

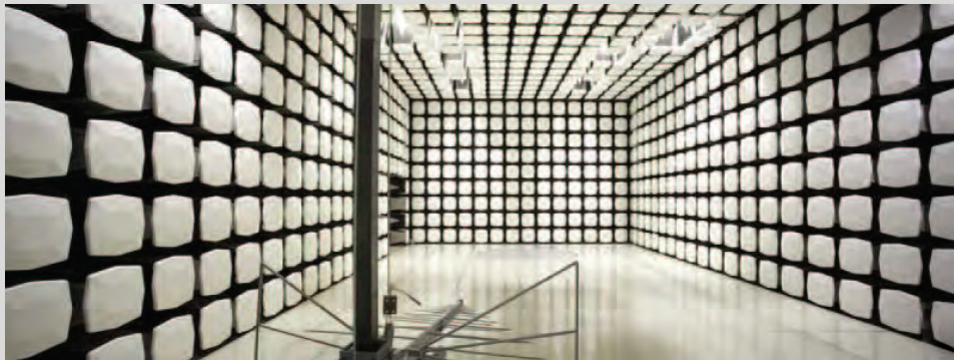


Ten One Design

Blue Tiger

FCC 15.247:2012

Report #: TEN10003



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

Last Date of Test: September 24, 2012
Ten One Design
Model: Blue Tiger

Emissions

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

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200630-0

Test Facility

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

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

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

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

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

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

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Hong Kong

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

Vietnam

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

Russia

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

SCOPE

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

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

Measurement Uncertainty

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

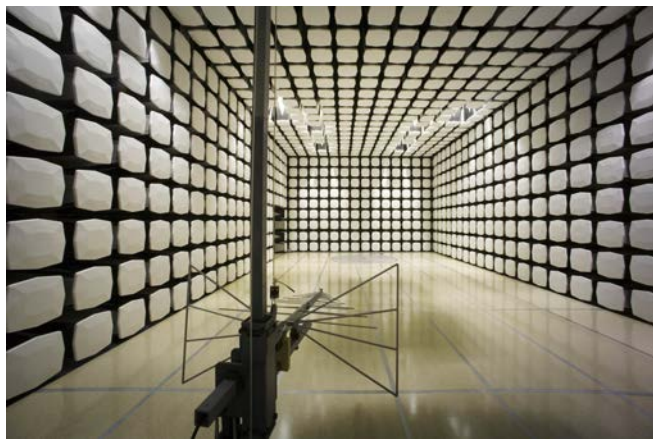
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement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

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

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



Oregon Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs SU01-SU07 14128 339 th Ave. SE Sultan, WA 98294 (360) 793-8675
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



Client and Equipment Under Test (EUT) Information

Company Name:	Ten One Design
Address:	149 Chestnut Street
City, State, Zip:	Montclair, NJ 07042
Test Requested By:	Peter Skinner
Model:	Blue Tiger
First Date of Test:	September 11, 2012
Last Date of Test:	September 24, 2012
Receipt Date of Samples:	September 11, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Bluetooth LE radio module with 1 antenna.
Testing Objective:
To demonstrate compliance to FCC 15.247 requirements.

Configuration TEN10003- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Pen	Ten One Design	Blue Tiger	None

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
iPad	Apple	A1416	DLXH864HDJBR

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/11/2012	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	9/11/2012	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	9/11/2012	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	9/11/2012	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	9/11/2012	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	9/24/2012	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

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.

The EUT operates at 100% Duty Cycle.

Testing was done with the radio operating at 100% duty cycle.

During normal product operation the information below applies:

The duty cycle correction factor applied to the average detector measurements is based on the worst case transmitter on time in a given period for each available operating mode. The duty cycle correction factor is based on the formula of $20 * \text{LOG} (T_{\text{on}}/\text{Period})$.

When operating in the Advertising mode the total transmission time is 300us with a 20ms period between advertising events:

$$20 * \text{LOG} (.300/20) = -36.5 \text{ dB}$$

When operating in the Data mode the total transmission time is 100us with a 28ms period between data events:

$$20 * \text{LOG} (.100/28) = -48.9 \text{ dB}$$

Occupied Bandwidth

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

TEST EQUIPMENT

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

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.



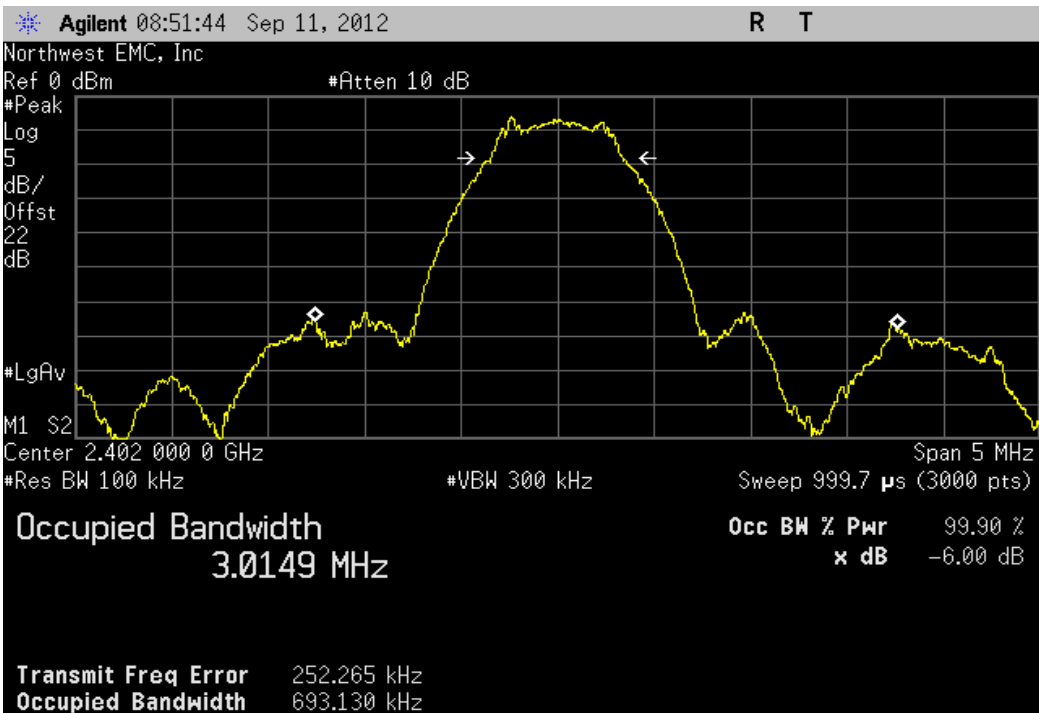
Occupied Bandwidth

XMit 2012.07.31
PsaTx 2012.09.04

EUT: Blue Tiger		Work Order: TEN10003	
Serial Number: None		Date: 09/11/12	
Customer: Ten One Design		Temperature: 18°C	
Attendees: None		Humidity: 48%	
Project: None		Barometric Pres.: 1025	
Tested by: Brandon Hobbs and Rod Peloquin		Power: Battery	
		Job Site: EV06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2012		ANSI C63.10:2009	
COMMENTS			
The EUT was operating at 100% duty cycle while under test.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Rodry L. Peloquin</i>	
		Value	Limit
BLE, ADV			Result
Low Channel 0		693.13 kHz	> 500 kHz
Mid Channel 12		703.566 kHz	> 500 kHz
High Channel 39		708.765 kHz	> 500 kHz
BLE, DATA			Result
Low Channel 1		736.889 kHz	> 500 kHz
Mid Channel 20		695.527 kHz	> 500 kHz
High Channel 38		695.467 kHz	> 500 kHz

