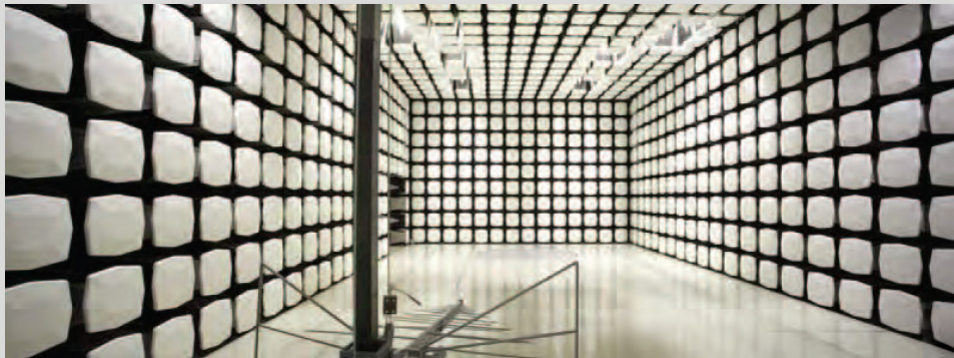




Logic PD, Inc.
37x Torpedo + Wireless SOM -31
FCC 15.207:2013
FCC 15.247:2013
Report #: LGPD0096.1



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: June 03, 2013
Logic PD, Inc.
Model: 37x Torpedo + Wireless SOM -31

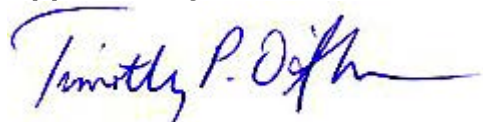
Emissions

Test Description	Specification	Test Method	Pass/Fail
Channel Spacing	FCC 15.247:2013	ANSI C63.10:2009	Pass
Dwell Time	FCC 15.247:2013	ANSI C63.10:2009	Pass
Number of Hopping Channels	FCC 15.247:2013	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2013	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2013	ANSI C63.10:2009	Pass
Band Edge Compliance - Hopping Mode	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
Spurious Radiated Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
AC 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.

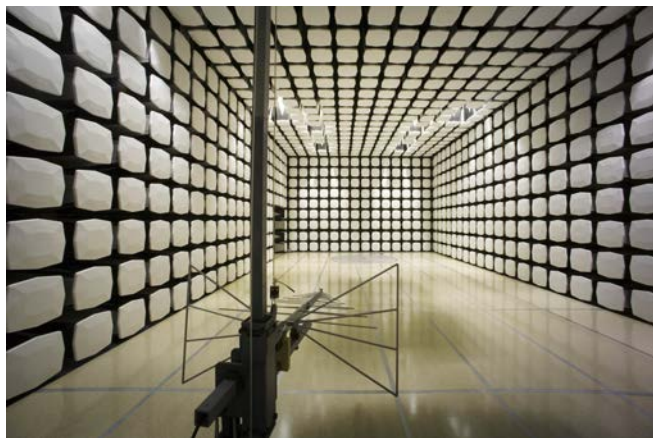
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement 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





PRODUCT DESCRIPTION

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 29, 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 requirements.

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	5/29/2013	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	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	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.
4	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.
5	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.
6	6/3/2013	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	6/3/2013	Channel Spacing	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	6/3/2013	Number of Hopping Channels	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.
9	6/3/2013	Dwell Time	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.
10	6/3/2013	Band Edge Compliance - Hopping Mode	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.

Channel Spacing

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 channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

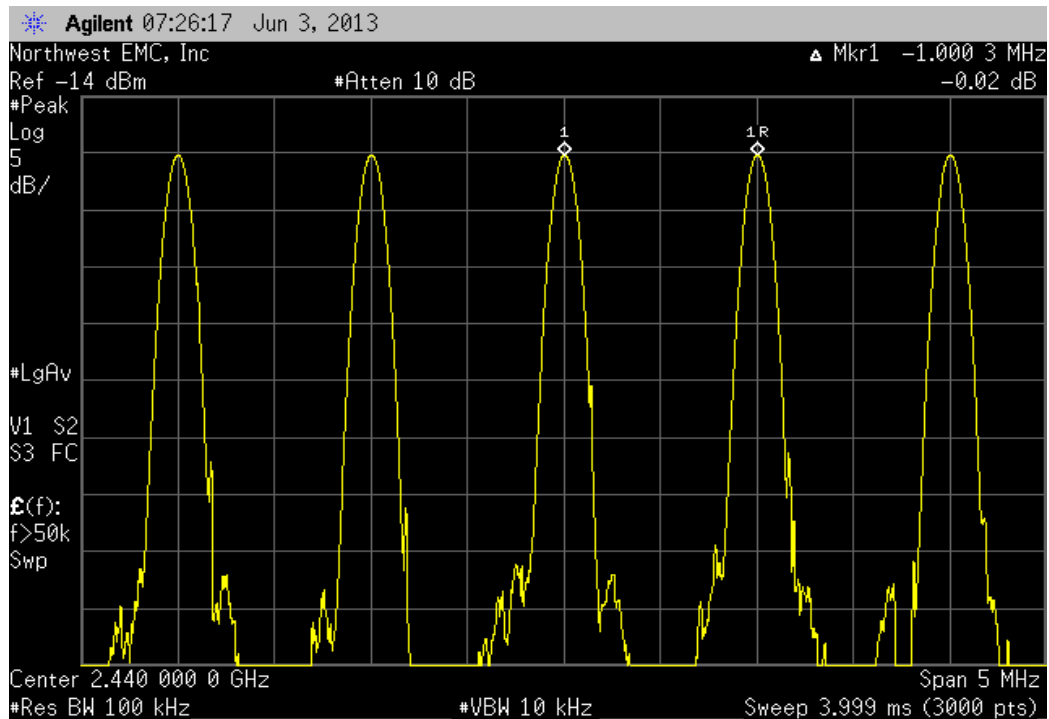


Channel Spacing

XMit 2013.02.28
PsaTx 2013.05.24

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		
FCC 15.247:2013		Test Method
		ANSI C63.10:2009
COMMENTS		
None		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	1	Signature <i>Trevor Buls</i>
Hopping Mode		Value 1.0 MHz
		Limit ≥ 1 MHz
		Result Pass

Hopping Mode						
				Value	Limit	Result
				1.0 MHz	≥ 1 MHz	Pass



Dwell Time

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 average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For Bluetooth this would be 79 Channels * 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width * Average Number of Pulses * Scale Factor

➤ Average Number of Pulses is based on 4 samples.

