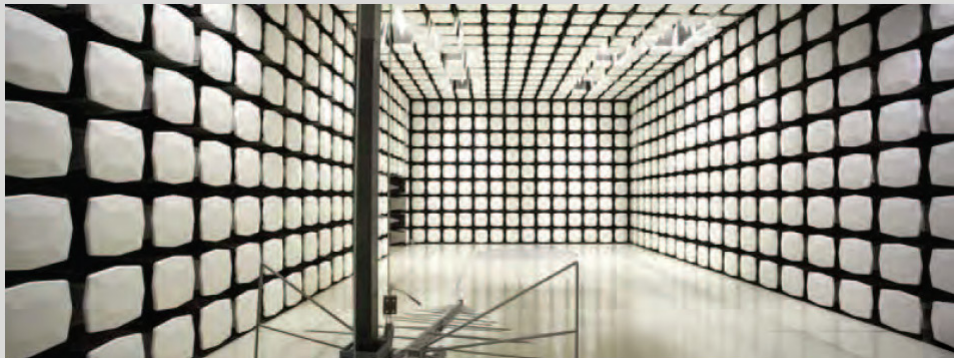




Logic PD, Inc.
37x Torpedo + Wireless SOM -31
FCC 15.207:2013
FCC 15.247:2013
Report #: LGPD0096.3



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: June 03, 2013

Logic PD, Inc.

Model: 37x Torpedo + Wireless SOM -31

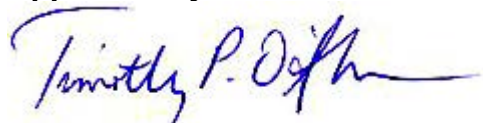
Emissions

Test Description	Specification	Test Method	Pass/Fail
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
Powerline Conducted Emissions	FCC 15.207:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200881-0

Test Facility

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

Northwest EMC, Inc.
9349 W Broadway Ave.
Brooklyn Park, MN 55445

Phone: (763) 425-2281 Fax: (763) 424-3469

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

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

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

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Hong Kong

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

Vietnam

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

Russia

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

SCOPE

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

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

Measurement Uncertainty

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

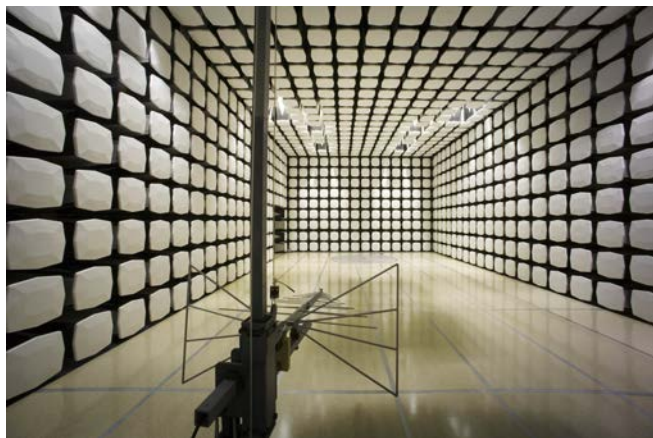
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement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

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

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



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05, SU02, SU07 19201 120 th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0



Client and Equipment Under Test (EUT) Information

Company Name:	Logic PD, Inc.
Address:	6201 Bury Drive
City, State, Zip:	Eden Prairie, MN 55346
Test Requested By:	Nathan Kro
Model:	37x Torpedo + Wireless SOM -31
First Date of Test:	May 22, 2013
Last Date of Test:	June 03, 2013
Receipt Date of Samples:	May 21, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Bluetooth radio module with 1 antenna
Testing Objective:
To demonstrate compliance under FCC 15.247 for operation in the 2.4 GHz and 5.8 GHz bands.

Configuration LGPD0096- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
802.11 and BT module	Logic PD, Inc.	37x Torpedo + Wireless SOM -31	1413M00359

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply	Sceptre	AD2405A	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Acer	Aspire One	LUSAL0B1370114F42B1601
Laptop Supply	Delta Electronics Inc	ADP-40TH A	AP0400100201108409P101

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.8m	No	Power Supply	AC Mains
DC Power	No	1.5m	No	802.11 and BT module	Power Supply
DC Power	No	2.4m	Yes	Laptop	Laptop Supply
Serial	Yes	> 3.0m	No	802.11 and BT module	Laptop
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration LGPD0096- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
802.11 and BT module	Logic PD, Inc.	37x Torpedo + Wireless SOM -31	1413M00359

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply	Sceptre	AD2405A	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.8m	No	Power Supply	AC Mains
DC Power	No	1.5m	No	802.11 and BT module	Power Supply
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	5/22/2013	Spurious Radiated Emissions	Modified from delivered configuration.	Power lowered to pass radiated band edge. Modification authorized by Nathan Kro.	EUT remained at Northwest EMC following the test.
2	5/30/2013	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	6/3/2013	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.
4	6/3/2013	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.
5	6/3/2013	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	6/3/2013	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	6/3/2013	Band Edge Compliance	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.

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
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/12/2013	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/5/2012	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	24

TEST DESCRIPTION

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

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



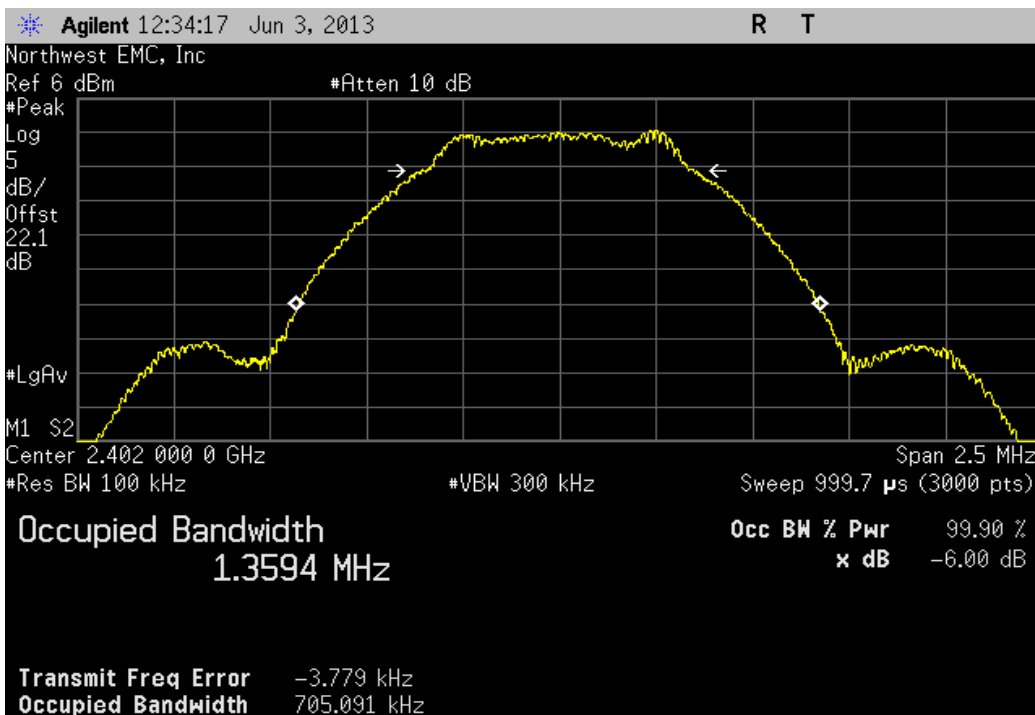
Occupied Bandwidth

XMit 2013.02.28
PsaTx 2013.06.03

EUT: 37x Torpedo + Wireless SOM -31		Work Order: LGPD0096	
Serial Number: 1413M00359		Date: 06/03/13	
Customer: Logic PD, Inc.		Temperature: 23.1°C	
Attendees: None		Humidity: 39%	
Project: None		Barometric Pres.: 1015.6	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Trevor Buls</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		705.09 kHz	≥ 500 kHz
Mid Channel, 2426 MHz		690.383 kHz	≥ 500 kHz
High Channel, 2480 MHz		709.416 kHz	≥ 500 kHz
BLE - Data			
Low Channel, 2404 MHz		703.572 kHz	≥ 500 kHz
Mid Channel, 2442 MHz		692.524 kHz	≥ 500 kHz
High Channel, 2478 MHz		697.359 kHz	≥ 500 kHz

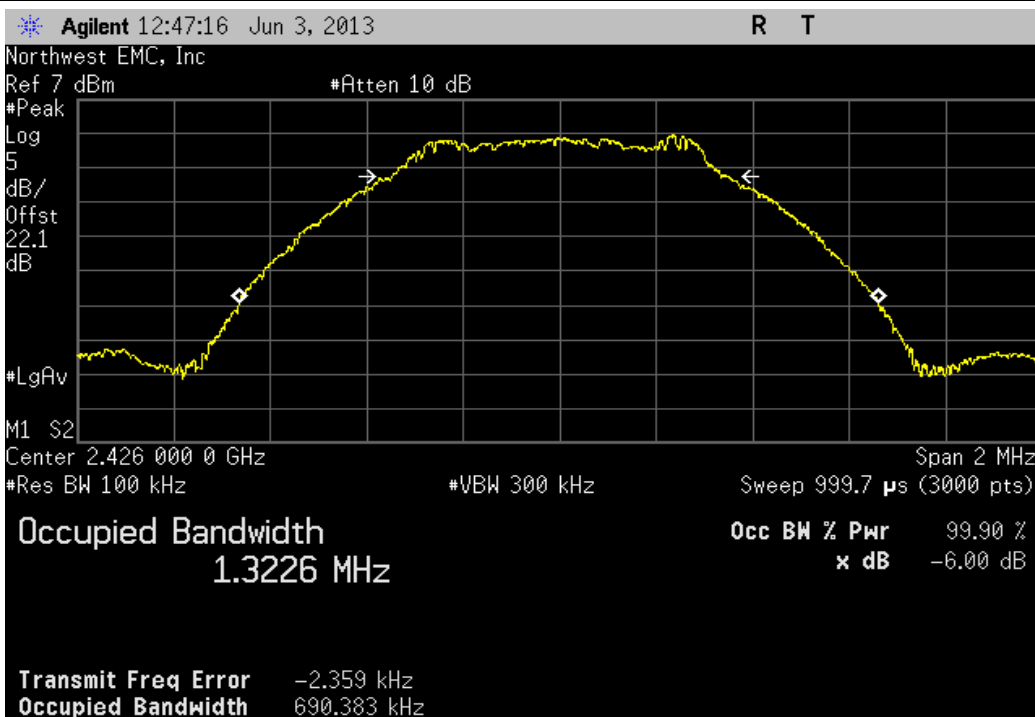
BLE - Advertising, Low Channel, 2402 MHz

				Value	Limit	Result
				705.09 kHz	≥ 500 kHz	Pass



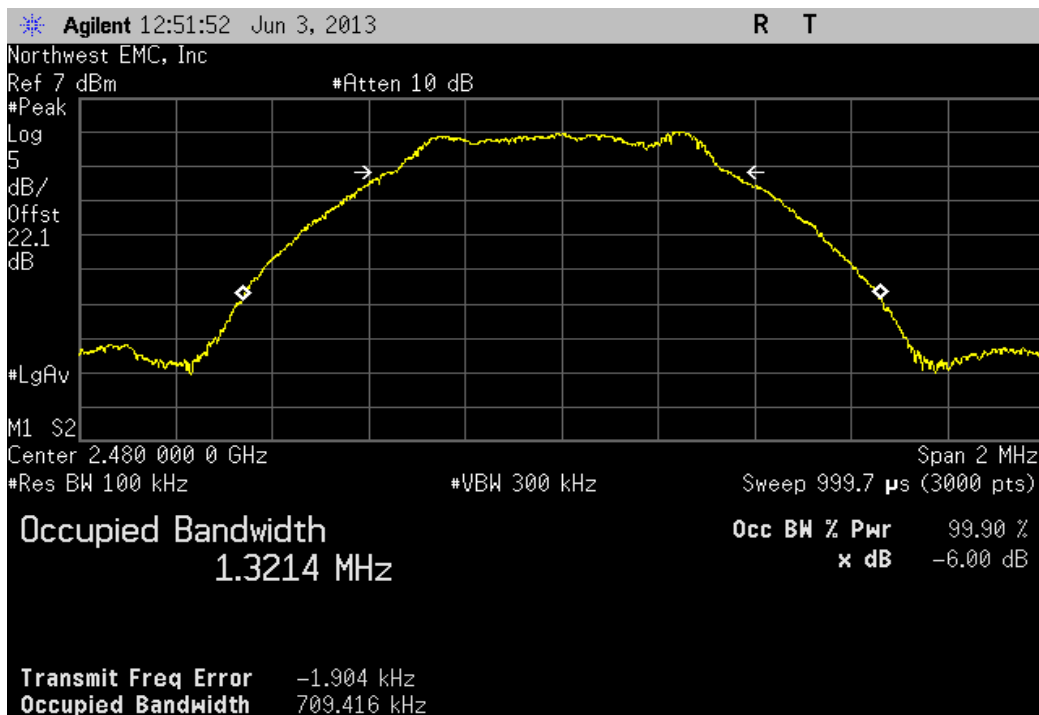
BLE - Advertising, Mid Channel, 2426 MHz

				Value	Limit	Result
				690.383 kHz	≥ 500 kHz	Pass



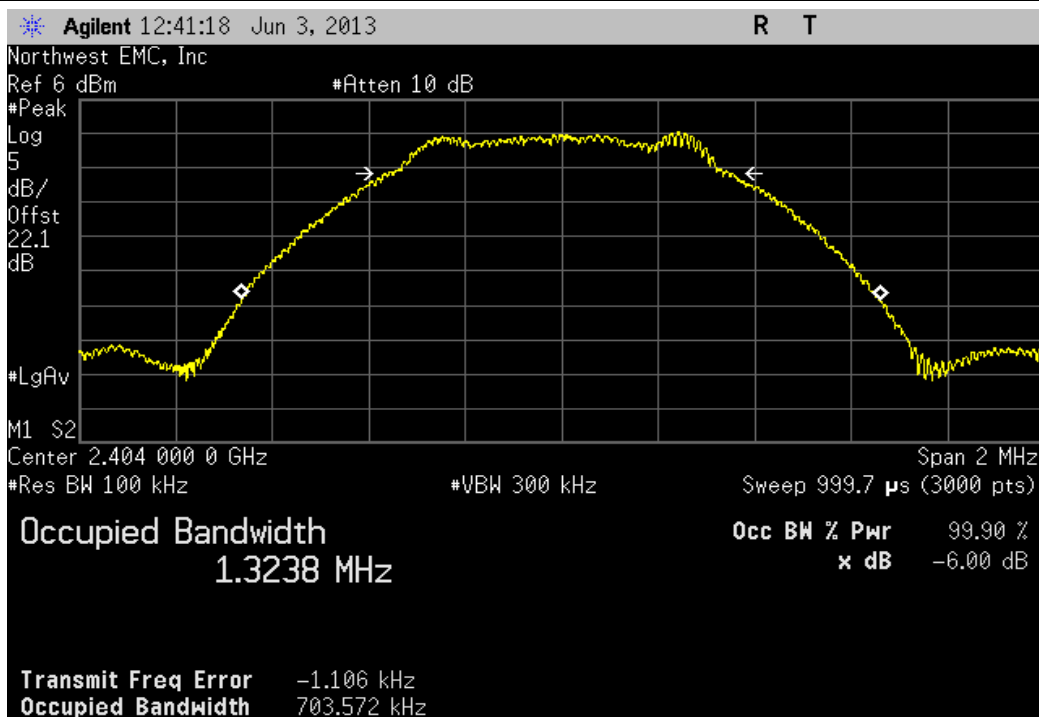
BLE - Advertising, High Channel, 2480 MHz

Value	Limit	Result
709.416 kHz	≥ 500 kHz	Pass



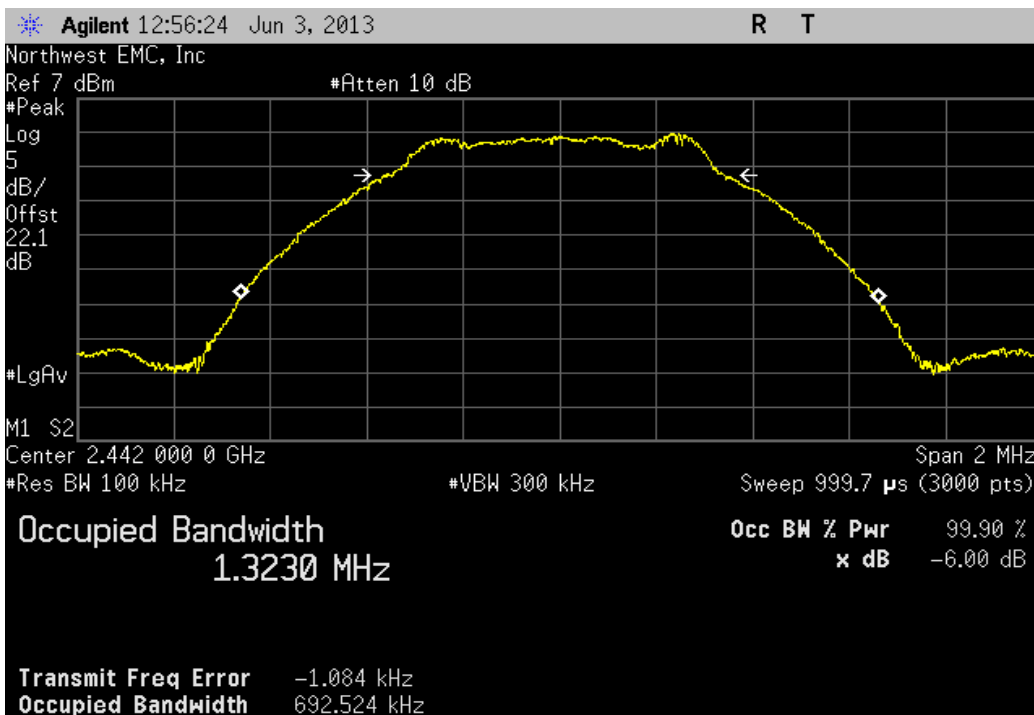
BLE - Data, Low Channel, 2404 MHz

Value	Limit	Result
703.572 kHz	≥ 500 kHz	Pass



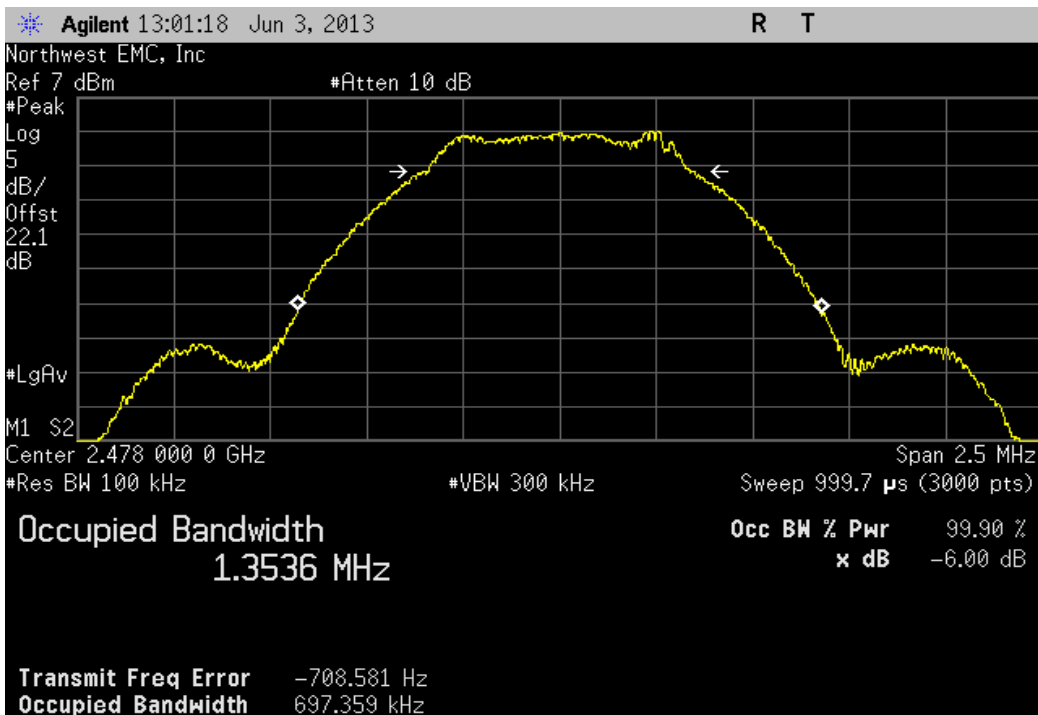
BLE - Data, Mid Channel, 2442 MHz

Value	Limit	Result
692.524 kHz	≥ 500 kHz	Pass



BLE - Data, High Channel, 2478 MHz

Value	Limit	Result
697.359 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
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/12/2013	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/5/2012	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	24