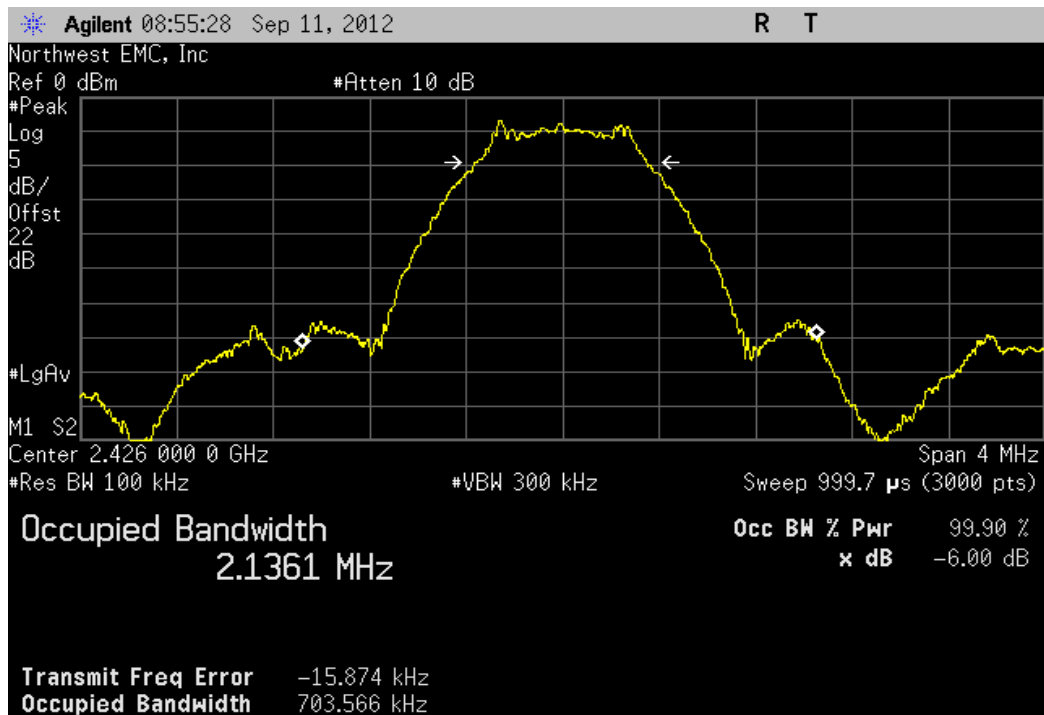
BLE, ADV, Low Channel 0

Value	Limit	Result
693.13 kHz	> 500 kHz	Pass



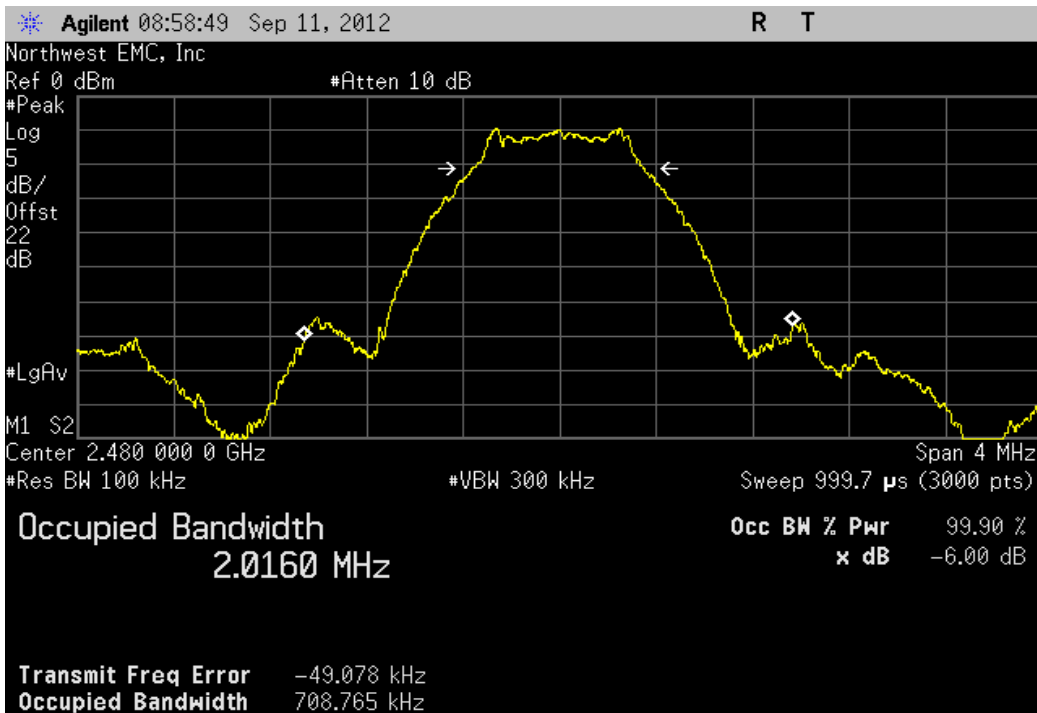
BLE, ADV, Mid Channel 12

Value	Limit	Result
703.566 kHz	> 500 kHz	Pass



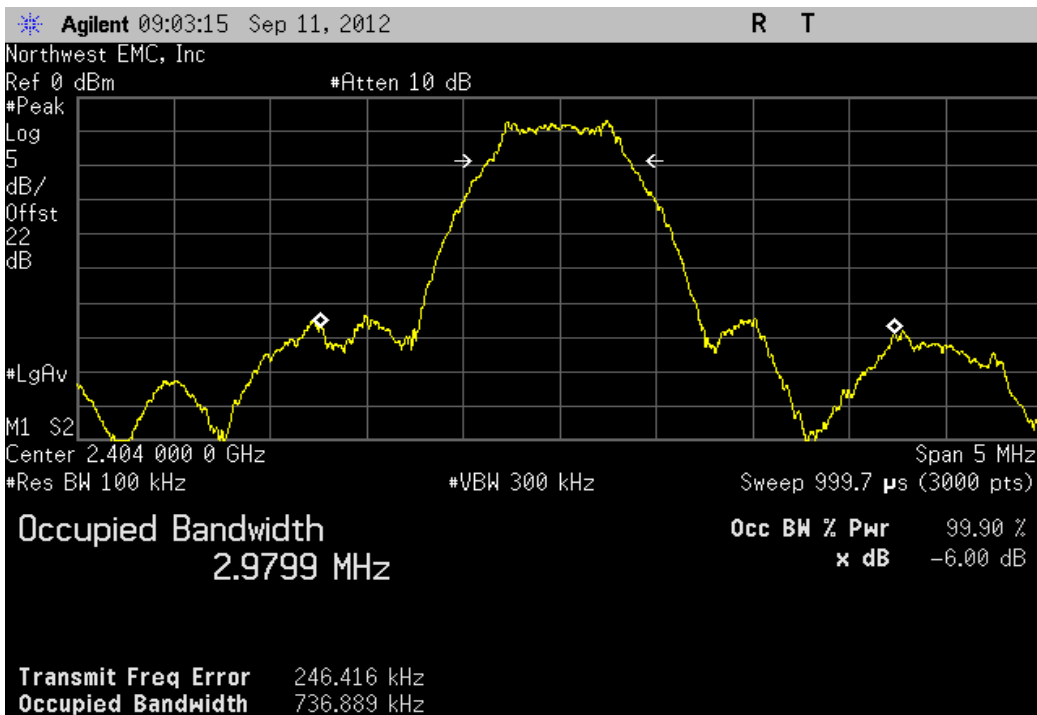
BLE, ADV, High Channel 39

				Value	Limit	Result
				708.765 kHz	> 500 kHz	Pass



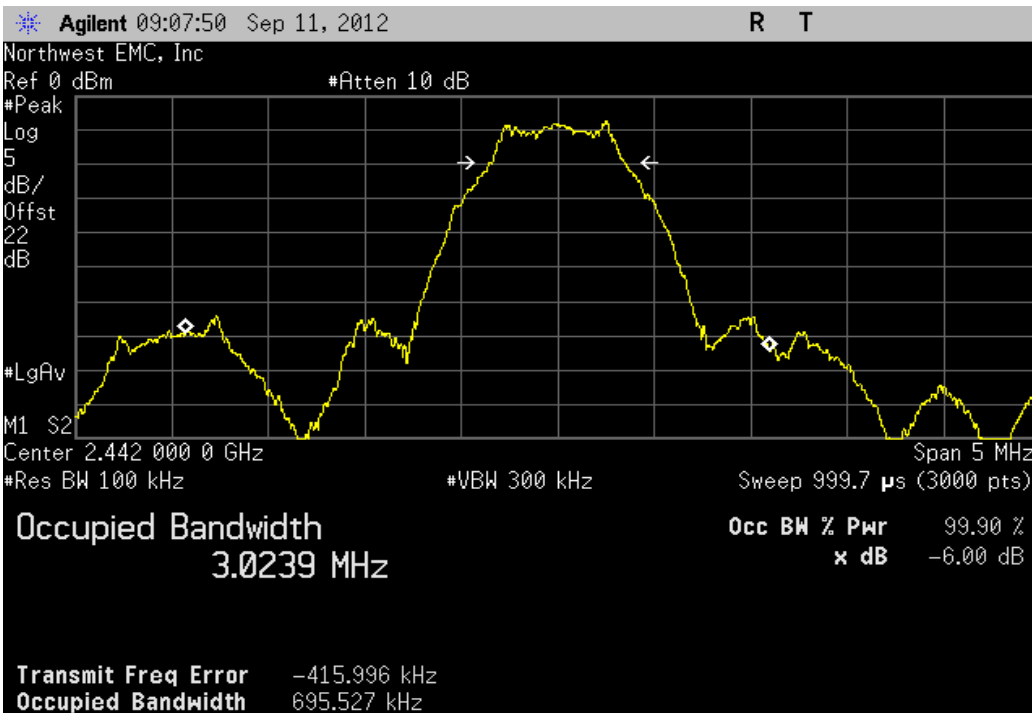
BLE, DATA, Low Channel 1

				Value	Limit	Result
				736.889 kHz	> 500 kHz	Pass



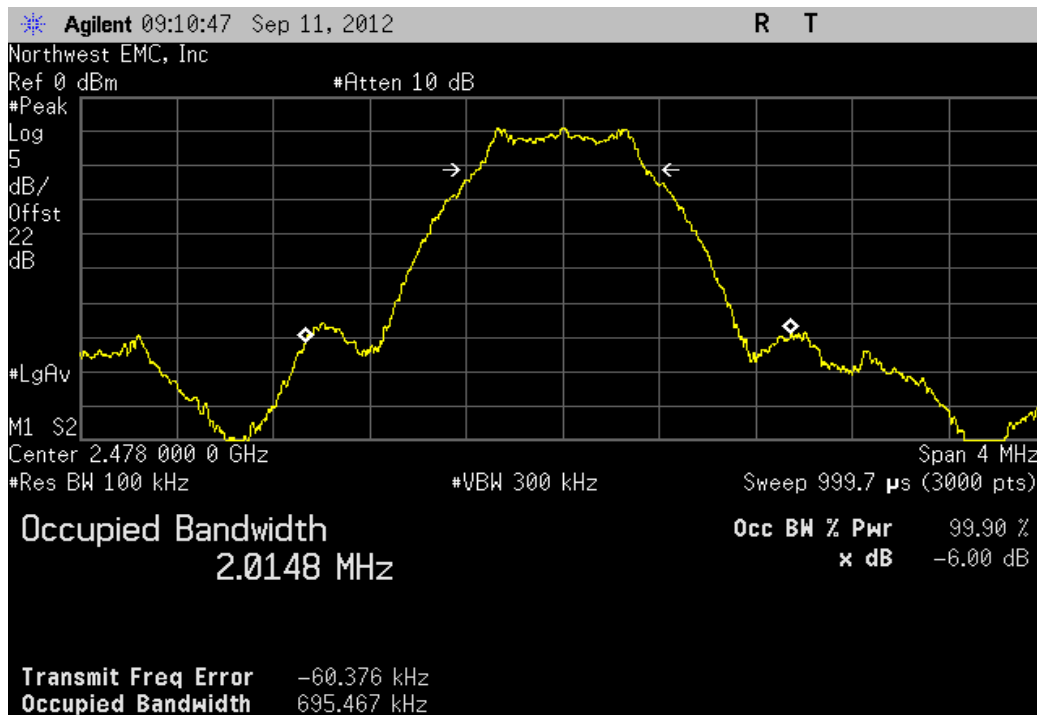
BLE, DATA, Mid Channel 20

Value	Limit	Result
695.527 kHz	> 500 kHz	Pass



BLE, DATA, High Channel 38

Value	Limit	Result
695.467 kHz	> 500 kHz	Pass



Output Power

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

TEST EQUIPMENT

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

MEASUREMENT UNCERTAINTY

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

TEST DESCRIPTION

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



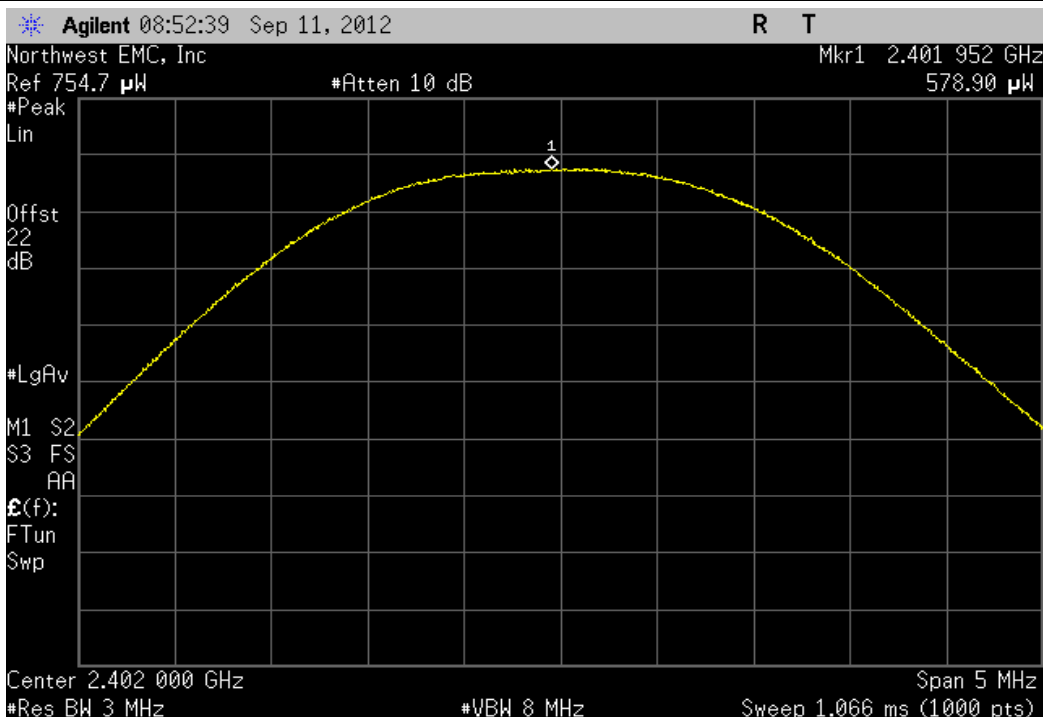
Output Power

XMit 2012.07.31
PsaTx 2012.09.04

EUT: Blue Tiger		Work Order: TEN10003	
Serial Number: None		Date: 09/11/12	
Customer: Ten One Design		Temperature: 18°C	
Attendees: None		Humidity: 48%	
Project: None		Barometric Pres.: 1025	
Tested by: Brandon Hobbs and Rod Peloquin		Power: Battery	
Job Site: EV06			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2012		ANSI C63.10:2009	
COMMENTS			
The EUT was operating at 100% duty cycle while under test.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Rodry L. Peloquin</i>	
		Value	Limit
BLE, ADV			Result
Low Channel 0		578.895 uW	< 1 W
Mid Channel 12		502.343 uW	< 1 W
High Channel 39		408.131 uW	< 1 W
BLE, DATA			
Low Channel 1		576.766 uW	< 1 W
Mid Channel 20		498.999 uW	< 1 W
High Channel 38		414.477 uW	< 1 W

