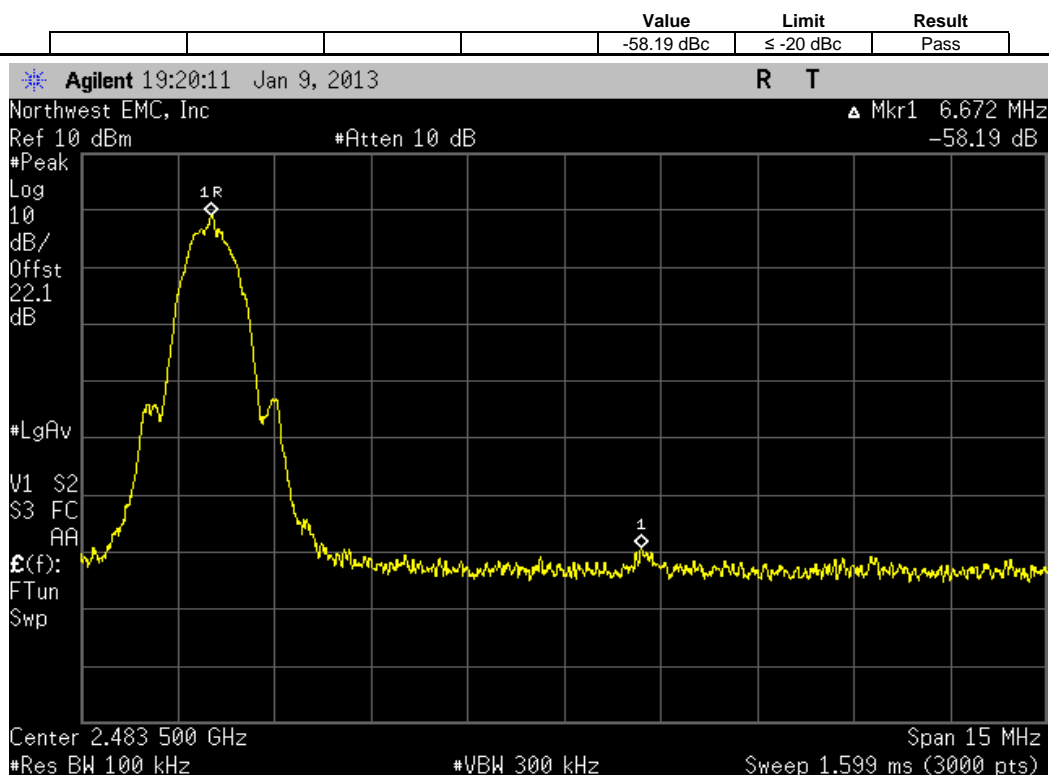
BLE - Advertising, High Channel, 2480 MHz



BLE - Data, Low Channel, 2404 MHz



BLE - Data, High Channel, 2478 MHz





## Spurious Conducted Emissions

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

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

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

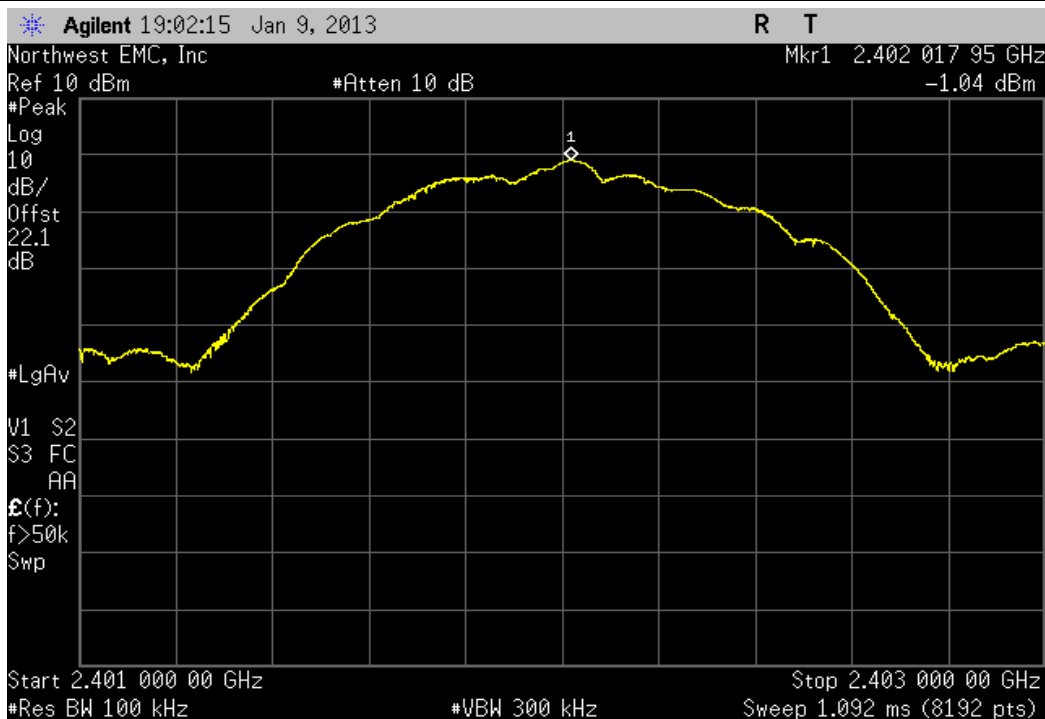


## Spurious Conducted Emissions

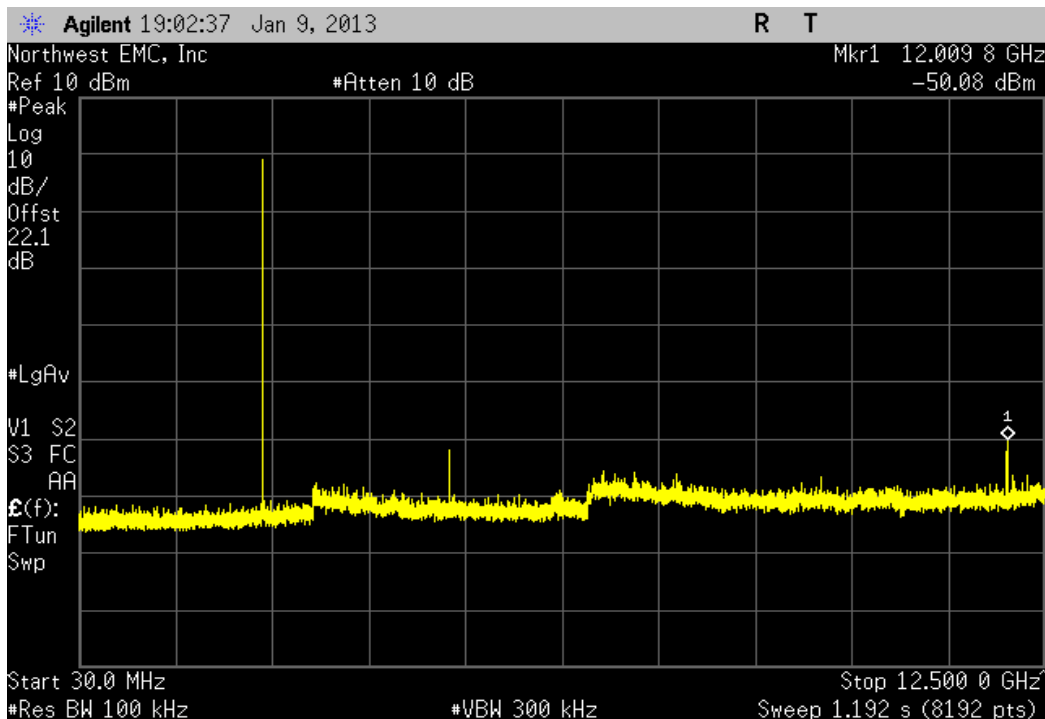
XMit 2012.09.20  
PsaTx 2012.11.16

EUT: iBox BT LE		Work Order: SUPR0100	
Serial Number: 50		Date: 01/10/13	
Customer: Supra, A Division of UTCFS		Temperature: 22.6°C	
Attendees: None		Humidity: 31%	
Project: None		Barometric Pres.: 1019	
Tested by: Brandon Hobbs and Rod Peloquin		Power: EUT Battery	
		Job Site: EV06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Brandon Hobbs</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	-49.04 dBc ≤ -20 dBc Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-51.8 dBc ≤ -20 dBc Pass
	Mid Channel, 2426 MHz	Fundamental	N/A N/A N/A
	Mid Channel, 2426 MHz	30 MHz - 12.5 GHz	-52.66 dBc ≤ -20 dBc Pass
	Mid Channel, 2426 MHz	12.5 GHz - 25 GHz	-52.18 dBc ≤ -20 dBc Pass
	High Channel, 2480 MHz	Fundamental	N/A N/A N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	-54.24 dBc ≤ -20 dBc Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	-51.09 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	-51.5 dBc ≤ -20 dBc Pass
	Low Channel, 2404 MHz	12.5 GHz - 25 GHz	-51.21 dBc ≤ -20 dBc Pass
	Mid Channel, 2442 MHz	Fundamental	N/A N/A N/A
	Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-51.96 dBc ≤ -20 dBc Pass
	Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-46.42 dBc ≤ -20 dBc Pass
	High Channel, 2478 MHz	Fundamental	N/A N/A N/A
	High Channel, 2478 MHz	30 MHz - 12.5 GHz	-54.76 dBc ≤ -20 dBc Pass
	High Channel, 2478 MHz	12.5 GHz - 25 GHz	-47.58 dBc ≤ -20 dBc Pass