TEST DESCRIPTION

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

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

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



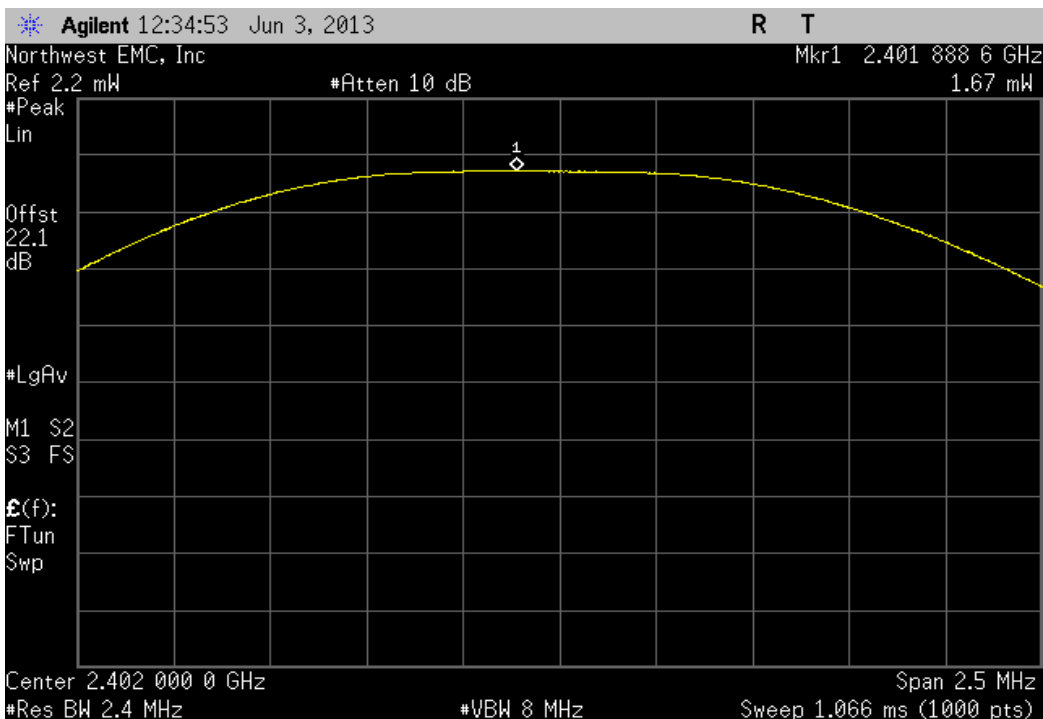
Output Power

XMit 2013.02.28
PsaTx 2013.06.03

EUT: 37x Torpedo + Wireless SOM -31		Work Order: LGPD0096	
Serial Number: 1413M00359		Date: 06/03/13	
Customer: Logic PD, Inc.		Temperature: 23.1°C	
Attendees: None		Humidity: 39%	
Project: None		Barometric Pres.: 1015.6	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Trevor Buls</i>	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		1.673 mW	< 1 W
Mid Channel, 2426 MHz		1.835 mW	< 1 W
High Channel, 2480 MHz		2 mW	< 1 W
BLE - Data			
Low Channel, 2404 MHz		1.631 mW	< 1 W
Mid Channel, 2442 MHz		1.852 mW	< 1 W
High Channel, 2478 MHz		1.996 mW	< 1 W

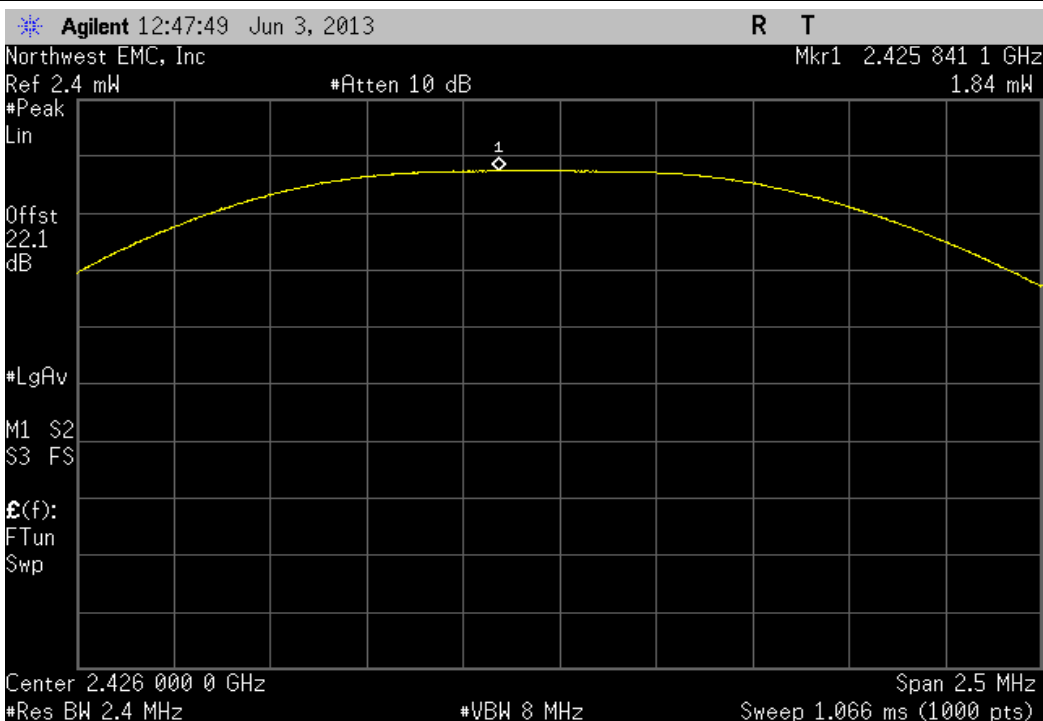
BLE - Advertising, Low Channel, 2402 MHz

	Value	Limit	Result
	1.673 mW	< 1 W	Pass



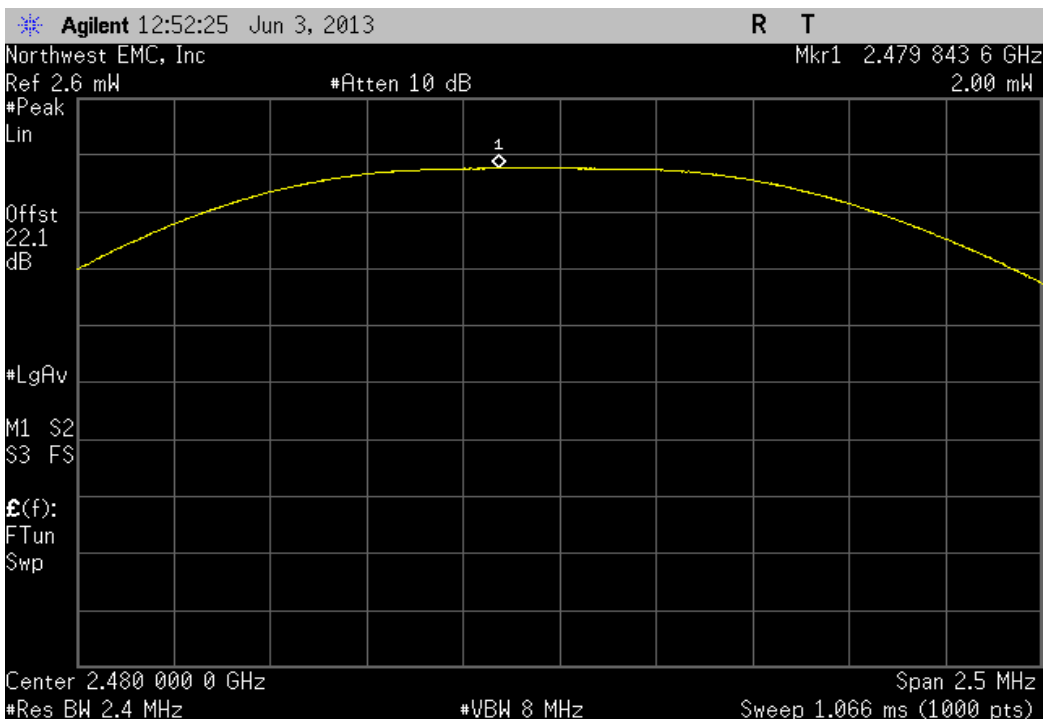
BLE - Advertising, Mid Channel, 2426 MHz

	Value	Limit	Result
	1.835 mW	< 1 W	Pass



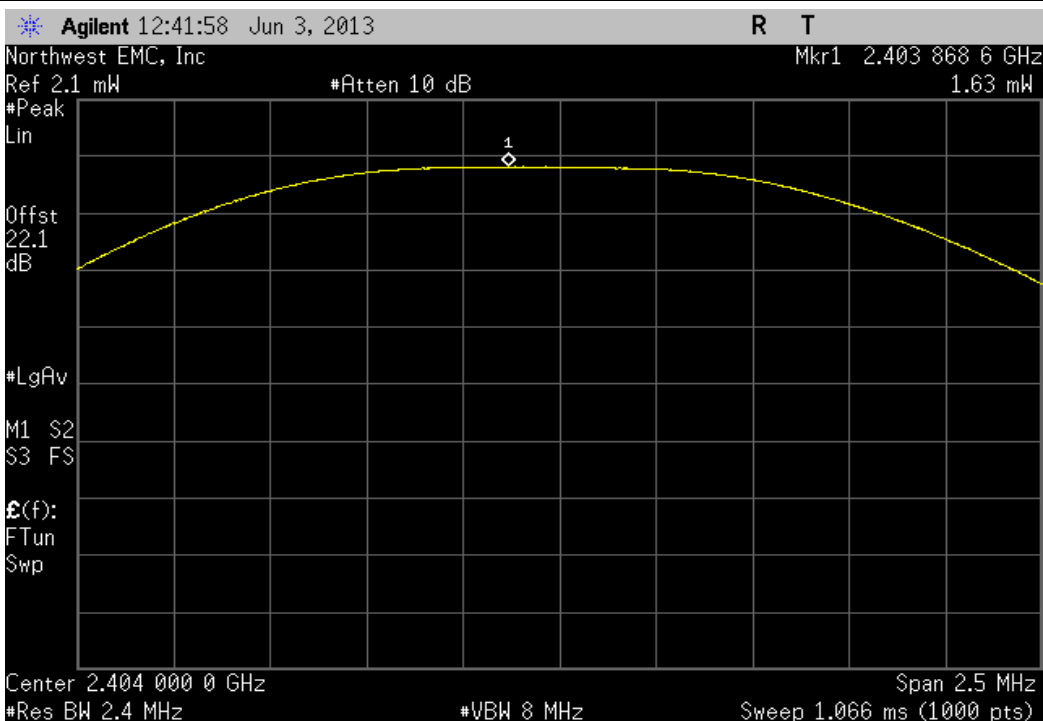
BLE - Advertising, High Channel, 2480 MHz

Value	Limit	Result
2 mW	< 1 W	Pass



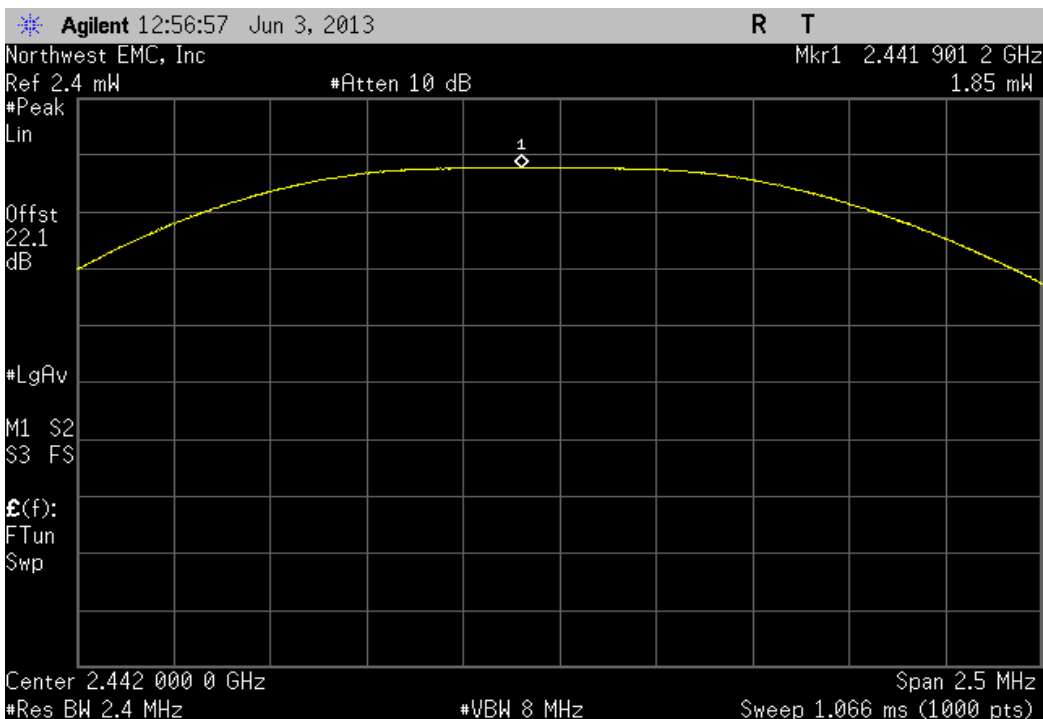
BLE - Data, Low Channel, 2404 MHz

Value	Limit	Result
1.631 mW	< 1 W	Pass



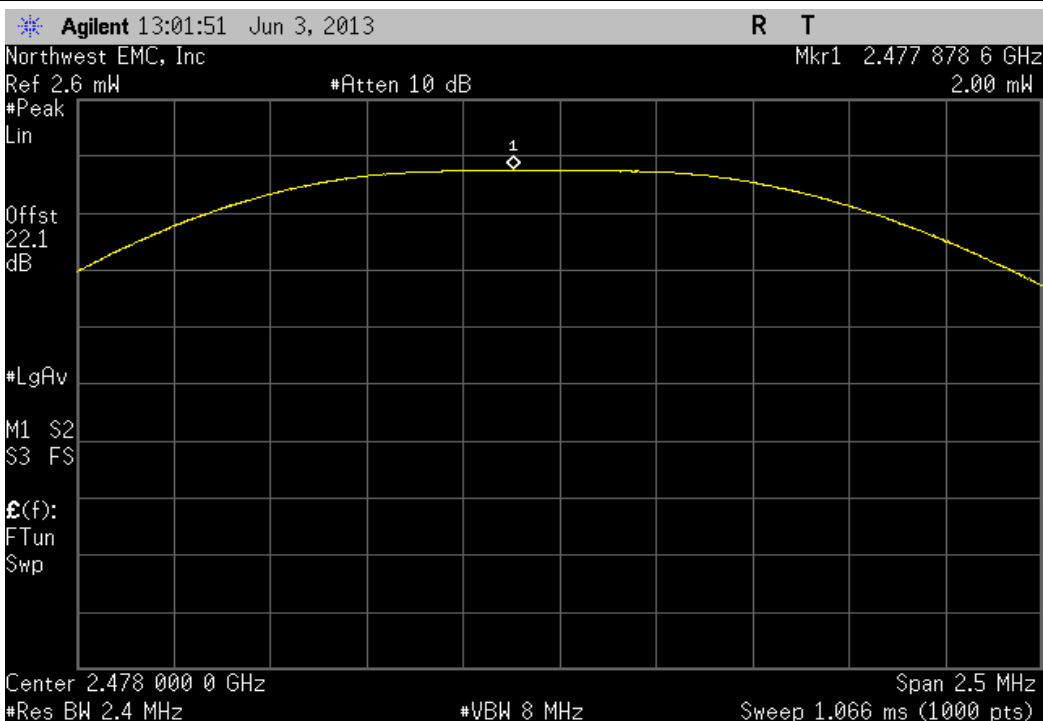
BLE - Data, Mid Channel, 2442 MHz

Value	Limit	Result
1.852 mW	< 1 W	Pass



BLE - Data, High Channel, 2478 MHz

Value	Limit	Result
1.996 mW	< 1 W	Pass



Band Edge Compliance

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


TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/12/2013	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/5/2012	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	24

TEST DESCRIPTION

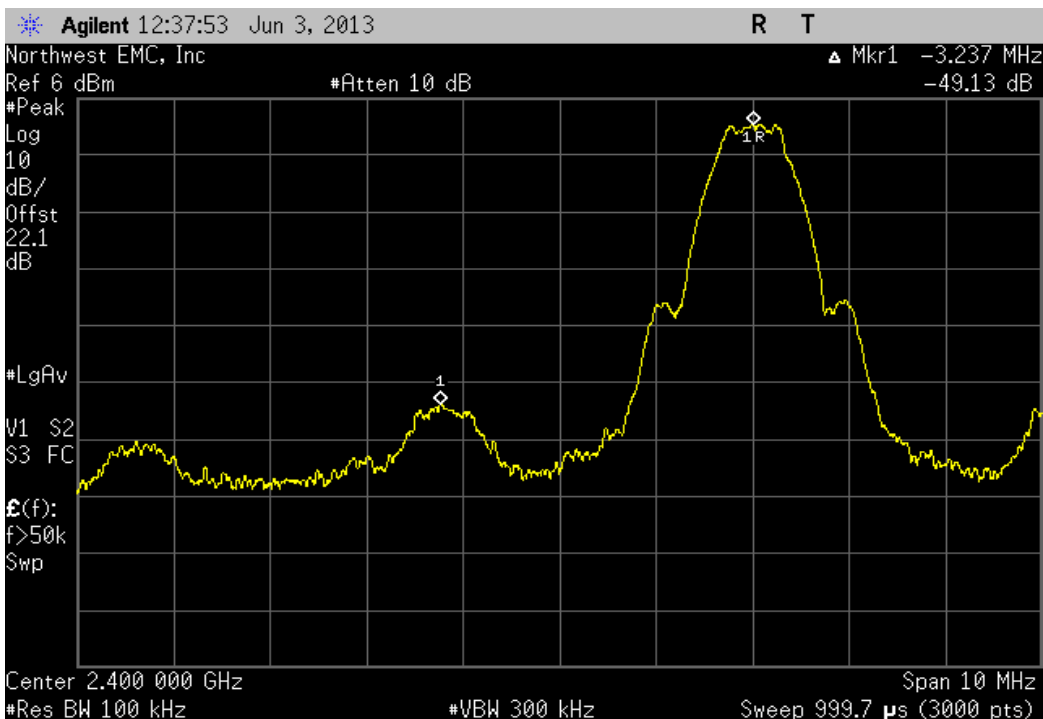
The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT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

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

EUT: 37x Torpedo + Wireless SOM -31		Work Order: LGPD0096	
Serial Number: 1413M00359		Date: 06/03/13	
Customer: Logic PD, Inc.		Temperature: 23.1°C	
Attendees: None		Humidity: 39%	
Project: None		Barometric Pres.: 1015.6	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
Job Site: MN08			
TEST SPECIFICATIONS		Test Method	
FCC 15.247.2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature 	
		Value	Limit
BLE - Advertising			Result
Low Channel, 2402 MHz		-49.13 dBc	≤ -20 dBc
High Channel, 2480 MHz		-53.33 dBc	≤ -20 dBc
BLE - Data			Result
Low Channel, 2404 MHz		-55.48 dBc	≤ -20 dBc
High Channel, 2478 MHz		-52.86 dBc	≤ -20 dBc
			Pass