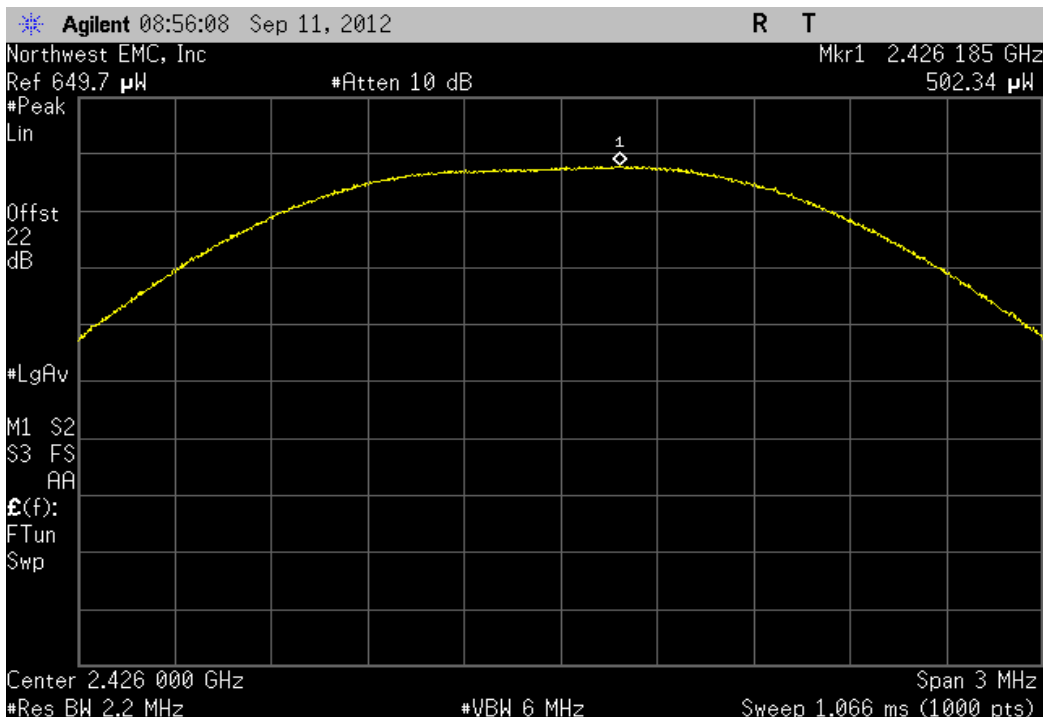
BLE, ADV, Low Channel 0

Value	Limit	Result
578.895 μ W	< 1 W	Pass



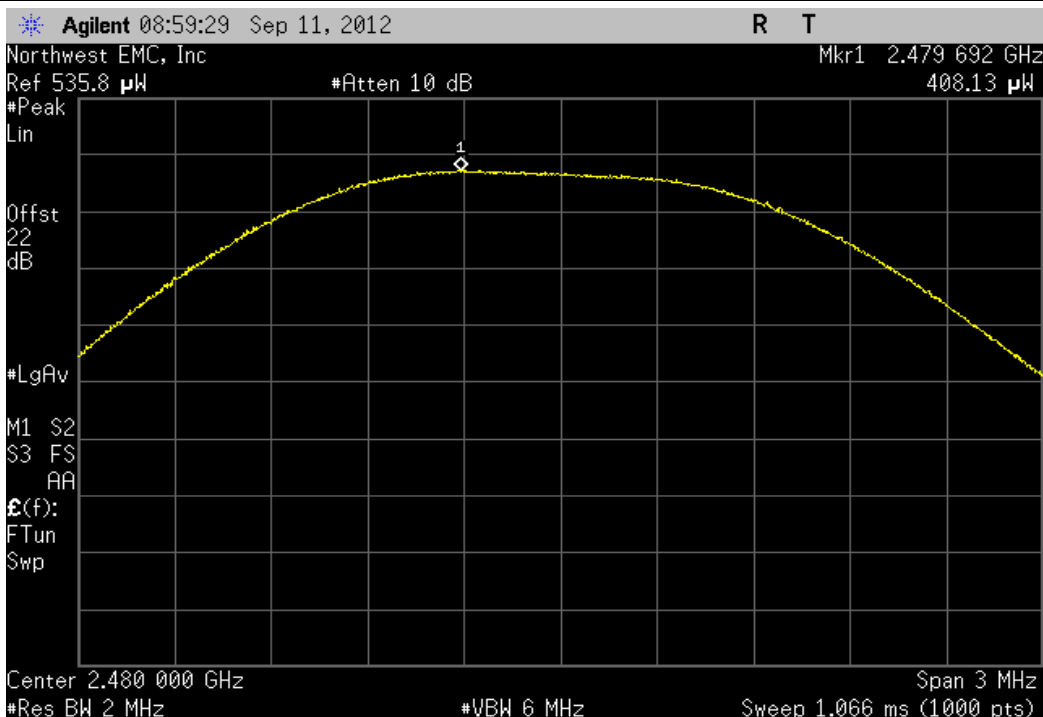
BLE, ADV, Mid Channel 12

Value	Limit	Result
502.343 μ W	< 1 W	Pass



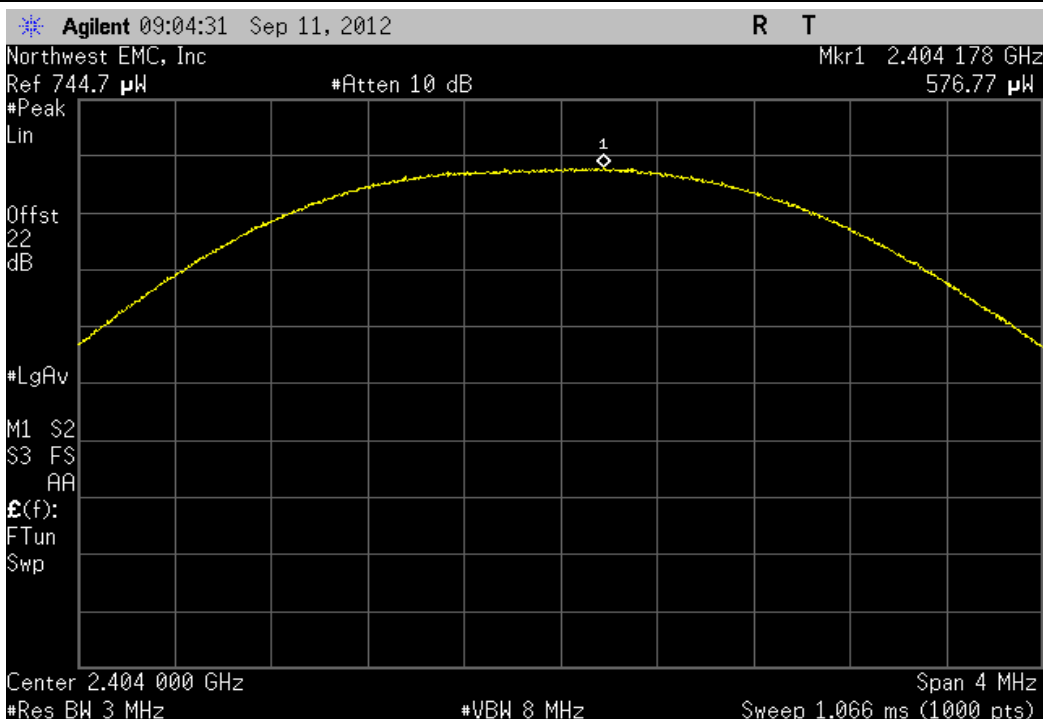
BLE, ADV, High Channel 39

				Value	Limit	Result
				408.131 uW	< 1 W	Pass



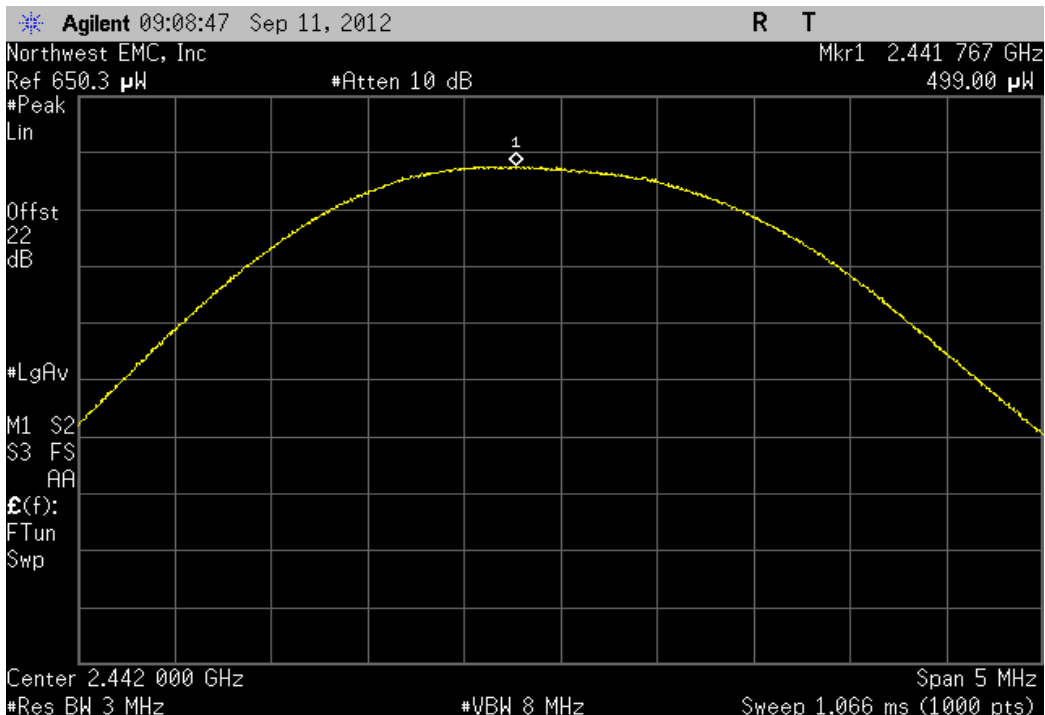
BLE, DATA, Low Channel 1

				Value	Limit	Result
				576.766 uW	< 1 W	Pass



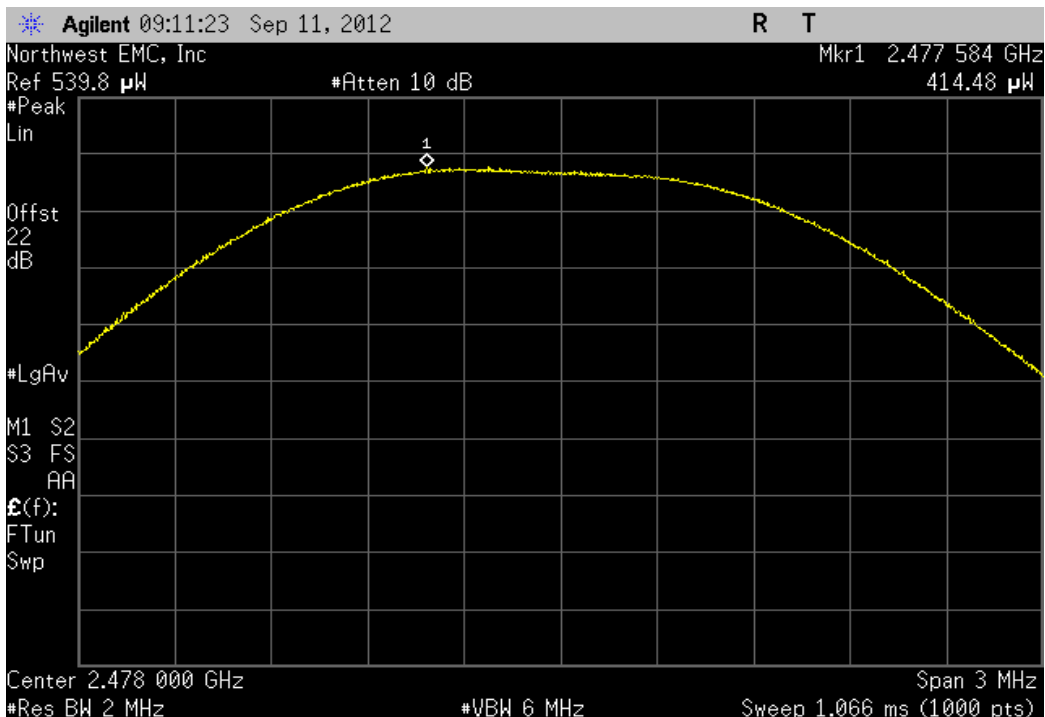
BLE, DATA, Mid Channel 20

	Value	Limit	Result
	498.999 μ W	< 1 W	Pass



BLE, DATA, High Channel 38

	Value	Limit	Result
	414.477 μ W	< 1 W	Pass



Band Edge Compliance

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

TEST EQUIPMENT

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

TEST DESCRIPTION

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

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



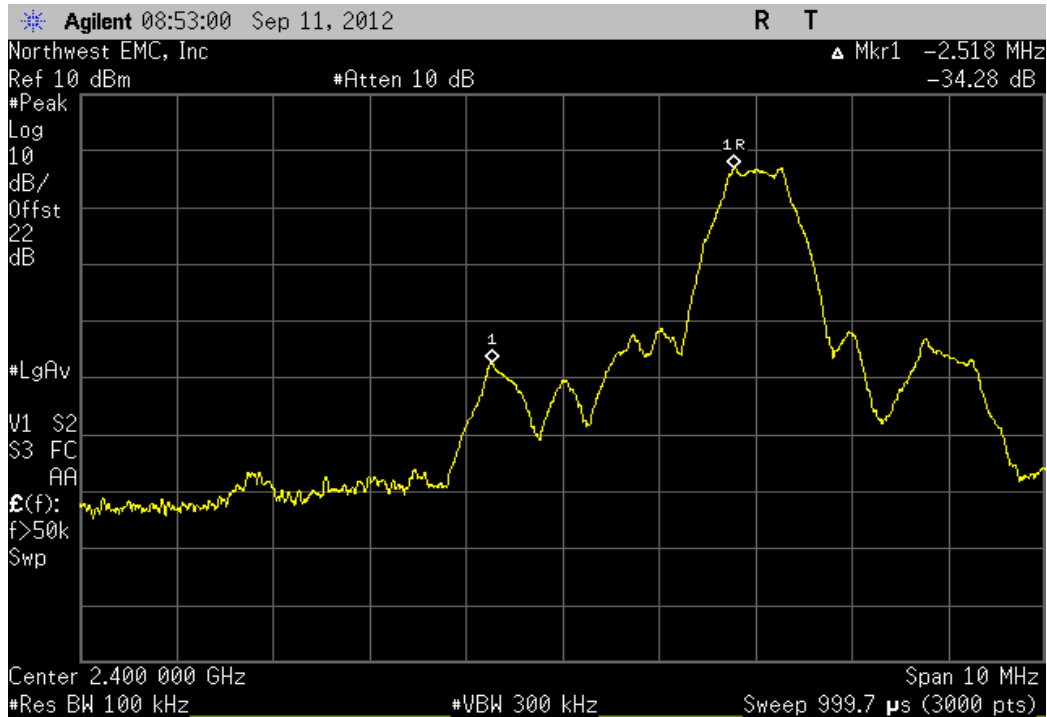
Band Edge Compliance

XMit 2012.07.31
PsaTx 2012.09.04

EUT: Blue Tiger		Work Order: TEN10003	
Serial Number: None		Date: 09/11/12	
Customer: Ten One Design		Temperature: 18°C	
Attendees: None		Humidity: 48%	
Project: None		Barometric Pres.: 1025	
Tested by: Brandon Hobbs and Rod Peloquin		Power: Battery	
		Job Site: EV06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2012		ANSI C63.10:2009	
COMMENTS			
The EUT was operating at 100% duty cycle while under test.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Rodry L. Peloquin</i>	
		Value	Limit
BLE, ADV			Result
Low Channel 0		-34.29 dBc	≤ -20 dBc
High Channel 39		-54.47 dBc	≤ -20 dBc
BLE, DATA			Result
Low Channel 1		-53.38 dBc	≤ -20 dBc
High Channel 38		-54.88 dBc	≤ -20 dBc

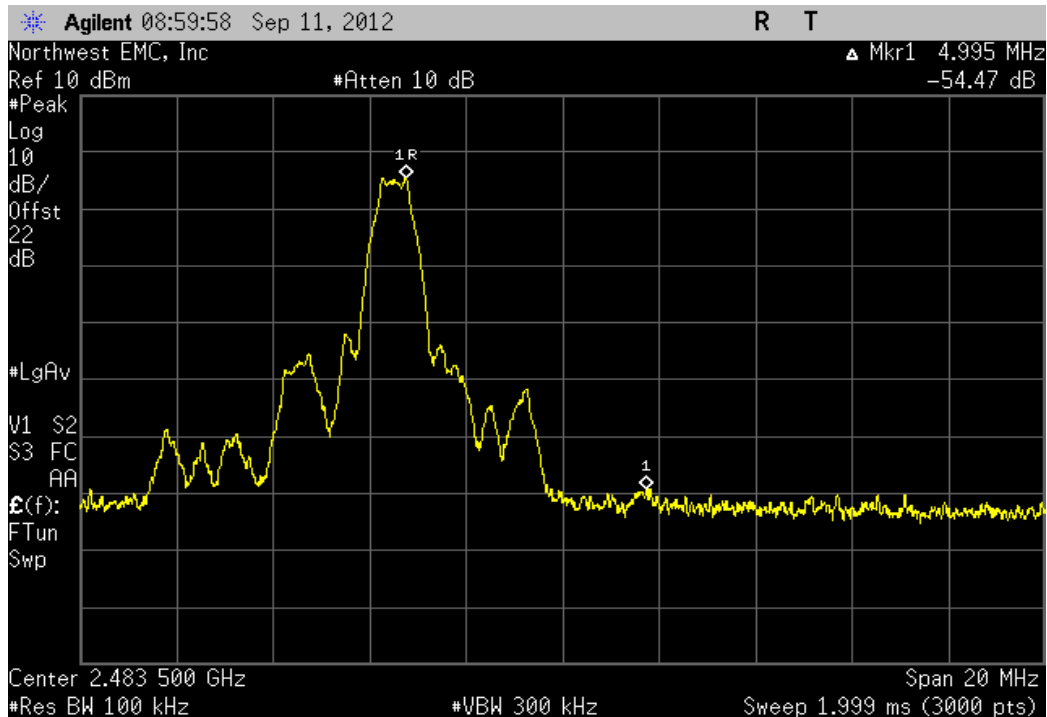
BLE, ADV, Low Channel 0

Value	Limit	Result
-34.29 dBc	≤ -20 dBc	Pass

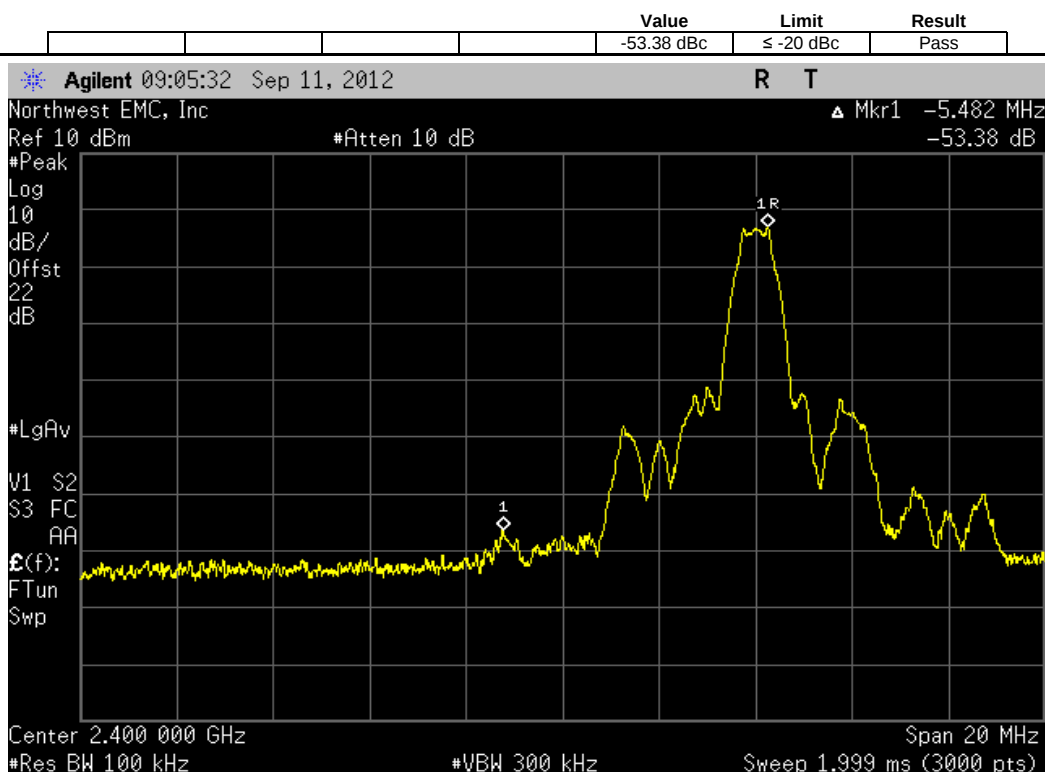


BLE, ADV, High Channel 39

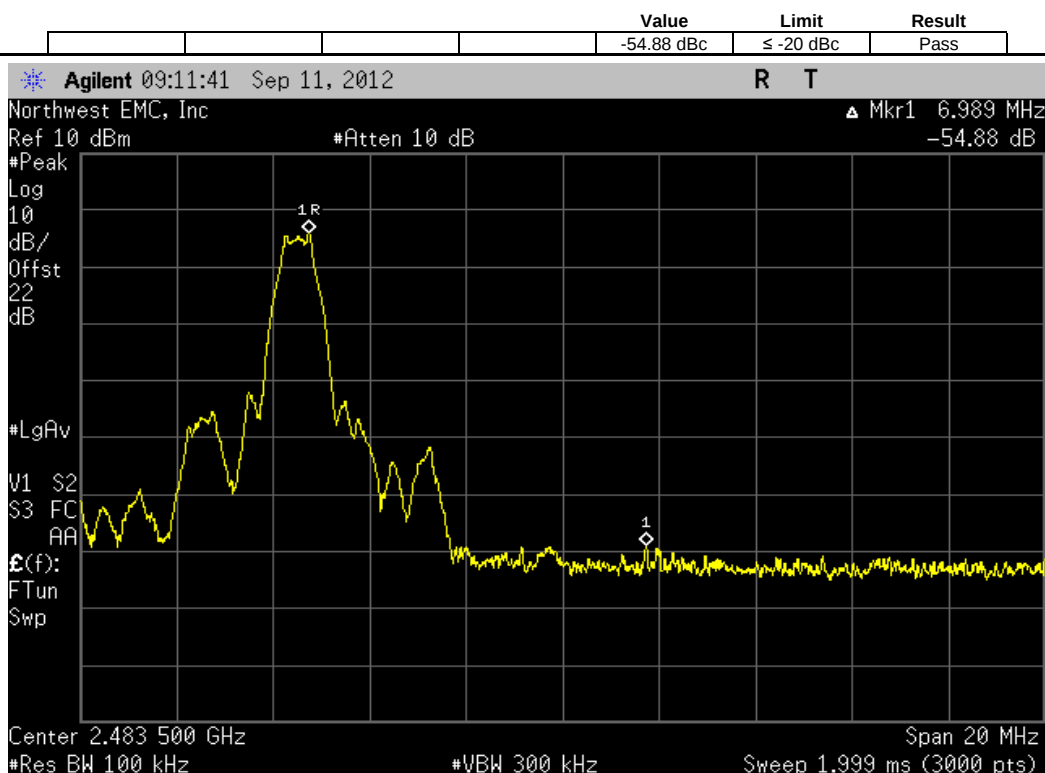
Value	Limit	Result
-54.47 dBc	≤ -20 dBc	Pass