➤ Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5

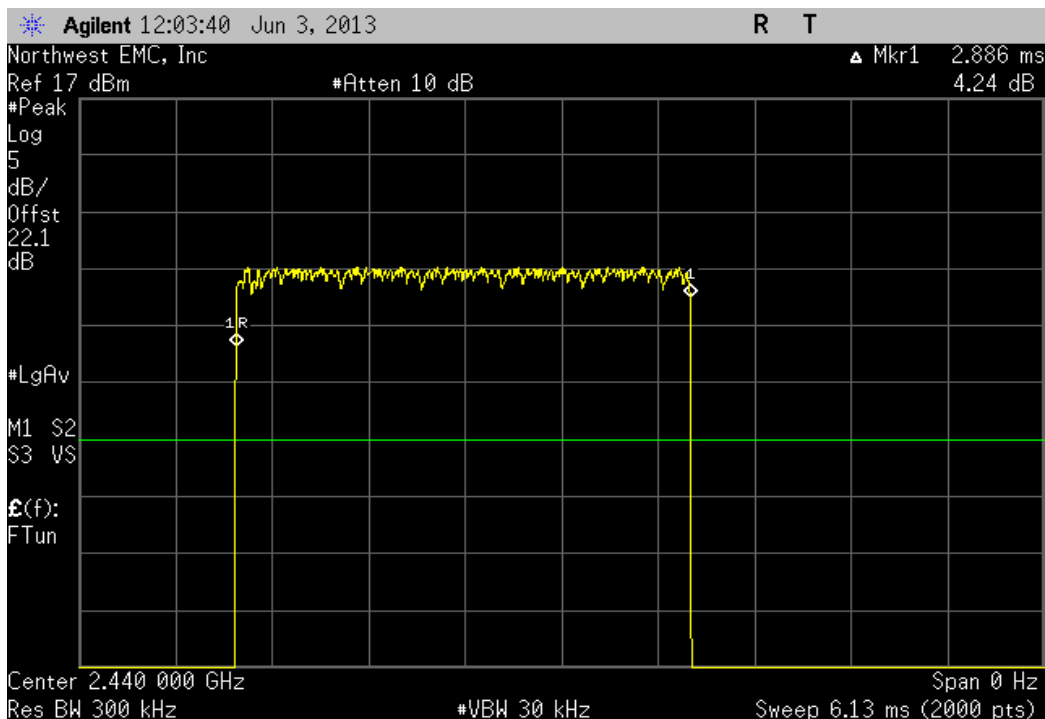


Dwell Time

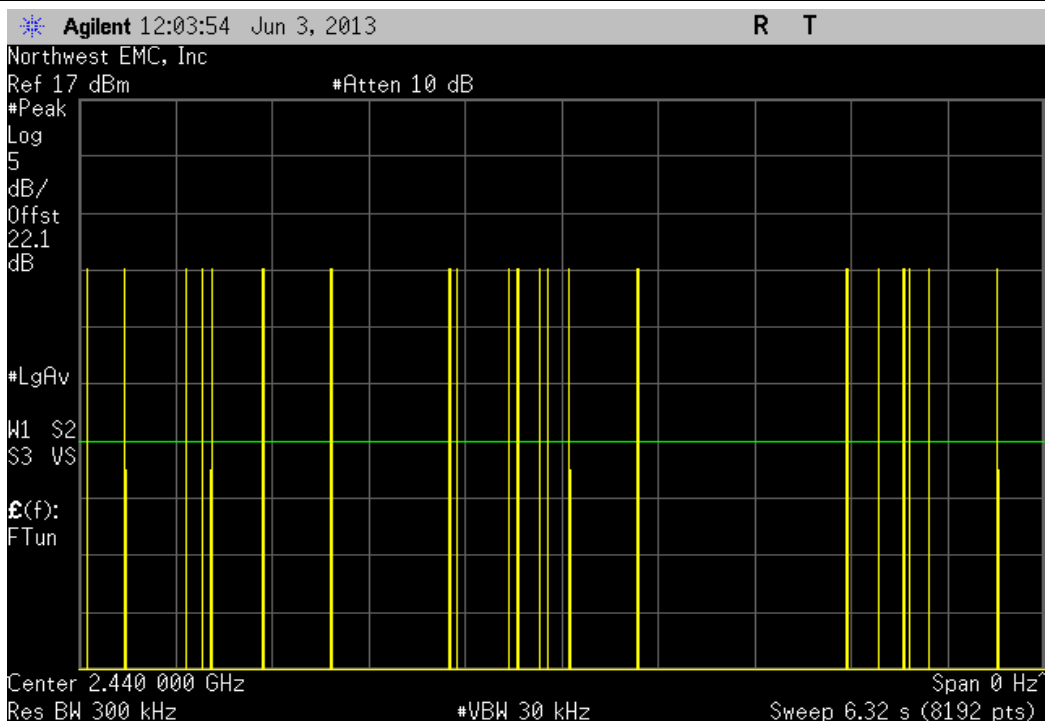
XMit 2013.02.28
PsaTx 2013.05.24

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>							
			Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
Hopping Mode									
DH5, GFSK									
	Mid Channel, 2440 MHz		2.886	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	21	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	24	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	13	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	25	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		2.886	N/A	20.75	5	299.42	400	Pass
2DH5, pi/4-DQPSK									
	Mid Channel, 2440 MHz		2.873	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	24	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	21	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	20	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	21	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		2.873	N/A	21.5	5	308.85	400	Pass
3DH5, 8-DPSK									
	Mid Channel, 2440 MHz		2.895	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	16	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	26	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	18	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		N/A	27	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 2440 MHz		2.895	N/A	21.75	5	314.83	400	Pass

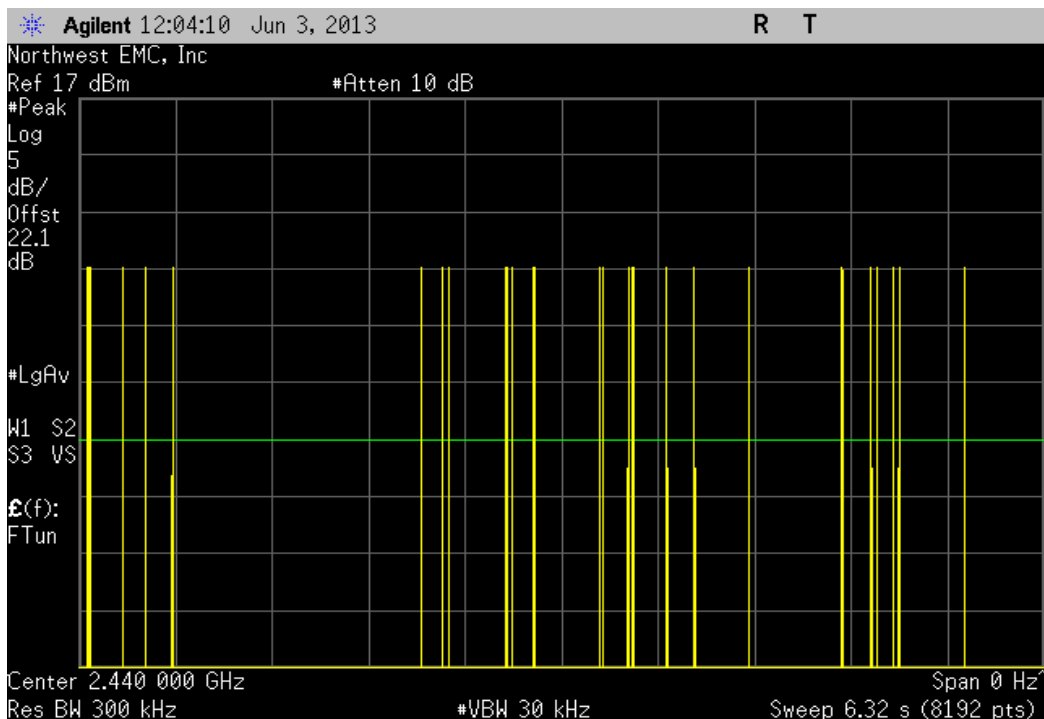
Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.886	N/A	N/A	N/A	N/A	N/A	N/A



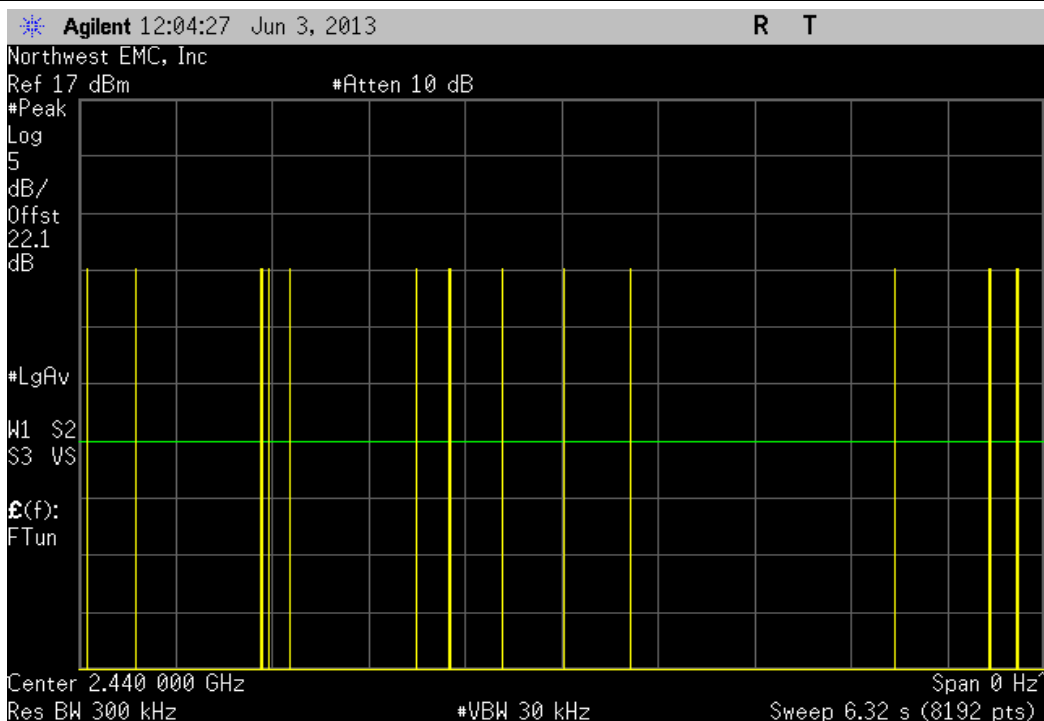
Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	21	N/A	N/A	N/A	N/A	N/A



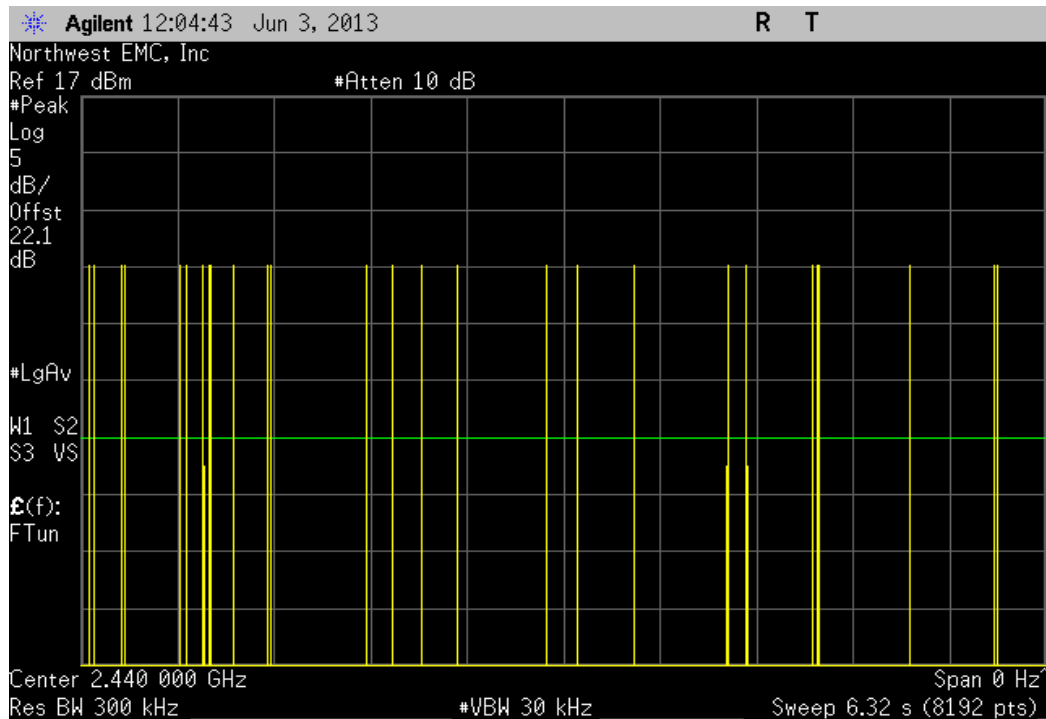
Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	24	N/A	N/A	N/A	N/A	N/A



Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	13	N/A	N/A	N/A	N/A	N/A



Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	25	N/A	N/A	N/A	N/A	N/A

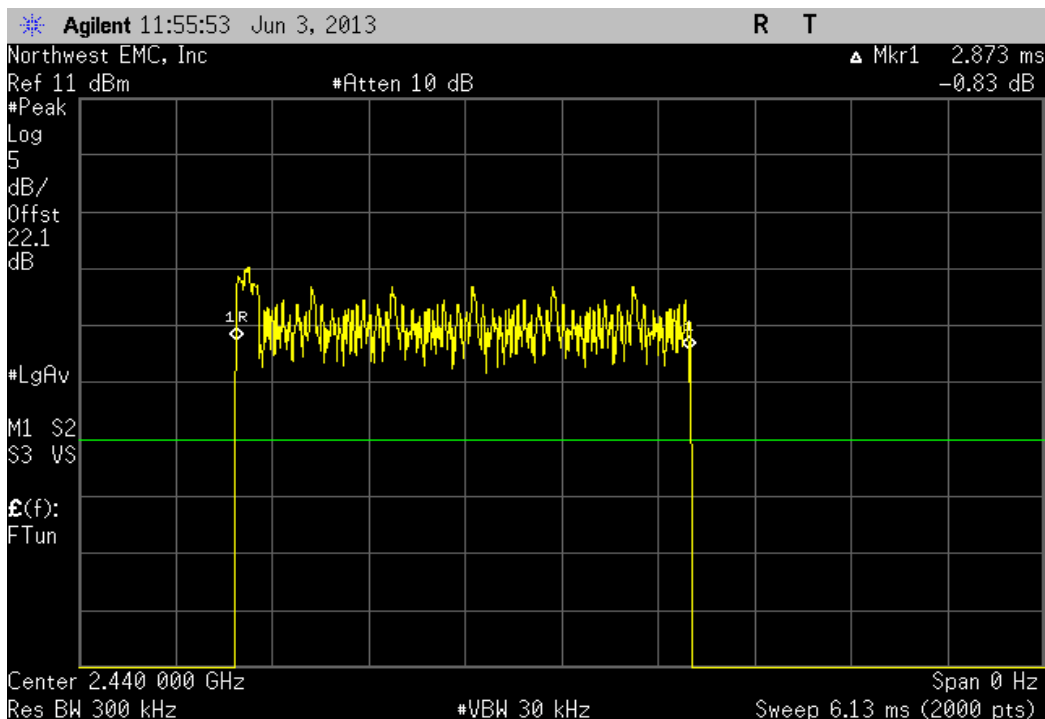


Hopping Mode, DH5, GFSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.886	N/A	20.75	5	299.42	400	Pass

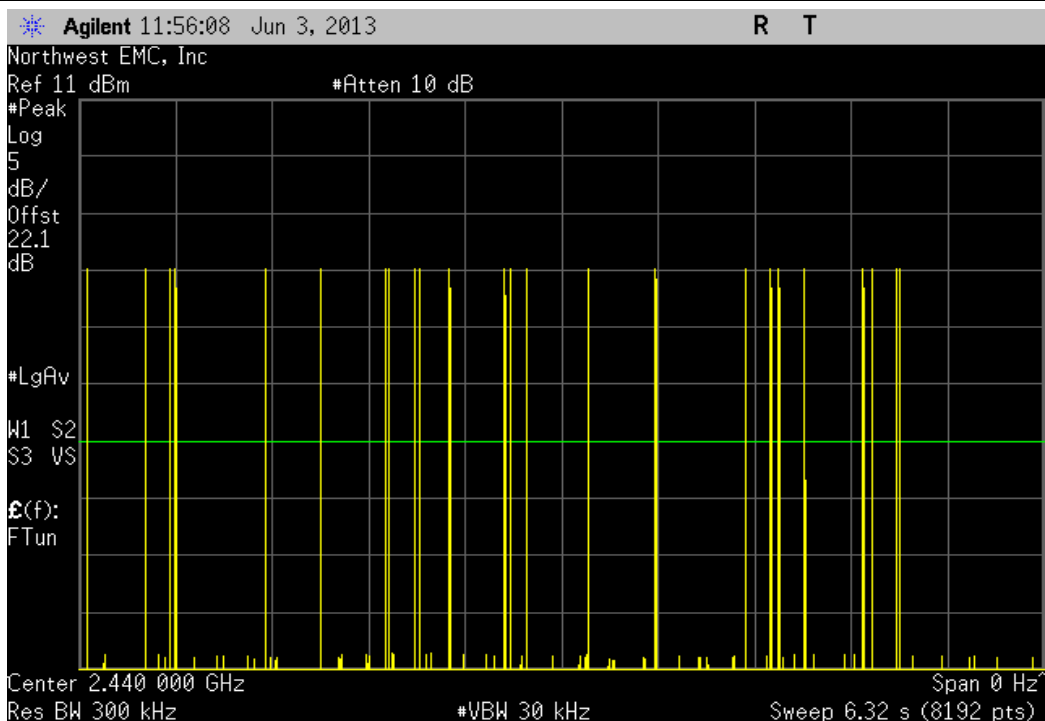
Calculation Only

No Screen Capture Required

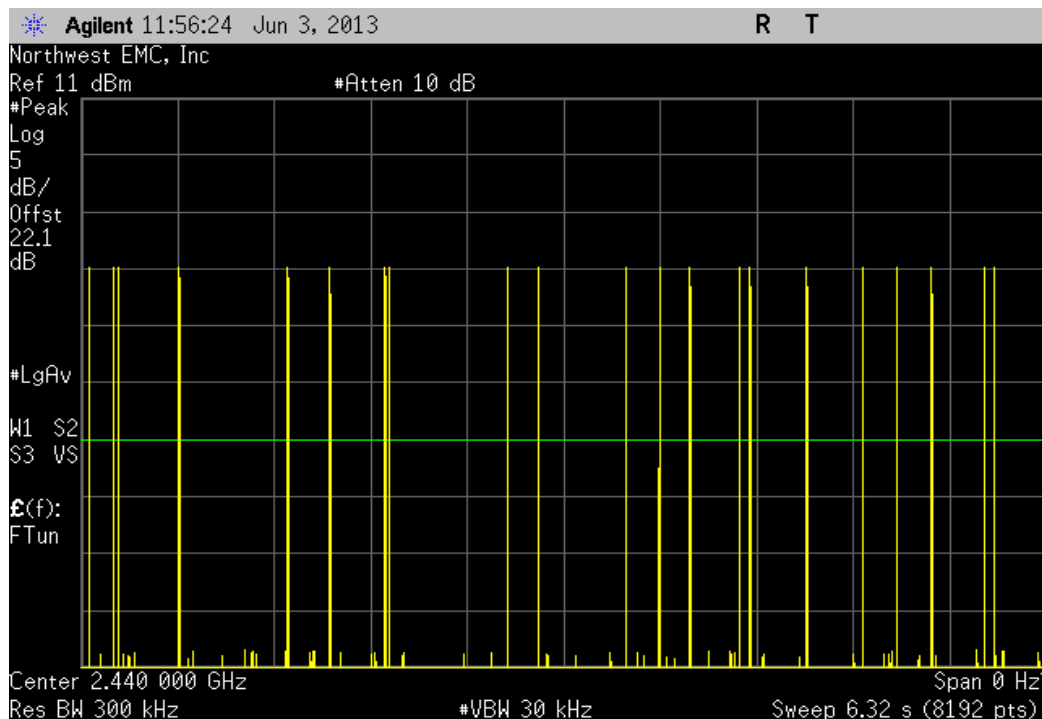
Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.873	N/A	N/A	N/A	N/A	N/A	N/A



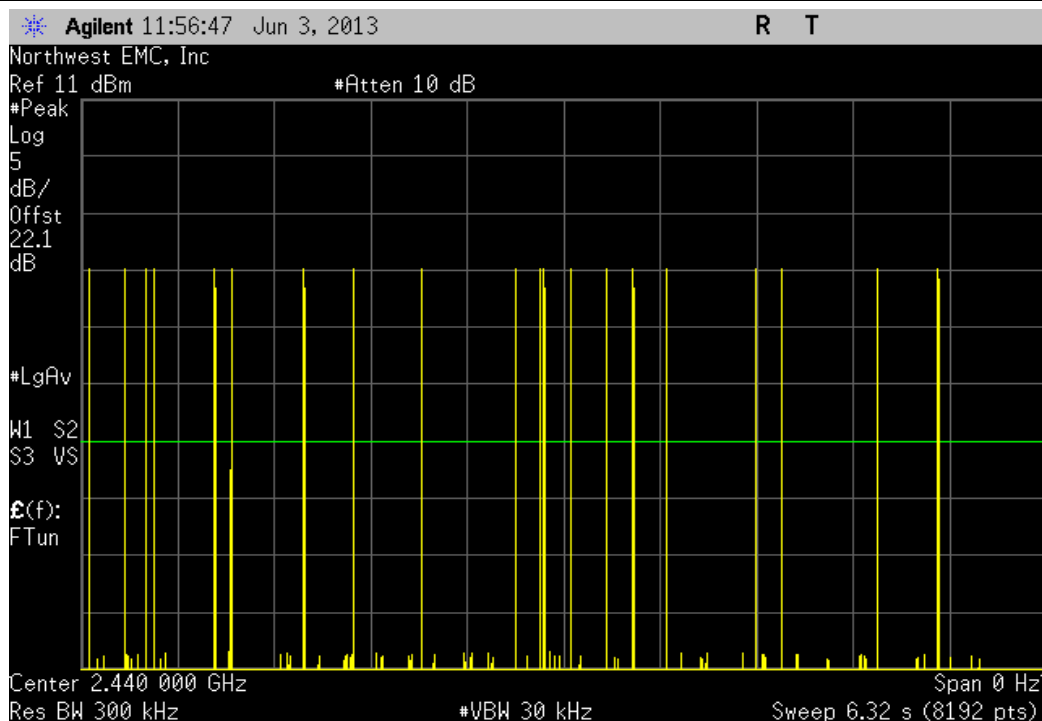
Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	24	N/A	N/A	N/A	N/A	N/A



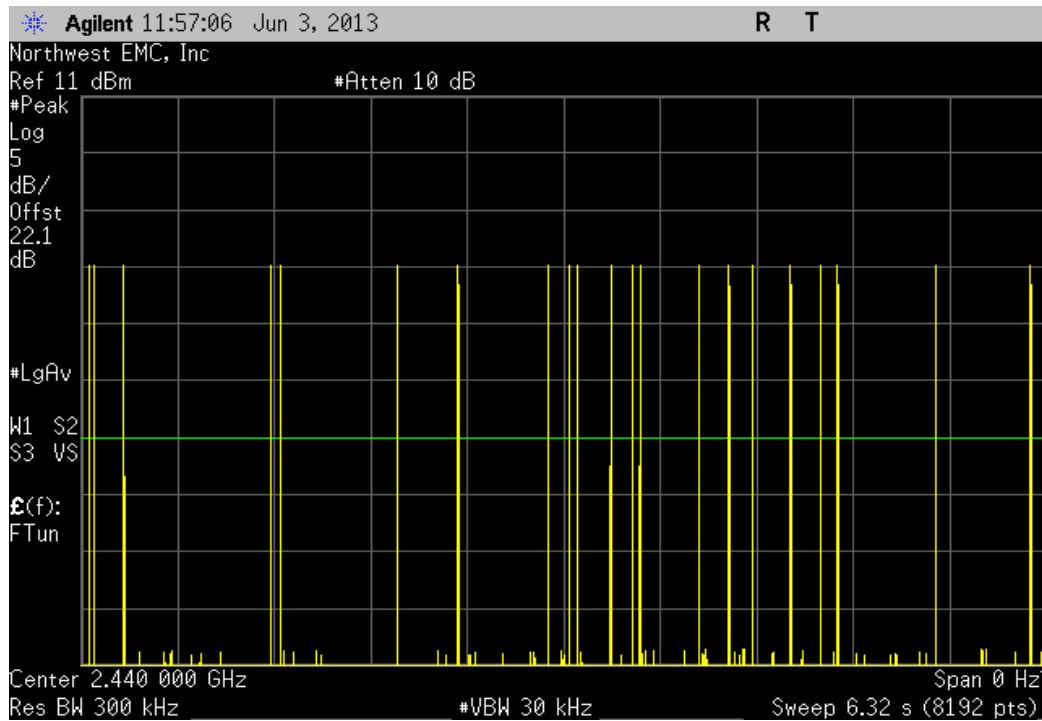
Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	21	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	20	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	21	N/A	N/A	N/A	N/A	N/A