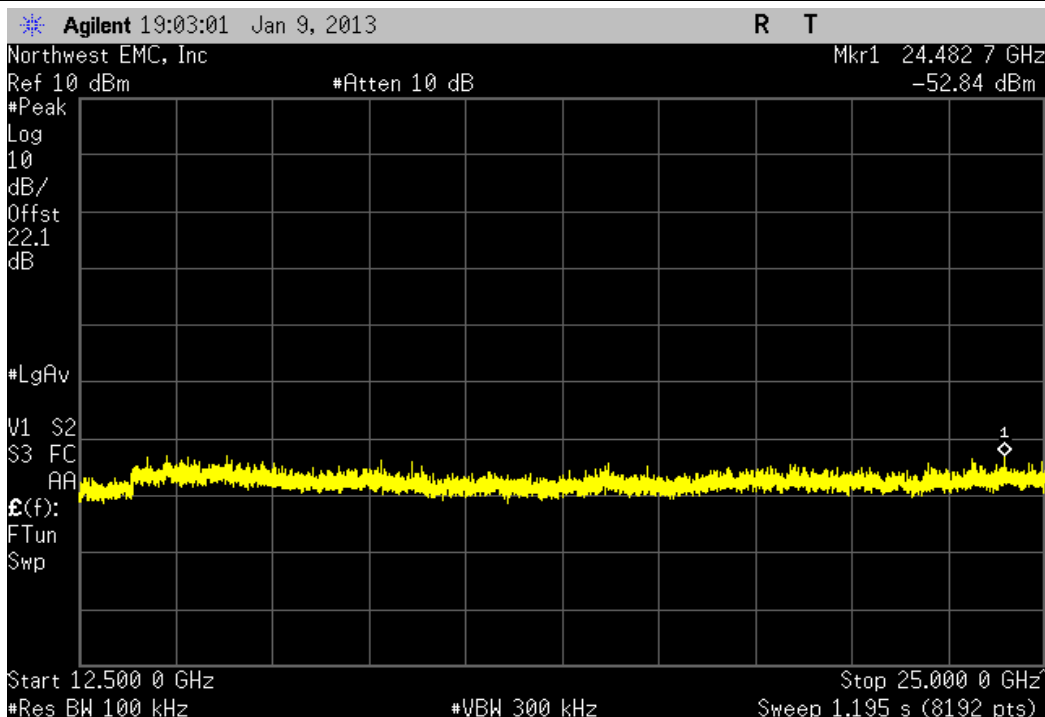
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



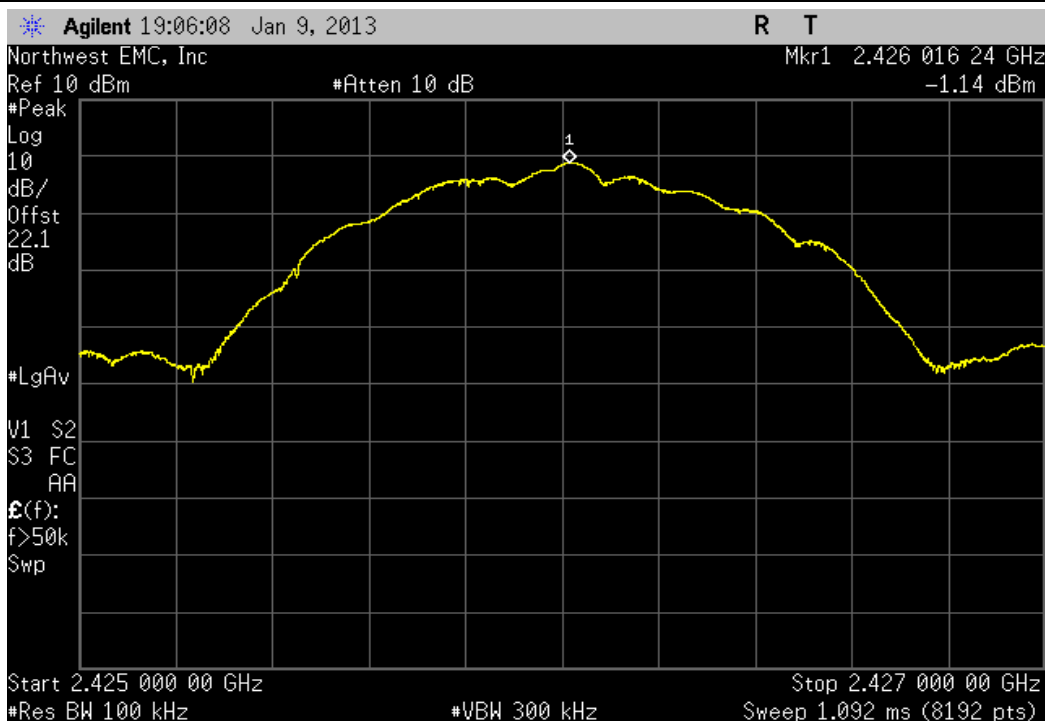
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-49.04 dBc	≤ -20 dBc	Pass	



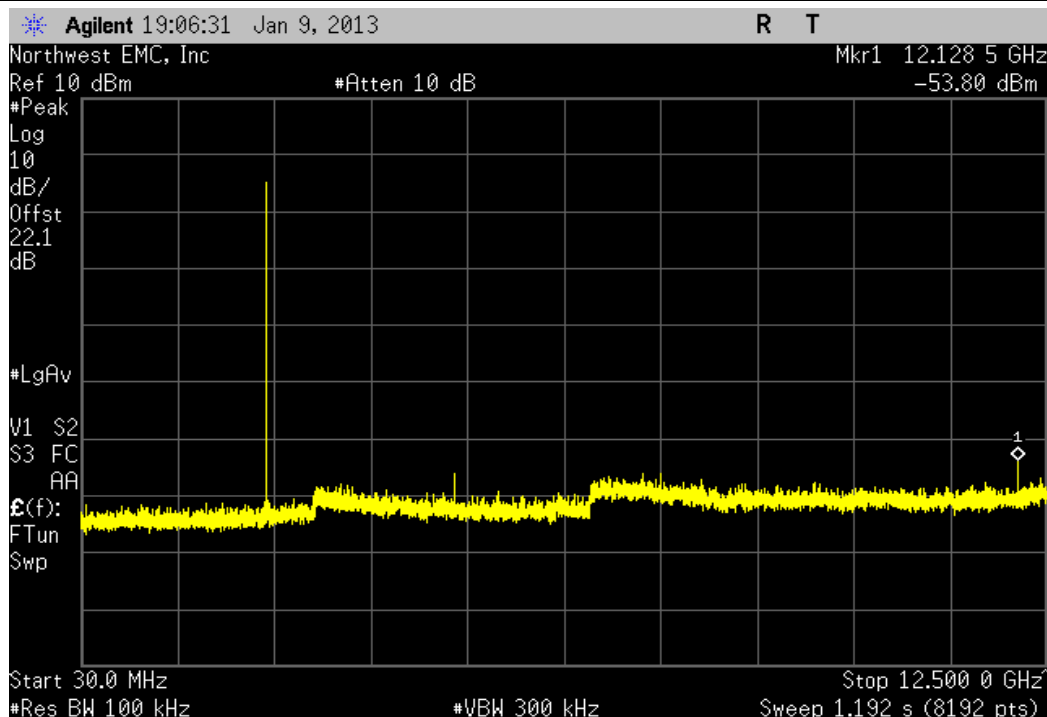
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-51.8 dBc	≤ -20 dBc	Pass	



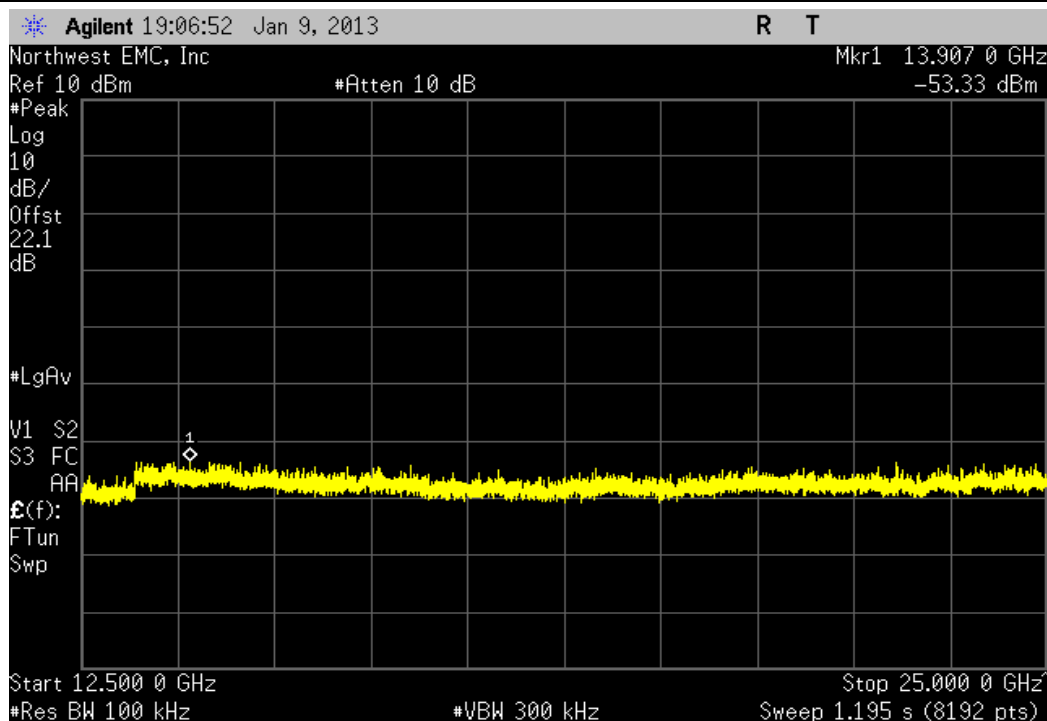
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