BLE, DATA, Low Channel 1



BLE, DATA, High Channel 38



Spurious Conducted Emissions

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

TEST EQUIPMENT

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

TEST DESCRIPTION

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

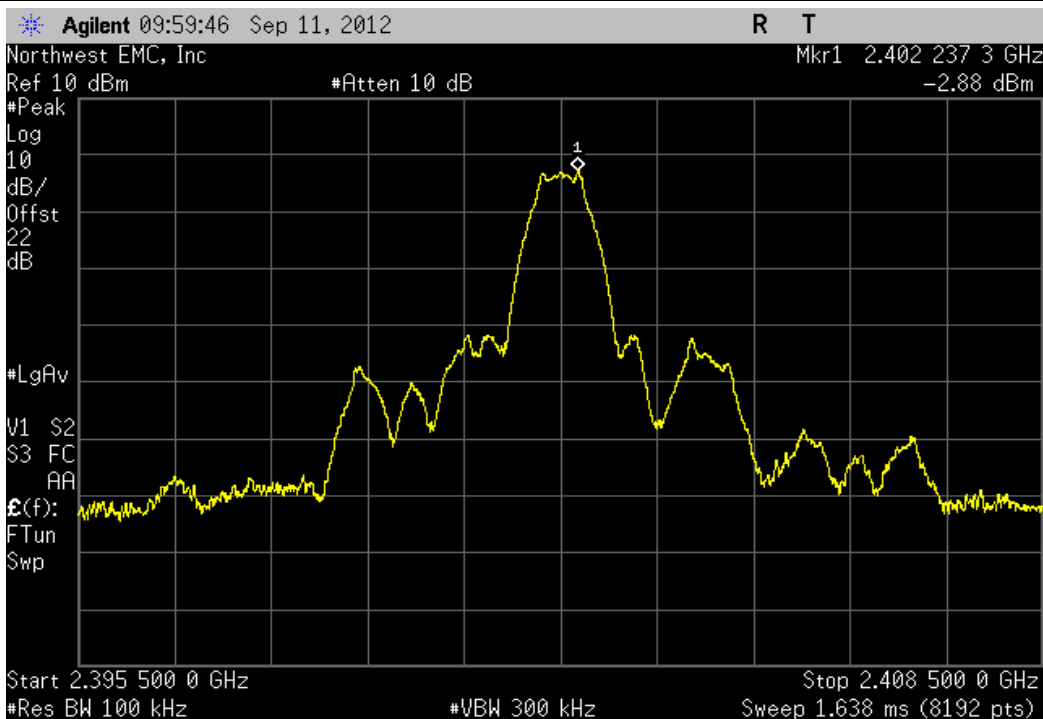


Spurious Conducted Emissions

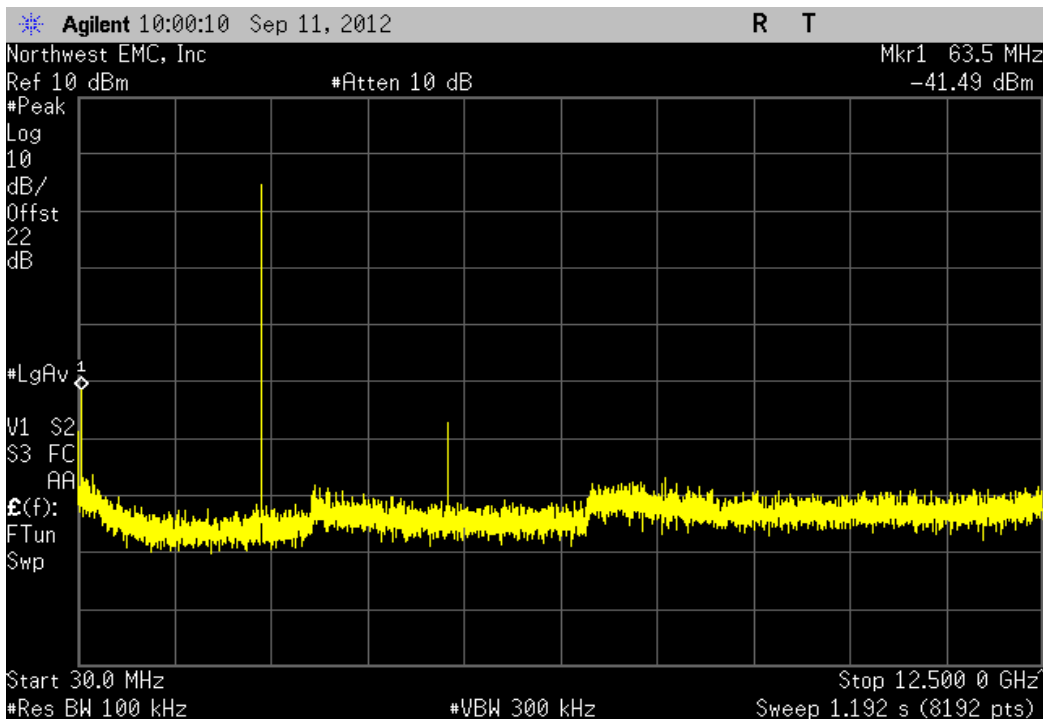
XMit 2012.07.31
PsaTx 2012.09.04

EUT: Blue Tiger		Work Order: TEN10003			
Serial Number: None		Date: 09/11/12			
Customer: Ten One Design		Temperature: 18°C			
Attendees: None		Humidity: 48%			
Project: None		Barometric Pres.: 1025			
Tested by: Brandon Hobbs and Rod Peloquin		Power: Battery			
		Job Site: EV06			
TEST SPECIFICATIONS		Test Method			
FCC 15.247:2012		ANSI C63.10:2009			
COMMENTS					
The EUT was operating at 100% duty cycle while under test.					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	1	Signature <i>Rodry L. Peloquin</i>			
		Frequency Range	Value	Limit	Result
BLE, ADV					
	Low Channel 0	Fundamental	N/A	N/A	N/A
	Low Channel 0	30 MHz - 12.5 GHz	-38.61 dBc	≤ -20 dBc	Pass
	Low Channel 0	12.5 GHz - 25 GHz	-50.08 dBc	≤ -20 dBc	Pass
	Mid Channel 12	Fundamental	N/A	N/A	N/A
	Mid Channel 12	30 MHz - 12.5 GHz	-37.42 dBc	≤ -20 dBc	Pass
	Mid Channel 12	12.5 GHz - 25 GHz	-49.81 dBc	≤ -20 dBc	Pass
	High Channel 39	Fundamental	N/A	N/A	N/A
	High Channel 39	30 MHz - 12.5 GHz	-36.55 dBc	≤ -20 dBc	Pass
	High Channel 39	12.5 GHz - 25 GHz	-48.98 dBc	≤ -20 dBc	Pass
BLE, DATA					
	Low Channel 1	Fundamental	N/A	N/A	N/A
	Low Channel 1	30 MHz - 12.5 GHz	-37.59 dBc	≤ -20 dBc	Pass
	Low Channel 1	12.5 GHz - 25 GHz	-50 dBc	≤ -20 dBc	Pass
	Mid Channel 20	Fundamental	N/A	N/A	N/A
	Mid Channel 20	30 MHz - 12.5 GHz	-37.24 dBc	≤ -20 dBc	Pass
	Mid Channel 20	12.5 GHz - 25 GHz	-50.26 dBc	≤ -20 dBc	Pass
	High Channel 38	Fundamental	N/A	N/A	N/A
	High Channel 38	30 MHz - 12.5 GHz	-36.25 dBc	≤ -20 dBc	Pass
	High Channel 38	12.5 GHz - 25 GHz	-49.13 dBc	≤ -20 dBc	Pass

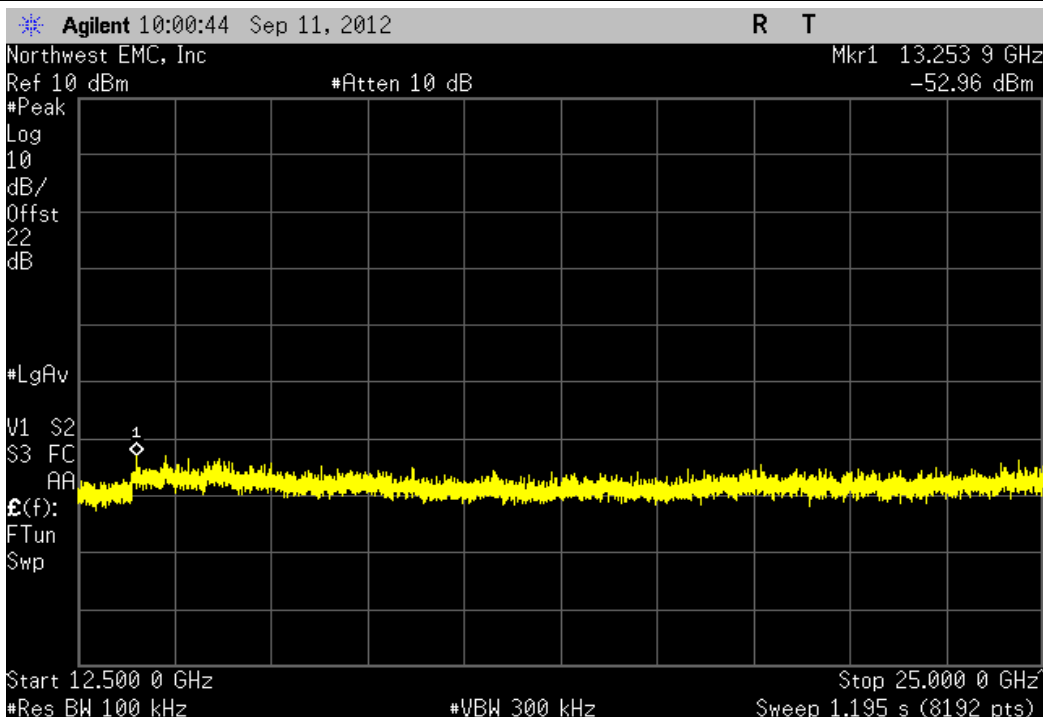
BLE, ADV, Low Channel 0				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



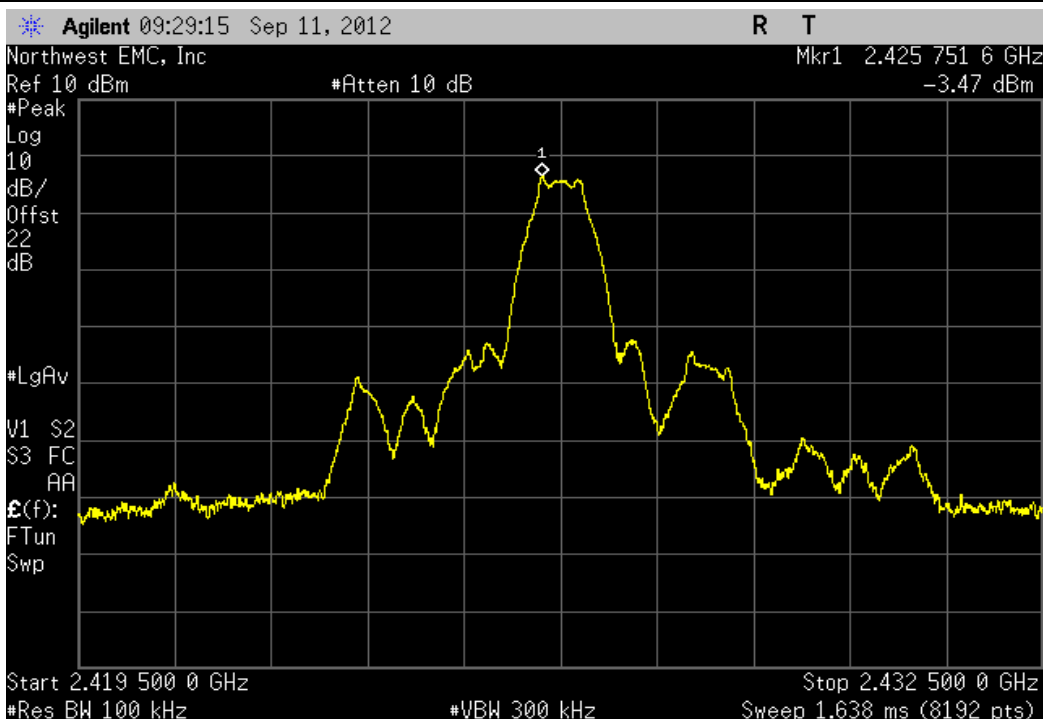
BLE, ADV, Low Channel 0				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-38.61 dBc	≤ -20 dBc	Pass	



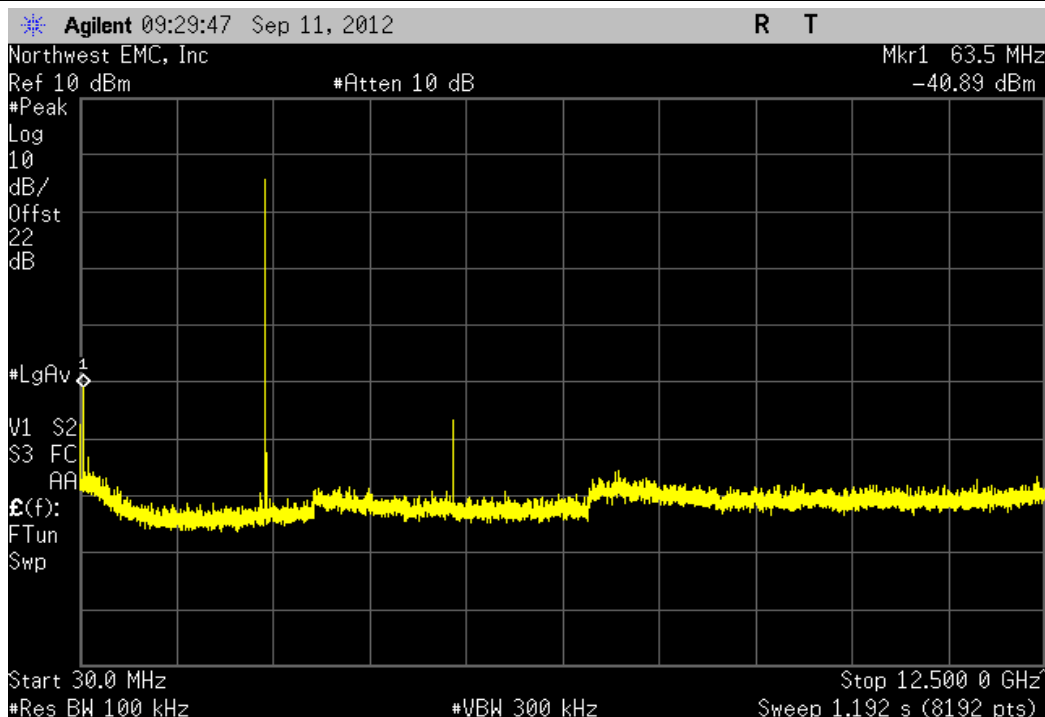
BLE, ADV, Low Channel 0				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50.08 dBc	≤ -20 dBc	Pass	



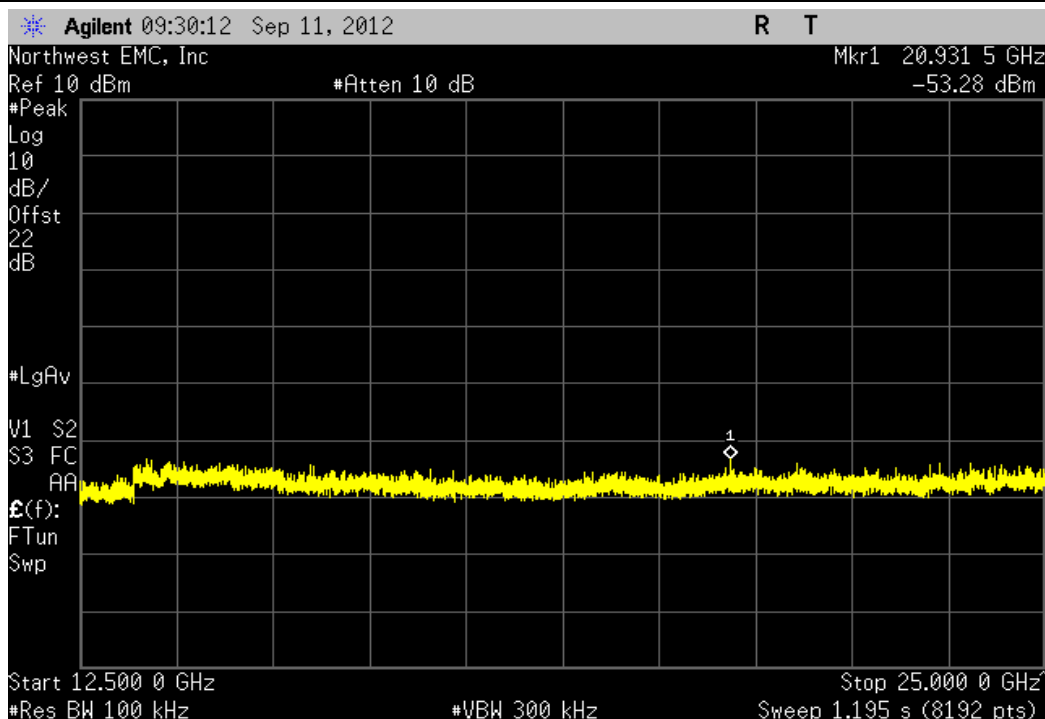
BLE, ADV, Mid Channel 12				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