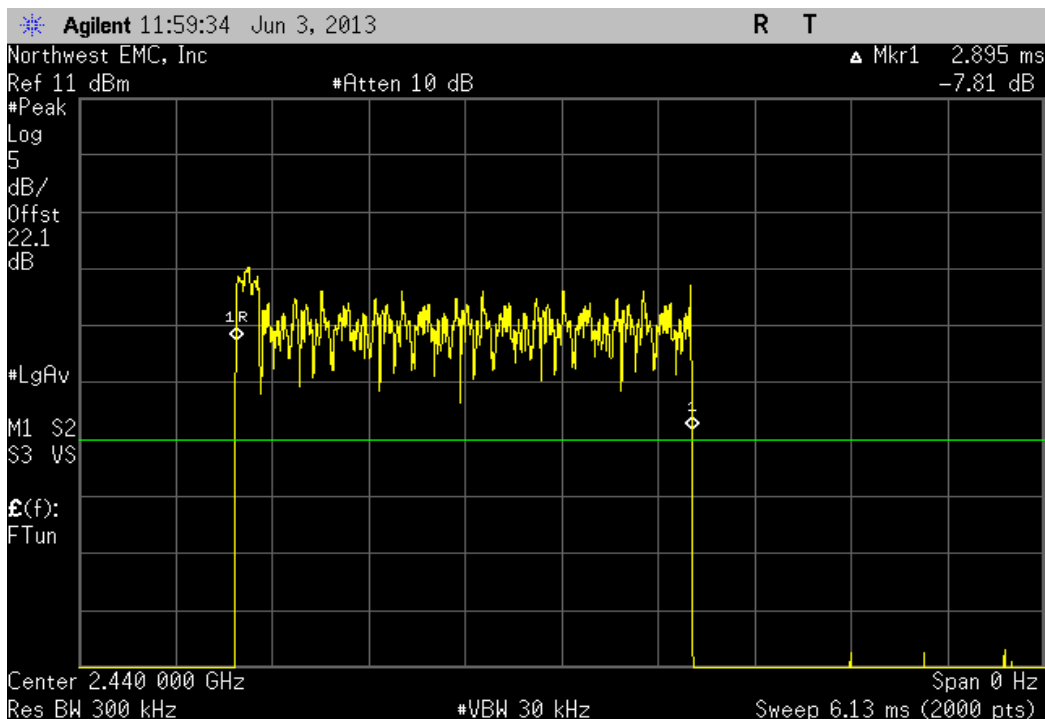


Hopping Mode, 2DH5, pi/4-DQPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.873	N/A	21.5	5	308.85	400	Pass

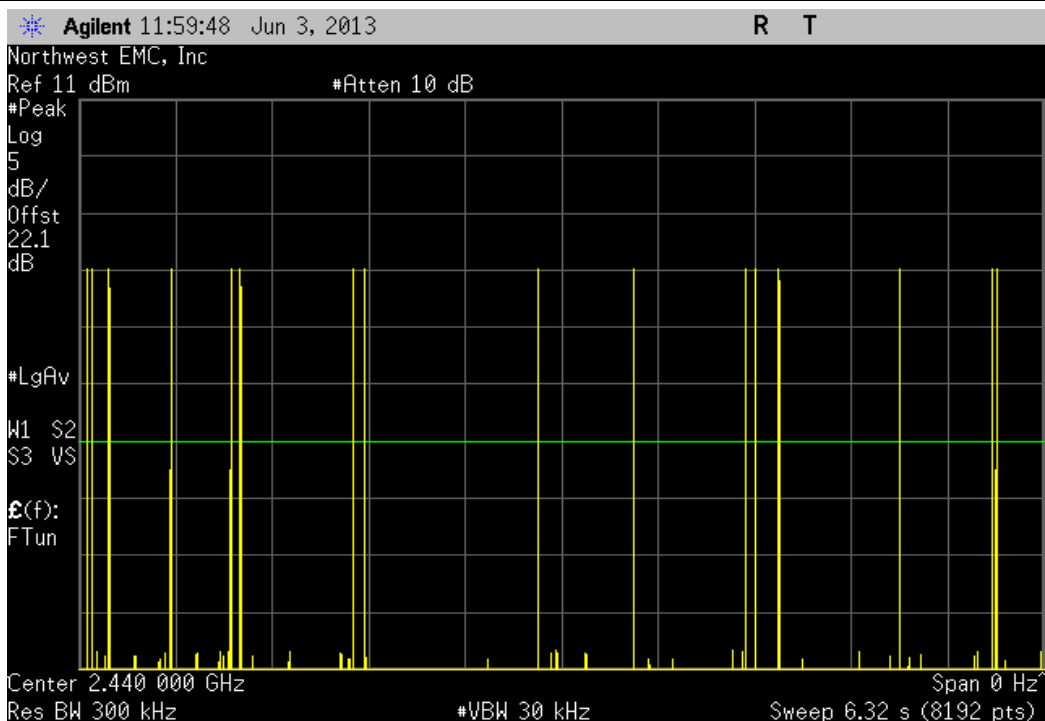
Calculation Only

No Screen Capture Required

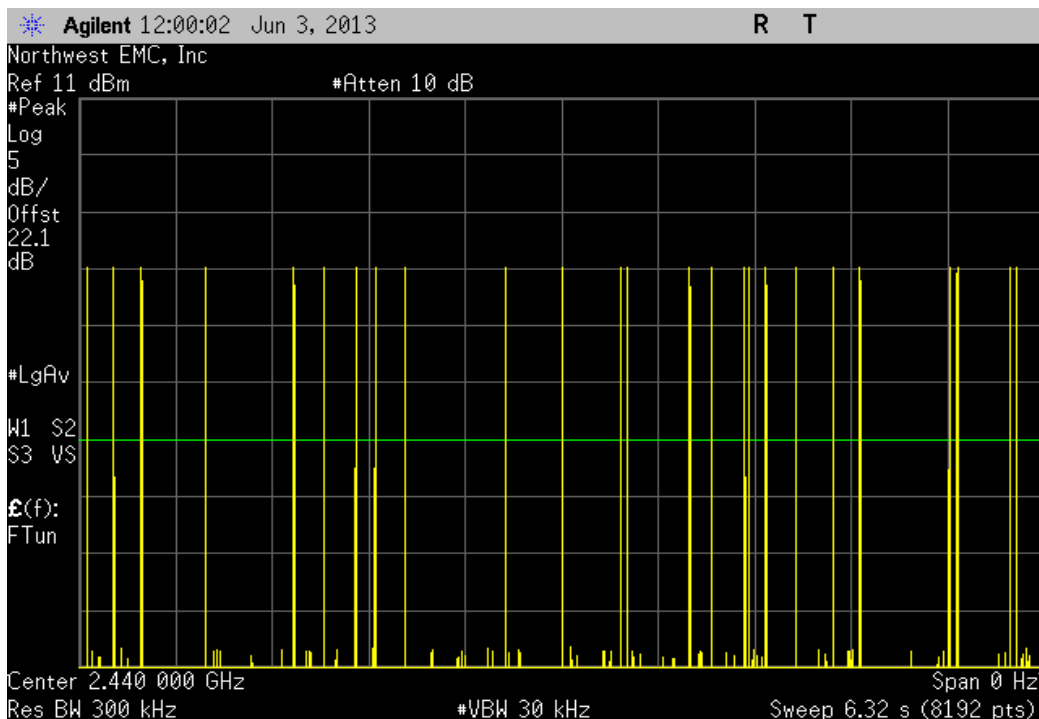
Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.895	N/A	N/A	N/A	N/A	N/A	N/A



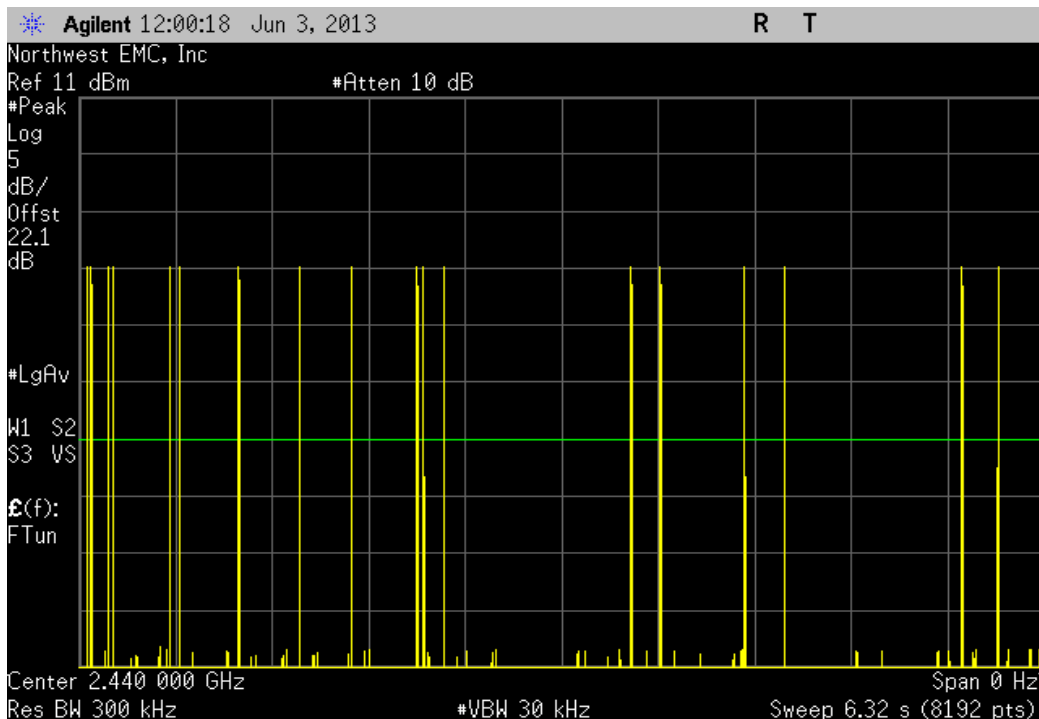
Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	16	N/A	N/A	N/A	N/A	N/A