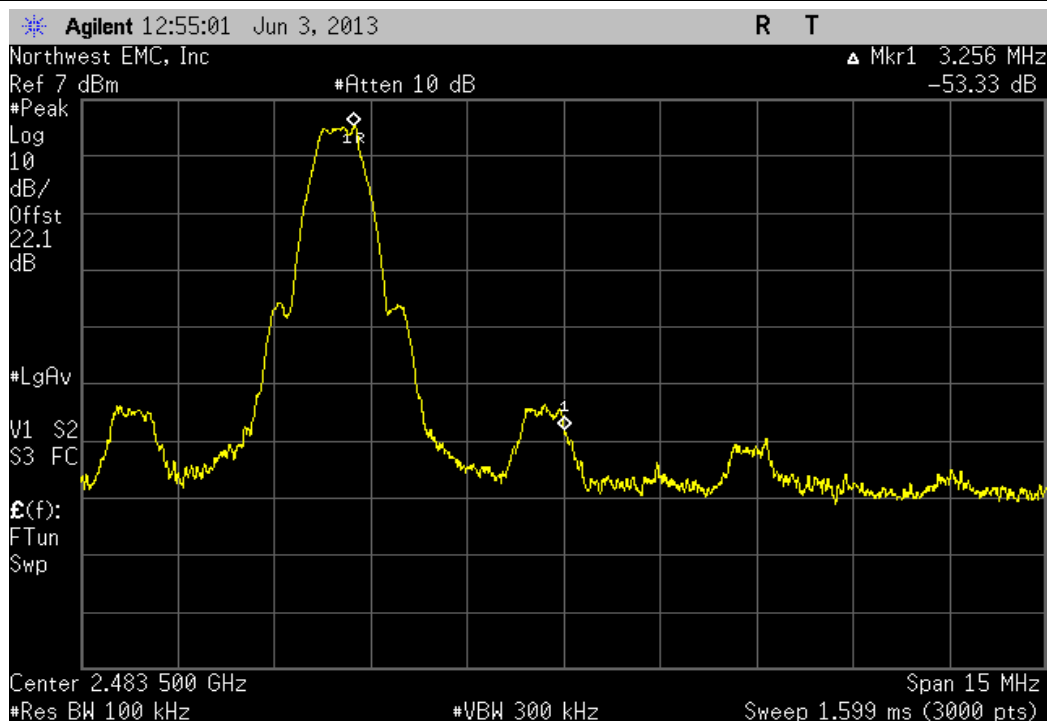
BLE - Advertising, Low Channel, 2402 MHz

Value	Limit	Result
-49.13 dBc	≤ -20 dBc	Pass



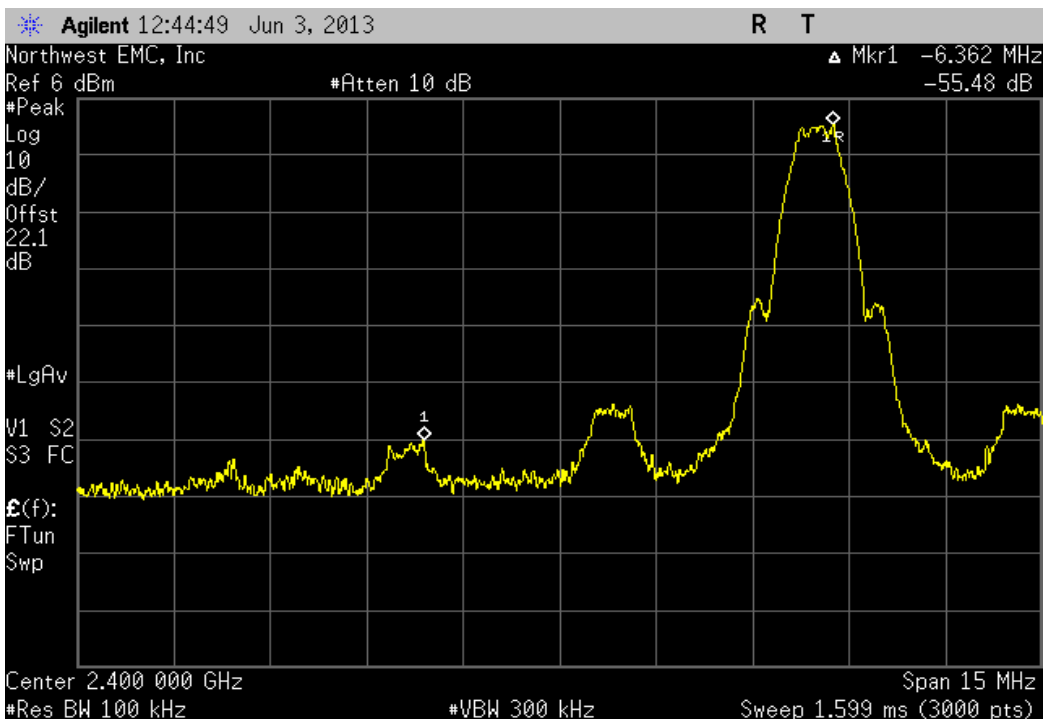
BLE - Advertising, High Channel, 2480 MHz

Value	Limit	Result
-53.33 dBc	≤ -20 dBc	Pass



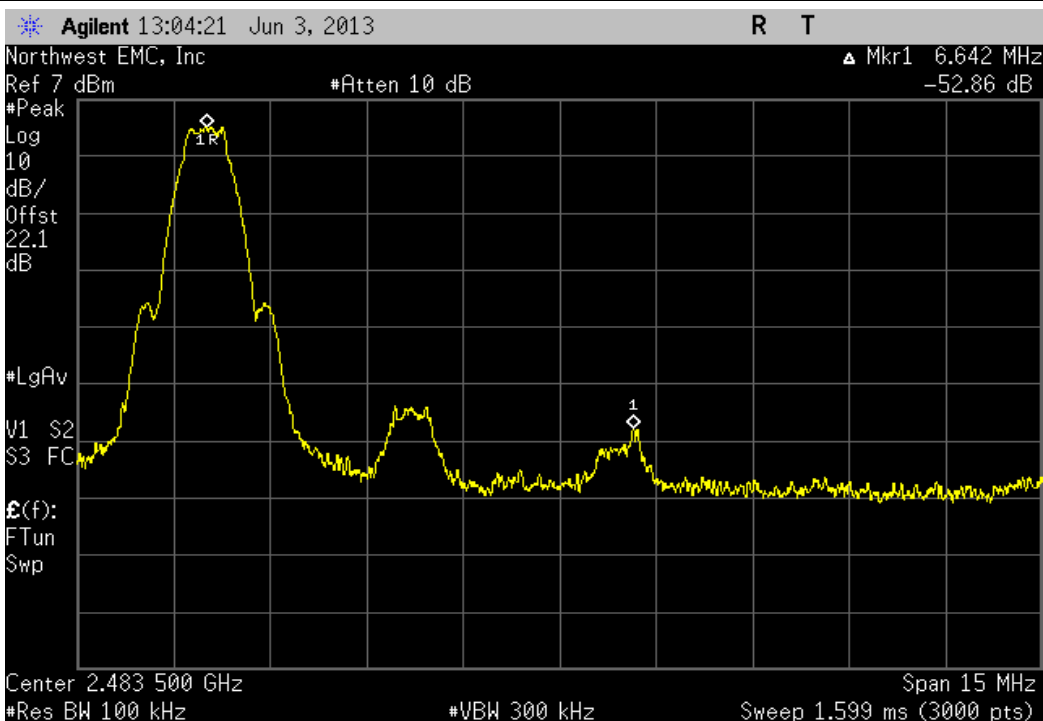
BLE - Data, Low Channel, 2404 MHz

Value	Limit	Result
-55.48 dBc	≤ -20 dBc	Pass



BLE - Data, High Channel, 2478 MHz

Value	Limit	Result
-52.86 dBc	≤ -20 dBc	Pass



Spurious Conducted Emissions

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/12/2013	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/5/2012	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	24

TEST DESCRIPTION

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

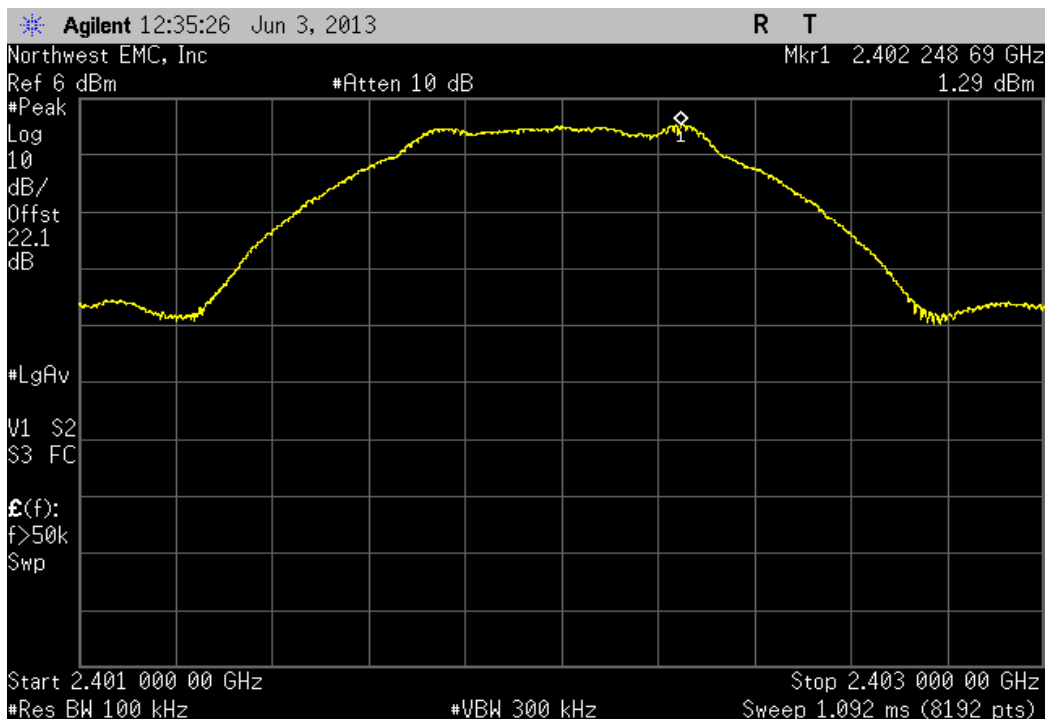


Spurious Conducted Emissions

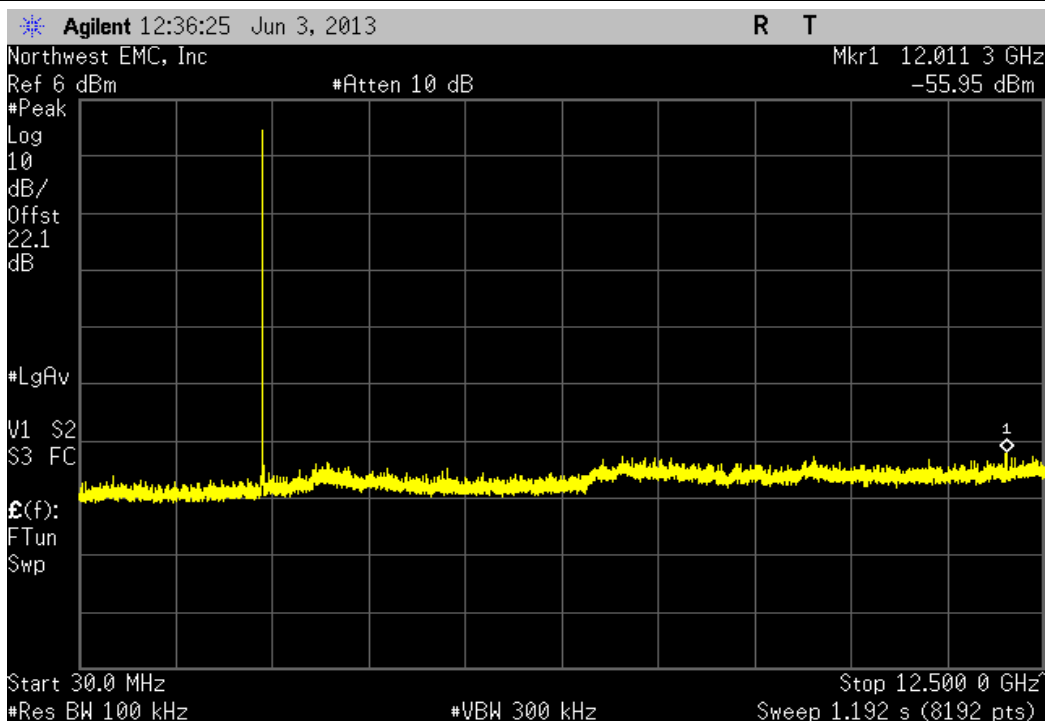
XMit 2013.02.28
PsaTx 2013.06.03

EUT: 37x Torpedo + Wireless SOM -31		Work Order: LGPD0096	
Serial Number: 1413M00359		Date: 06/03/13	
Customer: Logic PD, Inc.		Temperature: 23.1°C	
Attendees: None		Humidity: 39%	
Project: None		Barometric Pres.: 1015.6	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2013		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Trevor Buls</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	-57.24 dBc ≤ -20 dBc Pass
	Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-53.86 dBc ≤ -20 dBc Pass
	Mid Channel, 2426 MHz	Fundamental	N/A N/A N/A
	Mid Channel, 2426 MHz	30 MHz - 12.5 GHz	-57.82 dBc ≤ -20 dBc Pass
	Mid Channel, 2426 MHz	12.5 GHz - 25 GHz	-53.71 dBc ≤ -20 dBc Pass
	High Channel, 2480 MHz	Fundamental	N/A N/A N/A
	High Channel, 2480 MHz	30 MHz - 12.5 GHz	-55.62 dBc ≤ -20 dBc Pass
	High Channel, 2480 MHz	12.5 GHz - 25 GHz	-54.14 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	-56.68 dBc ≤ -20 dBc Pass
	Low Channel, 2404 MHz	12.5 GHz - 25 GHz	-53.16 dBc ≤ -20 dBc Pass
	Mid Channel, 2442 MHz	Fundamental	N/A N/A N/A
	Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-58.12 dBc ≤ -20 dBc Pass
	Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-54.3 dBc ≤ -20 dBc Pass
	High Channel, 2478 MHz	Fundamental	N/A N/A N/A
	High Channel, 2478 MHz	30 MHz - 12.5 GHz	-58.57 dBc ≤ -20 dBc Pass
	High Channel, 2478 MHz	12.5 GHz - 25 GHz	-54.75 dBc ≤ -20 dBc Pass

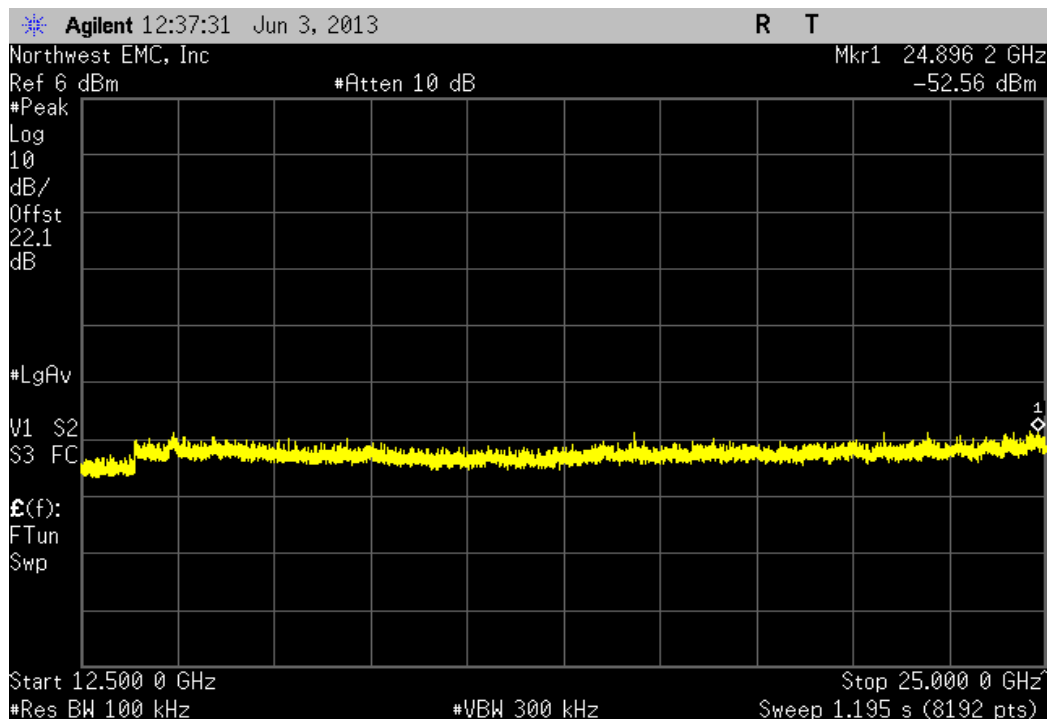
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



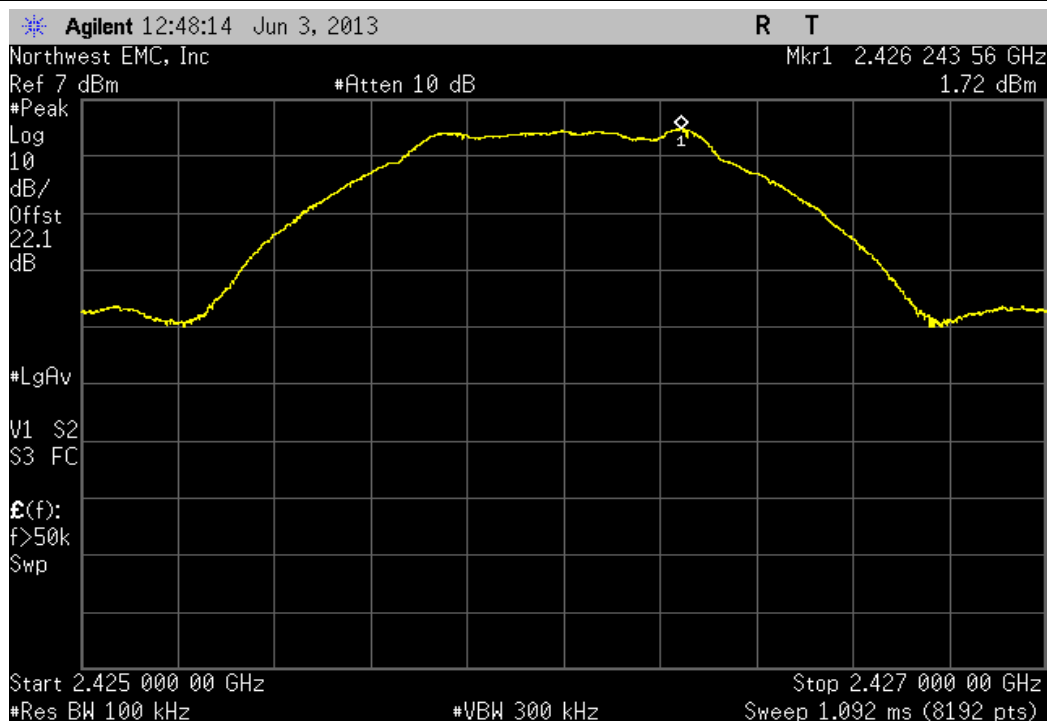
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-57.24 dBc	≤ -20 dBc	Pass	