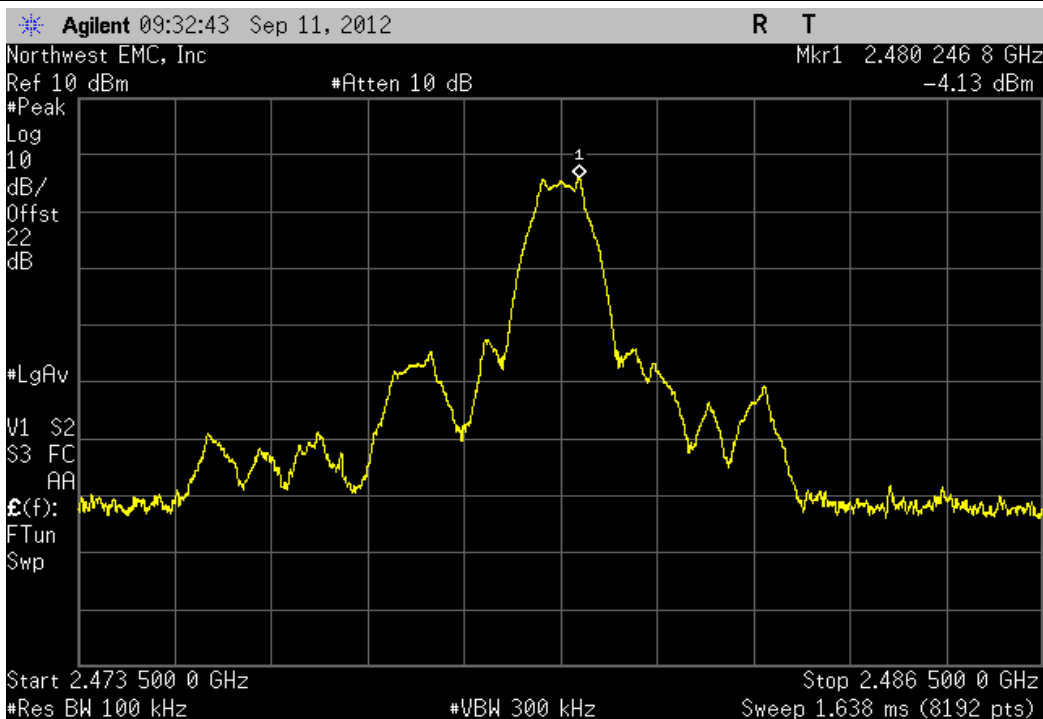
BLE, ADV, Mid Channel 12				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-37.42 dBc	≤ -20 dBc	Pass	



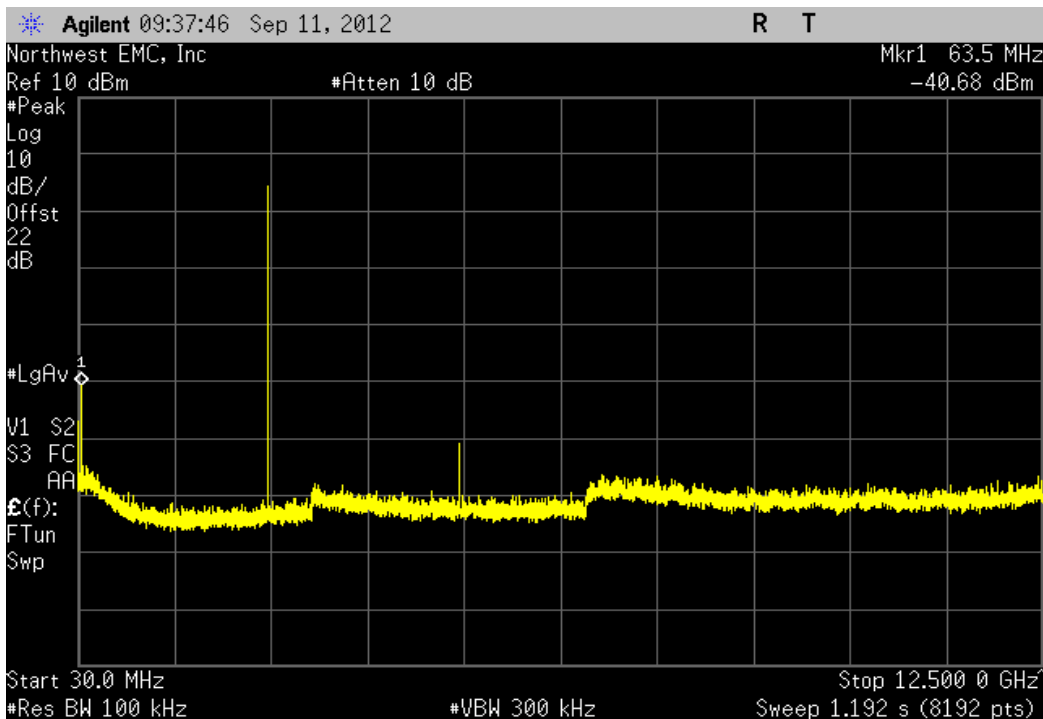
BLE, ADV, Mid Channel 12				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-49.81 dBc	≤ -20 dBc	Pass	



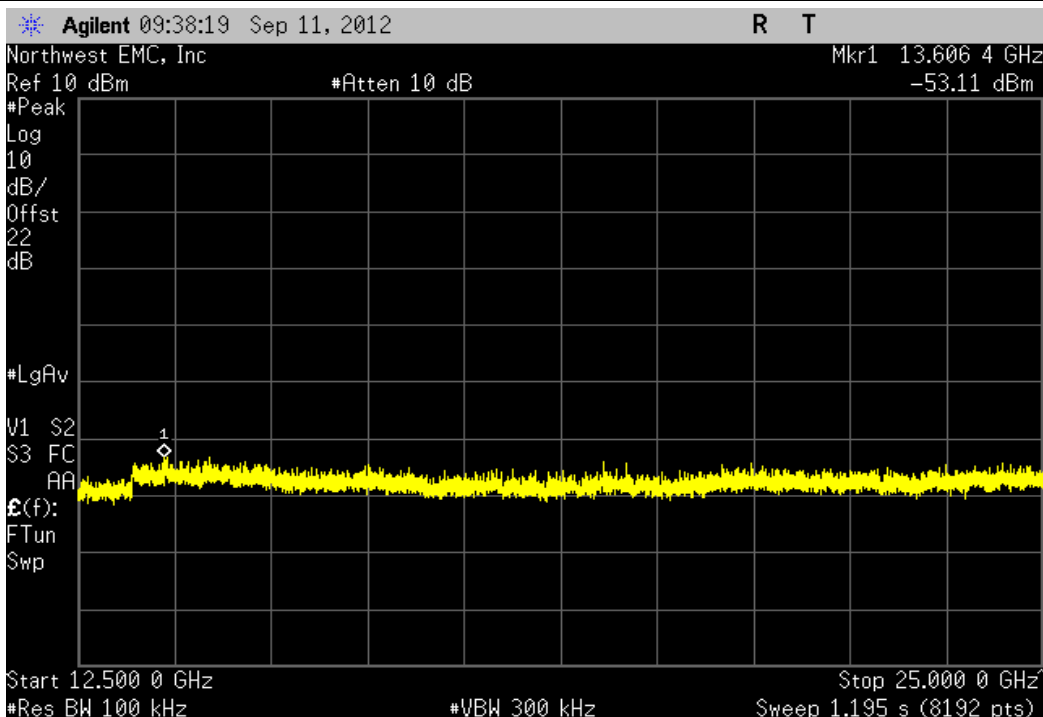
BLE, ADV, High Channel 39				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



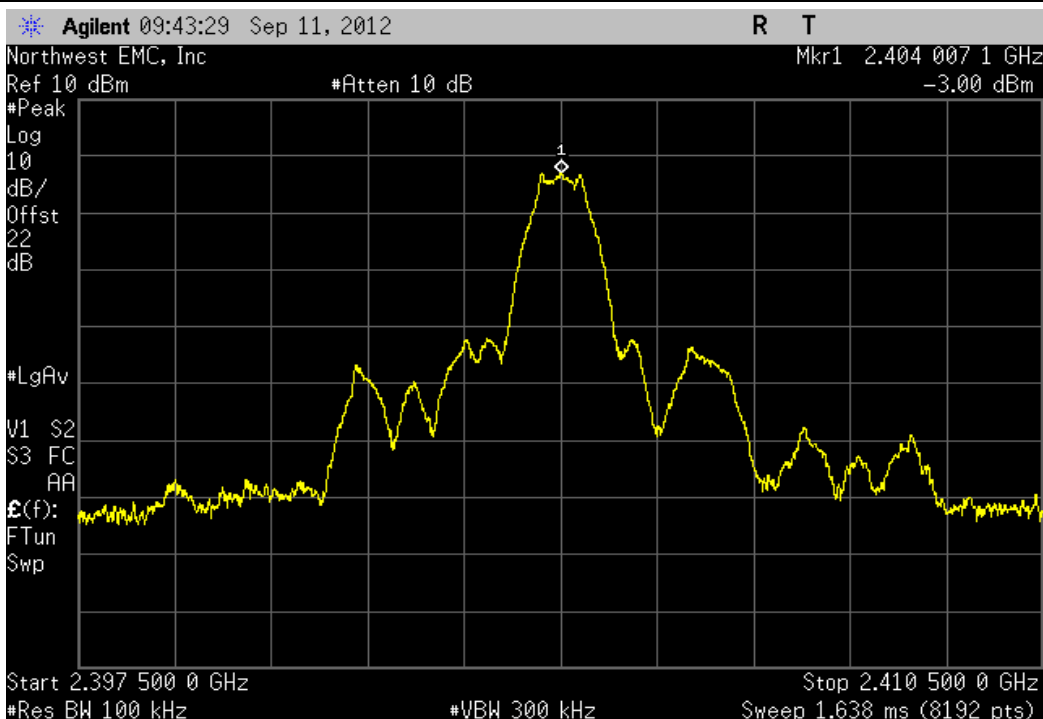
BLE, ADV, High Channel 39				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-36.55 dBc	≤ -20 dBc	Pass	



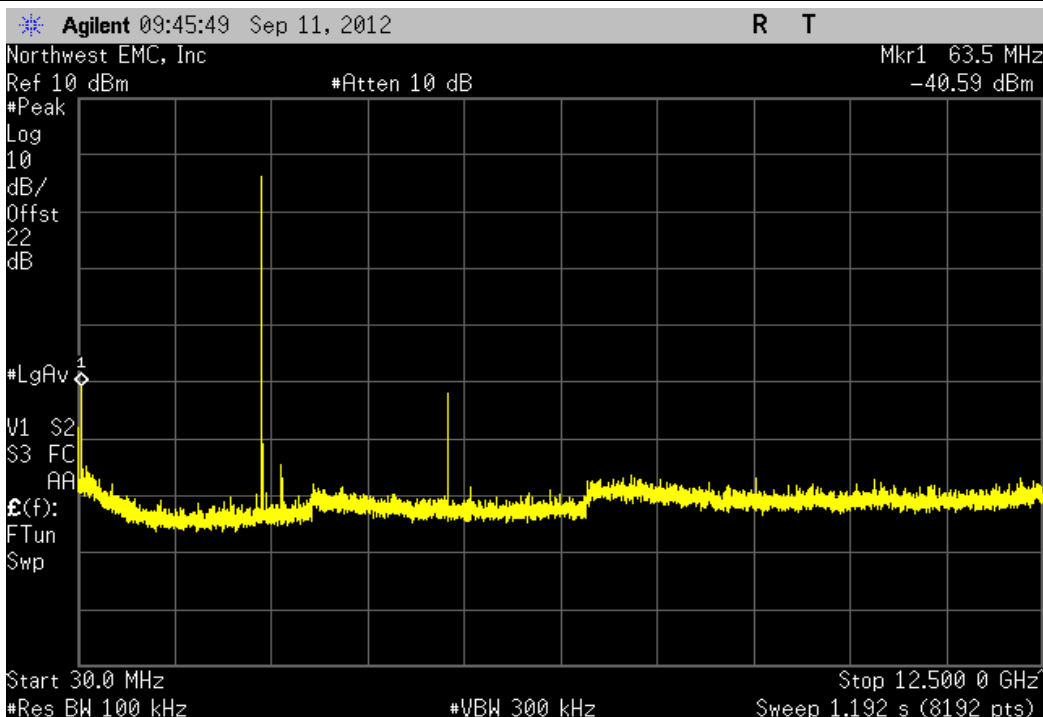
BLE, ADV, High Channel 39				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-48.98 dBc	≤ -20 dBc	Pass	



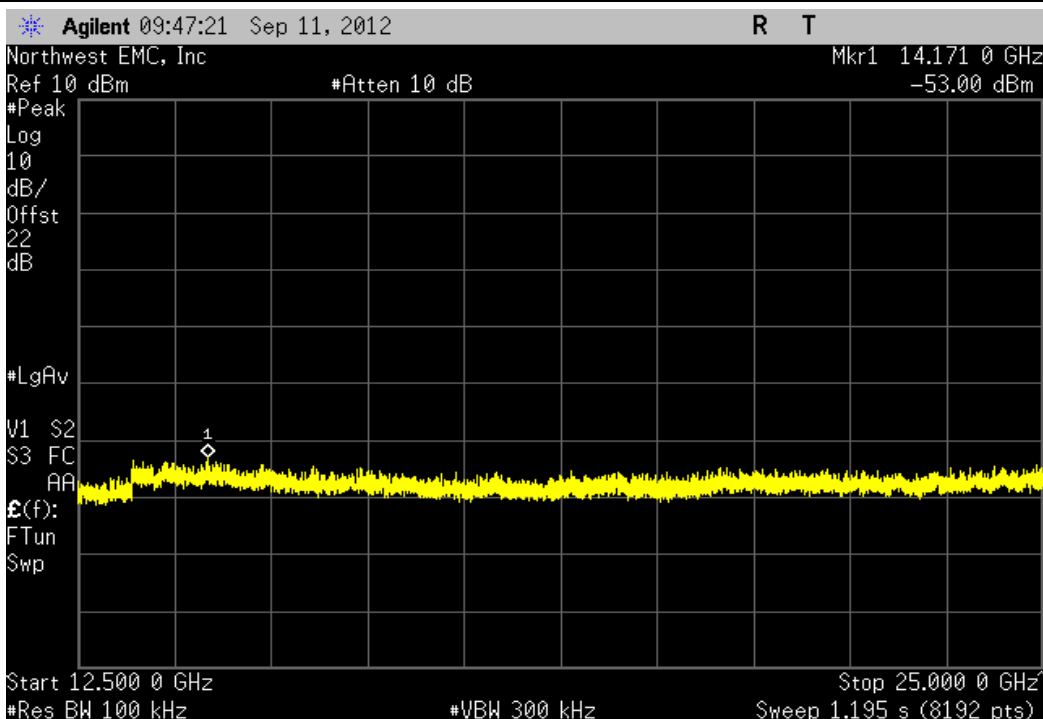
BLE, DATA, Low Channel 1				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



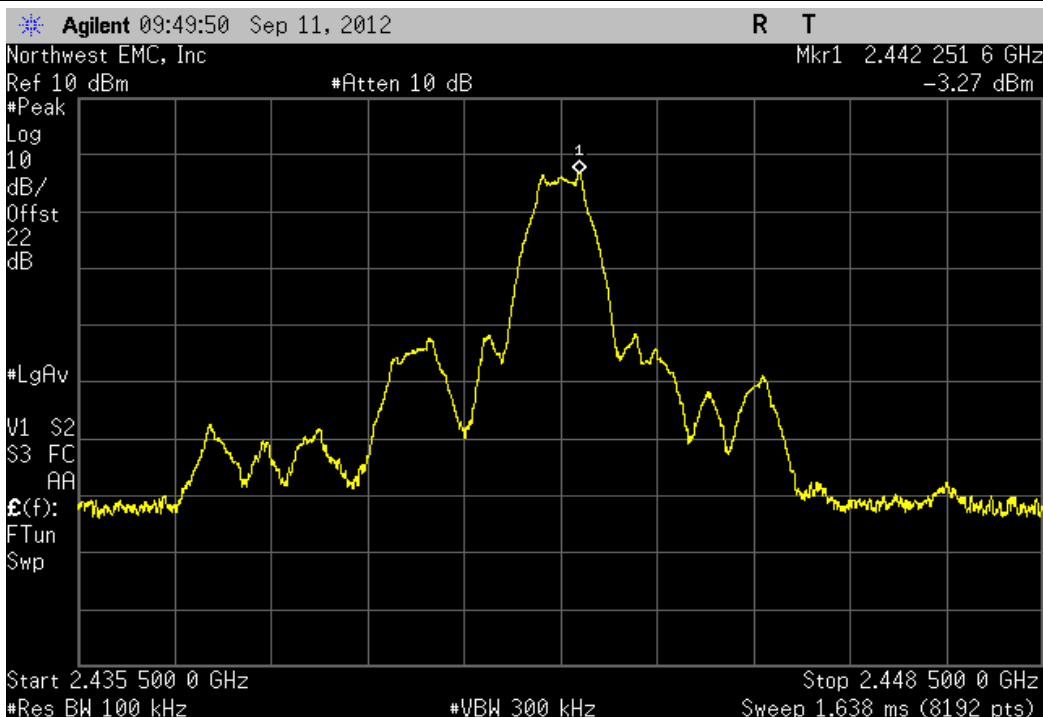
BLE, DATA, Low Channel 1				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-37.59 dBc	≤ -20 dBc	Pass	