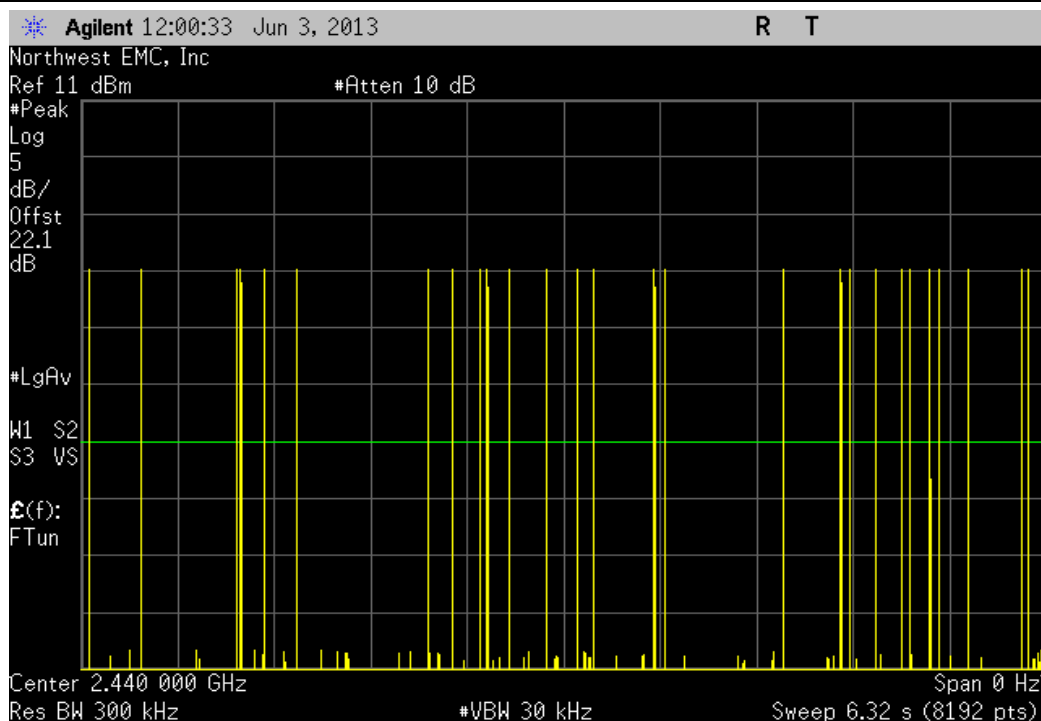
Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	26	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	18	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	27	N/A	N/A	N/A	N/A	N/A



Hopping Mode, 3DH5, 8-DPSK, Mid Channel, 2440 MHz						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
2.895	N/A	21.75	5	314.83	400	Pass

Calculation Only

No Screen Capture Required



Number of Hopping Frequencies

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 number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

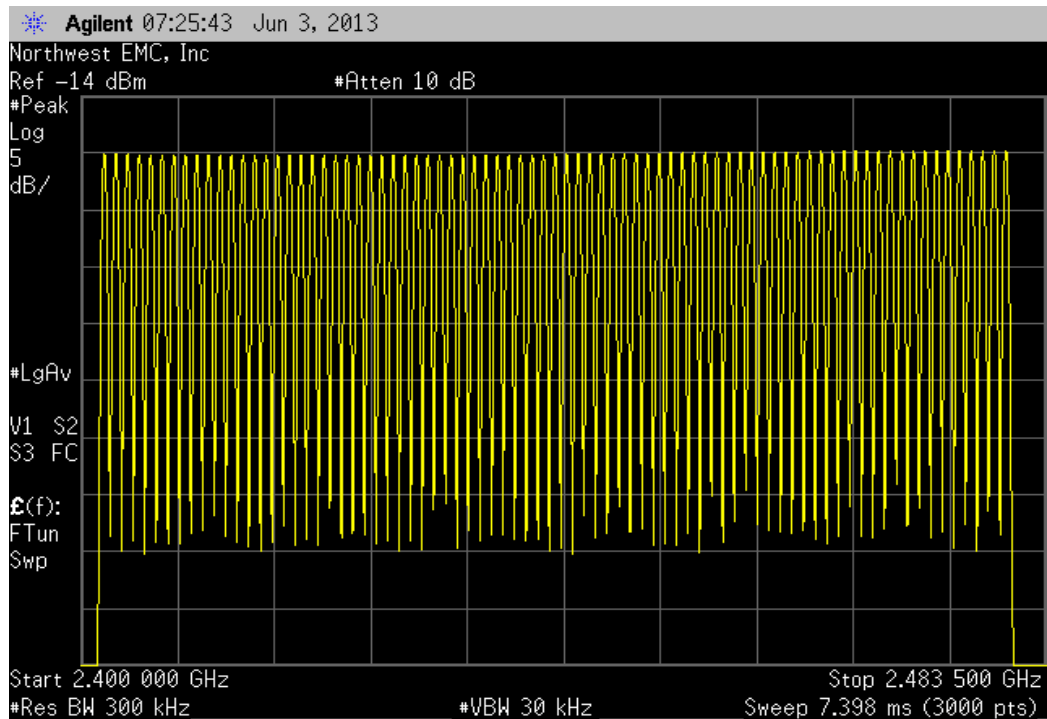


Number of Hopping Frequencies

XMit 2013.02.28
PsaTx 2013.05.24

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>	
		Number of Channels	Limit
Hopping Mode		79	≥ 15
			Result
			Pass

Hopping Mode						
				Number of Channels	Limit	Result
				79	≥ 15	Pass



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



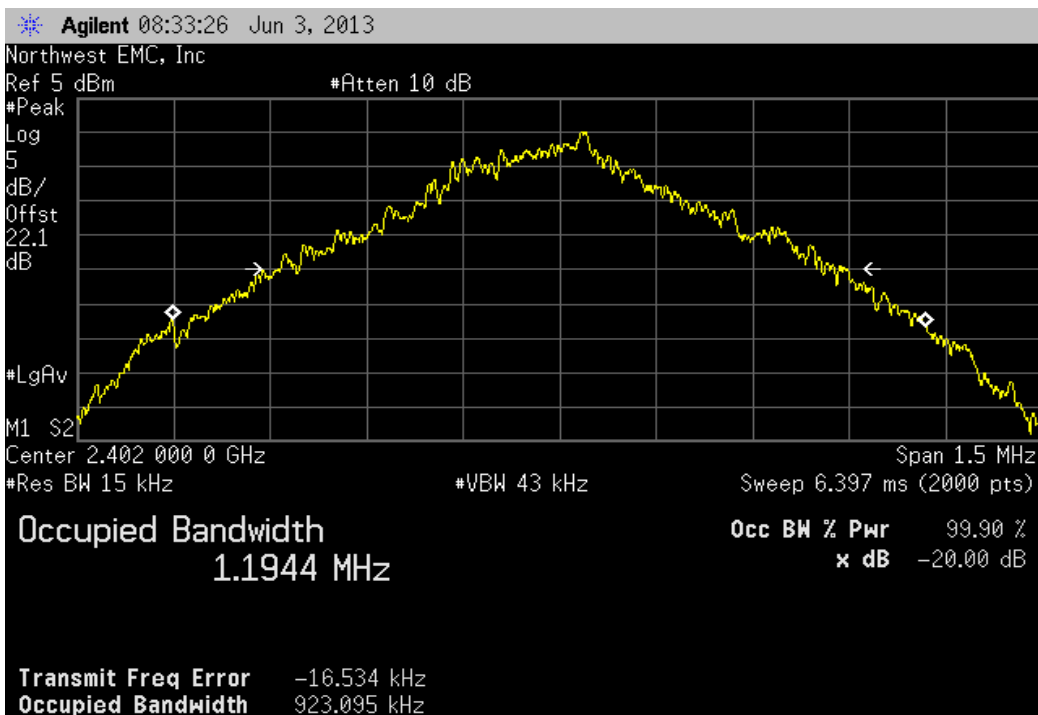
Occupied Bandwidth

XMit 2013.02.28
PsaTx 2013.05.24

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
			Result
DH5, GFSK			
Low Channel		923.095 kHz	< 1.5 MHz
Mid Channel		893.039 kHz	< 1.5 MHz
High Channel		906.714 kHz	< 1.5 MHz
2DH5, pi/4-DQPSK			
Low Channel		1.365 MHz	< 1.5 MHz
Mid Channel		1.346 MHz	< 1.5 MHz
High Channel		1.361 MHz	< 1.5 MHz
3DH5, 8-DPSK			
Low Channel		1.359 MHz	< 1.5 MHz
Mid Channel		1.366 MHz	< 1.5 MHz
High Channel		1.358 MHz	< 1.5 MHz