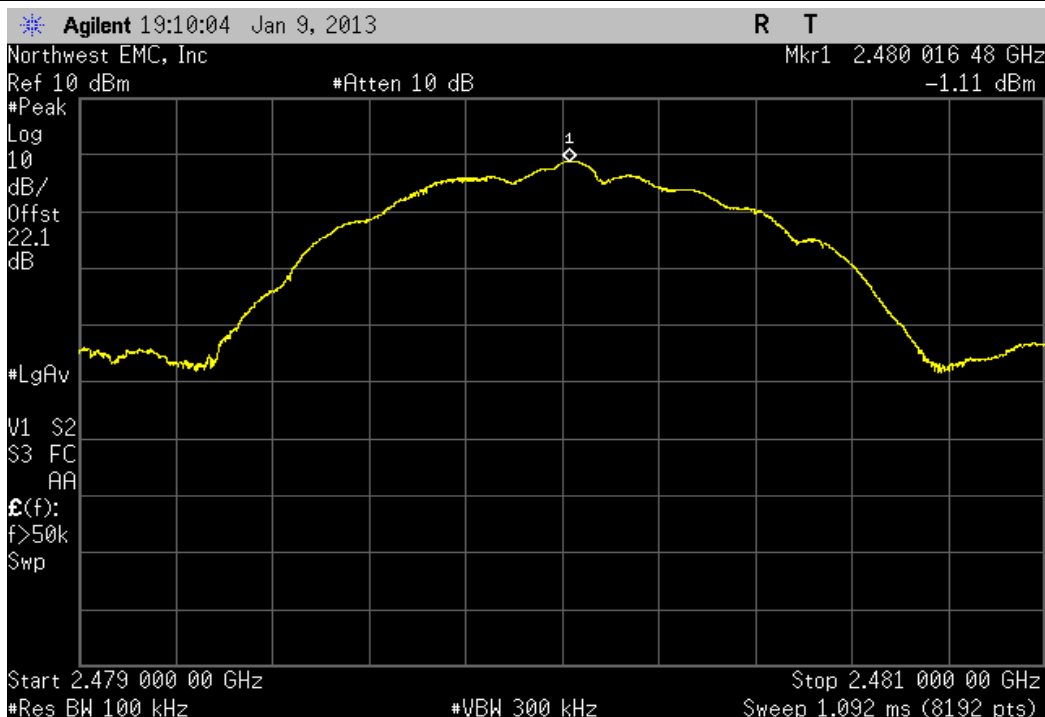
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-52.66 dBc	≤ -20 dBc	Pass	



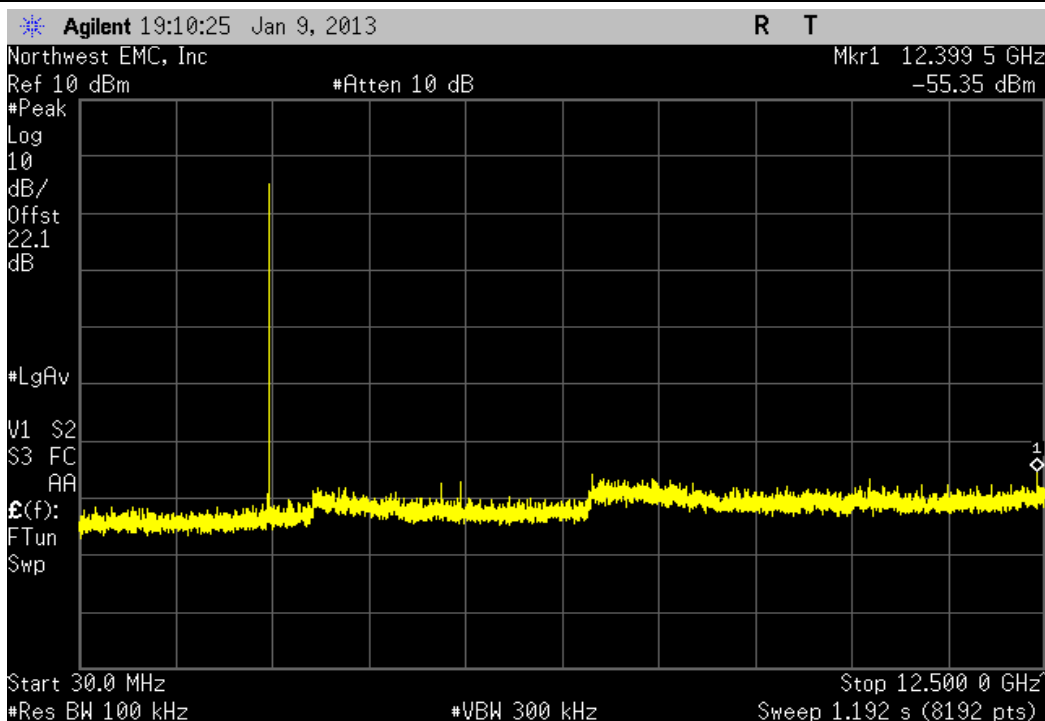
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-52.18 dBc	≤ -20 dBc	Pass	



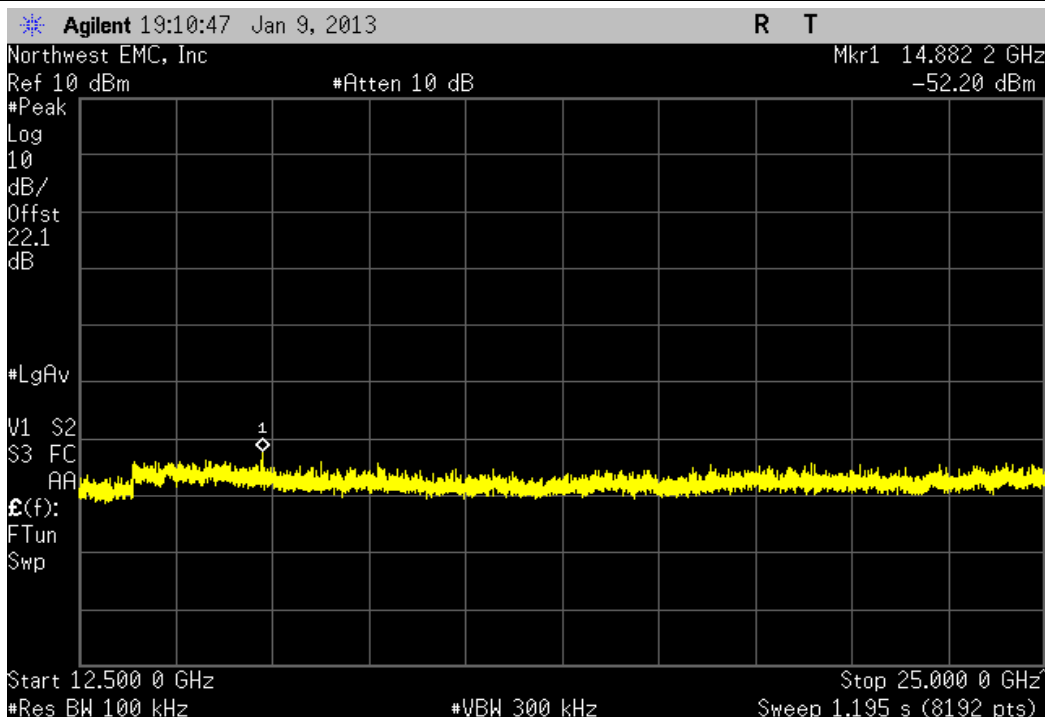
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



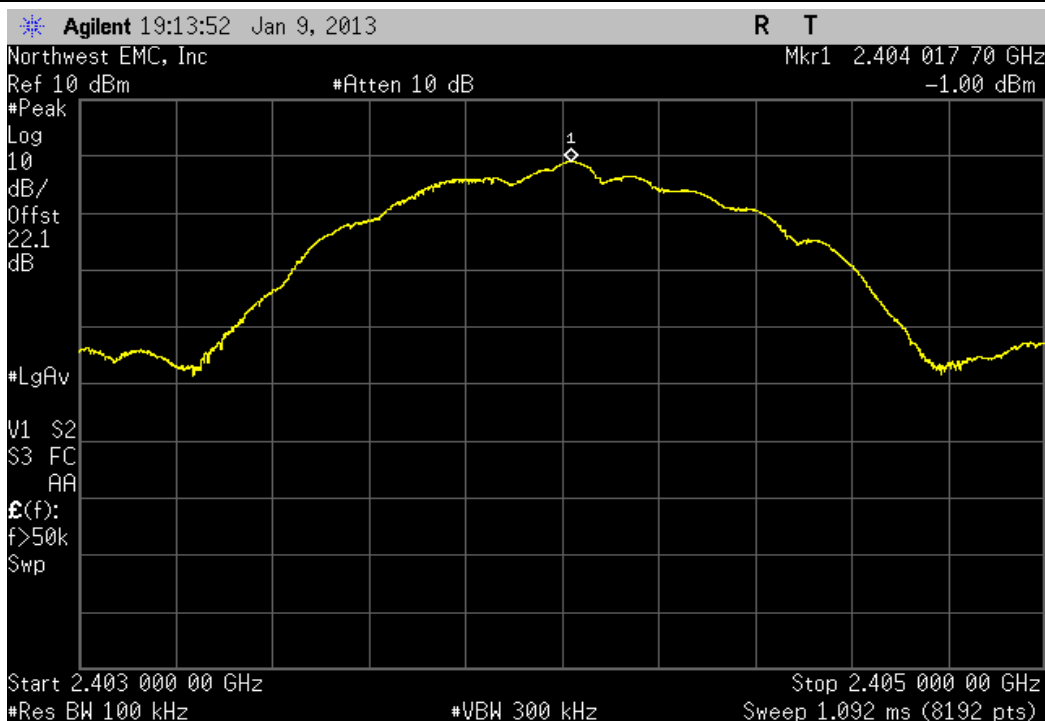
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-54.24 dBc	≤ -20 dBc	Pass	