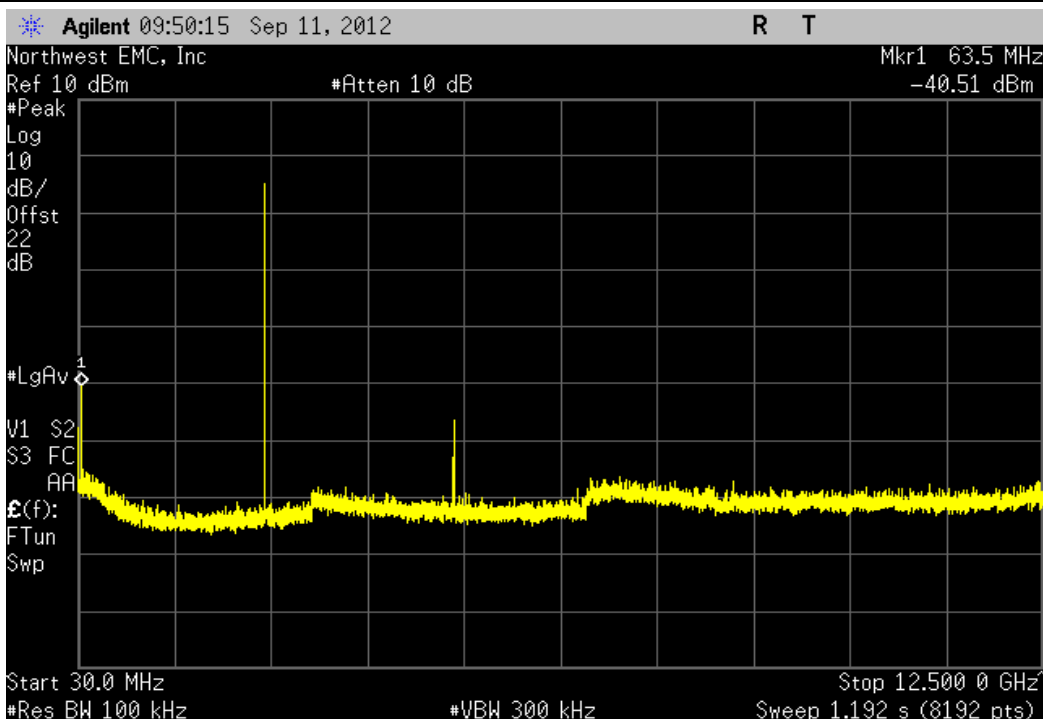
BLE, DATA, Low Channel 1				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50 dBc	≤ -20 dBc	Pass	



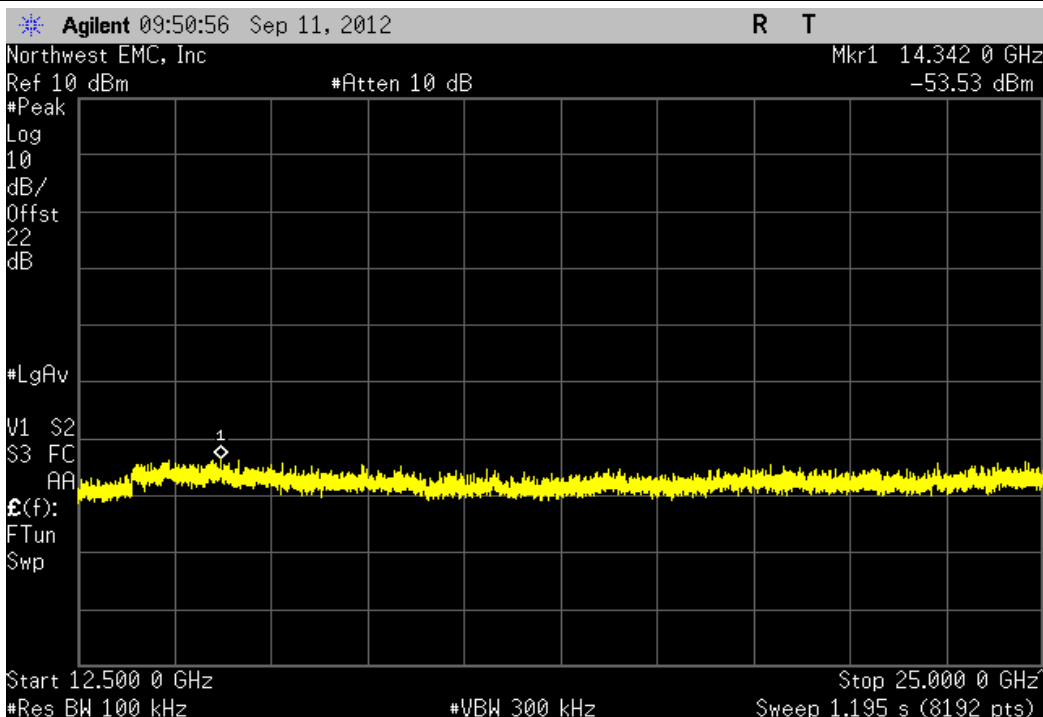
BLE, DATA, Mid Channel 20				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



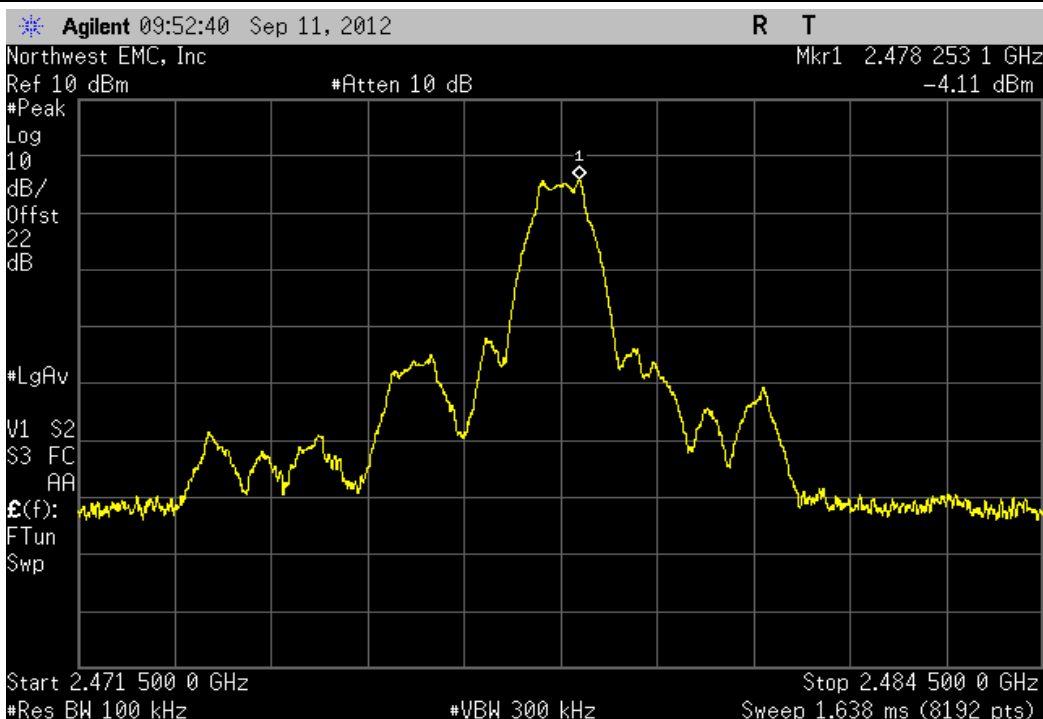
BLE, DATA, Mid Channel 20				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-37.24 dBc	≤ -20 dBc	Pass	



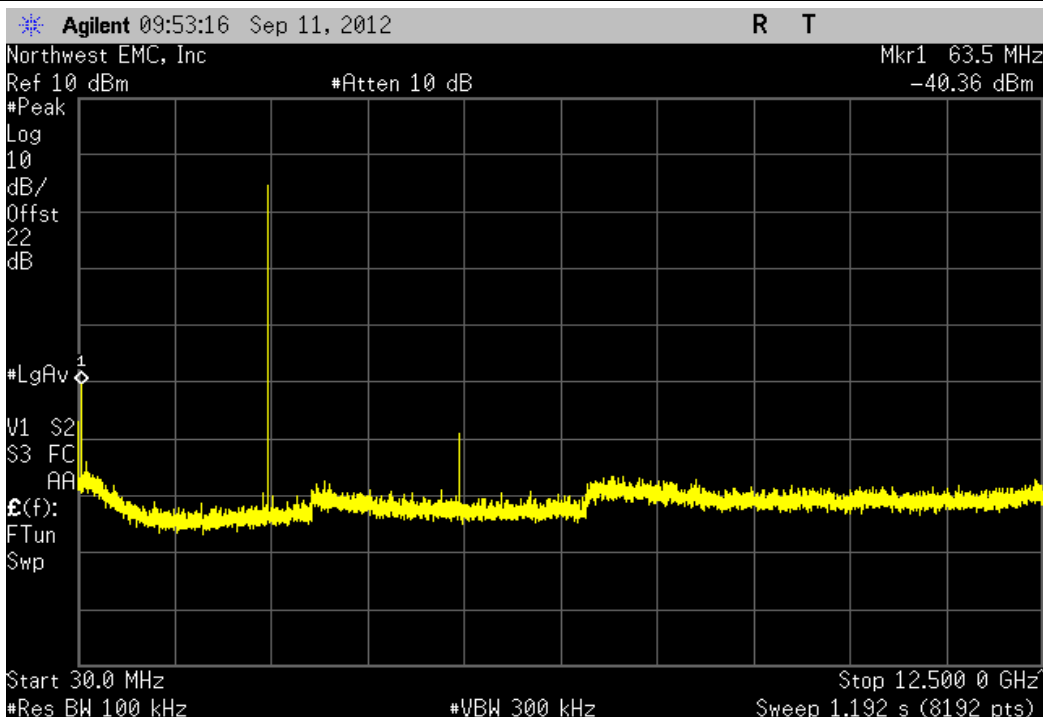
BLE, DATA, Mid Channel 20				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-50.26 dBc	≤ -20 dBc	Pass	



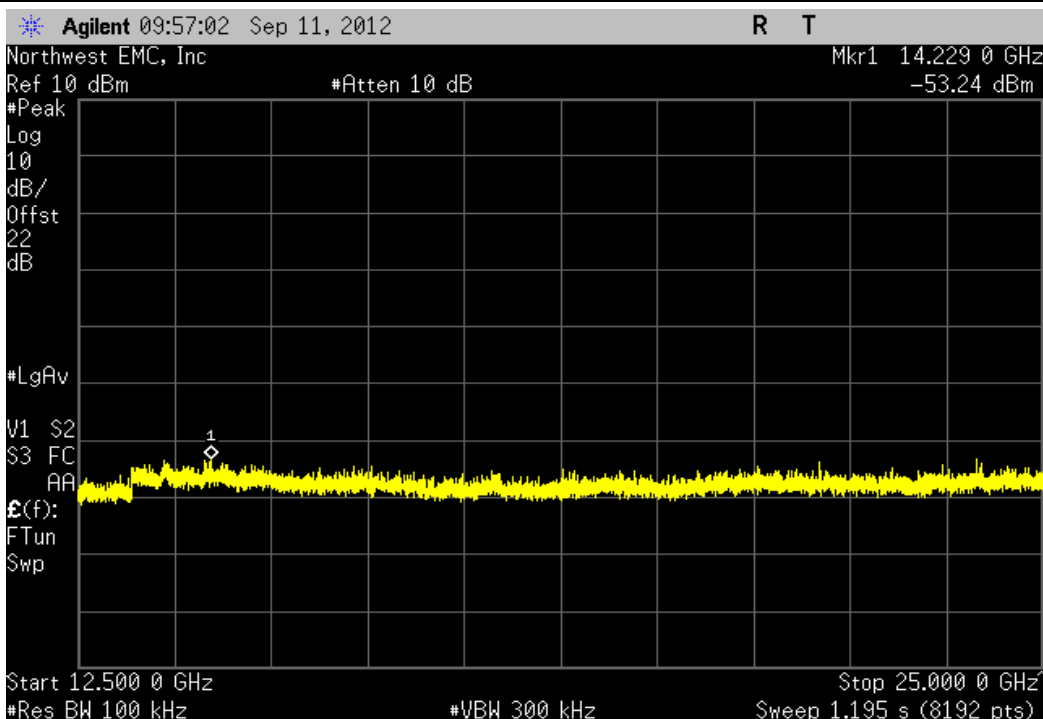
BLE, DATA, High Channel 38				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



BLE, DATA, High Channel 38				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-36.25 dBc	≤ -20 dBc	Pass	



BLE, DATA, High Channel 38				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-49.13 dBc	≤ -20 dBc	Pass	



Power Spectral Density

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

TEST EQUIPMENT

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

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:

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

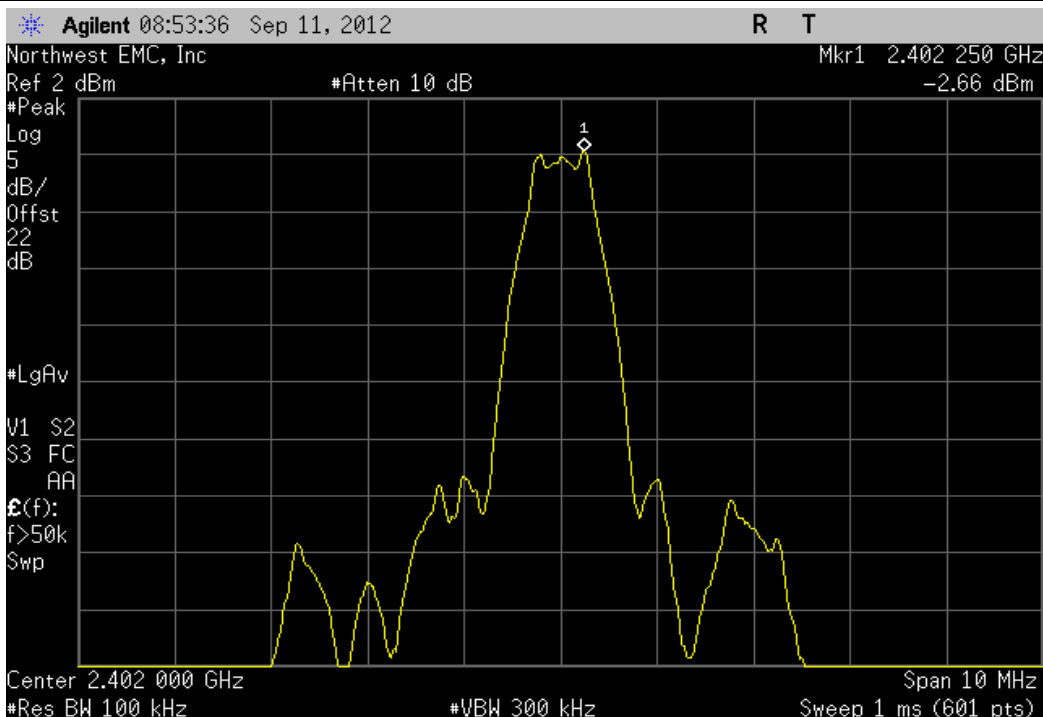


Power Spectral Density

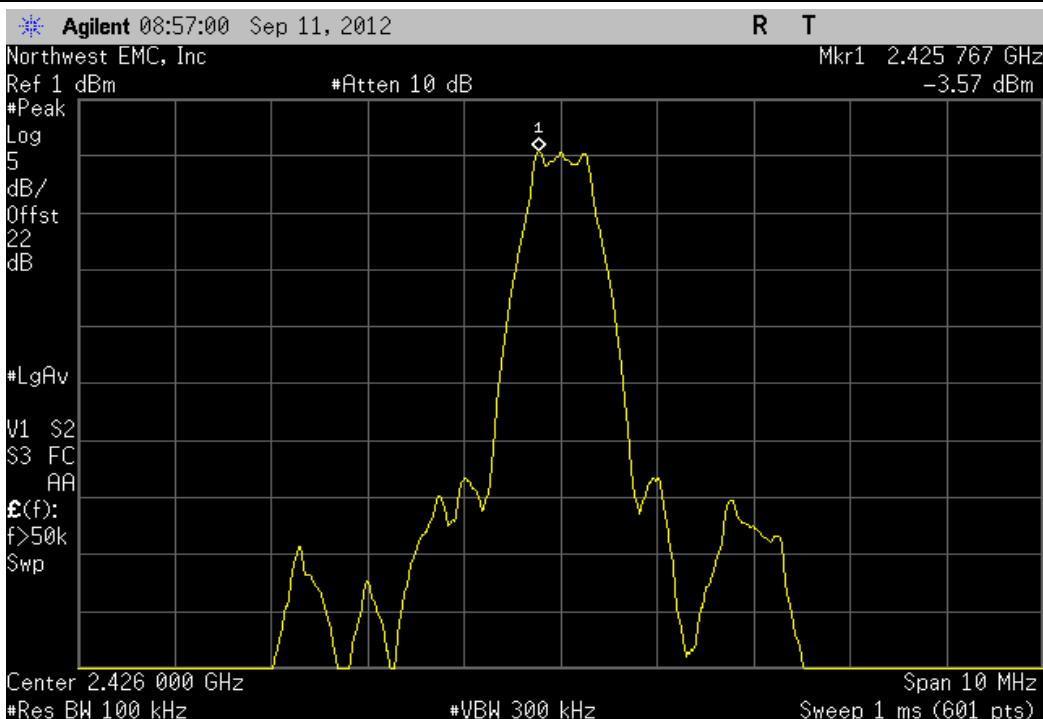
XMit 2012.07.31
PsaTx 2012.09.04

EUT: Blue Tiger		Work Order: TEN10003				
Serial Number: None		Date: 09/11/12				
Customer: Ten One Design		Temperature: 18°C				
Attendees: None		Humidity: 48%				
Project: None		Barometric Pres.: 1025				
Tested by: Brandon Hobbs and Rod Peloquin		Power: Battery				
Job Site: EV06						
TEST SPECIFICATIONS		Test Method				
FCC 15.247:2012		ANSI C63.10:2009				
COMMENTS						
The EUT was operating at 100% duty cycle while under test.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1	Signature <i>Rod Peloquin</i>				
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
BLE, ADV						
	Low Channel 0	-2.664	-15.2	-17.864	8	Pass
	Mid Channel 12	-3.572	-15.2	-18.772	8	Pass
	High Channel 39	-4.184	-15.2	-19.384	8	Pass
BLE, DATA						
	Low Channel 1	-2.897	-15.2	-18.097	8	Pass
	Mid Channel 20	-3.377	-15.2	-18.577	8	Pass
	High Channel 38	-4.223	-15.2	-19.423	8	Pass