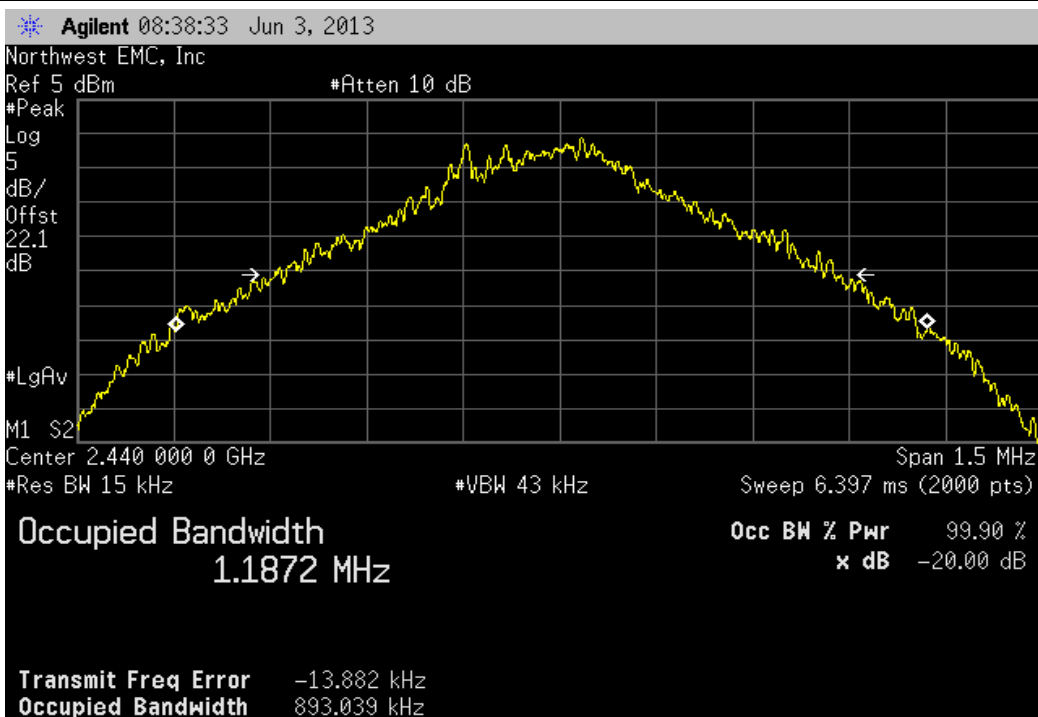
DH5, GFSK, Low Channel

				Value	Limit	Result
				923.095 kHz	< 1.5 MHz	Pass



DH5, GFSK, Mid Channel

				Value	Limit	Result
				893.039 kHz	< 1.5 MHz	Pass



DH5, GFSK, High Channel

	Value	Limit	Result
	906.714 kHz	< 1.5 MHz	Pass

Agilent 08:41:49 Jun 3, 2013

Northwest EMC, Inc

Ref 5 dBm

#Atten 10 dB

#Peak

Log

5

dB/

Offst

22.1

dB

#LgAv

M1 S2

Center 2.480 000 0 GHz

#Res BW 15 kHz

#VBW 43 kHz

Span 2 MHz
Sweep 8.529 ms (2000 pts)

Occupied Bandwidth

1.1931 MHz

Occ BW % Pwr 99.90 %
x dB -20.00 dB

Transmit Freq Error

-7.069 kHz

Occupied Bandwidth

906.714 kHz

2DH5, pi/4-DQPSK, Low Channel

	Value	Limit	Result
	1.365 MHz	< 1.5 MHz	Pass

Agilent 08:45:40 Jun 3, 2013

Northwest EMC, Inc

Ref 5 dBm

#Atten 10 dB

#Peak

Log

5

dB/

Offst

22.1

dB

#LgAv

M1 S2

Center 2.402 000 0 GHz

#Res BW 24 kHz

#VBW 75 kHz

Span 2 MHz
Sweep 3.332 ms (2000 pts)

Occupied Bandwidth

1.3686 MHz

Occ BW % Pwr 99.90 %
x dB -20.00 dB

Transmit Freq Error

223.267 Hz

Occupied Bandwidth

1.365 MHz

2DH5, pi/4-DQPSK, Mid Channel

Value	Limit	Result
1.346 MHz	< 1.5 MHz	Pass

Agilent 08:49:35 Jun 3, 2013

Northwest EMC, Inc

Ref 5 dBm

#Atten 10 dB

#Peak

Log

5

dB/

Offst

22.1

dB

#LgAv

M1 S2

Center 2.440 000 0 GHz

#Res BW 24 kHz

#VBW 75 kHz

Span 2 MHz

Sweep 3.332 ms (2000 pts)

Occupied Bandwidth

1.3697 MHz

Occ BW % Pwr 99.90 %

x dB -20.00 dB

Transmit Freq Error 121.435 Hz

Occupied Bandwidth 1.346 MHz

2DH5, pi/4-DQPSK, High Channel

Value	Limit	Result
1.361 MHz	< 1.5 MHz	Pass

Agilent 08:55:42 Jun 3, 2013

Northwest EMC, Inc

Ref 5 dBm

#Atten 10 dB

#Peak

Log

5

dB/

Offst

22.1

dB

#LgAv

M1 S2

Center 2.480 000 0 GHz

#Res BW 24 kHz

#VBW 75 kHz

Span 2 MHz

Sweep 3.332 ms (2000 pts)

Occupied Bandwidth

1.3701 MHz

Occ BW % Pwr 99.90 %

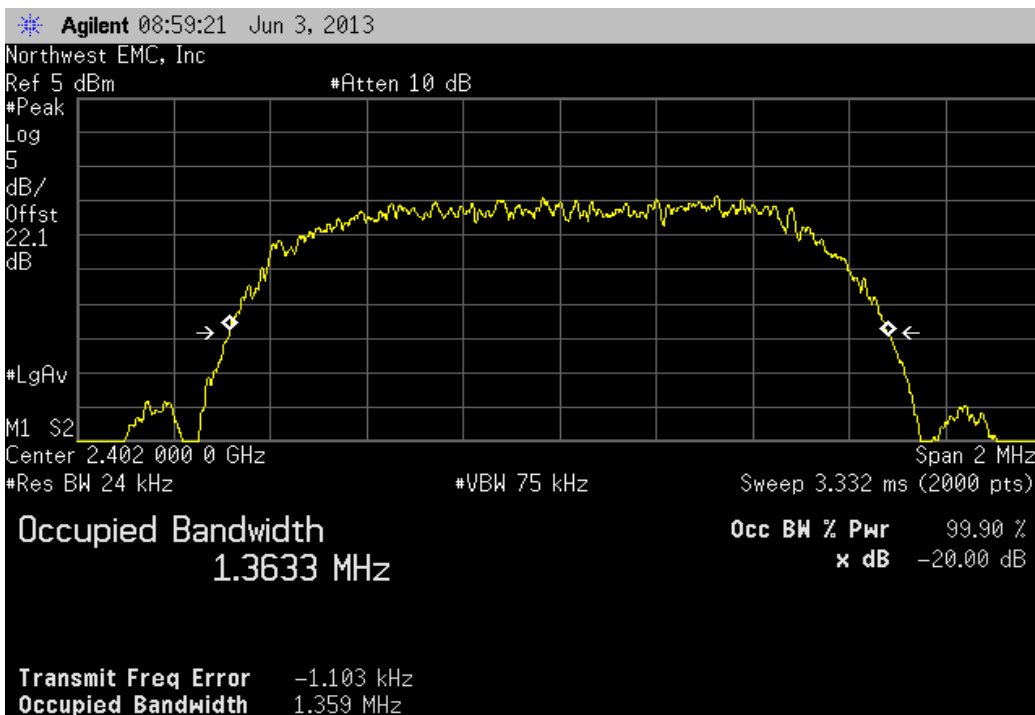
x dB -20.00 dB

Transmit Freq Error -1.405 kHz

Occupied Bandwidth 1.361 MHz

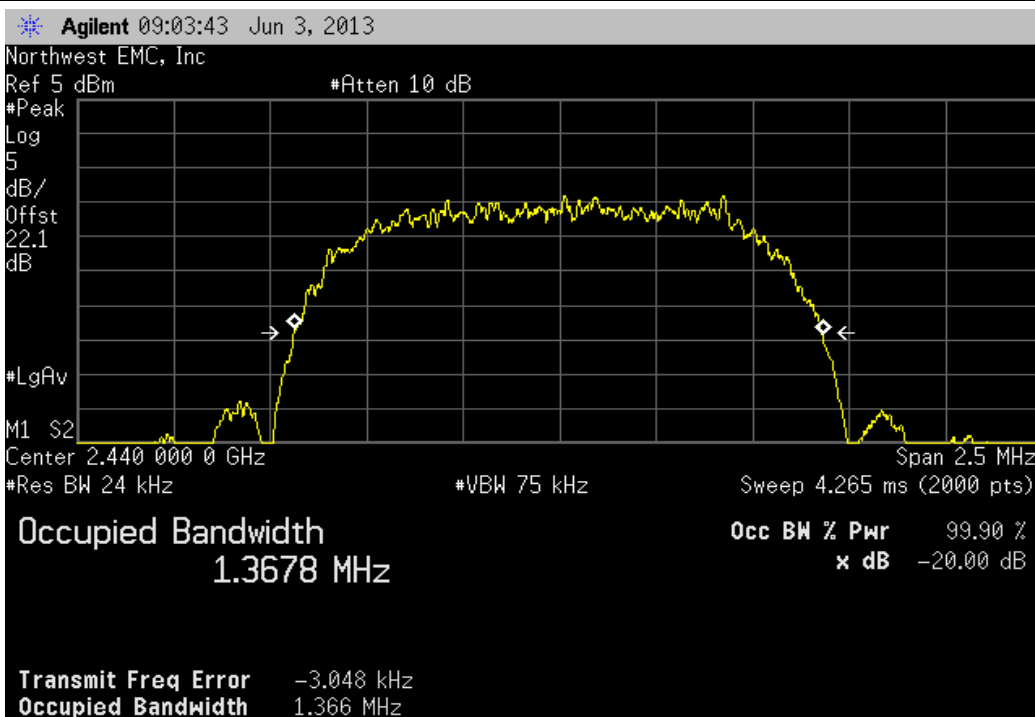
3DH5, 8-DPSK, Low Channel

				Value	Limit	Result
				1.359 MHz	< 1.5 MHz	Pass



3DH5, 8-DPSK, Mid Channel

				Value	Limit	Result
				1.366 MHz	< 1.5 MHz	Pass



3DH5, 8-DPSK, High Channel

	Value	Limit	Result
	1.358 MHz	< 1.5 MHz	Pass

Agilent 09:07:29 Jun 3, 2013

Northwest EMC, Inc

Ref 5 dBm

#Atten 10 dB

#Peak

Log

5

dB/

Offst

22.1

dB

#LgAv

M1 S2

Center 2.480 000 0 GHz

#Res BW 24 kHz

#VBW 75 kHz

Span 2.5 MHz

Sweep 4.265 ms (2000 pts)