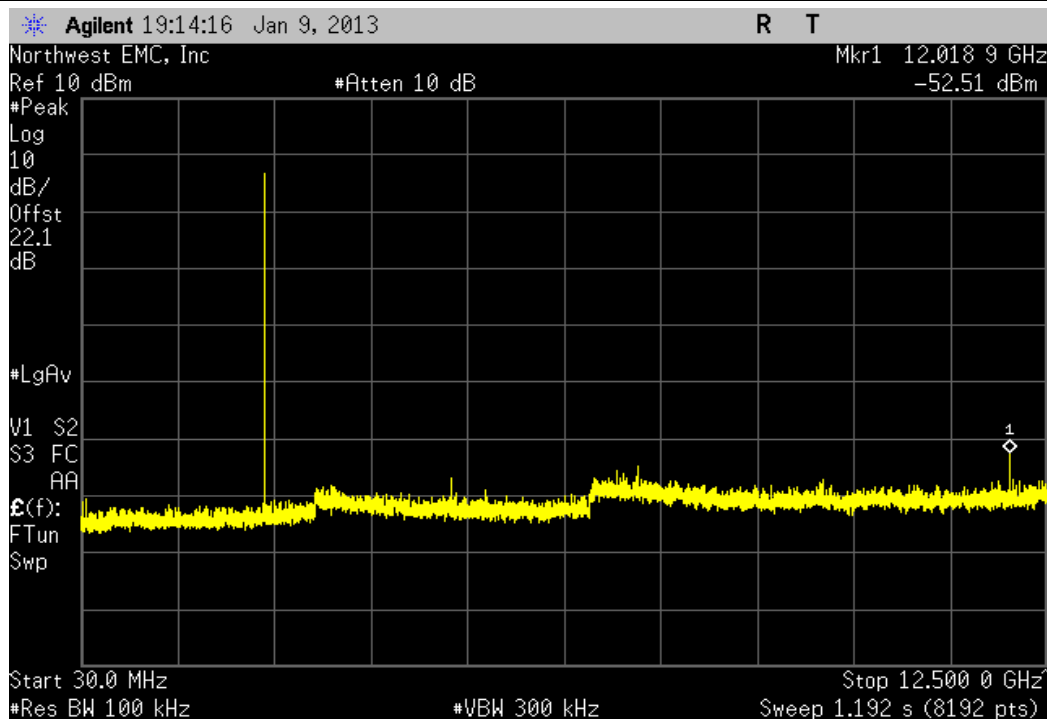
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-51.09 dBc	≤ -20 dBc	Pass	



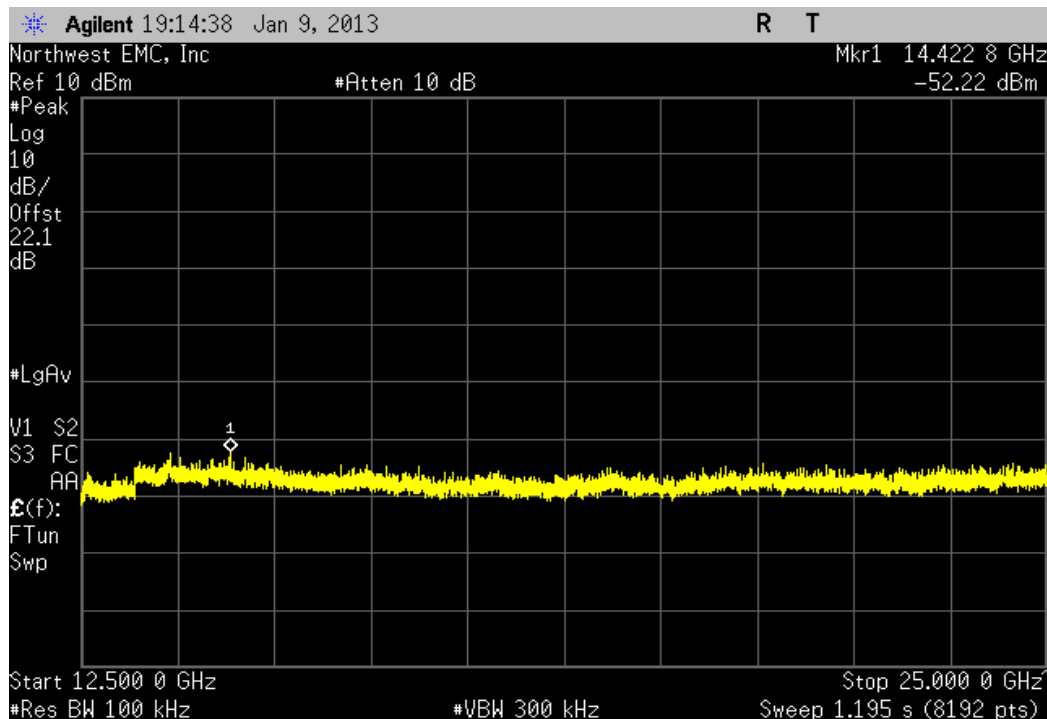
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.5 dBc	≤ -20 dBc	Pass	