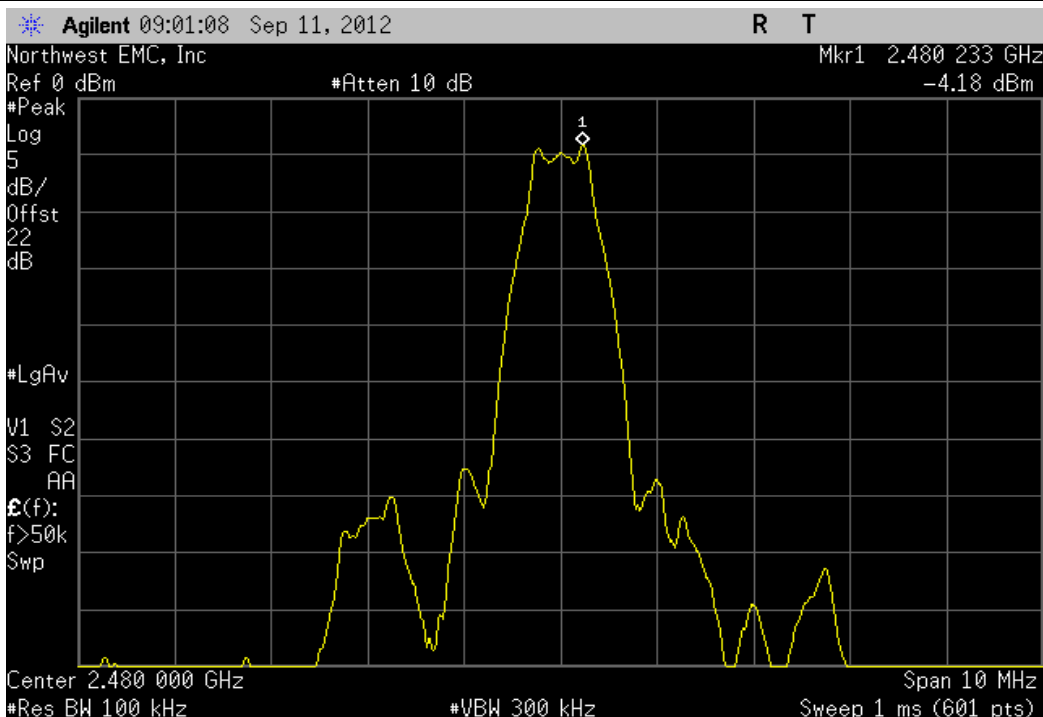
BLE, ADV, Low Channel 0					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz			
	-2.664	-15.2	-17.864	8	Pass



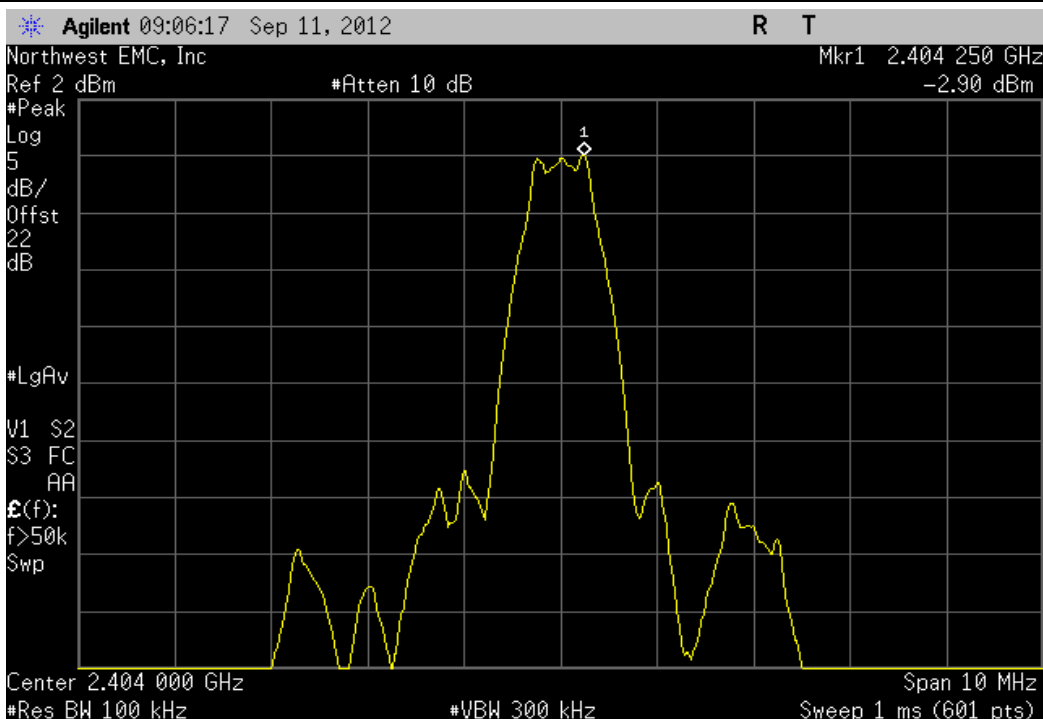
BLE, ADV, Mid Channel 12					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz			
	-3.572	-15.2	-18.772	8	Pass



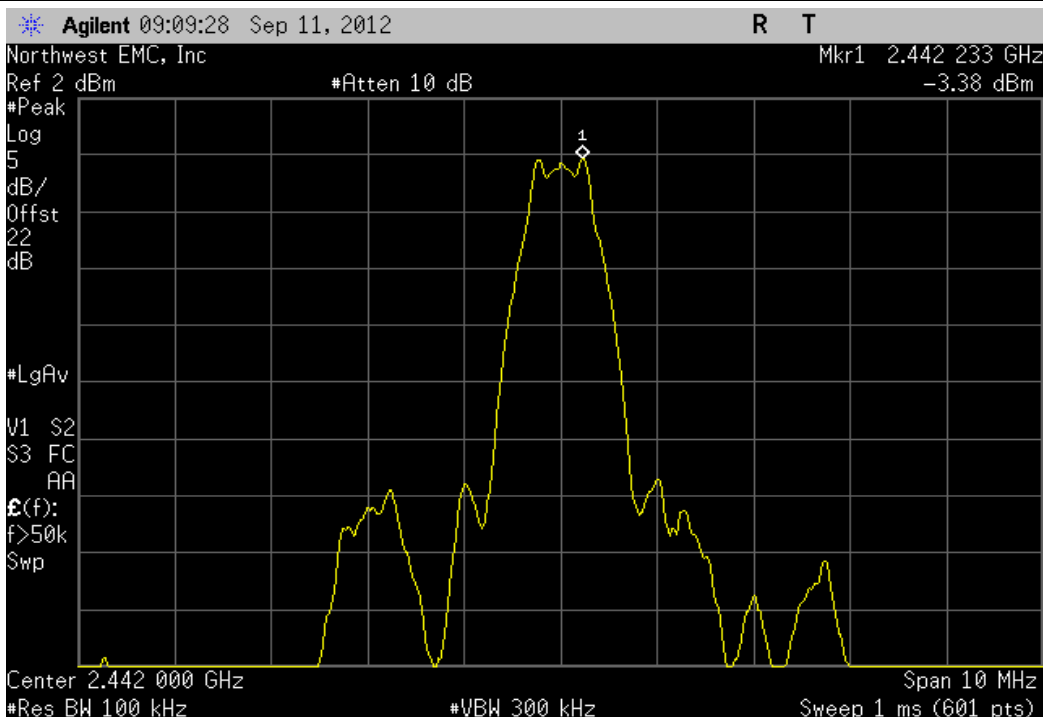
BLE, ADV, High Channel 39					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-4.184	-15.2	-19.384	8	Pass



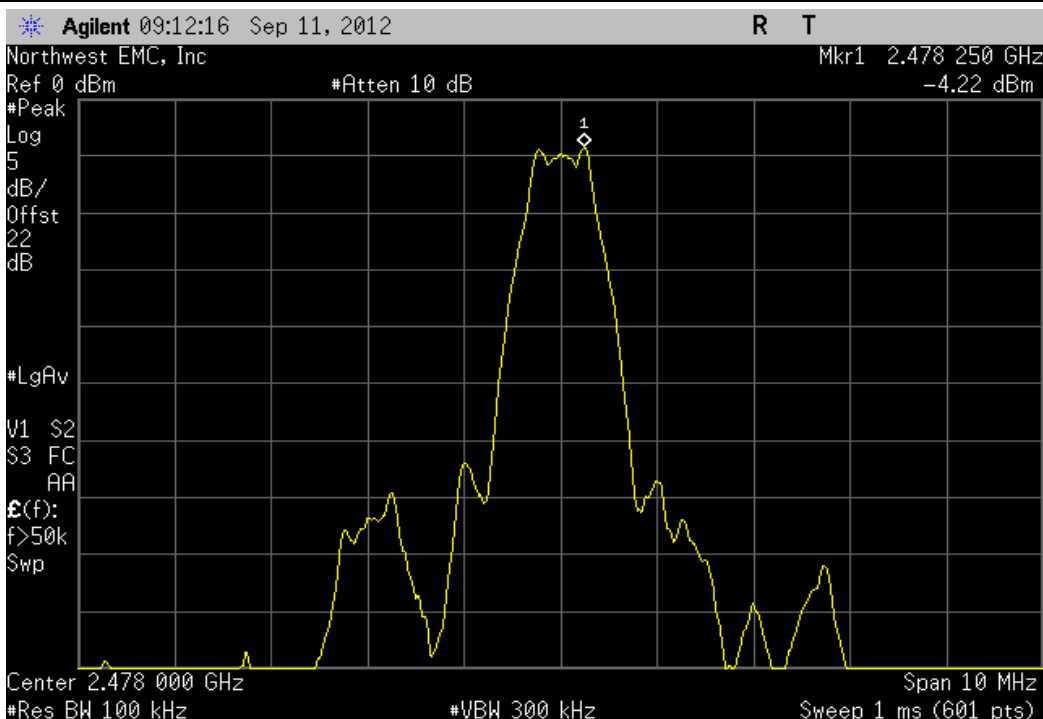
BLE, DATA, Low Channel 1					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-2.897	-15.2	-18.097	8	Pass



BLE, DATA, Mid Channel 20					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-3.377	-15.2	-18.577	8	Pass



BLE, DATA, High Channel 38					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	-4.223	-15.2	-19.423	8	Pass



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

MODES OF OPERATION

Transmitting Bluetooth Low Energy Data mode, 100% duty cycle
Transmitting Bluetooth Low Energy Advertising mode, 100% duty cycle

POWER SETTINGS INVESTIGATED

EUT Battery

CONFIGURATIONS INVESTIGATED

TEN10003 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 26.5 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
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
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.

Testing was done with the radio operating at 100% duty cycle.

During normal product operation the information below applies:

The duty cycle correction factor applied to the average detector measurements is based on the worst case transmitter on time in a given period for each available operating mode. The duty cycle correction factor is based on the formula of $20 * \text{LOG} (T_{\text{on}}/\text{Period})$.

When operating in the Advertising mode the total transmission time is 300us with a 20ms period between advertising events:

$$20 * \text{LOG}(.300/20) = -36.5 \text{ dB}$$

When operating in the Data mode the total transmission time is 100us with a 28ms period between data events:

$$20 * \text{LOG}(.100/28) = -48.9 \text{ dB}$$



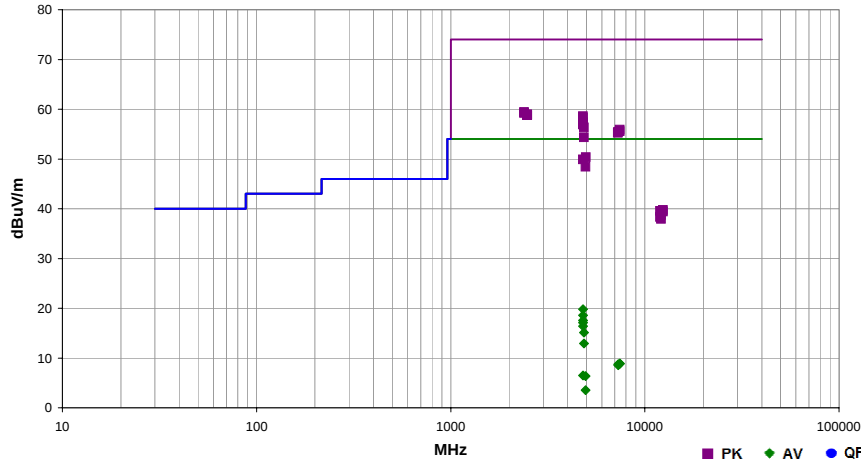
SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2012.06.08
PSA-ESCI Version 2011.12.21

Work Order:	TEN10003	Date:	09/17/12	
Project:	None	Temperature:	23.9 °C	
Job Site:	EV01	Humidity:	37% RH	
Serial Number:	None	Barometric Pres.:	1017.1 mbar	
EUT:	Blue Tiger			
Configuration:	1			
Customer:	Ten One Design			
Attendees:	None			
EUT Power:	EUT Battery			
Operating Mode:	Transmitting Bluetooth Low Energy Advertising mode, 100% duty cycle			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.247.2012	ANSI C63.10.2009