Occupied Bandwidth

1.3724 MHz

Occ BW % Pwr 99.90 %

x dB -20.00 dB

Transmit Freq Error -3.269 kHz

Occupied Bandwidth 1.358 MHz

Output Power

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

TEST EQUIPMENT

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

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



Output Power

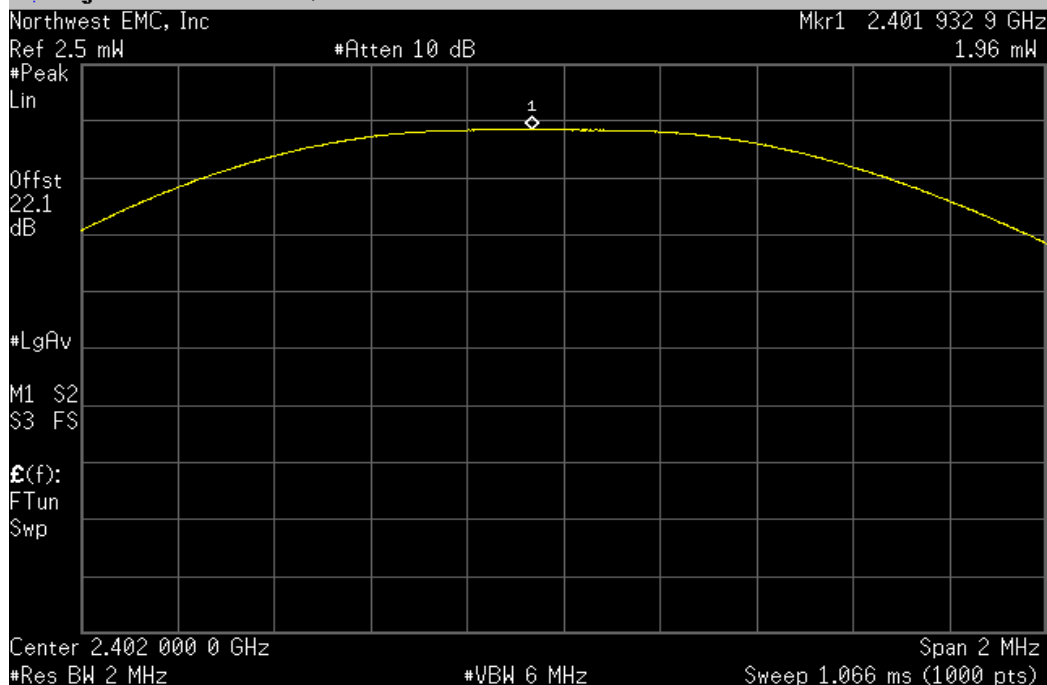
XMit 2013.02.28
PsaTx 2013.05.24

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			
FCC 15.247:2013		Test Method	
		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Trevor Buls</i>	
		Value	Limit
			Result
DH5, GFSK			
Low Channel		1.958 mW	< 125 mW
Mid Channel		1.94 mW	< 125 mW
High Channel		2.112 mW	< 125 mW
2DH5, pi/4-DQPSK			
Low Channel		839.653 uW	< 125 mW
Mid Channel		816.582 uW	< 125 mW
High Channel		909.285 uW	< 125 mW
3DH5, 8-DPSK			
Low Channel		985.145 uW	< 125 mW
Mid Channel		959.622 uW	< 125 mW
High Channel		1.065 mW	< 125 mW

DH5, GFSK, Low Channel

Value	Limit	Result
1.958 mW	< 125 mW	Pass

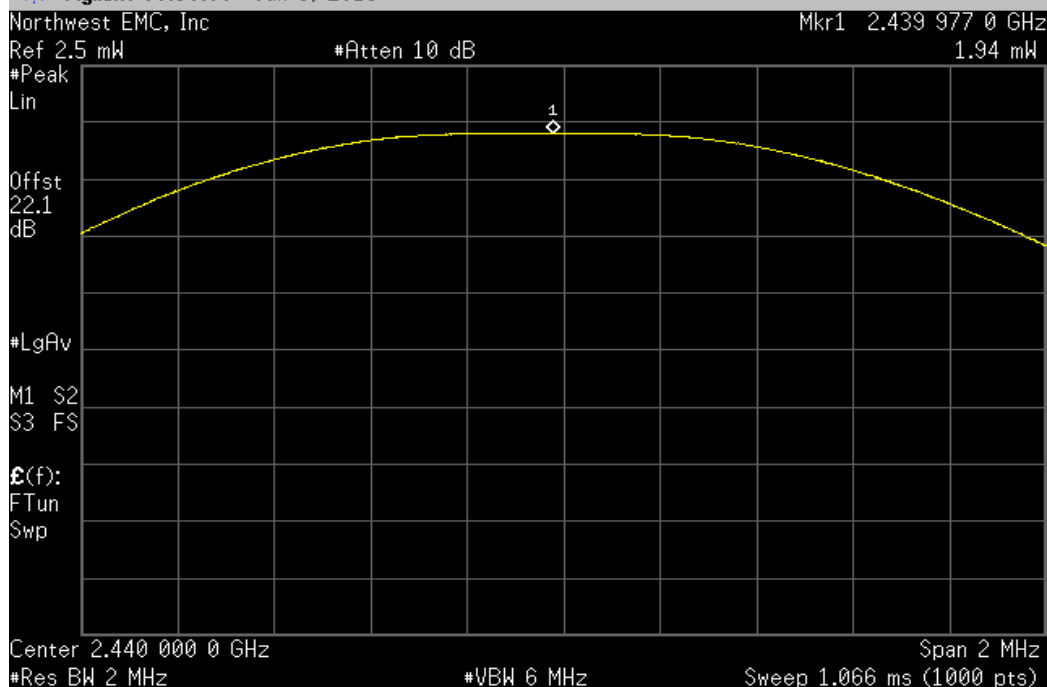
Agilent 08:34:58 Jun 3, 2013



DH5, GFSK, Mid Channel

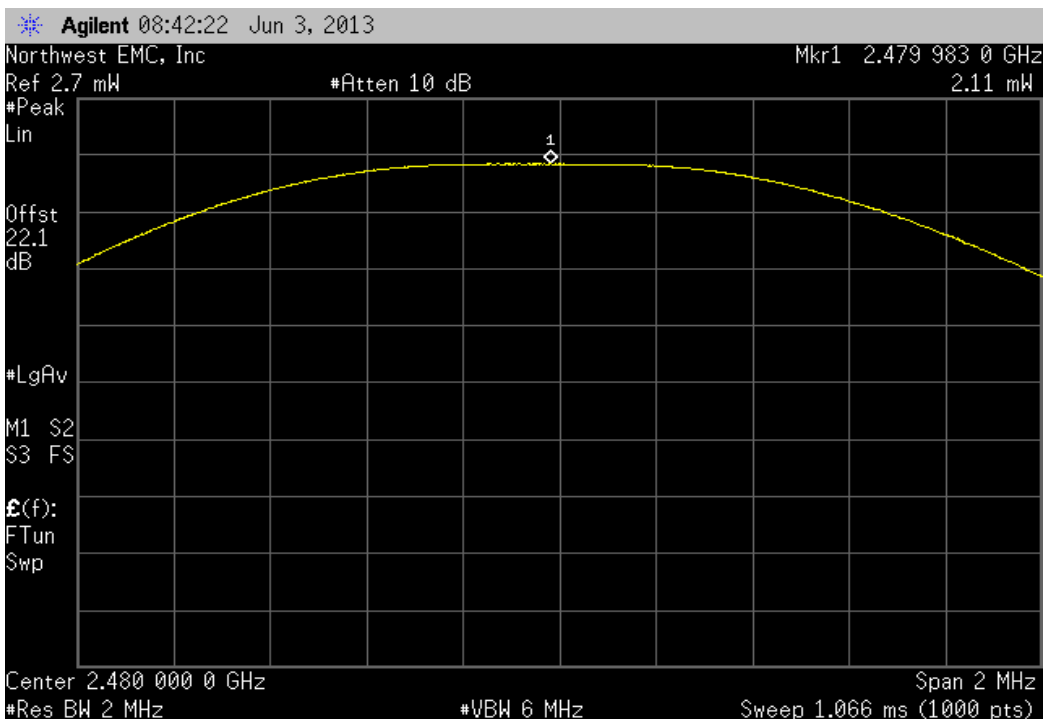
Value	Limit	Result
1.94 mW	< 125 mW	Pass