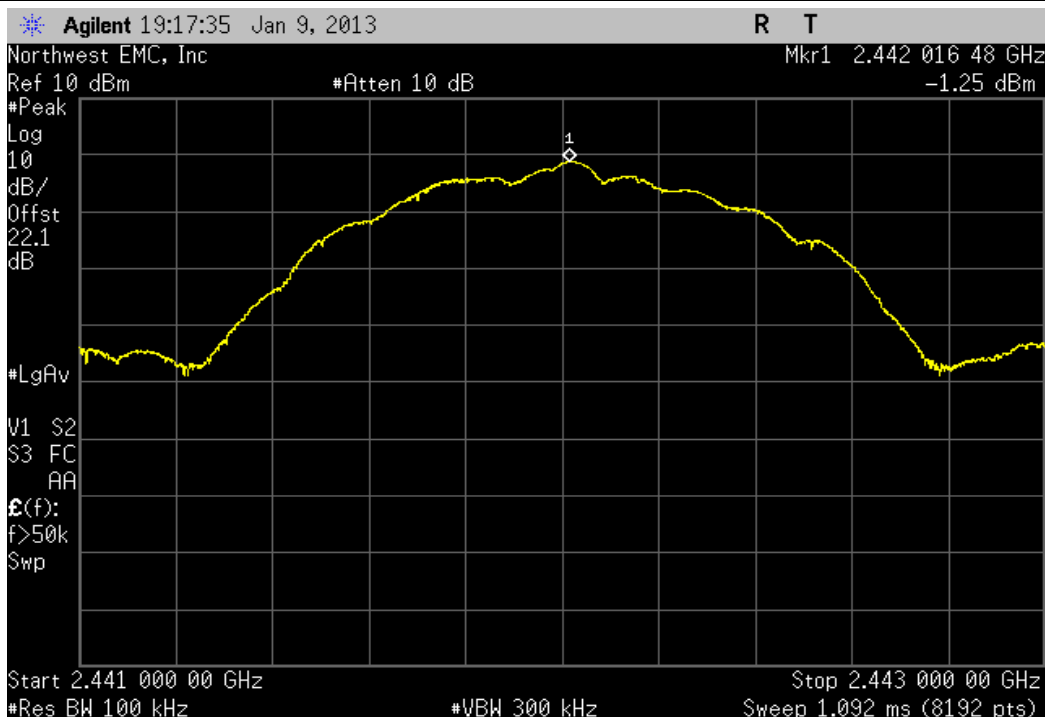


BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-51.21 dBc	≤ -20 dBc	Pass	

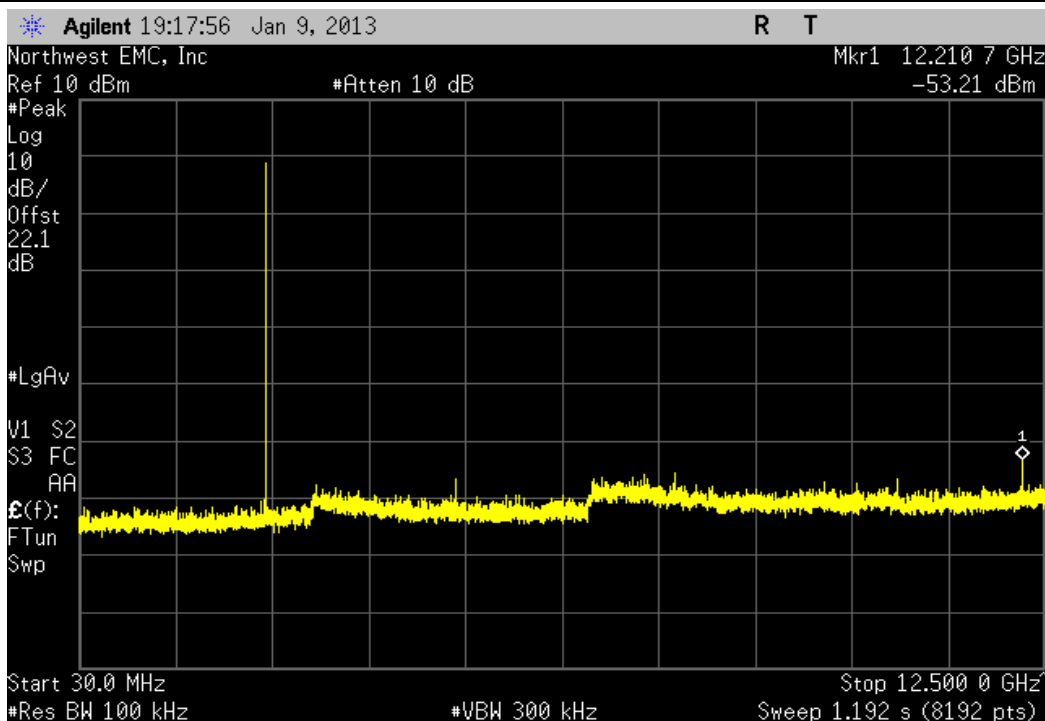




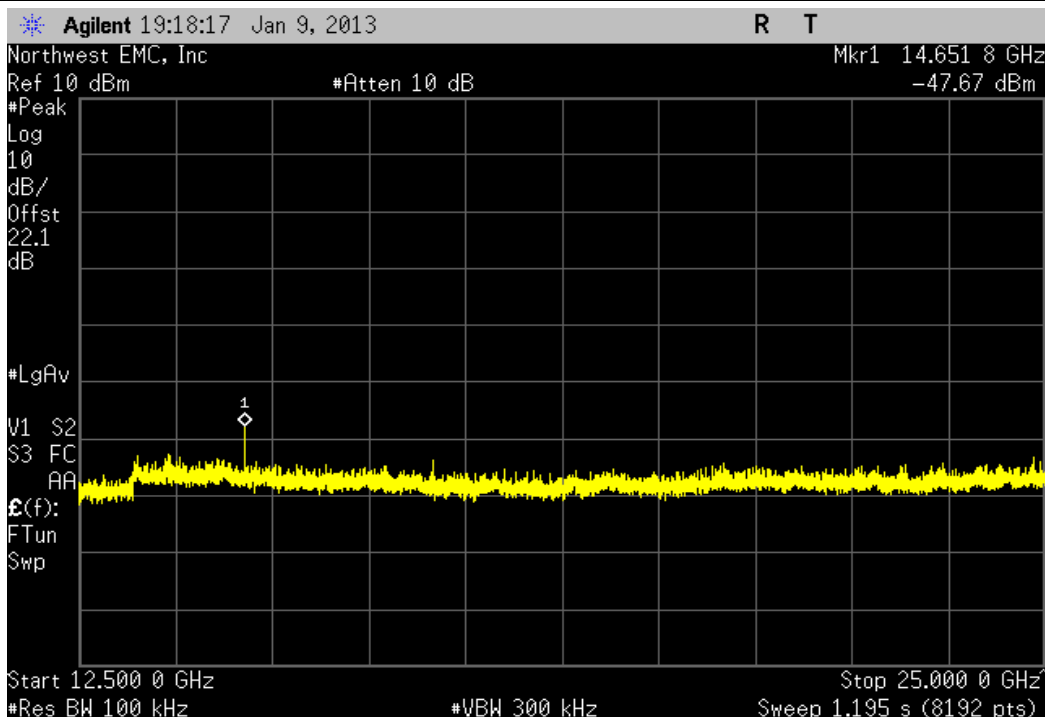
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



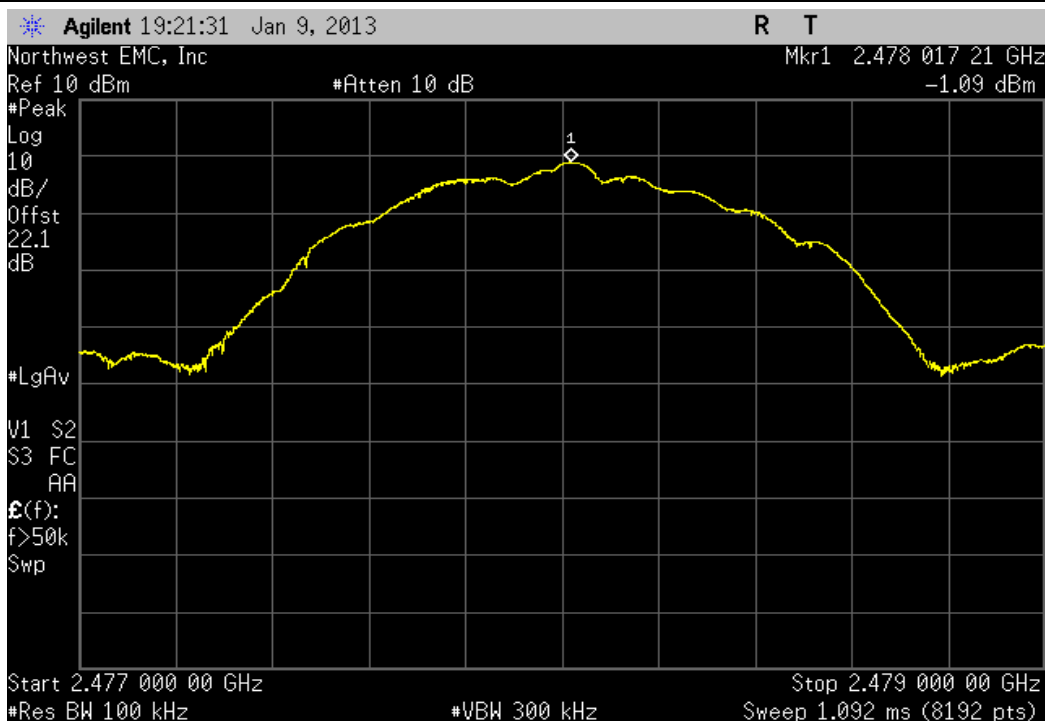
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.96 dBc	≤ -20 dBc	Pass	



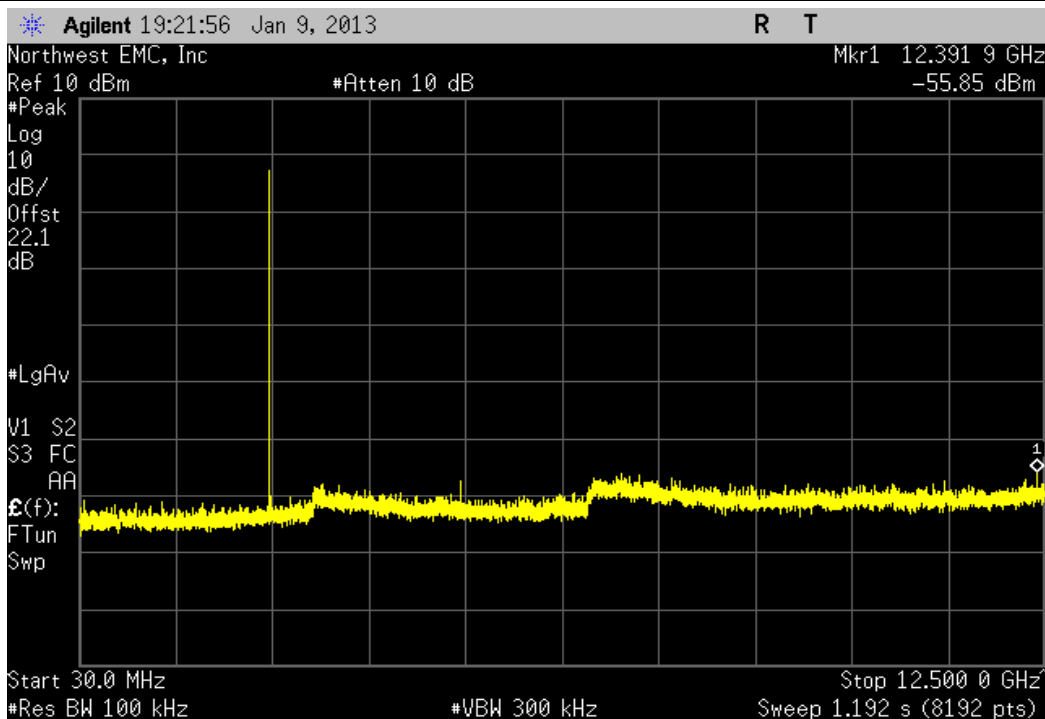
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-46.42 dBc	≤ -20 dBc	Pass	



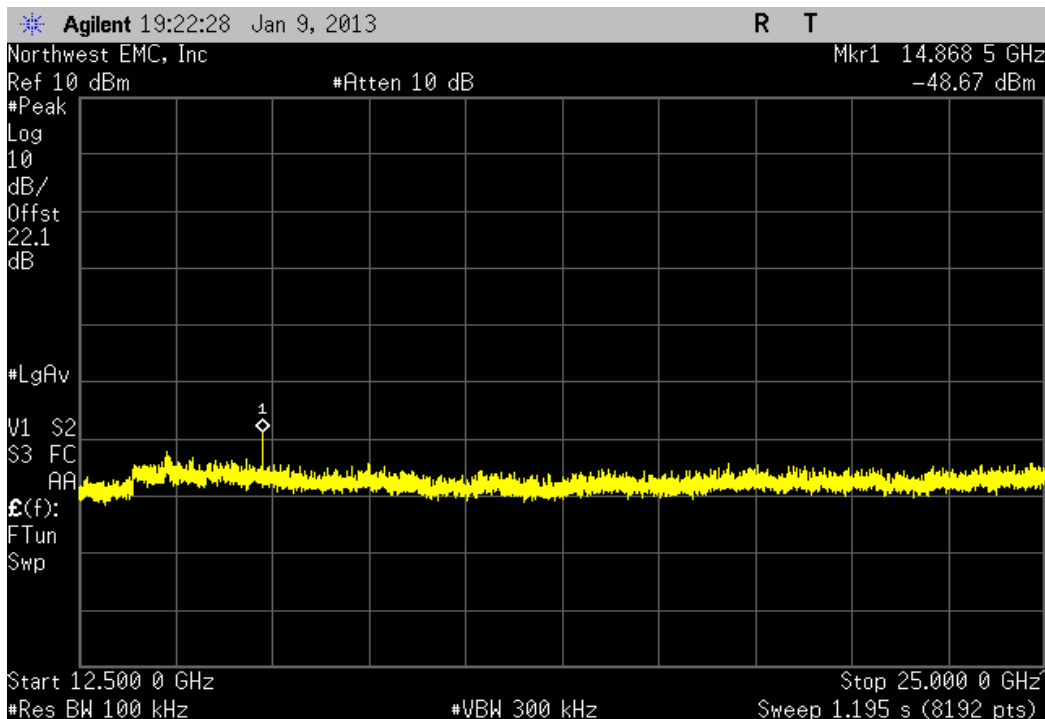
BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-54.76 dBc	≤ -20 dBc	Pass	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-47.58 dBc	≤ -20 dBc	Pass	