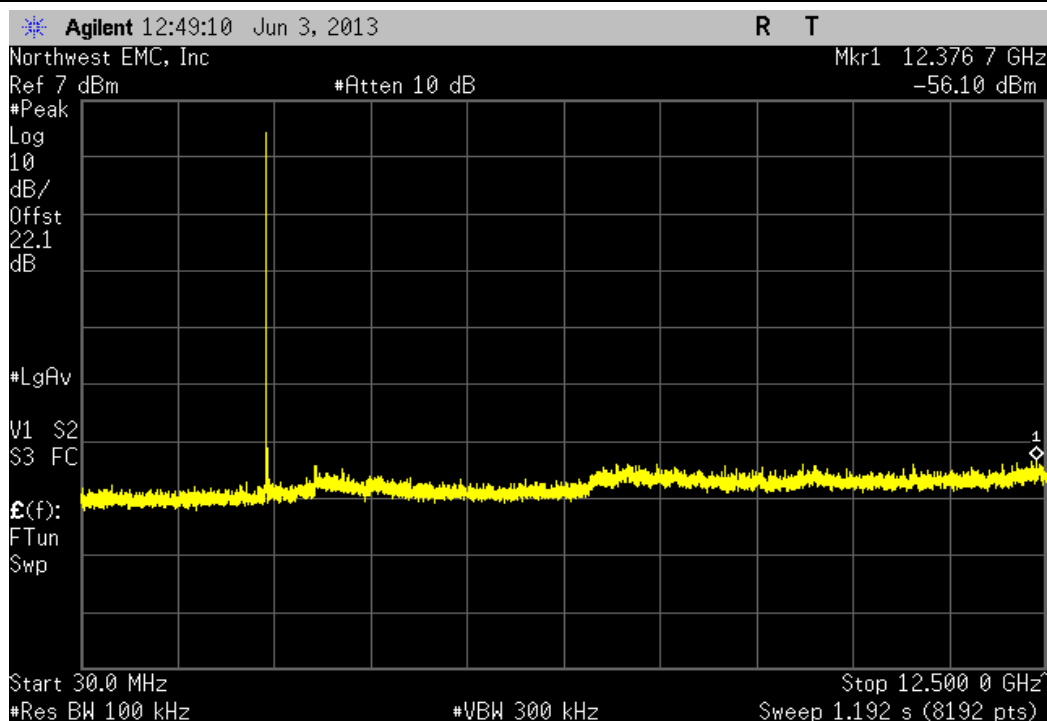
BLE - Advertising, Low Channel, 2402 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-53.86 dBc	≤ -20 dBc	Pass	



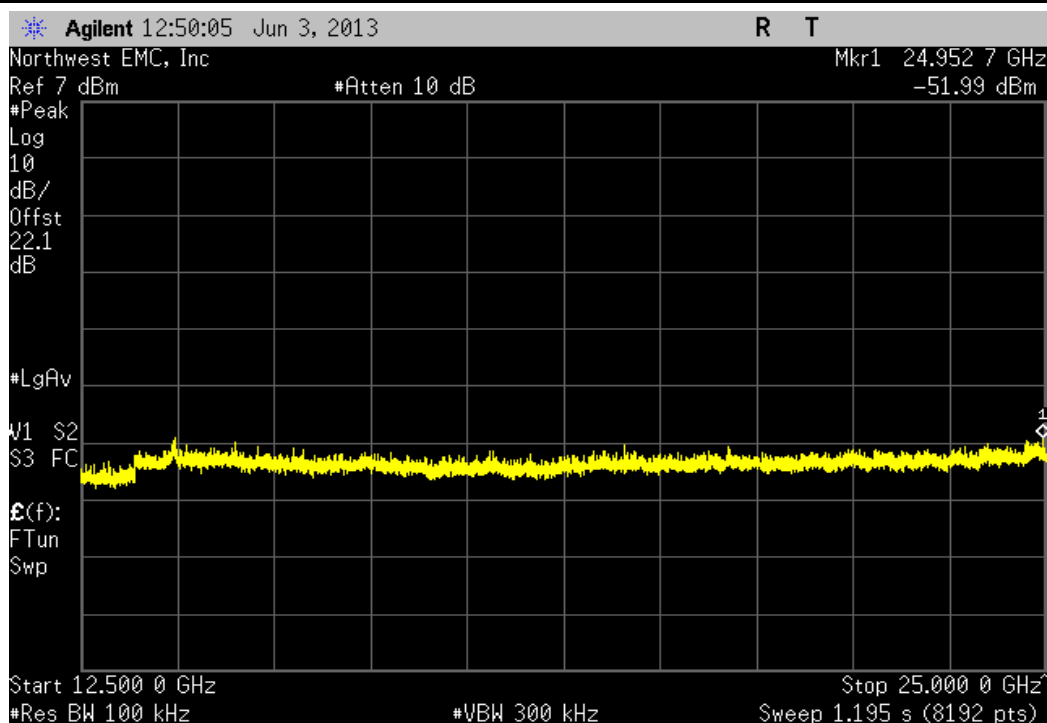
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



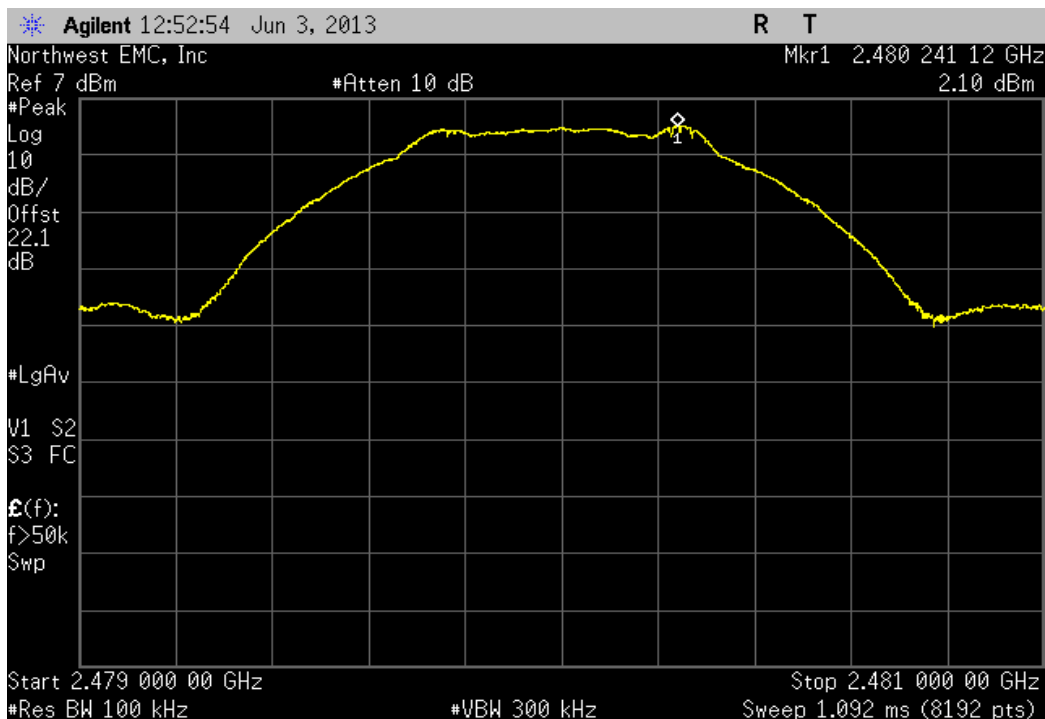
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-57.82 dBc	≤ -20 dBc	Pass	



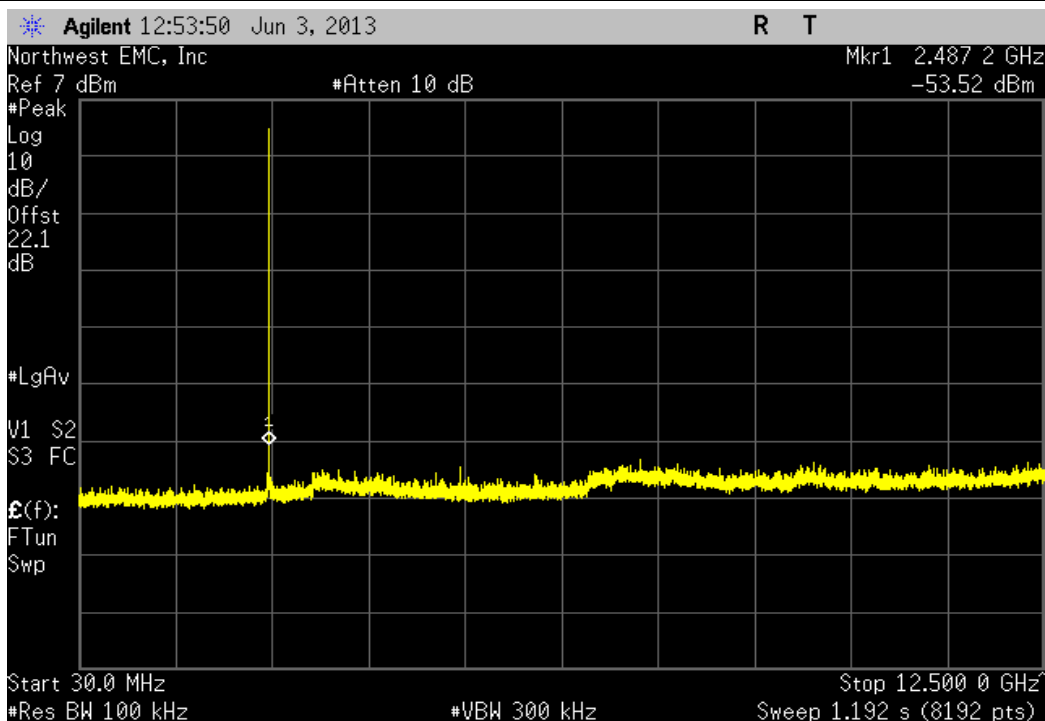
BLE - Advertising, Mid Channel, 2426 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-53.71 dBc	≤ -20 dBc	Pass	



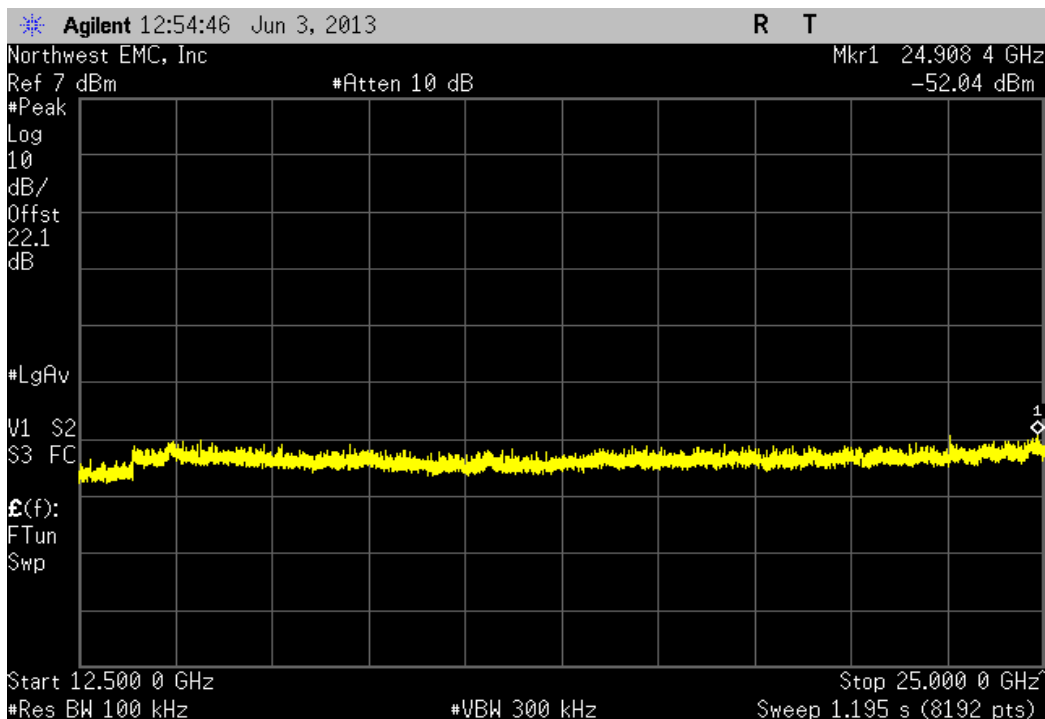
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



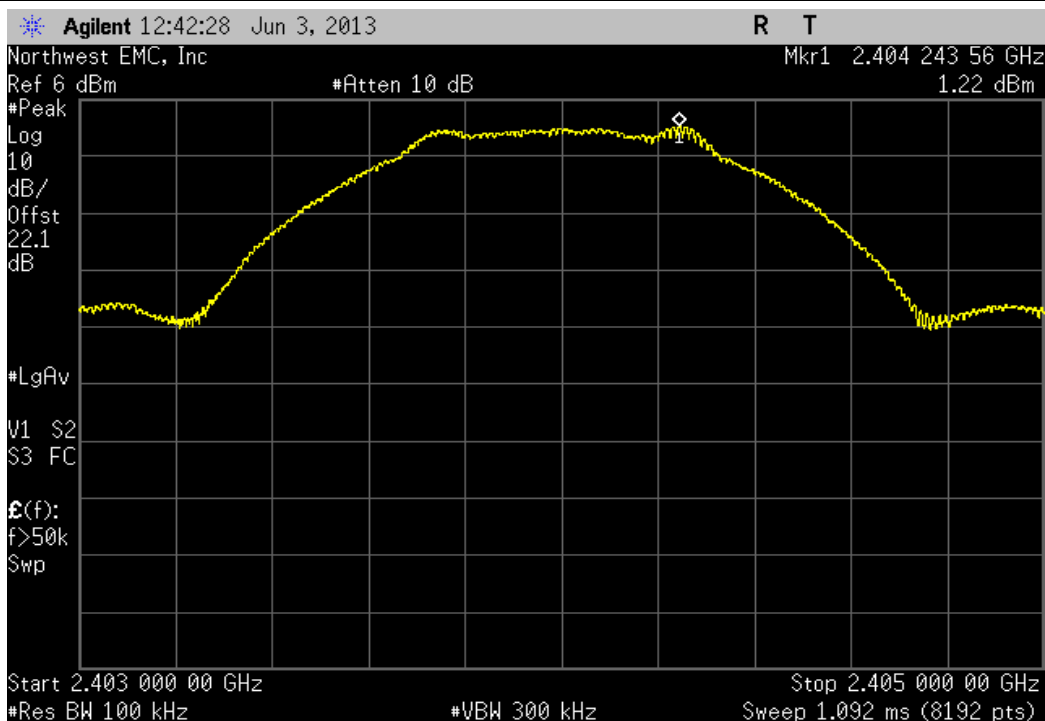
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-55.62 dBc	≤ -20 dBc	Pass	



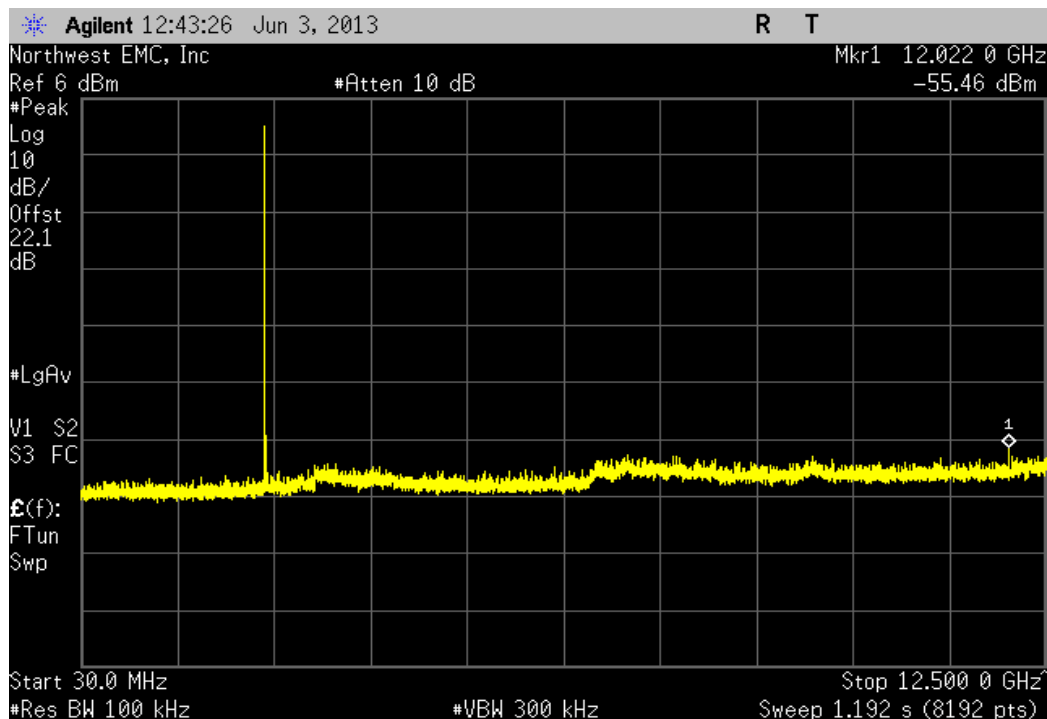
BLE - Advertising, High Channel, 2480 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-54.14 dBc	≤ -20 dBc	Pass	



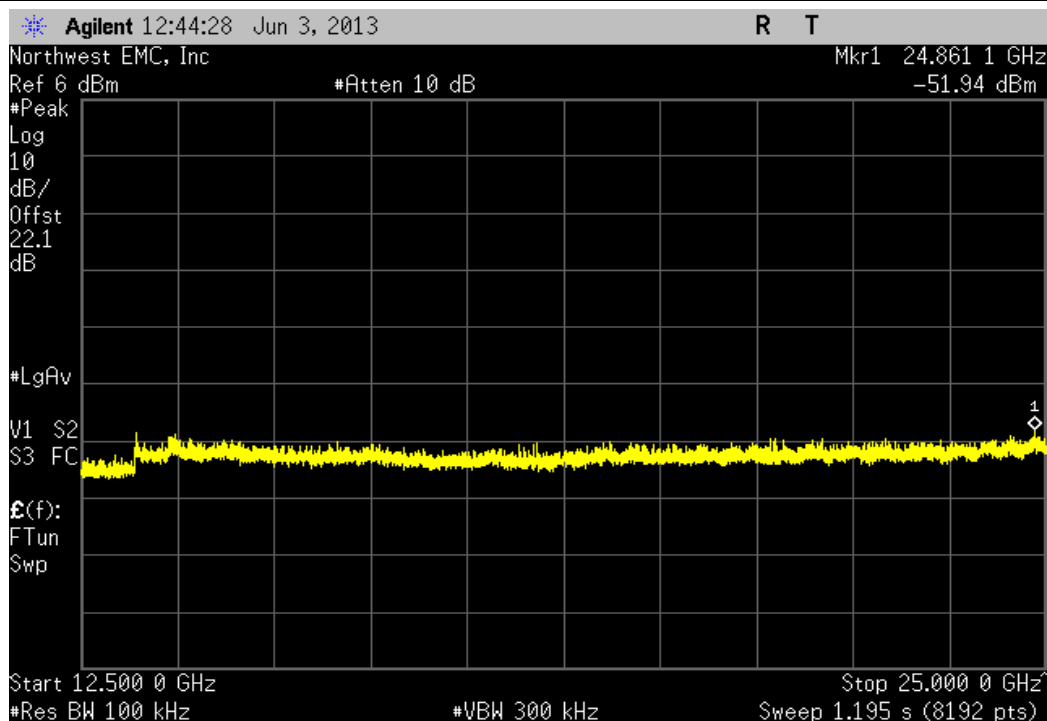
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



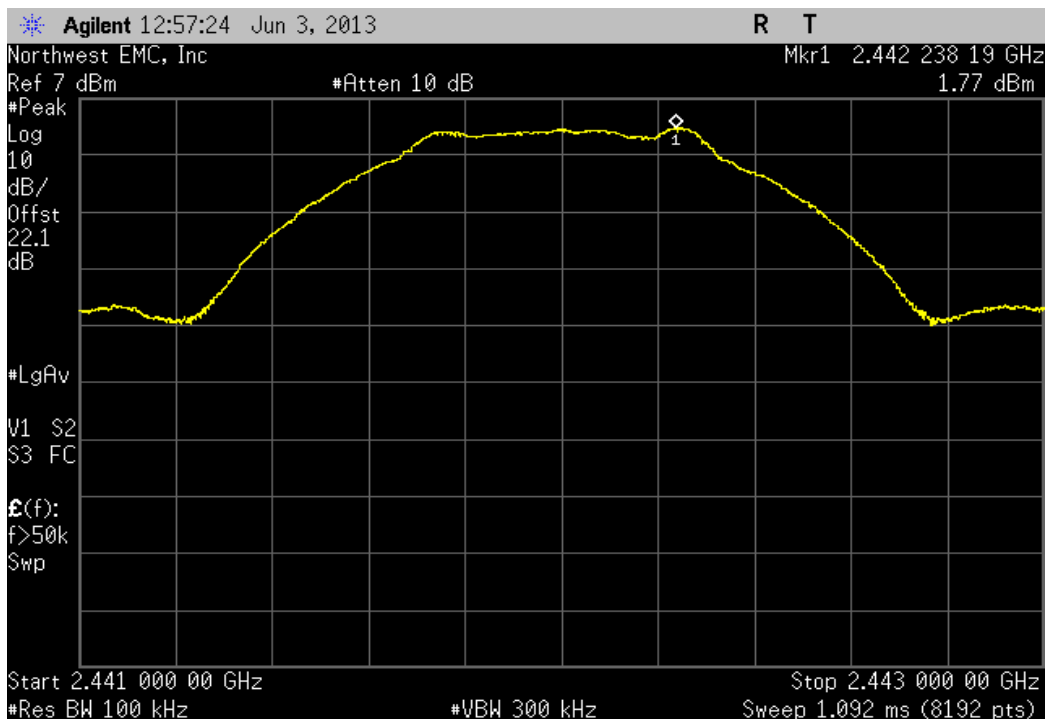
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-56.68 dBc	≤ -20 dBc	Pass	