Run #	16	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	Duty Cycle Correction (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.530	37.9	1.6	1.0	117.0	3.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	EUT Horiz (button up), Adv Mode, Low CH (2402)
2388.237	37.7	1.6	1.2	245.0	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	EUT Vertical, Adv Mode, Low CH (2402)
2484.043	37.1	1.9	1.0	140.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	EUT Horiz (button up), Adv Mode, High CH (2480)
2485.427	37.0	1.9	1.0	328.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	EUT Vertical, Adv Mode, High CH (2480)
2484.913	37.0	1.9	1.0	0.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	EUT Horiz (button side), Adv Mode, High CH (2480)
2485.257	36.9	1.9	1.3	51.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	EUT Horiz (button side), Adv Mode, High CH (2480)
2484.137	36.9	1.9	1.0	278.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	EUT Horiz (button up), Adv Mode, High CH (2480)
2484.013	36.9	1.9	1.4	150.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	EUT Vertical, Adv Mode, High CH (2480)
4804.535	48.4	10.2	1.1	140.0	3.0	0.0	Horz	PK	0.0	58.6	74.0	-15.4	EUT Horiz (button side), Adv Mode, Low Ch (2402MHz)
4804.482	48.1	10.2	1.1	133.0	3.0	0.0	Horz	PK	0.0	58.3	74.0	-15.7	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
4803.582	47.2	10.2	2.2	100.0	3.0	0.0	Vert	PK	0.0	57.4	74.0	-16.6	EUT Horiz (button side), Adv Mode, Low Ch (2402MHz)
4804.448	46.9	10.2	2.2	90.0	3.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
4803.615	46.7	10.2	1.1	248.0	3.0	0.0	Vert	PK	0.0	56.9	74.0	-17.1	EUT Vert, Adv mode, Low Ch (2402MHz)
4851.667	46.0	10.3	1.0	221.0	3.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)
7441.520	36.4	19.5	1.0	145.0	3.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
7439.347	36.1	19.5	1.0	278.0	3.0	0.0	Vert	PK	0.0	55.6	74.0	-18.4	EUT Vertical, Adv Mode, High Ch (2480MHz)
7277.460	36.7	18.8	2.1	96.0	3.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
7276.420	36.5	18.8	1.0	29.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)
4851.380	44.0	10.3	1.0	210.0	3.0	0.0	Vert	PK	0.0	54.3	74.0	-19.7	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
4960.687	39.6	10.7	1.2	153.0	3.0	0.0	Horz	PK	0.0	50.3	74.0	-23.7	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
4804.148	39.7	10.2	1.0	266.0	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	EUT Vert, Adv mode, Low Ch (2402MHz)
4958.133	37.7	10.7	1.1	162.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	EUT Vertical, Adv Mode, High Ch (2480MHz)
4804.062	46.1	10.2	1.0	215.0	3.0	0.0	Horz	AV	-36.5	19.8	54.0	-34.2	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
12401.430	42.6	-2.9	1.0	152.0	3.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	EUT Vertical, Adv Mode, High Ch (2480MHz)
12008.390	45.0	-5.5	1.0	155.0	3.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	EUT Vertical (button up), Adv Mode, Low Ch (2402MHz)
12399.470	42.3	-2.9	3.1	171.0	3.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
12130.550	43.4	-4.7	1.0	96.0	3.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)
4804.062	44.9	10.2	1.1	156.0	3.0	0.0	Horz	AV	-36.5	18.6	54.0	-35.4	EUT Horiz (button side), Adv Mode, Low Ch (2402MHz)
12009.250	43.8	-5.5	1.0	258.0	3.0	0.0	Horz	PK	0.0	38.3	74.0	-35.7	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
12131.530	42.6	-4.7	1.0	279.0	3.0	0.0	Vert	PK	0.0	37.9	74.0	-36.1	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
4804.055	43.9	10.2	1.1	143.0	3.0	0.0	Vert	AV	-36.5	17.6	54.0	-36.4	EUT Vert, Adv mode, Low Ch (2402MHz)
4804.015	43.4	10.2	2.2	100.0	3.0	0.0	Vert	AV	-36.5	17.1	54.0	-36.9	EUT Horiz (button side), Adv Mode, Low Ch (2402MHz)
4803.922	42.7	10.2	2.2	90.0	3.0	0.0	Vert	AV	-36.5	16.4	54.0	-37.6	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
4852.107	41.3	10.3	1.0	221.0	3.0	0.0	Horz	AV	-36.5	15.1	54.0	-38.9	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)
4851.993	39.1	10.3	1.0	210.0	3.0	0.0	Vert	AV	-36.5	12.9	54.0	-41.1	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
7438.407	25.9	19.5	1.0	145.0	3.0	0.0	Horz	AV	-36.5	8.9	54.0	-45.1	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
7438.020	25.9	19.5	1.0	278.0	3.0	0.0	Vert	AV	-36.5	8.9	54.0	-45.1	EUT Vertical, Adv Mode, High Ch (2480MHz)
7278.680	26.5	18.8	2.1	96.0	3.0	0.0	Vert	AV	-36.5	8.8	54.0	-45.2	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
7278.640	26.3	18.8	1.0	29.0	3.0	0.0	Horz	AV	-36.5	8.6	54.0	-45.4	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)
4804.155	32.8	10.2	1.0	266.0	3.0	0.0	Horz	AV	-36.5	6.5	54.0	-47.5	EUT Vert, Adv mode, Low Ch (2402MHz)
4960.060	32.1	10.7	1.2	153.0	3.0	0.0	Horz	AV	-36.5	6.3	54.0	-47.7	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
4958.020	29.3	10.7	1.1	162.0	3.0	0.0	Vert	AV	-36.5	3.5	54.0	-50.5	EUT Vertical, Adv Mode, Mid Ch (2480MHz)
12402.000	31.7	-2.9	3.1	171.0	3.0	0.0	Horz	AV	-36.5	-7.7	54.0	-61.7	EUT Horiz (button up), Adv Mode, High Ch (2480MHz)
12398.990	31.6	-2.9	1.0	152.0	3.0	0.0	Vert	AV	-36.5	-7.8	54.0	-61.8	EUT Vertical, Adv Mode, High Ch (2480MHz)
2483.517	26.4	1.9	1.0	140.0	3.0	20.0	Horz	AV	-36.5	-8.2	54.0	-62.2	EUT Horiz (button up), Adv Mode, High CH (2480)
2485.420	26.3	1.9	1.3	51.0	3.0	20.0	Vert	AV	-36.5	-8.3	54.0	-62.3	EUT Horiz (button side), Adv Mode, High CH (2480)
2485.243	26.3	1.9	1.0	278.0	3.0	20.0	Vert	AV	-36.5	-8.3	54.0	-62.3	EUT Horiz (button up), Adv Mode, High CH (2480)
2485.207	26.3	1.9	1.4	150.0	3.0	20.0	Horz	AV	-36.5	-8.3	54.0	-62.3	EUT Vertical, Adv Mode, High CH (2480)
2483.533	26.3	1.9	1.0	328.0	3.0	20.0	Vert	AV	-36.5	-8.3	54.0	-62.3	EUT Vertical, Adv Mode, High CH (2480)
2485.413	26.2	1.9	1.0	0.0	3.0	20.0	Horz	AV	-36.5	-8.4	54.0	-62.4	EUT Horiz (button side), Adv Mode, High CH (2480)
2389.247	26.5	1.5	1.2	245.0	3.0	20.0	Vert	AV	-36.5	-8.5	54.0	-62.5	EUT Vertical, Adv Mode, Low CH (2402)
2389.593	26.5	1.5	1.0	117.0	3.0	20.0	Horz	AV	-36.5	-8.5	54.0	-62.5	EUT Horiz (button up), Adv Mode, Low CH (2402)
12011.870	33.4	-5.5	1.0	155.0	3.0	0.0	Vert	AV	-36.5	-8.6	54.0	-62.6	EUT Vertical (button up), Adv Mode, Low Ch (2402MHz)
12010.050	33.4	-5.5	1.0	258.0	3.0	0.0	Horz	AV	-36.5	-8.6	54.0	-62.6	EUT Horiz (button up), Adv Mode, Low Ch (2402MHz)
12129.170	32.2	-4.7	1.0	279.0	3.0	0.0	Vert	AV	-36.5	-9.0	54.0	-63.0	EUT Vertical, Adv Mode, Mid Ch (2426MHz)
12128.350	32.2	-4.7	1.0	96.0	3.0	0.0	Horz	AV	-36.5	-9.0	54.0	-63.0	EUT Horiz (button up), Adv Mode, Mid Ch (2426MHz)



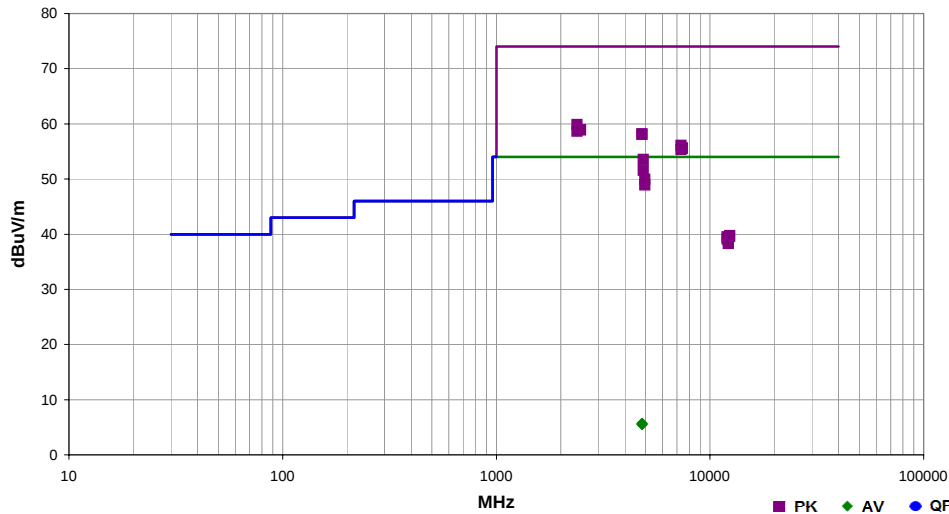
SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2012.09.10
PSA-ESCI Version 2011.12.21

Work Order:	TEN10003	Date:	09/24/12	
Project:	None	Temperature:	22.7 °C	
Job Site:	EV01	Humidity:	42% RH	
Serial Number:	None	Barometric Pres.:	1020.3 mbar	
EUT:	Blue Tiger			
Configuration:	1			
Customer:	Ten One Design			
Attendees:	None			
EUT Power:	EUT Battery			
Operating Mode:	Transmitting Bluetooth Low Energy Data mode, 100% duty cycle			
Deviations:	None			
Comments:	None			

Test Specifications	FCC 15.247:2012	Test Method	ANSI C63.10:2009
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Run #	17	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	Duty Cycle Correction (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.133	38.3	1.5	1.0	201.0	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	EUT Horiz (button up), Data Mode, Low CH (2404)
2484.253	37.1	1.9	1.0	1.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	EUT Horiz (button up), Data Mode, High CH (2478)
2485.120	37.0	1.9	1.0	98.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	EUT Vertical, Data Mode, High CH (2478)
2388.917	37.1	1.6	1.0	333.0	3.0	20.0	Vert	PK	0.0	58.7	74.0	-15.4	EUT Vertical, Data Mode, Low CH (2404)
4808.473	48.0	10.2	1.0	221.0	3.0	0.0	Horz	PK	0.0	58.2	74.0	-15.8	EUT Horiz (button up), Data Mode, Low CH (2404)
4807.487	47.9	10.2	1.2	276.0	3.0	0.0	Vert	PK	0.0	58.1	74.0	-15.9	EUT Vertical, Data Mode, Low CH (2404)
7325.833	37.1	19.0	1.8	120.0	3.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	EUT Vertical, Data Mode, Mid CH (2442)
7434.787	36.2	19.4	1.0	130.0	3.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	EUT Horiz (button up), Data Mode, High CH (2478)
7434.267	36.1	19.4	1.0	130.0	3.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	EUT Vertical, Data Mode, High CH (2478)
7325.507	36.3	19.0	1.0	53.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT Horiz (button up), Data Mode, Mid CH (2442)
4884.533	43.1	10.4	1.0	214.0	3.0	0.0	Horz	PK	0.0	53.5	74.0	-20.5	EUT Horiz (button up), Data Mode, Mid CH (2442)
4884.367	41.1	10.4	1.2	252.0	3.0	0.0	Vert	PK	0.0	51.5	74.0	-22.5	EUT Vertical, Data Mode, Mid CH (2442)
4955.460	39.2	10.7	1.3	82.0	3.0	0.0	Vert	PK	0.0	49.9	74.0	-24.1	EUT Vertical, Data Mode, High CH (2478)
4955.513	38.2	10.7	1.0	141.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	EUT Horiz (button up), Data Mode, High CH (2478)
12390.430	42.7	-2.9	1.0	281.0	3.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	EUT Vertical, Data Mode, High CH (2478)
12388.810	42.5	-3.0	1.0	248.0	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.5	EUT Horiz (button up), Data Mode, High CH (2478)
12020.060	44.9	-5.4	1.0	276.0	3.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	EUT Vertical, Data Mode, Low CH (2404)
12020.080	44.5	-5.4	1.0	73.0	3.0	0.0	Horz	PK	0.0	39.1	74.0	-34.9	EUT Horiz (button up), Data Mode, Low CH (2404)
12210.610	42.9	-4.1	1.0	154.0	3.0	0.0	Vert	PK	0.0	38.8	74.0	-35.2	EUT Vertical, Data Mode, Mid CH (2442)
12210.230	42.4	-4.1	1.0	248.0	3.0	0.0	Horz	PK	0.0	38.3	74.0	-35.7	EUT Horiz (button up), Data Mode, Mid CH (2442)
4807.887	44.4	10.2	1.0	221.0	3.0	0.0	Horz	AV	-48.9	5.7	54.0	-48.3	EUT Horiz (button up), Data Mode, Low CH (2404)
4808.013	44.2	10.2	1.2	276.0	3.0	0.0	Vert	AV	-48.9	5.5	54.0	-48.5	EUT Vertical, Data Mode, Low CH (2404)
4883.900	37.3	10.4	1.0	214.0	3.0	0.0	Horz	AV	-48.9	-1.2	54.0	-55.2	EUT Horiz (button up), Data Mode, Mid CH (2442)
7433.747	26.1	19.4	1.0	130.0	3.0	0.0	Vert	AV	-48.9	-3.4	54.0	-57.4	EUT Vertical, Data Mode, High CH (2478)
7433.147	25.9	19.4	1.0	130.0	3.0	0.0	Horz	AV	-48.9	-3.6	54.0	-57.6	EUT Horiz (button up), Data Mode, High CH (2478)
7325.360	26.3	19.0	1.8	120.0	3.0	0.0	Vert	AV	-48.9	-3.6	54.0	-57.6	EUT Vertical, Data Mode, Mid CH (2442)
4884.027	34.8	10.4	1.2	252.0	3.0	0.0	Vert	AV	-48.9	-3.7	54.0	-57.7	EUT Vertical, Data Mode, Mid CH (2442)
7325.413	26.0	19.0	1.0	53.0	3.0	0.0	Horz	AV	-48.9	-3.9	54.0	-57.9	EUT Horiz (button up), Data Mode, Mid CH (2442)
4955.907	31.4	10.7	1.3	82.0	3.0	0.0	Vert	AV	-48.9	-6.8	54.0	-60.8	EUT Vertical, Data Mode, High CH (2478)
4955.913	30.7	10.7	1.0	141.0	3.0	0.0	Horz	AV	-48.9	-7.5	54.0	-61.5	EUT Horiz (button up), Data Mode, High CH (2478)
12388.340	31.9	-3.0	1.0	281.0	3.0	0.0	Vert	AV	-48.9	-20.0	54.0	-74.0	EUT Vertical, Data Mode, High CH (2478)
12388.360	31.8	-3.0	1.0	248.0	3.0	0.0	Horz	AV	-48.9	-20.1	54.0	-74.1	EUT Horiz (button up), Data Mode, High CH (2478)
12019.730	33.8	-5.4	1.0	73.0	3.0	0.0	Horz	AV	-48.9	-20.5	54.0	-74.5	EUT Horiz (button up), Data Mode, Low CH (2404)
12018.960	33.8	-5.4	1.0	276.0	3.0	0.0	Vert	AV	-48.9	-20.5	54.0	-74.5	EUT Vertical, Data Mode, Low CH (2404)
2485.047	26.4	1.9	1.0	1.0	3.0	20.0	Horz	AV	-48.9	-20.6	54.0	-74.6	EUT Horiz (button up), Data Mode, High CH (2478)
2484.740	26.3	1.9	1.0	98.0	3.0	20.0	Vert	AV	-48.9	-20.7	54.0	-74.7	EUT Vertical, Data Mode, High CH (2478)
12208.360	32.2	-4.1	1.0	248.0	3.0	0.0	Horz	AV	-48.9	-20.8	54.0	-74.8	EUT Horiz (button up), Data Mode, Mid CH (2442)
2389.073	26.5	1.5	1.0	201.0	3.0	20.0	Horz	AV	-48.9	-20.9	54.0	-74.9	EUT Horiz (button up), Data Mode, Low CH (2404)
2389.817	26.5	1.5	1.0	333.0	3.0	20.0	Vert	AV	-48.9	-20.9	54.0	-74.9	EUT Vertical, Data Mode, Low CH (2404)
12208.620	32.1	-4.1	1.0	154.0	3.0	0.0	Vert	AV	-48.9	-20.9	54.0	-74.9	EUT Vertical, Data Mode, Mid CH (2442)