## Power Spectral Density

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

### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/26/2012	12
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

### TEST DESCRIPTION

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

Per the procedure outlined in FCC KDB 558074 D01 DTS 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:

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

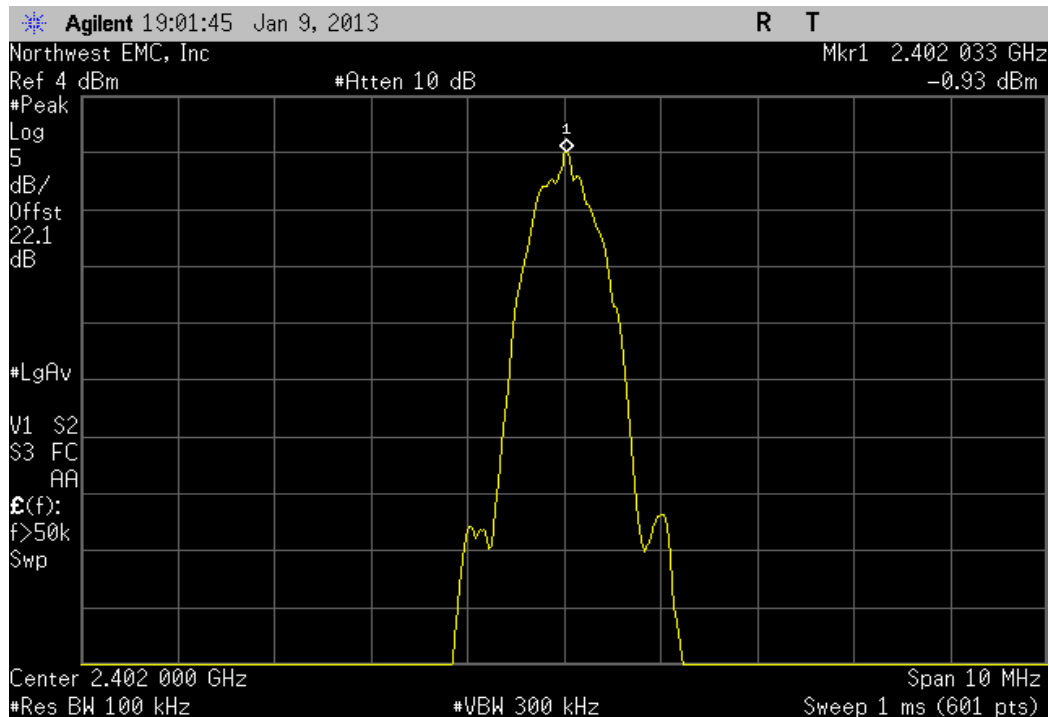


## Power Spectral Density

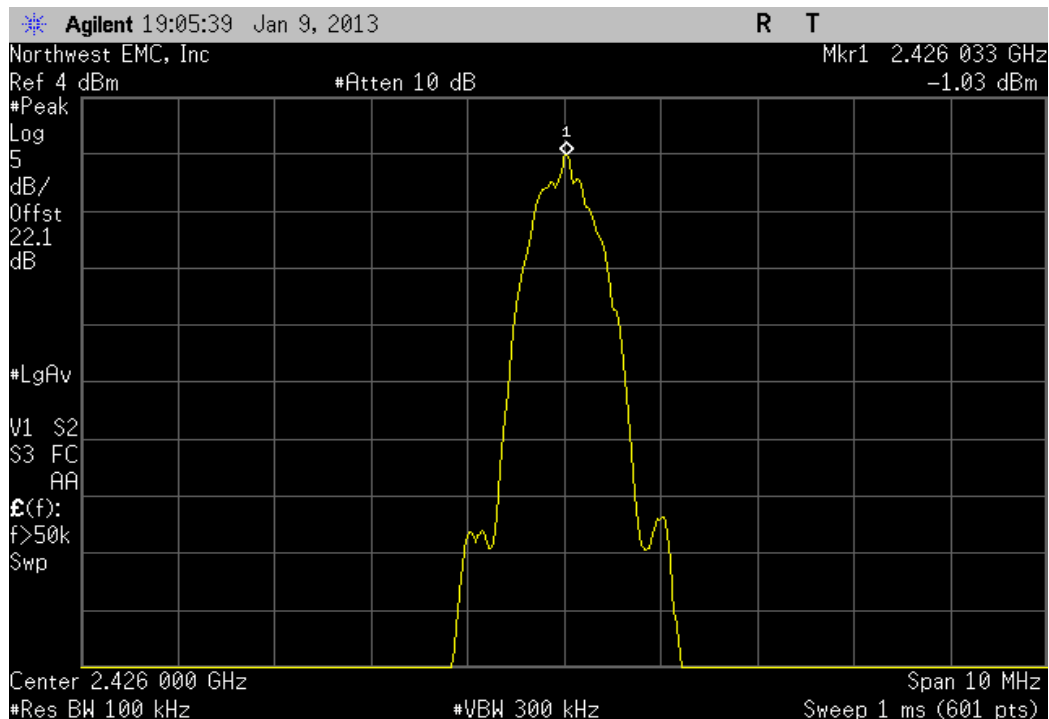
XMit 2012.09.20  
PsaTx 2012.11.16

EUT: iBox BT LE		Work Order: SUPR0100				
Serial Number: 50		Date: 01/10/13				
Customer: Supra, A Division of UTCFS		Temperature: 22.6°C				
Attendees: None		Humidity: 31%				
Project: None		Barometric Pres.: 1019				
Tested by: Brandon Hobbs and Rod Peloquin		Power: EUT Battery				
Job Site: EV06		Test Method				
FCC 15.247:2013		ANSI C63.10:2009				
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	2	Signature <i>Brandon Hobbs</i>				
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
BLE - Advertising						
Low Channel, 2402 MHz		-0.927	-15.2	-16.127	8	Pass
Mid Channel, 2426 MHz		-1.026	-15.2	-16.226	8	Pass
High Channel, 2480 MHz		-1.008	-15.2	-16.208	8	Pass
BLE - Data						
Low Channel, 2404 MHz		-0.912	-15.2	-16.112	8	Pass
Mid Channel, 2442 MHz		-1.149	-15.2	-16.349	8	Pass
High Channel, 2478 MHz		-0.975	-15.2	-16.175	8	Pass

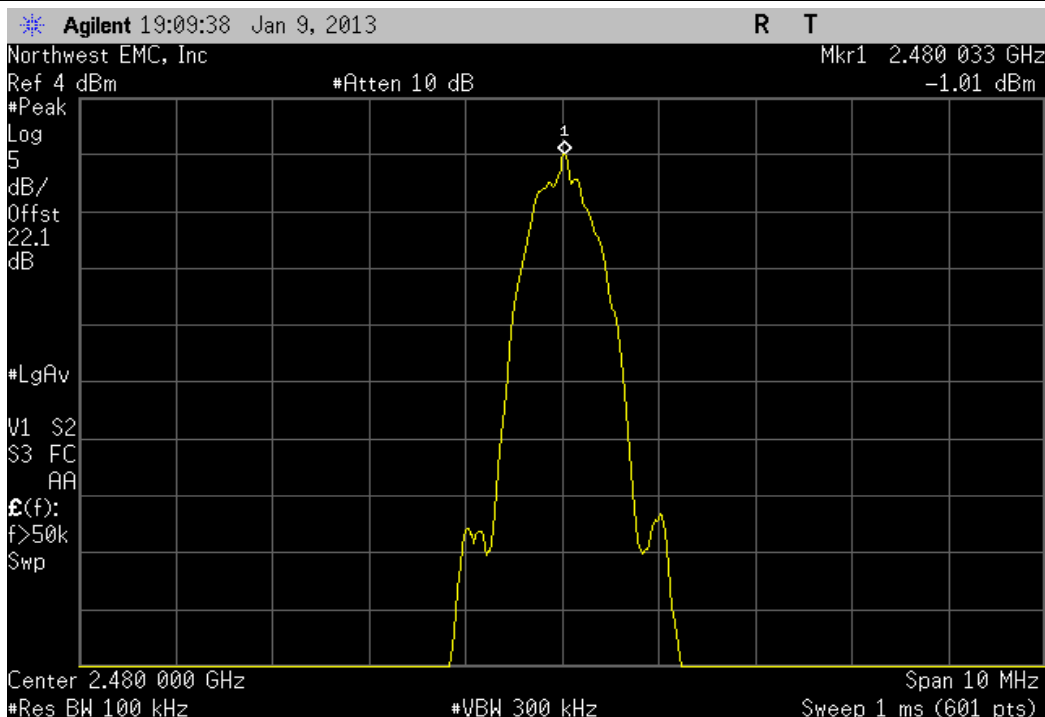
BLE - Advertising, Low Channel, 2402 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-0.927	-15.2	-16.127	8	Pass