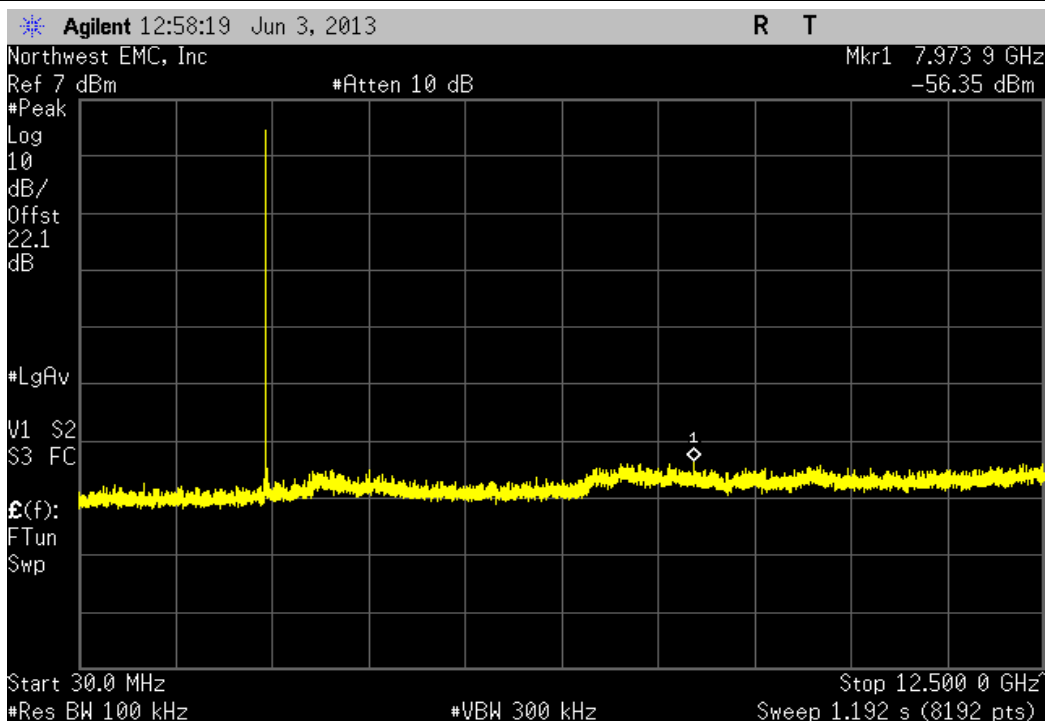
BLE - Data, Low Channel, 2404 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-53.16 dBc	≤ -20 dBc	Pass	



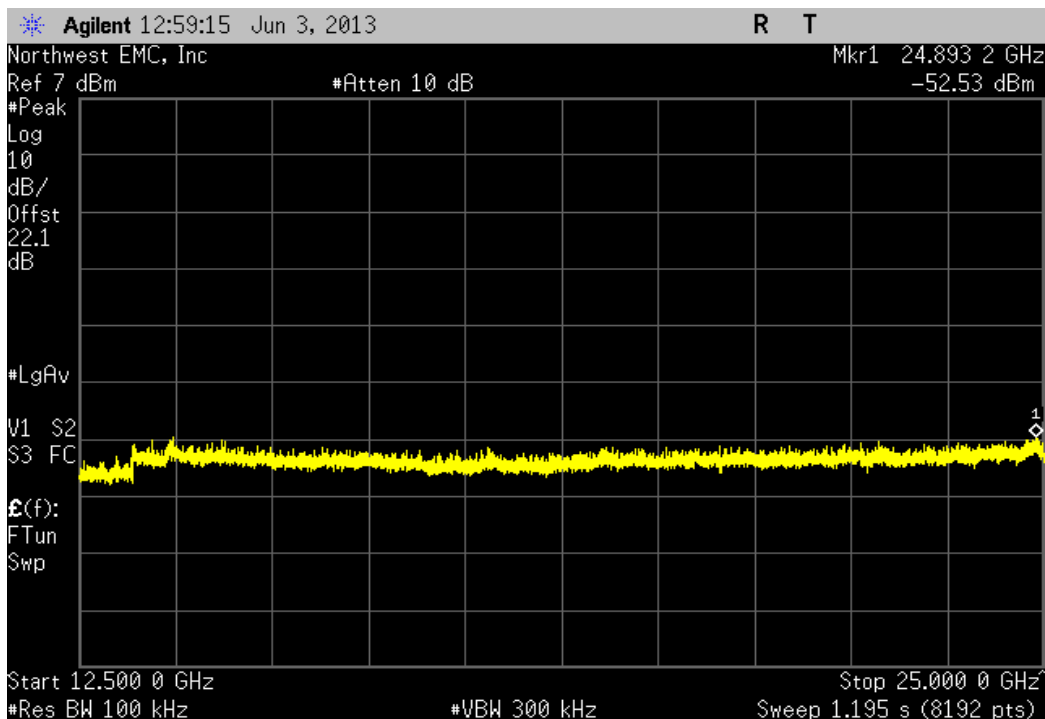
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range		Value	Limit	Result
Fundamental		N/A	N/A	N/A



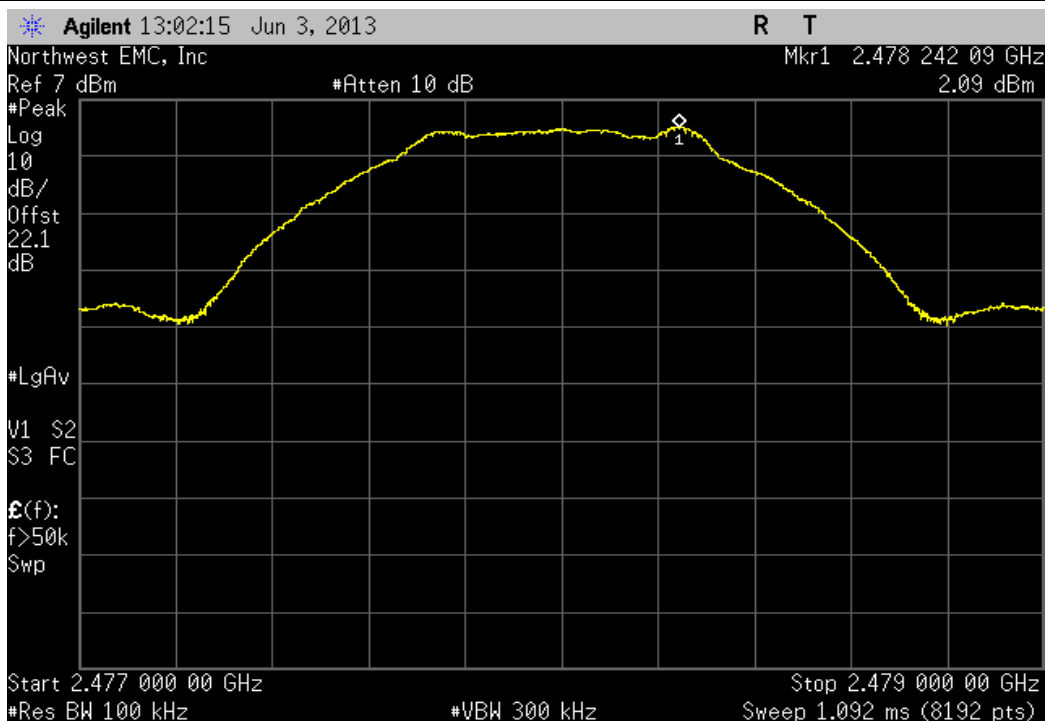
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-58.12 dBc	≤ -20 dBc	Pass



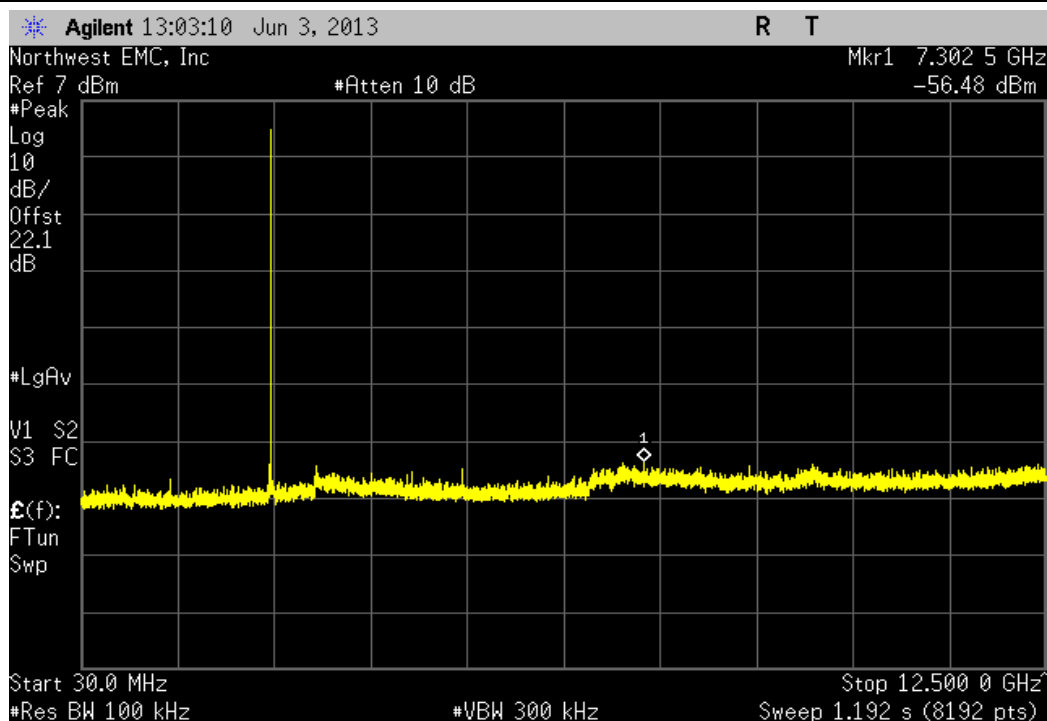
BLE - Data, Mid Channel, 2442 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-54.3 dBc	≤ -20 dBc	Pass	



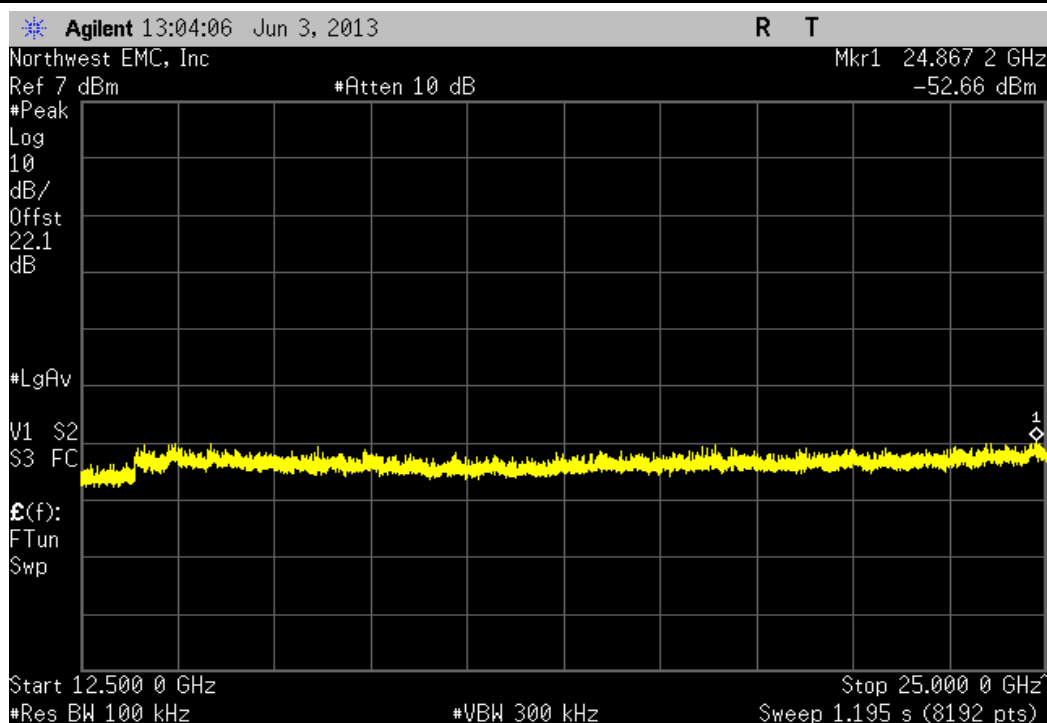
BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
Fundamental	N/A	N/A	N/A	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-58.57 dBc	≤ -20 dBc	Pass	



BLE - Data, High Channel, 2478 MHz				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-54.75 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
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/5/2012	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/12/2013	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	24

TEST DESCRIPTION

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

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

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

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

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

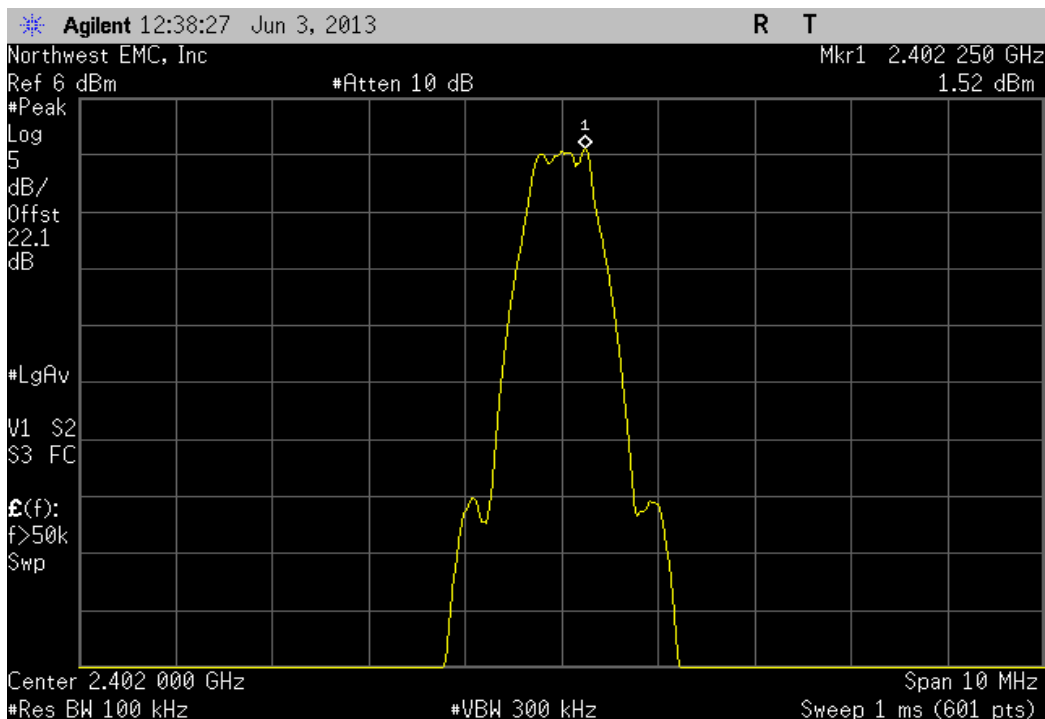


Power Spectral Density

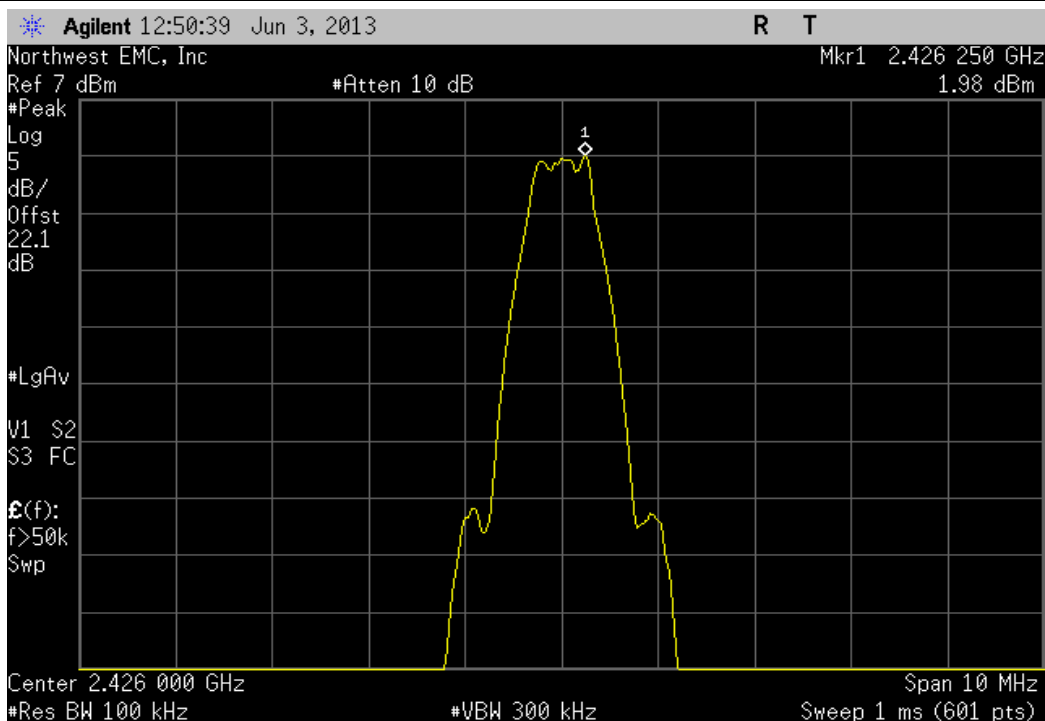
XMit 2013.02.28
PsaTx 2013.06.03

EUT: 37x Torpedo + Wireless SOM -31		Work Order: LGPD0096				
Serial Number: 1413M00359		Date: 06/03/13				
Customer: Logic PD, Inc.		Temperature: 23.1°C				
Attendees: None		Humidity: 39%				
Project: None		Barometric Pres.: 1015.6				
Tested by: Trevor Buls		Power: 110VAC/60Hz				
		Job Site: MN08				
TEST SPECIFICATIONS		Test Method				
FCC 15.247:2013		ANSI C63.10:2009				
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1	Signature <i>Trevor Buls</i>				
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
BLE - Advertising						
	Low Channel, 2402 MHz	1.525	-15.2	-13.675	8	Pass
	Mid Channel, 2426 MHz	1.976	-15.2	-13.224	8	Pass
	High Channel, 2480 MHz	2.358	-15.2	-12.842	8	Pass
BLE - Data						
	Low Channel, 2404 MHz	1.48	-15.2	-13.72	8	Pass
	Mid Channel, 2442 MHz	2.048	-15.2	-13.152	8	Pass
	High Channel, 2478 MHz	2.315	-15.2	-12.885	8	Pass