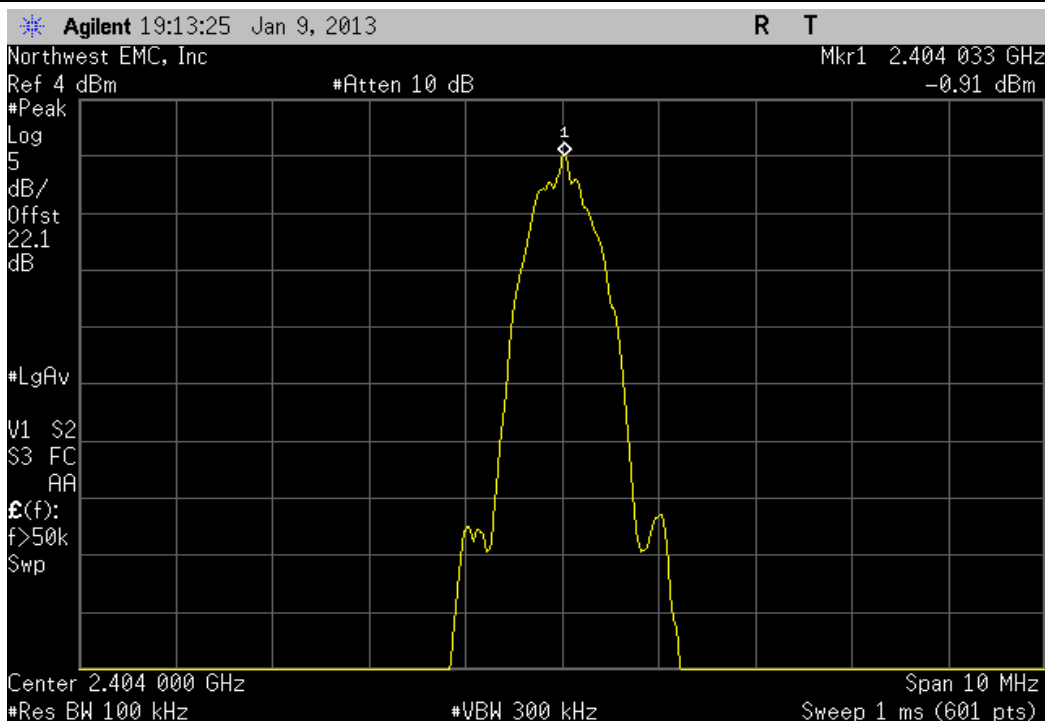
BLE - Advertising, Mid Channel, 2426 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-1.026	-15.2	-16.226	8	Pass



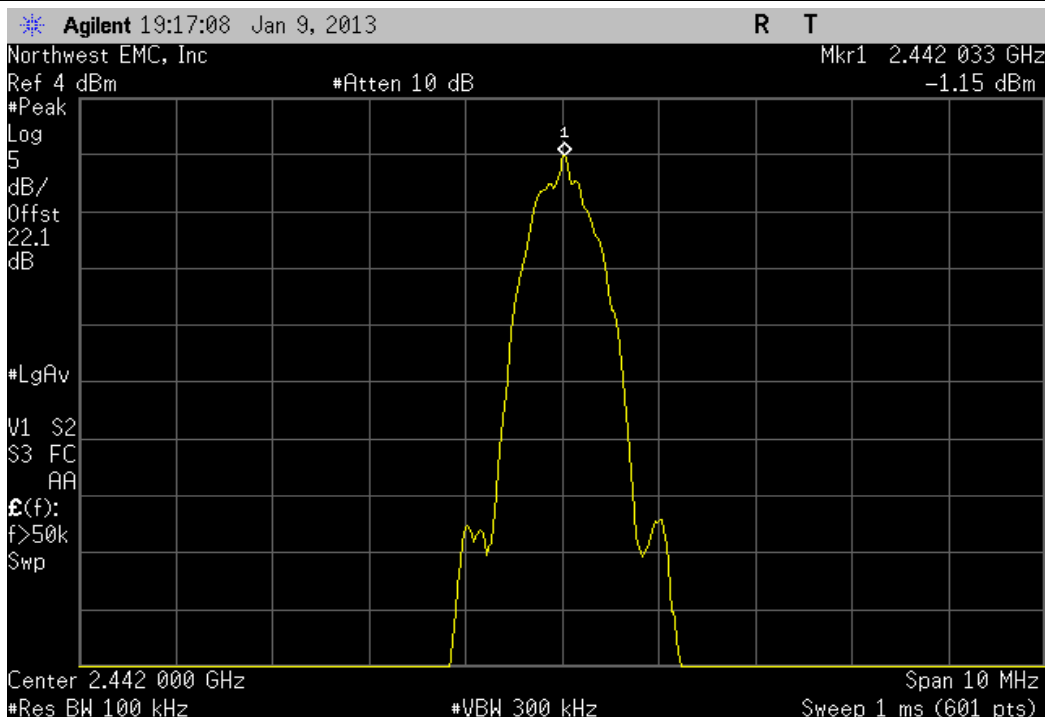
BLE - Advertising, High Channel, 2480 MHz					
Value	dBm/100kHz	Value	Limit	Result	
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-1.008	-15.2	-16.208	8	Pass



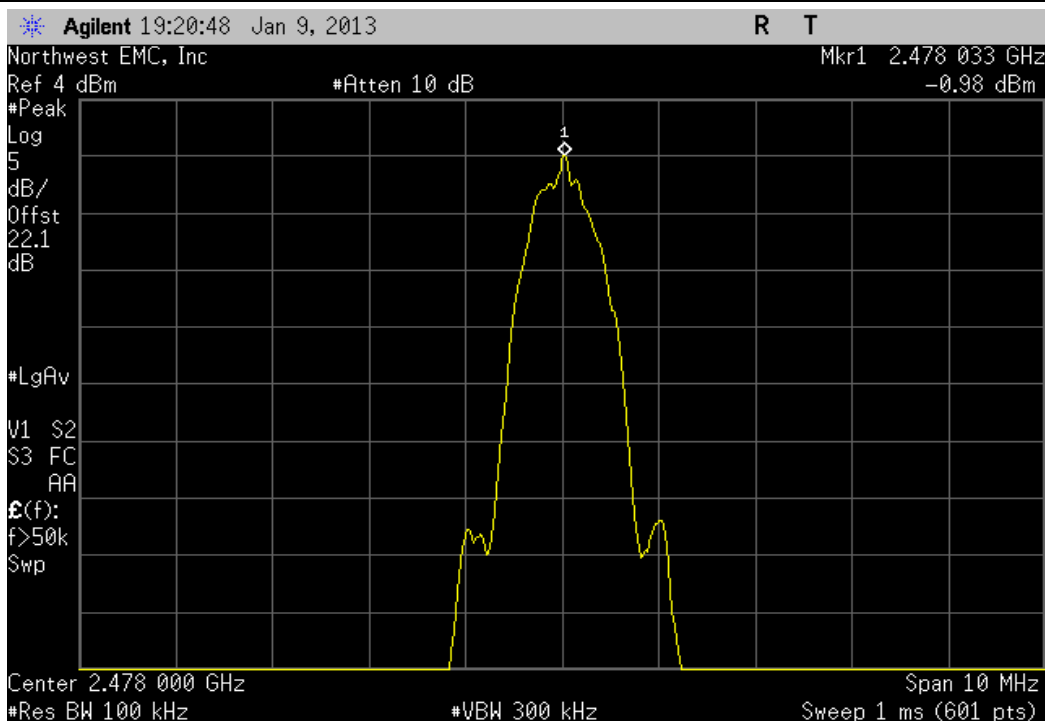
BLE - Data, Low Channel, 2404 MHz					
Value	dBm/100kHz	Value	Limit	Result	
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	-0.912	-15.2	-16.112	8	Pass



BLE - Data, Mid Channel, 2442 MHz						
	Value	dBm/100kHz	Value	Limit	Result	
		To dBm/3kHz				
	-1.149	-15.2	-16.349	8	Pass	



BLE - Data, High Channel, 2478 MHz						
	Value	dBm/100kHz	Value	Limit	Result	
		To dBm/3kHz				
	-0.975	-15.2	-16.175	8	Pass	





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

## MODES OF OPERATION

Continuous transmit, Bluetooth Low Energy (BLE)

## POWER SETTINGS INVESTIGATED

EUT Battery

## CONFIGURATIONS INVESTIGATED

SUPR0100 - 2

## FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz
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## SAMPLE CALCULATIONS

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

## TEST EQUIPMENT

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


## 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.



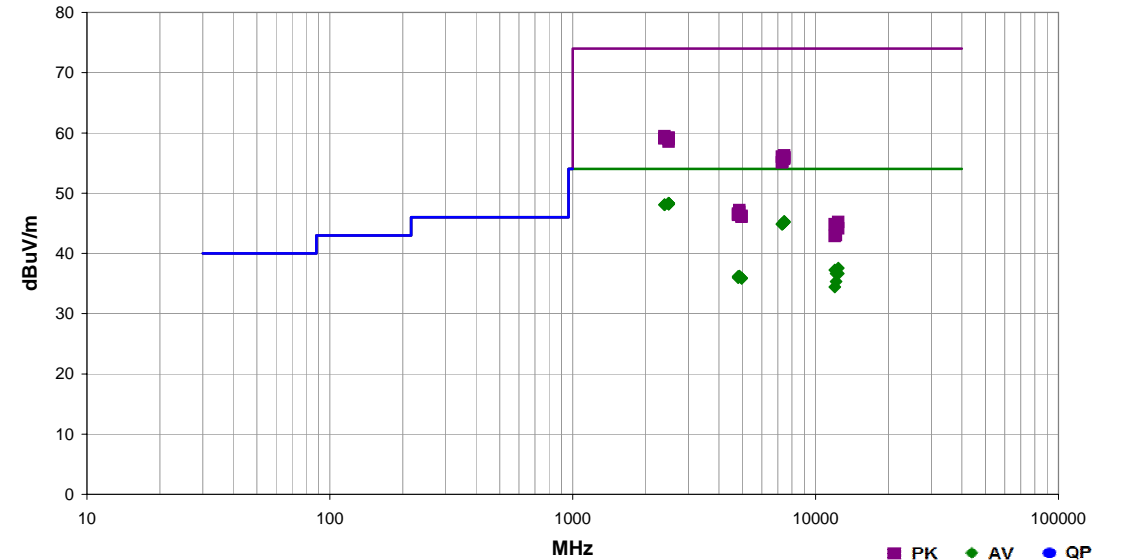
# SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2012.12.14  
PSA-ESCI Version 2011.12.21

Work Order:	SUPR0100	Date:	01/30/13	
Project:	None	Temperature:	21.9 °C	
Job Site:	EV01	Humidity:	36% RH	
Serial Number:	45	Barometric Pres.:	1031 mbar	
EUT:	iBox BT LE			
Configuration:	2			
Customer:	Supra, A Division of UTCFS			
Attendees:	None			
EUT Power:	EUT Battery			
Operating Mode:	Continuous transmit, Bluetooth Low Energy (BLE)			
Deviations:	None			
Comments:	See comments below for channel, frequency, BLE mode, and EUT orientation.			