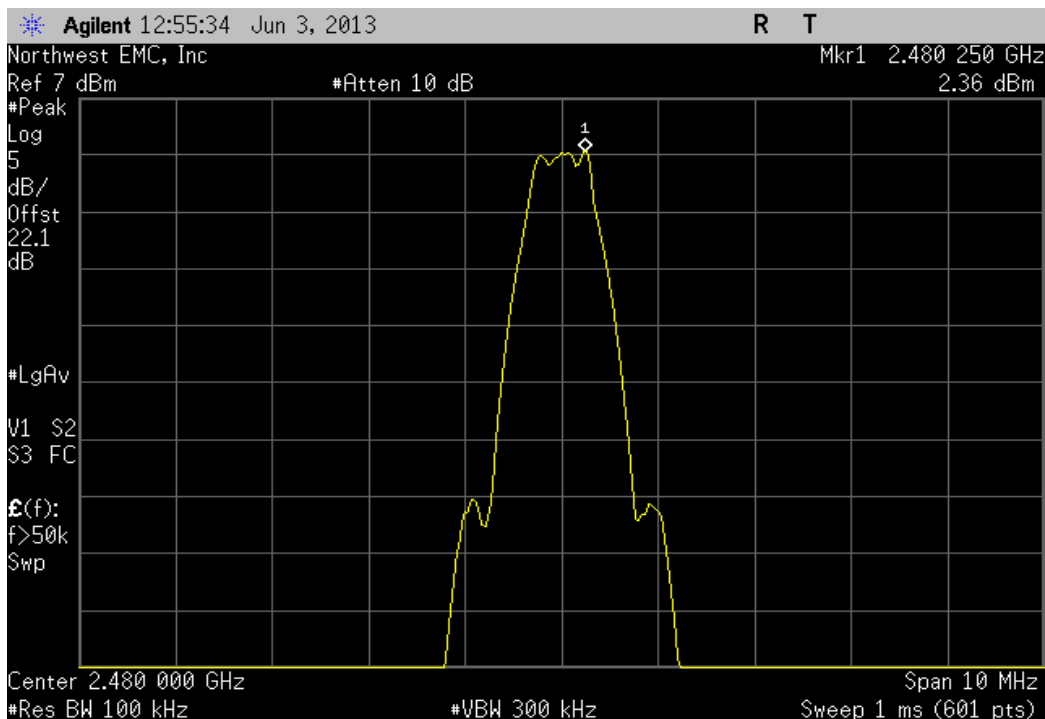
BLE - Advertising, Low Channel, 2402 MHz					
Value	dBm/100kHz	Value	Limit		
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.525	-15.2	-13.675	8	Pass



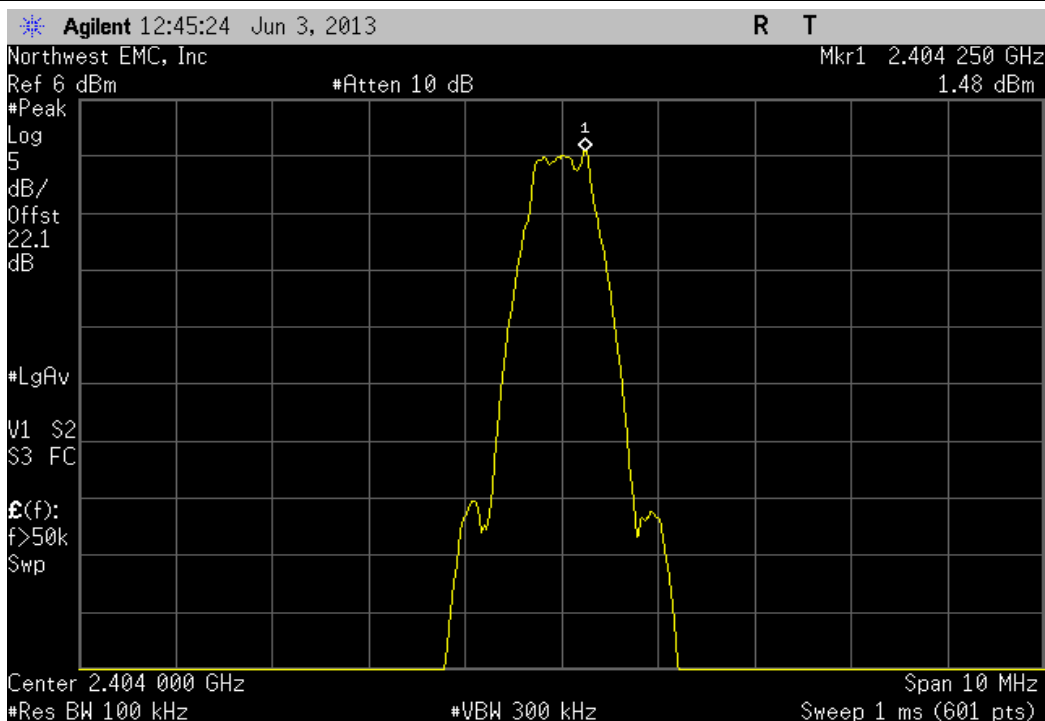
BLE - Advertising, Mid Channel, 2426 MHz					
Value	dBm/100kHz	Value	Limit		
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz	Result	
	1.976	-15.2	-13.224	8	Pass



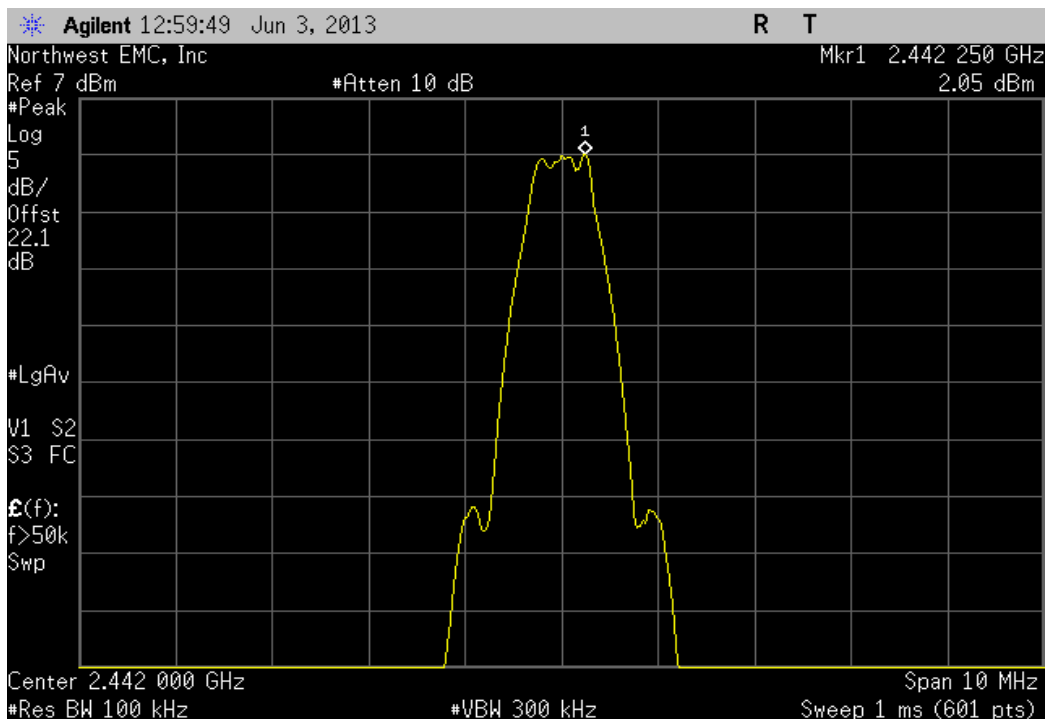
BLE - Advertising, High Channel, 2480 MHz					
Value	dBm/100kHz	Value	Limit	Result	
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	2.358	-15.2	-12.842	8	Pass



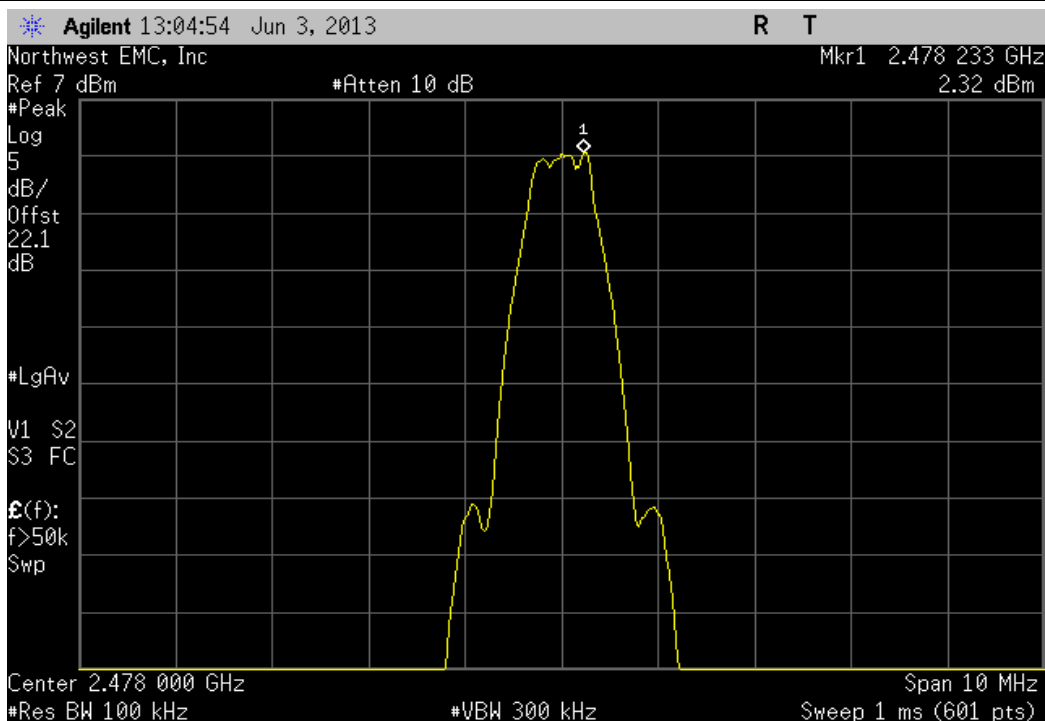
BLE - Data, Low Channel, 2404 MHz					
Value	dBm/100kHz	Value	Limit	Result	
dBm/100kHz	To dBm/3kHz	dBm/3kHz	dBm/3kHz		
	1.48	-15.2	-13.72	8	Pass



BLE - Data, Mid Channel, 2442 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	2.048	-15.2	-13.152	8	Pass



BLE - Data, High Channel, 2478 MHz					
	Value	dBm/100kHz	Value	Limit	Result
		To dBm/3kHz	dBm/3kHz		
	2.315	-15.2	-12.885	8	Pass



Spurious Radiated Emissions

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

MODES OF OPERATION

Transmitting Low, Mid, High with BTLE ADV @ 2402, 2426, 2480 MHz, BTLE Data @ 2404, 2442, 2478 MHz -PIFA (see comments)

Transmitting Low, Mid, High with BTLE ADV @ 2402, 2426, 2480 MHz, BTLE Data @ 2404, 2442, 2478 MHz -Chip (see comments)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

LGPD0096 - 1

LGPD0100 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 25 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
High Pass Filter	Micro-Tronics	HPM50111	HGQ	6/1/2012	24 mo
Low Pass Filter	Micro-Tronics	LPM50004	HGK	5/31/2012	24 mo
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	5/20/2013	12 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	10/5/2012	12 mo
MN05 Cables	N/A	18-26GHz Standard Gain Horn Cable	MNP	10/5/2012	12 mo
Antenna, Horn	ETS	3160-09	AHG	NCR	0 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	5/20/2013	12 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	5/20/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	5/20/2013	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	5/20/2013	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/20/2013	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	5/20/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	5/20/2013	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2012	12 mo
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24 mo

MEASUREMENT BANDWIDTHS

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

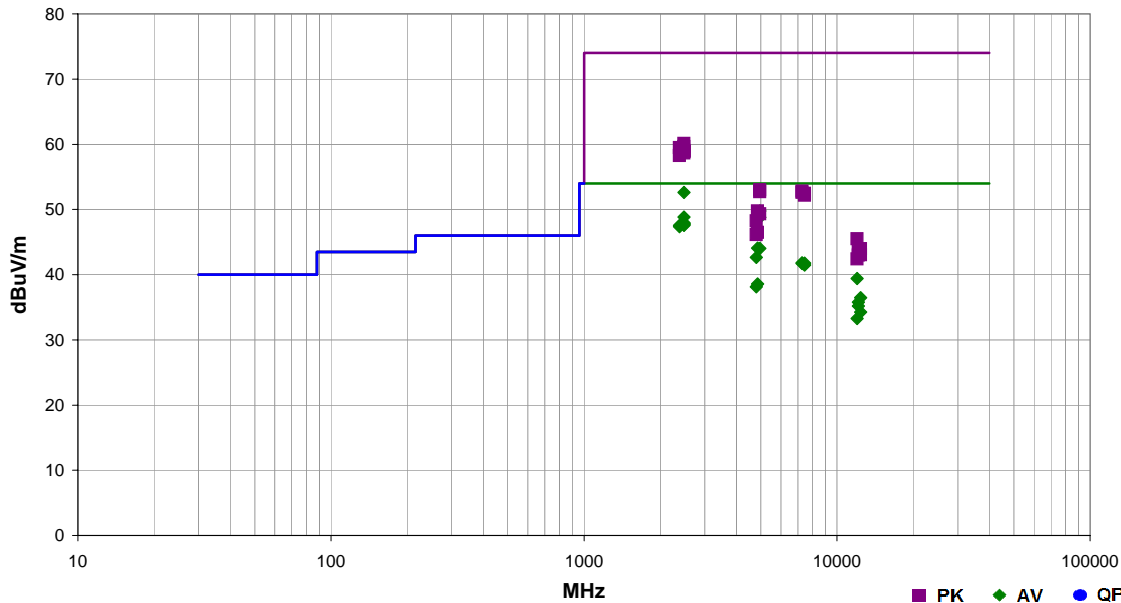
TEST DESCRIPTION

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

Work Order:	LGPD0096	Date:	05/22/13	<i>Trevor Buls</i>
Project:	None	Temperature:	22 °C	
Job Site:	MN05	Humidity:	42.5% RH	
Serial Number:	1413M00359	Barometric Pres.:	1006.8 mbar	
EUT:		37x Torpedo + Wireless SOM -31		
Configuration:	1			
Customer:	Logic PD, Inc.			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Low, Mid, High with BTLE ADV @ 2402, 2426, 2480 MHz, BTLE Data @ 2404, 2442, 2478 MHz -PIFA (see comments)			
Deviations:	None			
Comments:	EUT orientation is based on the transmit module.			

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

Run #	46	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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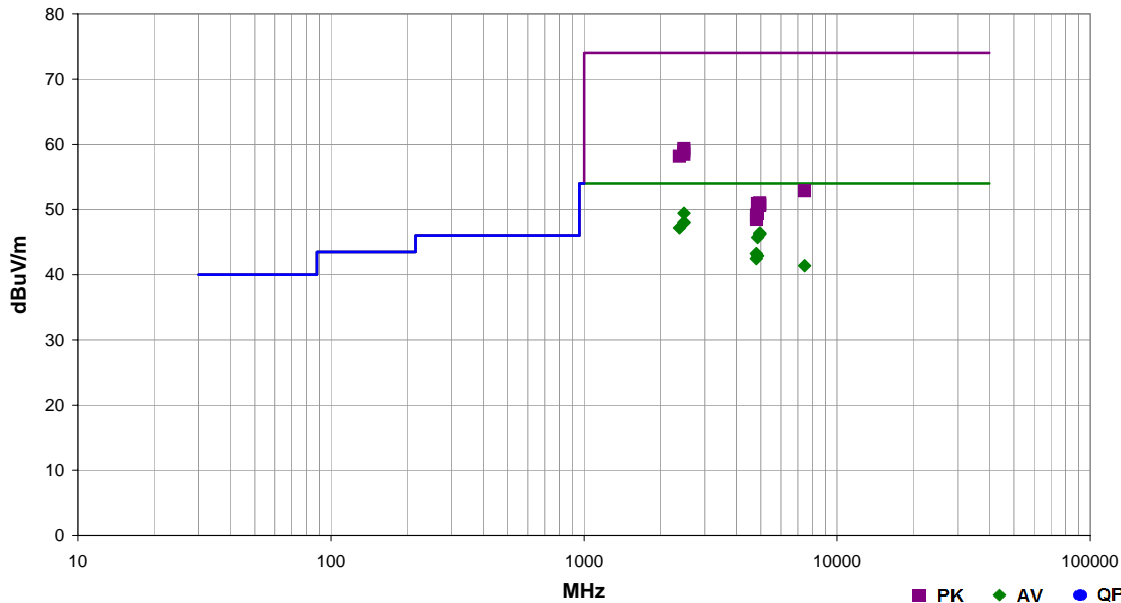
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.500	36.2	-3.6	1.0	6.0	3.0	20.0	Vert	AV	0.0	52.6	54.0	-1.4	EUT Vertical, High Ch, BTLE ADV
4955.992	44.7	5.1	1.1	162.0	3.0	0.0	Horz	AV	0.0	49.8	54.0	-4.2	EUT on Side, High Ch, BTLE Data
2483.500	32.4	-3.6	2.0	213.0	3.0	20.0	Horz	AV	0.0	48.8	54.0	-5.2	EUT Horizontal, High Ch, BTLE ADV
4959.992	43.7	5.1	1.2	337.0	3.0	0.0	Horz	AV	0.0	48.8	54.0	-5.2	EUT on Side, High Ch, BLE ADV
2485.525	31.5	-3.6	1.0	95.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	EUT Vertical, High Ch, BTLE Data
2485.442	31.4	-3.6	1.0	272.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	EUT Horizontal, High Ch, BTLE ADV
2484.258	31.3	-3.6	1.0	296.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Vertical, High Ch, BTLE ADV
2483.508	31.2	-3.6	1.0	177.0	3.0	20.0	Horz	AV	0.0	47.6	54.0	-6.4	EUT on Side, High Ch, BTLE ADV
2385.842	31.4	-3.8	1.7	228.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT Vertical, Low Ch, BTLE ADV
2487.408	31.1	-3.6	1.0	142.0	3.0	20.0	Vert	AV	0.0	47.5	54.0	-6.5	EUT on Side, High Ch, BTLE ADV
2387.208	31.2	-3.8	3.2	27.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	EUT Vertical, Low Ch, BTLE Data
4851.992	39.5	4.6	1.0	339.0	3.0	0.0	Horz	AV	0.0	44.1	54.0	-9.9	EUT on Side, Mid Ch, BLE ADV
4960.075	38.9	5.1	1.0	271.0	3.0	0.0	Vert	AV	0.0	44.0	54.0	-10.0	EUT Vertical, High Ch, BLE ADV
4804.042	38.3	4.3	1.0	314.0	3.0	0.0	Horz	AV	0.0	42.6	54.0	-11.4	EUT on Side, Low Ch, BLE ADV
7279.425	29.7	12.1	1.0	135.0	3.0	0.0	Horz	AV	0.0	41.8	54.0	-12.2	EUT on Side, Mid Ch, BLE ADV
7440.067	28.3	13.5	1.0	0.0	3.0	0.0	Horz	AV	0.0	41.8	54.0	-12.2	EUT on Side, High Ch, BLE ADV
7279.875	29.6	12.1	1.6	166.0	3.0	0.0	Vert	AV	0.0	41.7	54.0	-12.3	EUT Vertical, Mid Ch, BLE ADV
7440.983	28.0	13.5	1.0	104.0	3.0	0.0	Vert	AV	0.0	41.5	54.0	-12.5	EUT Vertical, High Ch, BLE ADV
2483.533	43.7	-3.6	1.3	218.0	3.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9	EUT Vertical, High Ch, BTLE ADV
2486.517	43.2	-3.6	2.0	213.0	3.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	EUT Horizontal, High Ch, BTLE ADV
2386.825	43.3	-3.8	1.7	228.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	EUT Vertical, Low Ch, BTLE ADV
12009.240	46.1	-6.7	1.0	292.0	3.0	0.0	Horz	AV	0.0	39.4	54.0	-14.6	EUT on Side, Low Ch, BLE ADV
2483.525	42.6	-3.6	1.0	177.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	EUT on Side, High Ch, BTLE ADV
2488.433	42.5	-3.5	1.0	296.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	EUT Vertical, High Ch, BTLE ADV
2487.150	42.5	-3.6	1.0	95.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	EUT Vertical, High Ch, BTLE Data
2487.025	42.4	-3.6	1.0	142.0	3.0	20.0	Vert	PK	0.0	58.8	74.0	-15.2	EUT on Side, High Ch, BTLE ADV
2487.117	42.2	-3.6	1.0	272.0	3.0	20.0	Vert	PK	0.0	58.6	74.0	-15.4	EUT Horizontal, High Ch, BTLE ADV

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
4851.975	34.0	4.6	1.0	287.0	3.0	0.0	Vert	AV	0.0	38.6	54.0	-15.4	EUT Vertical, Mid Ch, BLE ADV
2385.308	42.1	-3.8	3.2	27.0	3.0	20.0	Vert	PK	0.0	58.3	74.0	-15.7	EUT Vertical, Low Ch, BTLE Data
4803.992	33.8	4.3	1.0	280.0	3.0	0.0	Vert	AV	0.0	38.1	54.0	-15.9	EUT Vertical, Low Ch, BLE ADV
12399.390	42.2	-5.7	1.0	260.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	EUT Vertical, High Ch, BLE ADV
12129.340	42.2	-6.4	1.1	253.0	3.0	0.0	Vert	AV	0.0	35.8	54.0	-18.2	EUT Vertical, Mid Ch, BLE ADV
12129.320	41.6	-6.4	1.0	285.0	3.0	0.0	Horz	AV	0.0	35.2	54.0	-18.8	EUT on Side, Mid Ch, BLE ADV
12399.400	40.0	-5.7	1.7	270.0	3.0	0.0	Horz	AV	0.0	34.3	54.0	-19.7	EUT on Side, High Ch, BLE ADV
12009.280	40.0	-6.7	1.0	249.0	3.0	0.0	Vert	AV	0.0	33.3	54.0	-20.7	EUT Vertical, Low Ch, BLE ADV
4956.292	47.9	5.1	1.1	340.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT on Side, High Ch, BLE Data
7275.808	40.7	12.1	1.6	166.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	EUT Vertical, Mid Ch, BLE ADV
4960.183	47.6	5.1	1.2	337.0	3.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	EUT on Side, High Ch, BLE ADV
7276.867	40.5	12.1	1.0	135.0	3.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	EUT on Side, Mid Ch, BLE ADV
7440.208	39.0	13.5	1.0	0.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT on Side, High Ch, BLE ADV
7440.858	38.7	13.5	1.0	104.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	EUT Vertical, High Ch, BLE ADV
4852.275	45.2	4.6	1.0	339.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	EUT on Side, Mid Ch, BLE ADV
4960.158	44.2	5.1	1.0	271.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	EUT Vertical, High Ch, BLE ADV
4803.550	43.9	4.3	1.0	314.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	EUT on Side, Low Ch, BLE ADV
4851.392	41.9	4.6	1.0	287.0	3.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	EUT Vertical, Mid Ch, BLE ADV
4803.383	41.8	4.3	1.0	280.0	3.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	EUT Vertical, Low Ch, BLE ADV
12010.740	52.2	-6.7	1.0	292.0	3.0	0.0	Horz	PK	0.0	45.5	74.0	-28.5	EUT on Side, Low Ch, BLE ADV
12400.430	49.7	-5.7	1.0	260.0	3.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	EUT Vertical, High Ch, BLE ADV
12130.650	50.0	-6.4	1.1	253.0	3.0	0.0	Vert	PK	0.0	43.6	74.0	-30.4	EUT Vertical, Mid Ch, BLE ADV
12400.550	48.8	-5.7	1.7	270.0	3.0	0.0	Horz	PK	0.0	43.1	74.0	-30.9	EUT on Side, High Ch, BLE ADV
12129.400	49.4	-6.4	1.0	285.0	3.0	0.0	Horz	PK	0.0	43.0	74.0	-31.0	EUT on Side, Mid Ch, BLE ADV
12010.850	49.1	-6.7	1.0	249.0	3.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	EUT Vertical, Low Ch, BLE ADV

Work Order:	LGPD0100	Date:	05/29/13	<i>Trevor Buls</i>
Project:	None	Temperature:	22.4 °C	
Job Site:	MN05	Humidity:	50.2% RH	
Serial Number:	1413M00359	Barometric Pres.:	1009.4 mbar	
EUT:		37x Torpedo + Wireless SOM -31		
Configuration:	1			
Customer:	Logic PD, Inc.			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Low, Mid, High with BTLE ADV @ 2402, 2426, 2480 MHz, BTLE Data @ 2404, 2442, 2478 MHz -Chip (see comments)			
Deviations:	None			
Comments:	EUT orientation is based on the transmit module.			

Test Specifications	Test Method
FCC 15.247:2013	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	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.500	33.0	-3.6	1.0	222.0	3.0	20.0	Vert	AV	0.0	49.4	54.0	-4.6	EUT Vertical, High Ch, BTLE ADV
2483.500	31.6	-3.6	1.0	339.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	EUT on Side, High Ch, BLE Adv
2484.367	31.5	-3.6	1.7	233.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	EUT Vertical, High Ch, BLE Data
2388.033	31.0	-3.8	3.7	216.0	3.0	20.0	Vert	AV	0.0	47.2	54.0	-6.8	EUT Vertical, Low Ch, BLE Adv
4960.017	41.3	5.1	1.0	297.0	3.0	0.0	Horz	AV	0.0	46.4	54.0	-7.6	EUT on Side, High Ch, BLE Adv
4959.950	41.2	5.1	1.1	258.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	EUT Vertical, High Ch, BLE Adv
4955.992	41.1	5.1	1.0	297.0	3.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	EUT on Side, High Ch, BLE Data
4852.042	41.1	4.6	1.0	349.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT on Side, Mid Ch, BLE Adv
4804.008	38.9	4.3	1.1	290.0	3.0	0.0	Horz	AV	0.0	43.2	54.0	-10.8	EUT on Side, Low Ch, BLE Adv
4852.008	38.3	4.6	1.0	296.0	3.0	0.0	Vert	AV	0.0	42.9	54.0	-11.1	EUT Vertical, Mid Ch, BLE Adv
4804.000	38.1	4.3	1.1	299.0	3.0	0.0	Vert	AV	0.0	42.4	54.0	-11.6	EUT Vertical, Low Ch, BLE Adv
7439.725	27.9	13.5	1.0	285.0	3.0	0.0	Horz	AV	0.0	41.4	54.0	-12.6	EUT on Side, High Ch, BLE Adv
2484.592	42.9	-3.6	1.7	233.0	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	EUT Vertical, High Ch, BLE Data
2486.617	42.5	-3.6	1.0	339.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	EUT on Side, High Ch, BLE Adv
2485.975	42.0	-3.6	1.7	233.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	EUT Vertical, High Ch, BLE Adv
2386.192	42.0	-3.8	3.7	216.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	EUT Vertical, Low Ch, BLE Adv
7441.433	39.4	13.5	1.0	285.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	EUT on Side, High Ch, BLE Adv
4955.608	45.9	5.1	1.0	297.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	EUT on Side, High Ch, BLE Data
4852.100	46.3	4.6	1.0	349.0	3.0	0.0	Horz	PK	0.0	50.9	74.0	-23.1	EUT on Side, Mid Ch, BLE Adv
4960.258	45.7	5.1	1.0	297.0	3.0	0.0	Horz	PK	0.0	50.8	74.0	-23.2	EUT on Side, High Ch, BLE Adv
4959.400	45.5	5.1	1.2	257.0	3.0	0.0	Vert	PK	0.0	50.6	74.0	-23.4	EUT Vertical, High Ch, BLE Adv
4851.517	44.8	4.6	1.0	296.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	EUT Vertical, Mid Ch, BLE Adv
4804.383	44.8	4.3	1.1	290.0	3.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	EUT on Side, Low Ch, BLE Adv
4804.367	44.1	4.3	1.1	299.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	EUT Vertical, Low Ch, BLE Adv

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARG	04/01/2013	12 mo
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	08/15/2012	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	05/31/2012	24 mo
DC Power Supply	EZ Digital Co	GP-4303D	TPY	NCR	0 mo
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	01/17/2013	12 mo
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	05/24/2013	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.94 dB	-2.94 dB

CONFIGURATIONS INVESTIGATED

LGPD0096-2

MODES INVESTIGATED

Transmitting BT ADV, High Ch
Transmitting BT ADV, Low Ch
Transmitting BT ADV, Mid Ch

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	23	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

None

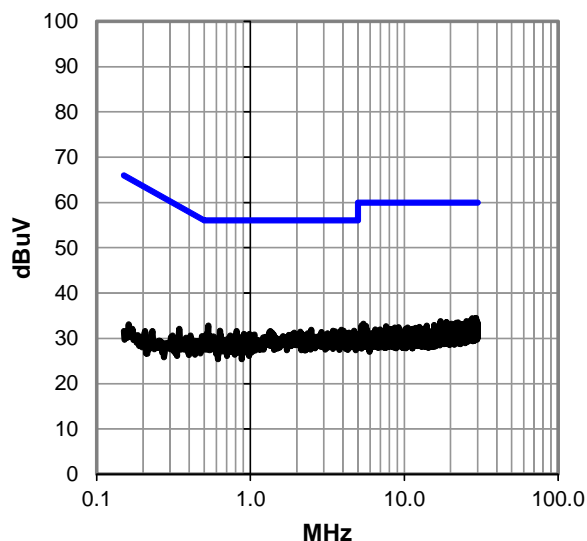
EUT OPERATING MODES

Transmitting BT ADV, Low Ch

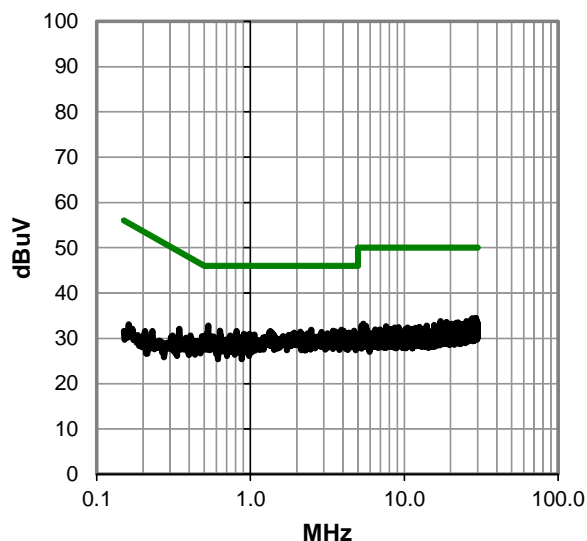
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #23

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.533	12.6	20.2	32.8	56.0	-23.2
2.480	11.6	20.3	31.9	56.0	-24.1
3.896	11.5	20.4	31.9	56.0	-24.1
0.635	11.5	20.2	31.7	56.0	-24.3
4.712	11.3	20.4	31.7	56.0	-24.3
4.024	11.3	20.4	31.7	56.0	-24.3
3.440	11.3	20.3	31.6	56.0	-24.4
1.344	11.4	20.2	31.6	56.0	-24.4
0.813	11.4	20.2	31.6	56.0	-24.4
3.552	11.2	20.4	31.6	56.0	-24.4
2.112	11.2	20.3	31.5	56.0	-24.5
2.896	11.1	20.3	31.4	56.0	-24.6
4.368	10.9	20.4	31.3	56.0	-24.7
4.264	10.8	20.4	31.2	56.0	-24.8
3.176	10.8	20.3	31.1	56.0	-24.9
2.360	10.8	20.3	31.1	56.0	-24.9
0.908	10.8	20.2	31.0	56.0	-25.0
0.986	10.8	20.2	31.0	56.0	-25.0
4.904	10.6	20.4	31.0	56.0	-25.0
2.184	10.6	20.3	30.9	56.0	-25.1
1.064	10.6	20.2	30.8	56.0	-25.2
2.304	10.3	20.3	30.6	56.0	-25.4
0.505	10.4	20.2	30.6	56.0	-25.4
0.740	10.4	20.2	30.6	56.0	-25.4
0.793	10.4	20.2	30.6	56.0	-25.4
29.260	12.2	22.3	34.5	60.0	-25.5

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.533	12.6	20.2	32.8	46.0	-13.2
2.480	11.6	20.3	31.9	46.0	-14.1
3.896	11.5	20.4	31.9	46.0	-14.1
0.635	11.5	20.2	31.7	46.0	-14.3
4.712	11.3	20.4	31.7	46.0	-14.3
4.024	11.3	20.4	31.7	46.0	-14.3
3.440	11.3	20.3	31.6	46.0	-14.4
1.344	11.4	20.2	31.6	46.0	-14.4
0.813	11.4	20.2	31.6	46.0	-14.4
3.552	11.2	20.4	31.6	46.0	-14.4
2.112	11.2	20.3	31.5	46.0	-14.5
2.896	11.1	20.3	31.4	46.0	-14.6
4.368	10.9	20.4	31.3	46.0	-14.7
4.264	10.8	20.4	31.2	46.0	-14.8
3.176	10.8	20.3	31.1	46.0	-14.9
2.360	10.8	20.3	31.1	46.0	-14.9
0.908	10.8	20.2	31.0	46.0	-15.0
0.986	10.8	20.2	31.0	46.0	-15.0
4.904	10.6	20.4	31.0	46.0	-15.0
2.184	10.6	20.3	30.9	46.0	-15.1
1.064	10.6	20.2	30.8	46.0	-15.2
2.304	10.3	20.3	30.6	46.0	-15.4
0.505	10.4	20.2	30.6	46.0	-15.4
0.740	10.4	20.2	30.6	46.0	-15.4
0.793	10.4	20.2	30.6	46.0	-15.4
29.260	12.2	22.3	34.5	50.0	-15.5

CONCLUSION

Pass

Trevor Buls
Tested_By

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	24	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

None

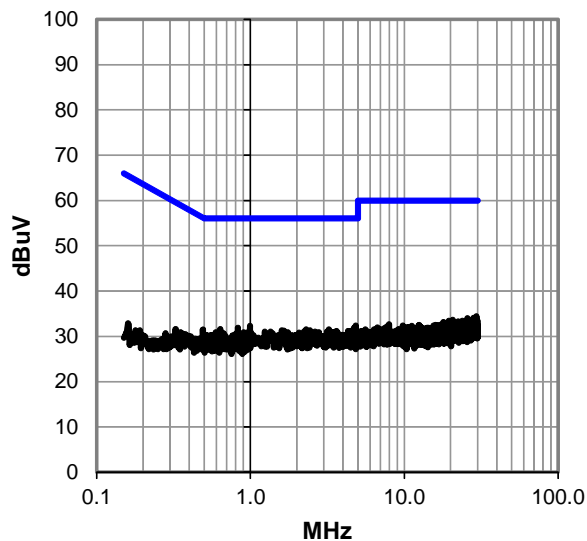
EUT OPERATING MODES

Transmitting BT ADV, Low Ch

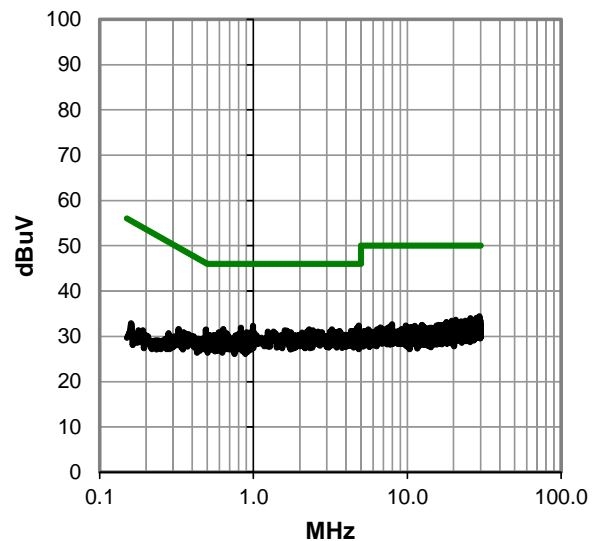
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #24

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.832	12.0	20.4	32.4	56.0	-23.6
0.993	12.1	20.2	32.3	56.0	-23.7
0.830	11.7	20.2	31.9	56.0	-24.1
4.696	11.4	20.4	31.8	56.0	-24.2
0.636	11.4	20.2	31.6	56.0	-24.4
3.240	11.2	20.3	31.5	56.0	-24.5
2.304	11.2	20.3	31.5	56.0	-24.5
0.492	11.3	20.2	31.5	56.1	-24.6
1.600	11.1	20.3	31.4	56.0	-24.6
2.440	11.0	20.3	31.3	56.0	-24.7
4.304	10.8	20.4	31.2	56.0	-24.8
3.624	10.8	20.4	31.2	56.0	-24.8
4.448	10.7	20.4	31.1	56.0	-24.9
1.352	10.8	20.2	31.0	56.0	-25.0
1.240	10.8	20.2	31.0	56.0	-25.0
2.784	10.6	20.3	30.9	56.0	-25.1
0.595	10.7	20.2	30.9	56.0	-25.1
0.903	10.7	20.2	30.9	56.0	-25.1
1.752	10.6	20.3	30.9	56.0	-25.1
2.072	10.5	20.3	30.8	56.0	-25.2
0.947	10.6	20.2	30.8	56.0	-25.2
0.660	10.4	20.2	30.6	56.0	-25.4
0.806	10.4	20.2	30.6	56.0	-25.4
29.470	12.1	22.3	34.4	60.0	-25.6
0.514	10.1	20.2	30.3	56.0	-25.7
0.551	10.1	20.2	30.3	56.0	-25.7

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.832	12.0	20.4	32.4	46.0	-13.6
0.993	12.1	20.2	32.3	46.0	-13.7
0.830	11.7	20.2	31.9	46.0	-14.1
4.696	11.4	20.4	31.8	46.0	-14.2
0.636	11.4	20.2	31.6	46.0	-14.4
3.240	11.2	20.3	31.5	46.0	-14.5
2.304	11.2	20.3	31.5	46.0	-14.5
0.492	11.3	20.2	31.5	46.1	-14.6
1.600	11.1	20.3	31.4	46.0	-14.6
2.440	11.0	20.3	31.3	46.0	-14.7
4.304	10.8	20.4	31.2	46.0	-14.8
3.624	10.8	20.4	31.2	46.0	-14.8
4.448	10.7	20.4	31.1	46.0	-14.9
1.352	10.8	20.2	31.0	46.0	-15.0
1.240	10.8	20.2	31.0	46.0	-15.0
2.784	10.6	20.3	30.9	46.0	-15.1
0.595	10.7	20.2	30.9	46.0	-15.1
0.903	10.7	20.2	30.9	46.0	-15.1
1.752	10.6	20.3	30.9	46.0	-15.1
2.072	10.5	20.3	30.8	46.0	-15.2
0.947	10.6	20.2	30.8	46.0	-15.2
0.660	10.4	20.2	30.6	46.0	-15.4
0.806	10.4	20.2	30.6	46.0	-15.4
29.470	12.1	22.3	34.4	50.0	-15.6
0.514	10.1	20.2	30.3	46.0	-15.7
0.551	10.1	20.2	30.3	46.0	-15.7

CONCLUSION

Pass

Trevor Buls
Tested_By

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	25	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

None

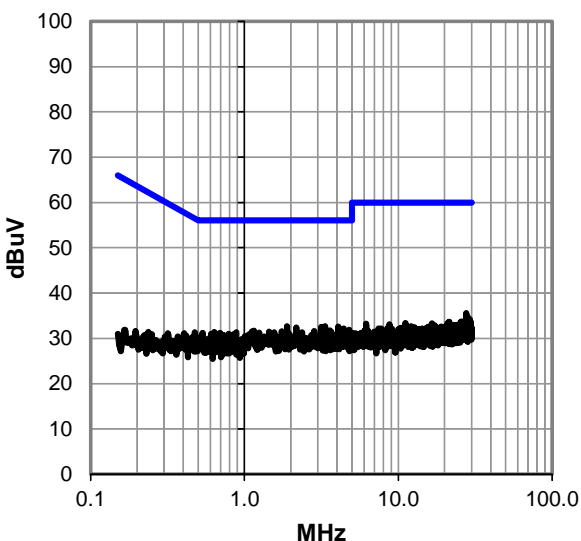
EUT OPERATING MODES

Transmitting BT ADV, Mid Ch

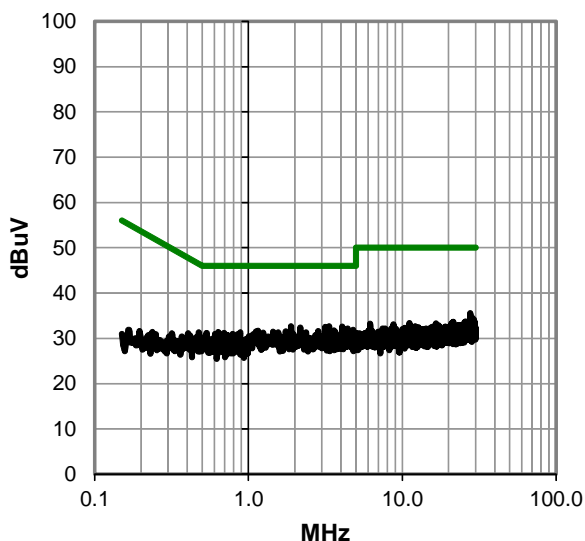
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #25