Test Specifications	Test Method
FCC 15.247:2013	ANSI C63.10:2009

Run #	56	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.113	26.5	1.9	1.0	48.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch (2480MHz), Adv Mode, EUT Vertical
2485.497	26.4	1.9	1.0	333.0	3.0	20.0	Vert	AV	0.0	48.3	54.0	-5.7	High Ch (2480MHz), Adv Mode, EUT On Side
2485.263	26.4	1.9	1.7	174.0	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	High Ch (2480MHz), Adv Mode, EUT Horizontal
2484.450	26.4	1.9	1.0	171.0	3.0	20.0	Vert	AV	0.0	48.3	54.0	-5.7	High Ch (2480MHz), Adv Mode, EUT Horizontal
2485.363	26.3	1.9	1.0	81.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch (2480MHz), Adv Mode, EUT Vertical
2483.697	26.3	1.9	1.0	262.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch (2480MHz), Adv Mode, EUT On Side
2388.977	26.5	1.5	1.0	124.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	Low Ch (2402MHz), Adv Mode, EUT Vertical
2389.720	26.5	1.5	1.0	184.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	Low Ch (2402MHz), Adv Mode, EUT Horizontal
7432.033	25.9	19.4	1.0	334.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	High Ch (2478MHz), Data Mode, EUT Vertical
7432.767	25.8	19.4	1.0	222.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch (2478MHz), Data Mode, EUT Vertical
7438.427	25.7	19.5	1.0	180.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch (2480MHz), Adv Mode, EUT Vertical
7438.000	25.7	19.5	1.0	12.0	3.0	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch (2480MHz), Adv Mode, EUT Vertical
7326.127	25.9	19.0	1.0	261.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Mid Ch (2442MHz), Data Mode, EUT Vertical
7324.027	25.9	19.0	1.0	214.0	3.0	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Mid Ch (2442MHz), Data Mode, EUT Vertical
7277.693	26.1	18.8	1.0	173.0	3.0	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Mid Ch (2426MHz), Adv Mode, EUT Vertical
7276.260	26.1	18.8	1.0	255.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Mid Ch (2426MHz), Adv Mode, EUT Vertical
2388.330	37.9	1.6	1.0	124.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	Low Ch (2402MHz), Adv Mode, EUT Vertical
2484.657	37.3	1.9	1.0	262.0	3.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch (2480MHz), Adv Mode, EUT On Side
2484.293	37.3	1.9	1.0	81.0	3.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch (2480MHz), Adv Mode, EUT Vertical
2485.433	37.2	1.9	1.0	171.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch (2480MHz), Adv Mode, EUT Horizontal
2484.100	37.2	1.9	1.0	333.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch (2480MHz), Adv Mode, EUT On Side
2389.797	37.5	1.5	1.0	184.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch (2402MHz), Adv Mode, EUT Horizontal
2483.897	37.1	1.9	1.7	174.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch (2480MHz), Adv Mode, EUT Horizontal
2485.007	36.7	1.9	1.0	48.0	3.0	20.0	Vert	PK	0.0	58.6	74.0	-15.4	High Ch (2480MHz), Adv Mode, EUT Vertical
12398.840	40.4	-2.9	1.2	94.0	3.0	0.0	Horz	AV	0.0	37.5	54.0	-16.5	Low Ch (2402MHz), Adv Mode, EUT Vertical
12008.890	42.7	-5.5	1.1	318.0	3.0	0.0	Vert	AV	0.0	37.2	54.0	-16.8	Low Ch (2402MHz), Adv Mode, EUT Vertical
12398.950	39.5	-2.9	1.1	168.0	3.0	0.0	Vert	AV	0.0	36.6	54.0	-17.4	High Ch (2480MHz), Adv Mode, EUT Vertical
12128.950	41.3	-4.7	1.0	322.0	3.0	0.0	Vert	AV	0.0	36.6	54.0	-17.4	Mid Ch (2426MHz), Adv Mode, EUT Vertical
4853.813	25.9	10.3	1.0	314.0	3.0	0.0	Horz	AV	0.0	36.2	54.0	-17.8	Mid Ch (2426MHz), Adv Mode, EUT Vertical
7434.313	36.8	19.4	1.0	222.0	3.0	0.0	Vert	PK	0.0	56.2	74.0	-17.8	High Ch (2478MHz), Data Mode, EUT Vertical
4805.840	26.0	10.2	1.3	297.0	3.0	0.0	Horz	AV	0.0	36.2	54.0	-17.8	Low Ch (2402MHz), Adv Mode, EUT Vertical
4850.987	25.8	10.3	1.0	352.0	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	Mid Ch (2426MHz), Adv Mode, EUT Vertical
7277.713	37.3	18.8	1.0	255.0	3.0	0.0	Horz	PK	0.0	56.1	74.0	-17.9	Mid Ch (2426MHz), Adv Mode, EUT Vertical
7324.773	37.0	19.0	1.0	261.0	3.0	0.0	Horz	PK	0.0	56.0	74.0	-18.0	Mid Ch (2442MHz), Data Mode, EUT Vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4805.400	25.8	10.2	1.0	71.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	Low Ch (2402MHz), Adv Mode, EUT Vertical
7435.613	36.5	19.4	1.0	334.0	3.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	High Ch (2478MHz), Data Mode, EUT Vertical
4958.740	25.2	10.7	1.0	258.0	3.0	0.0	Horz	AV	0.0	35.9	54.0	-18.1	High Ch (2480MHz), Adv Mode, EUT Vertical
7440.307	36.4	19.5	1.0	12.0	3.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	High Ch (2480MHz), Adv Mode, EUT Vertical
4959.300	25.1	10.7	1.0	325.0	3.0	0.0	Vert	AV	0.0	35.8	54.0	-18.2	High Ch (2480MHz), Adv Mode, EUT Vertical
7438.107	36.2	19.5	1.0	180.0	3.0	0.0	Vert	PK	0.0	55.7	74.0	-18.3	High Ch (2480MHz), Adv Mode, EUT Vertical
12128.840	40.0	-4.7	1.0	98.0	3.0	0.0	Horz	AV	0.0	35.3	54.0	-18.7	Mid Ch (2426MHz), Adv Mode, EUT Vertical
7326.273	36.2	19.0	1.0	214.0	3.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	Mid Ch (2442MHz), Data Mode, EUT Vertical
7278.260	36.3	18.8	1.0	173.0	3.0	0.0	Vert	PK	0.0	55.1	74.0	-18.9	Mid Ch (2426MHz), Adv Mode, EUT Vertical
12008.890	39.9	-5.5	1.0	237.0	3.0	0.0	Horz	AV	0.0	34.4	54.0	-19.6	Low Ch (2402MHz), Adv Mode, EUT Vertical
4853.127	36.8	10.3	1.0	352.0	3.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	Mid Ch (2426MHz), Adv Mode, EUT Vertical
4852.093	36.5	10.3	1.0	314.0	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Mid Ch (2426MHz), Adv Mode, EUT Vertical
4805.413	36.4	10.2	1.0	71.0	3.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	Low Ch (2402MHz), Adv Mode, EUT Vertical
4802.140	36.2	10.2	1.3	297.0	3.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Low Ch (2402MHz), Adv Mode, EUT Vertical
4958.413	35.5	10.7	1.0	325.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	High Ch (2480MHz), Adv Mode, EUT Vertical
4958.673	35.3	10.7	1.0	258.0	3.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	High Ch (2480MHz), Adv Mode, EUT Vertical
12398.670	48.1	-2.9	1.2	94.0	3.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8	Low Ch (2402MHz), Adv Mode, EUT Vertical
12011.400	50.3	-5.5	1.1	318.0	3.0	0.0	Vert	PK	0.0	44.8	74.0	-29.2	Low Ch (2402MHz), Adv Mode, EUT Vertical
12131.320	49.0	-4.7	1.0	322.0	3.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	Mid Ch (2426MHz), Adv Mode, EUT Vertical
12398.630	47.0	-2.9	1.1	168.0	3.0	0.0	Vert	PK	0.0	44.1	74.0	-29.9	High Ch (2480MHz), Adv Mode, EUT Vertical
12131.090	47.7	-4.7	1.0	98.0	3.0	0.0	Horz	PK	0.0	43.0	74.0	-31.0	Mid Ch (2426MHz), Adv Mode, EUT Vertical
12011.200	48.3	-5.5	1.0	237.0	3.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	Low Ch (2402MHz), Adv Mode, EUT Vertical