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.888	12.4	20.3	32.7	56.0	-23.3
3.344	12.3	20.3	32.6	56.0	-23.4
4.064	12.2	20.4	32.6	56.0	-23.4
3.160	12.2	20.3	32.5	56.0	-23.5
2.168	12.1	20.3	32.4	56.0	-23.6
4.416	11.8	20.4	32.2	56.0	-23.8
4.792	11.5	20.4	31.9	56.0	-24.1
4.288	11.4	20.4	31.8	56.0	-24.2
3.592	11.4	20.4	31.8	56.0	-24.2
1.152	11.5	20.2	31.7	56.0	-24.3
2.840	11.3	20.3	31.6	56.0	-24.4
1.752	11.3	20.3	31.6	56.0	-24.4
27.730	13.4	22.2	35.6	60.0	-24.4
3.656	11.1	20.4	31.5	56.0	-24.5
1.448	11.2	20.2	31.4	56.0	-24.6
0.638	11.2	20.2	31.4	56.0	-24.6
2.368	11.0	20.3	31.3	56.0	-24.7
0.884	11.1	20.2	31.3	56.0	-24.7
1.248	11.0	20.2	31.2	56.0	-24.8
0.534	11.0	20.2	31.2	56.0	-24.8
0.694	11.0	20.2	31.2	56.0	-24.8
0.607	10.8	20.2	31.0	56.0	-25.0
0.789	10.8	20.2	31.0	56.0	-25.0
0.850	10.7	20.2	30.9	56.0	-25.1
0.475	11.1	20.2	31.3	56.4	-25.1
28.280	12.6	22.2	34.8	60.0	-25.2

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
1.888	12.4	20.3	32.7	46.0	-13.3
3.344	12.3	20.3	32.6	46.0	-13.4
4.064	12.2	20.4	32.6	46.0	-13.4
3.160	12.2	20.3	32.5	46.0	-13.5
2.168	12.1	20.3	32.4	46.0	-13.6
4.416	11.8	20.4	32.2	46.0	-13.8
4.792	11.5	20.4	31.9	46.0	-14.1
4.288	11.4	20.4	31.8	46.0	-14.2
3.592	11.4	20.4	31.8	46.0	-14.2
1.152	11.5	20.2	31.7	46.0	-14.3
2.840	11.3	20.3	31.6	46.0	-14.4
1.752	11.3	20.3	31.6	46.0	-14.4
27.730	13.4	22.2	35.6	50.0	-14.4
3.656	11.1	20.4	31.5	46.0	-14.5
1.448	11.2	20.2	31.4	46.0	-14.6
0.638	11.2	20.2	31.4	46.0	-14.6
2.368	11.0	20.3	31.3	46.0	-14.7
0.884	11.1	20.2	31.3	46.0	-14.7
1.248	11.0	20.2	31.2	46.0	-14.8
0.534	11.0	20.2	31.2	46.0	-14.8
0.694	11.0	20.2	31.2	46.0	-14.8
0.607	10.8	20.2	31.0	46.0	-15.0
0.789	10.8	20.2	31.0	46.0	-15.0
0.850	10.7	20.2	30.9	46.0	-15.1
0.475	11.1	20.2	31.3	46.4	-15.1
28.280	12.6	22.2	34.8	50.0	-15.2

CONCLUSION

Pass

Trevor Buls
Tested_By

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	26	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

None

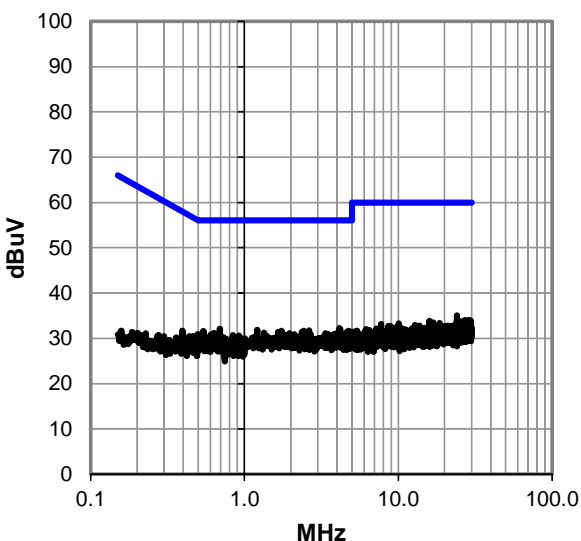
EUT OPERATING MODES

Transmitting BT ADV, Mid Ch

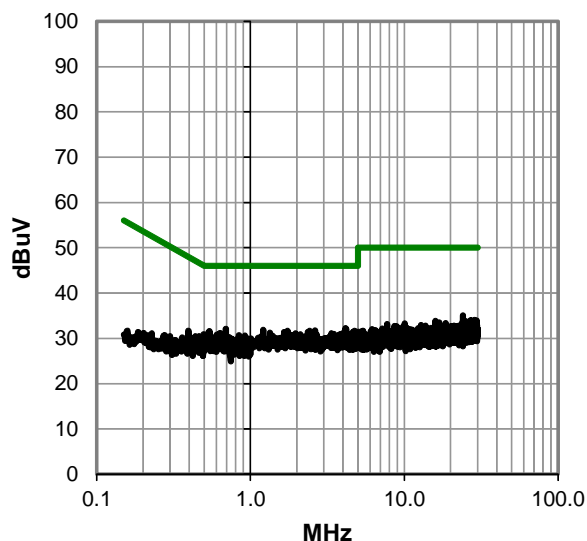
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #26

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.144	11.9	20.4	32.3	56.0	-23.7
0.691	11.9	20.2	32.1	56.0	-23.9
4.192	11.7	20.4	32.1	56.0	-23.9
1.208	11.7	20.2	31.9	56.0	-24.1
2.624	11.4	20.3	31.7	56.0	-24.3
2.424	11.4	20.3	31.7	56.0	-24.3
4.744	11.3	20.4	31.7	56.0	-24.3
1.744	11.4	20.3	31.7	56.0	-24.3
0.541	11.4	20.2	31.6	56.0	-24.4
4.840	11.1	20.4	31.5	56.0	-24.5
4.072	11.1	20.4	31.5	56.0	-24.5
4.624	11.0	20.4	31.4	56.0	-24.6
1.656	11.1	20.3	31.4	56.0	-24.6
0.533	11.1	20.2	31.3	56.0	-24.7
1.336	11.0	20.2	31.2	56.0	-24.8
0.635	11.0	20.2	31.2	56.0	-24.8
3.360	10.8	20.3	31.1	56.0	-24.9
1.968	10.8	20.3	31.1	56.0	-24.9
24.080	13.3	21.7	35.0	60.0	-25.0
4.552	10.6	20.4	31.0	56.0	-25.0
4.360	10.6	20.4	31.0	56.0	-25.0
2.112	10.6	20.3	30.9	56.0	-25.1
0.497	10.7	20.2	30.9	56.1	-25.2
2.696	10.5	20.3	30.8	56.0	-25.2
0.604	10.6	20.2	30.8	56.0	-25.2
0.842	10.5	20.2	30.7	56.0	-25.3

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.144	11.9	20.4	32.3	46.0	-13.7
0.691	11.9	20.2	32.1	46.0	-13.9
4.192	11.7	20.4	32.1	46.0	-13.9
1.208	11.7	20.2	31.9	46.0	-14.1
2.624	11.4	20.3	31.7	46.0	-14.3
2.424	11.4	20.3	31.7	46.0	-14.3
4.744	11.3	20.4	31.7	46.0	-14.3
1.744	11.4	20.3	31.7	46.0	-14.3
0.541	11.4	20.2	31.6	46.0	-14.4
4.840	11.1	20.4	31.5	46.0	-14.5
4.072	11.1	20.4	31.5	46.0	-14.5
4.624	11.0	20.4	31.4	46.0	-14.6
1.656	11.1	20.3	31.4	46.0	-14.6
0.533	11.1	20.2	31.3	46.0	-14.7
1.336	11.0	20.2	31.2	46.0	-14.8
0.635	11.0	20.2	31.2	46.0	-14.8
3.360	10.8	20.3	31.1	46.0	-14.9
1.968	10.8	20.3	31.1	46.0	-14.9
24.080	13.3	21.7	35.0	50.0	-15.0
4.552	10.6	20.4	31.0	46.0	-15.0
4.360	10.6	20.4	31.0	46.0	-15.0
2.112	10.6	20.3	30.9	46.0	-15.1
0.497	10.7	20.2	30.9	46.1	-15.2
2.696	10.5	20.3	30.8	46.0	-15.2
0.604	10.6	20.2	30.8	46.0	-15.2
0.842	10.5	20.2	30.7	46.0	-15.3

CONCLUSION

Pass

Trevor Buls
Tested_By

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	27	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

None

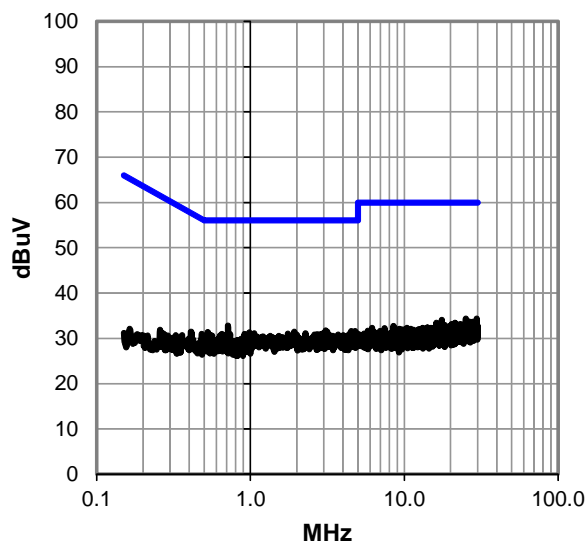
EUT OPERATING MODES

Transmitting BT ADV, High Ch

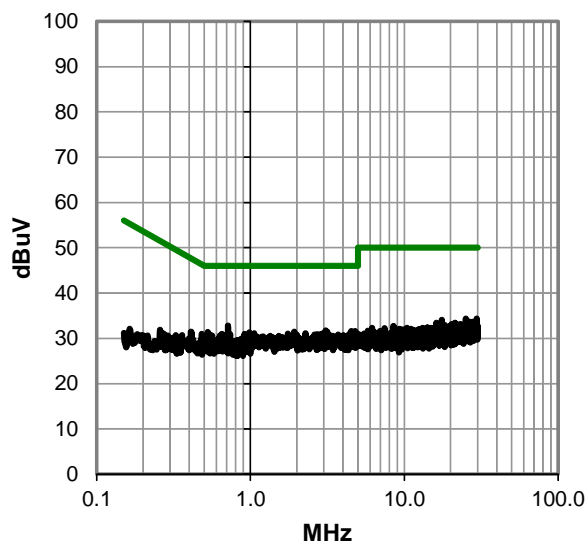
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #27

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.714	12.6	20.2	32.8	56.0	-23.2
3.088	11.4	20.3	31.7	56.0	-24.3
4.792	11.2	20.4	31.6	56.0	-24.4
4.528	11.2	20.4	31.6	56.0	-24.4
1.928	11.2	20.3	31.5	56.0	-24.5
3.152	11.1	20.3	31.4	56.0	-24.6
0.527	11.2	20.2	31.4	56.0	-24.6
0.983	11.1	20.2	31.3	56.0	-24.7
2.280	10.8	20.3	31.1	56.0	-24.9
1.056	10.9	20.2	31.1	56.0	-24.9
4.920	10.7	20.4	31.1	56.0	-24.9
2.936	10.7	20.3	31.0	56.0	-25.0
0.653	10.8	20.2	31.0	56.0	-25.0
0.915	10.8	20.2	31.0	56.0	-25.0
2.712	10.6	20.3	30.9	56.0	-25.1
0.738	10.7	20.2	30.9	56.0	-25.1
3.720	10.5	20.4	30.9	56.0	-25.1
2.600	10.5	20.3	30.8	56.0	-25.2
0.679	10.5	20.2	30.7	56.0	-25.3
0.725	10.5	20.2	30.7	56.0	-25.3
0.482	10.8	20.2	31.0	56.3	-25.3
0.551	10.4	20.2	30.6	56.0	-25.4
0.563	10.4	20.2	30.6	56.0	-25.4
4.232	10.2	20.4	30.6	56.0	-25.4
25.100	12.5	21.9	34.4	60.0	-25.6
29.550	12.0	22.4	34.4	60.0	-25.6

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.714	12.6	20.2	32.8	46.0	-13.2
3.088	11.4	20.3	31.7	46.0	-14.3
4.792	11.2	20.4	31.6	46.0	-14.4
4.528	11.2	20.4	31.6	46.0	-14.4
1.928	11.2	20.3	31.5	46.0	-14.5
3.152	11.1	20.3	31.4	46.0	-14.6
0.527	11.2	20.2	31.4	46.0	-14.6
0.983	11.1	20.2	31.3	46.0	-14.7
2.280	10.8	20.3	31.1	46.0	-14.9
1.056	10.9	20.2	31.1	46.0	-14.9
4.920	10.7	20.4	31.1	46.0	-14.9
2.936	10.7	20.3	31.0	46.0	-15.0
0.653	10.8	20.2	31.0	46.0	-15.0
0.915	10.8	20.2	31.0	46.0	-15.0
2.712	10.6	20.3	30.9	46.0	-15.1
0.738	10.7	20.2	30.9	46.0	-15.1
3.720	10.5	20.4	30.9	46.0	-15.1
2.600	10.5	20.3	30.8	46.0	-15.2
0.679	10.5	20.2	30.7	46.0	-15.3
0.725	10.5	20.2	30.7	46.0	-15.3
0.482	10.8	20.2	31.0	46.3	-15.3
0.551	10.4	20.2	30.6	46.0	-15.4
0.563	10.4	20.2	30.6	46.0	-15.4
4.232	10.2	20.4	30.6	46.0	-15.4
25.100	12.5	21.9	34.4	50.0	-15.6
29.550	12.0	22.4	34.4	50.0	-15.6

CONCLUSION

Pass

Trevor Buls
Tested_By

POWERLINE CONDUCTED EMISSIONS

EUT:	37x Torpedo + Wireless SOM -31	Work Order:	LGPD0096
Serial Number:	1413M00359	Date:	05/30/2013
Customer:	Logic PD, Inc.	Temperature:	22.8°C
Attendees:	None	Relative Humidity:	60.6%
Customer Project:	None	Bar. Pressure:	1002.2 mb
Tested By:	Mike Sutherland, Trevor Buls	Job Site:	MN03
Power:	5VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	28	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

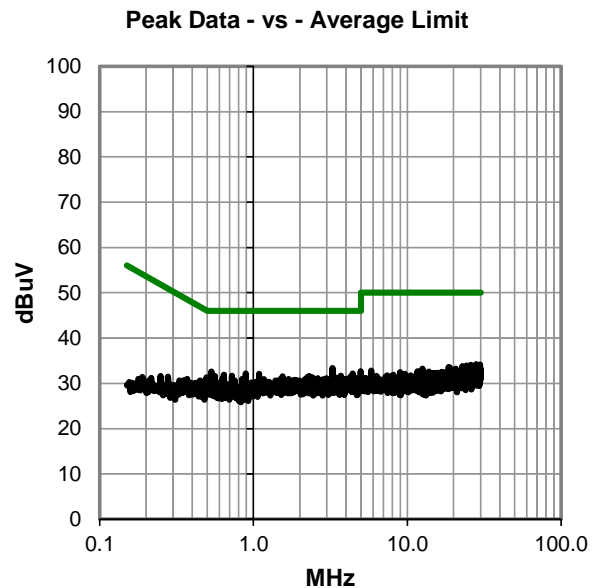
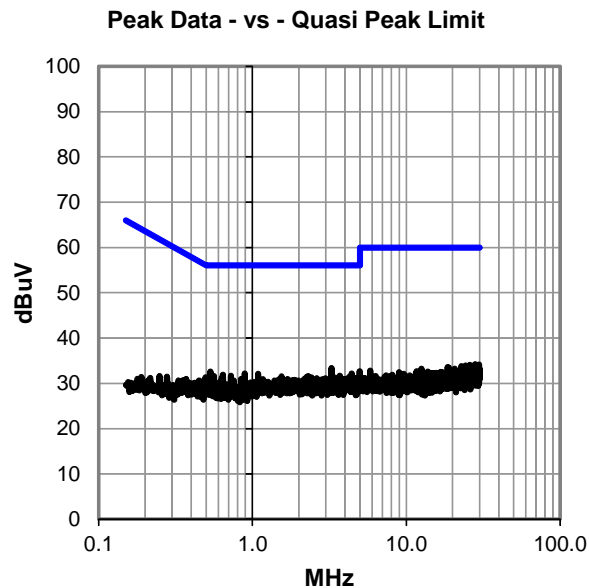
None

EUT OPERATING MODES

Transmitting BT ADV, High Ch

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #28

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
3.264	13.0	20.3	33.3	56.0	-22.7
4.976	12.3	20.4	32.7	56.0	-23.3
0.534	12.4	20.2	32.6	56.0	-23.4
0.889	12.0	20.2	32.2	56.0	-23.8
4.424	11.8	20.4	32.2	56.0	-23.8
1.088	11.9	20.2	32.1	56.0	-23.9
0.643	11.7	20.2	31.9	56.0	-24.1
0.723	11.5	20.2	31.7	56.0	-24.3
3.688	11.3	20.4	31.7	56.0	-24.3
2.296	11.3	20.3	31.6	56.0	-24.4
0.560	11.4	20.2	31.6	56.0	-24.4
1.544	11.3	20.3	31.6	56.0	-24.4
4.248	11.0	20.4	31.4	56.0	-24.6
2.408	11.0	20.3	31.3	56.0	-24.7
2.232	11.0	20.3	31.3	56.0	-24.7
3.456	10.9	20.3	31.2	56.0	-24.8
0.495	11.1	20.2	31.3	56.1	-24.8
4.752	10.8	20.4	31.2	56.0	-24.8
2.984	10.8	20.3	31.1	56.0	-24.9
2.616	10.8	20.3	31.1	56.0	-24.9
3.600	10.7	20.4	31.1	56.0	-24.9
0.845	10.8	20.2	31.0	56.0	-25.0
3.856	10.6	20.4	31.0	56.0	-25.0
1.168	10.7	20.2	30.9	56.0	-25.1
1.704	10.6	20.3	30.9	56.0	-25.1
1.480	10.6	20.2	30.8	56.0	-25.2

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
3.264	13.0	20.3	33.3	46.0	-12.7
4.976	12.3	20.4	32.7	46.0	-13.3
0.534	12.4	20.2	32.6	46.0	-13.4
0.889	12.0	20.2	32.2	46.0	-13.8
4.424	11.8	20.4	32.2	46.0	-13.8
1.088	11.9	20.2	32.1	46.0	-13.9
0.643	11.7	20.2	31.9	46.0	-14.1
0.723	11.5	20.2	31.7	46.0	-14.3
3.688	11.3	20.4	31.7	46.0	-14.3
2.296	11.3	20.3	31.6	46.0	-14.4
0.560	11.4	20.2	31.6	46.0	-14.4
1.544	11.3	20.3	31.6	46.0	-14.4
4.248	11.0	20.4	31.4	46.0	-14.6
2.408	11.0	20.3	31.3	46.0	-14.7
2.232	11.0	20.3	31.3	46.0	-14.7
3.456	10.9	20.3	31.2	46.0	-14.8
0.495	11.1	20.2	31.3	46.1	-14.8
4.752	10.8	20.4	31.2	46.0	-14.8
2.984	10.8	20.3	31.1	46.0	-14.9
2.616	10.8	20.3	31.1	46.0	-14.9
3.600	10.7	20.4	31.1	46.0	-14.9
0.845	10.8	20.2	31.0	46.0	-15.0
3.856	10.6	20.4	31.0	46.0	-15.0
1.168	10.7	20.2	30.9	46.0	-15.1
1.704	10.6	20.3	30.9	46.0	-15.1
1.480	10.6	20.2	30.8	46.0	-15.2

CONCLUSION

Pass

Trevor Buls
Tested_By