Agilent 08:39:06 Jun 3, 2013



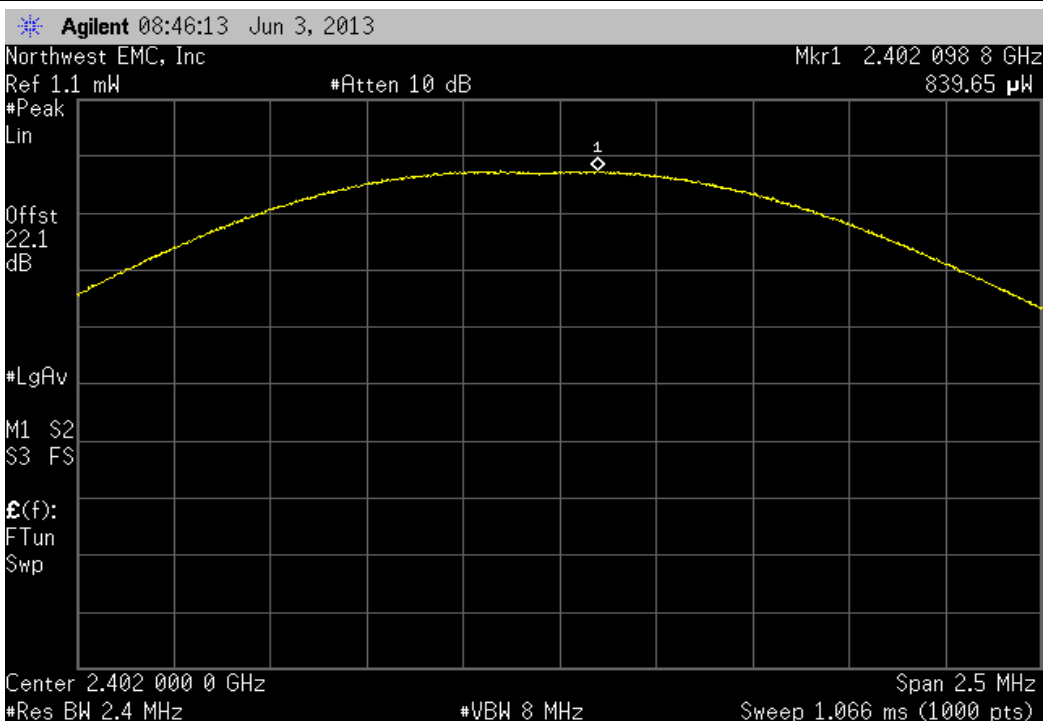
DH5, GFSK, High Channel

				Value	Limit	Result
				2.112 mW	< 125 mW	Pass



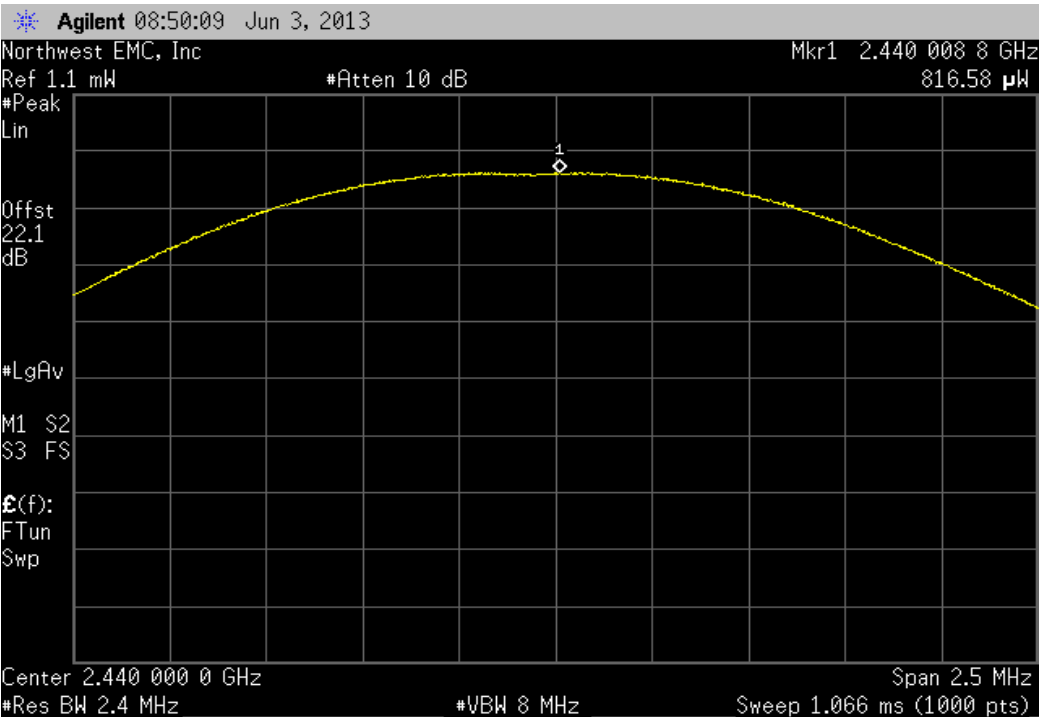
2DH5, pi/4-DQPSK, Low Channel

				Value	Limit	Result
				839.653 uW	< 125 mW	Pass



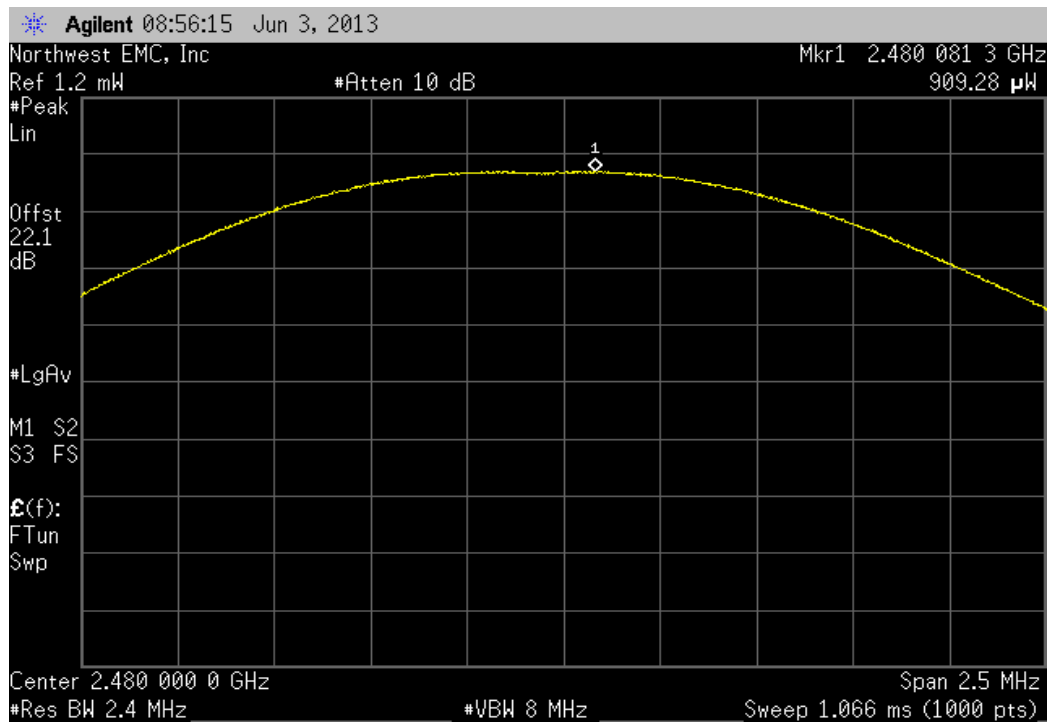
2DH5, pi/4-DQPSK, Mid Channel

Value	Limit	Result
816.582 uW	< 125 mW	Pass



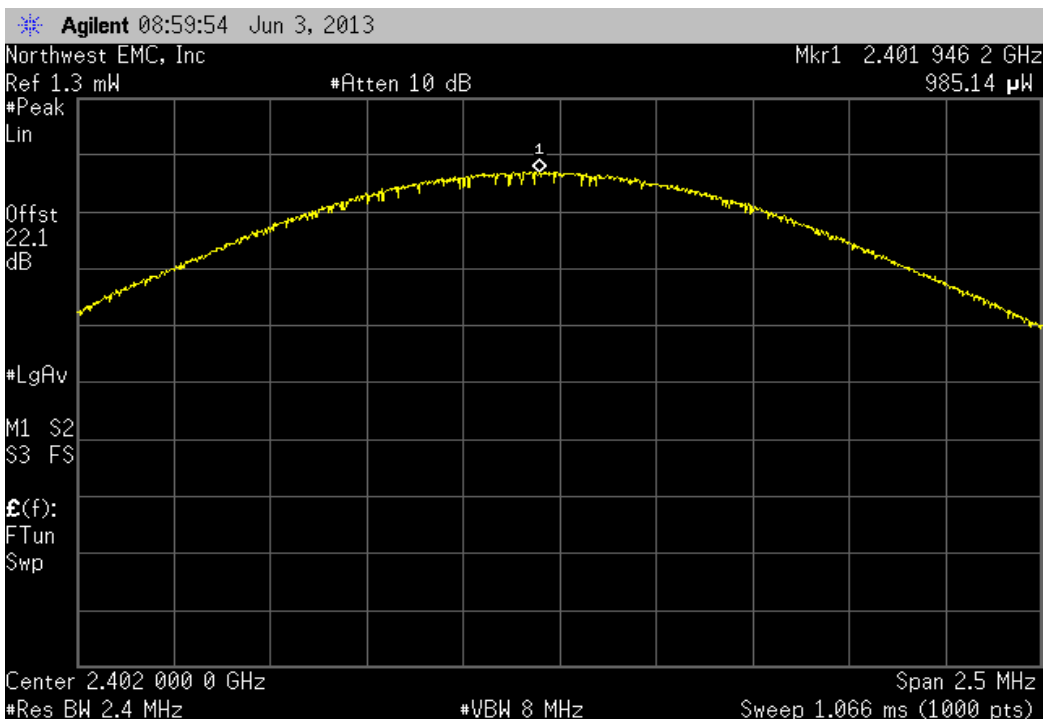
2DH5, pi/4-DQPSK, High Channel

Value	Limit	Result
909.285 uW	< 125 mW	Pass



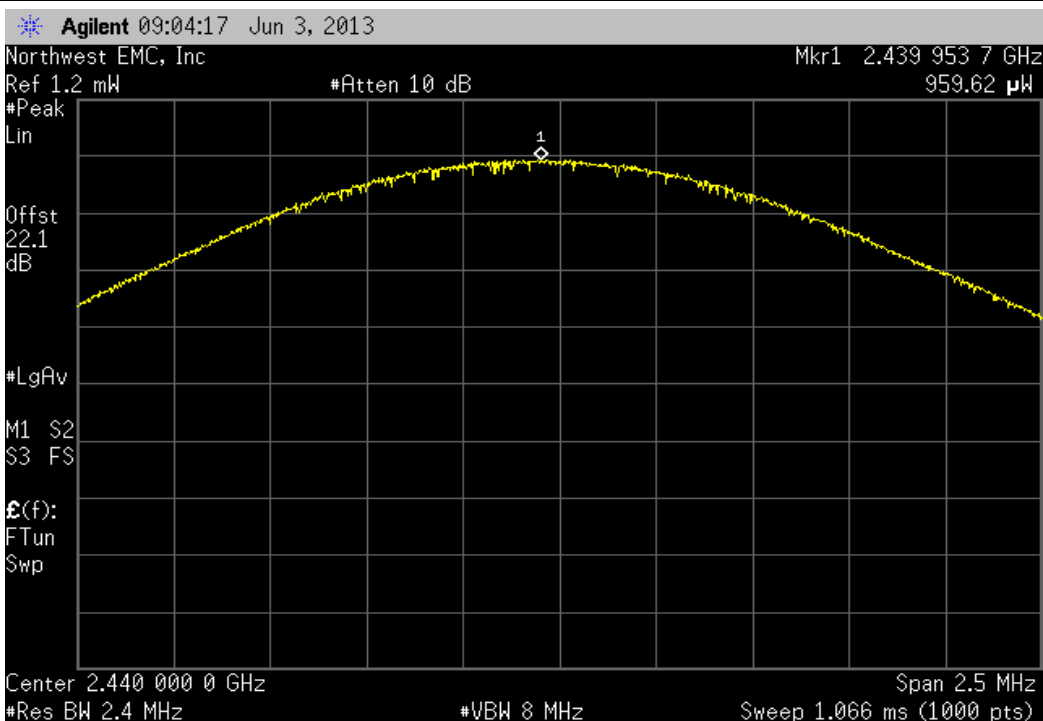
3DH5, 8-DPSK, Low Channel

Value	Limit	Result
985.145 μ W	< 125 mW	Pass



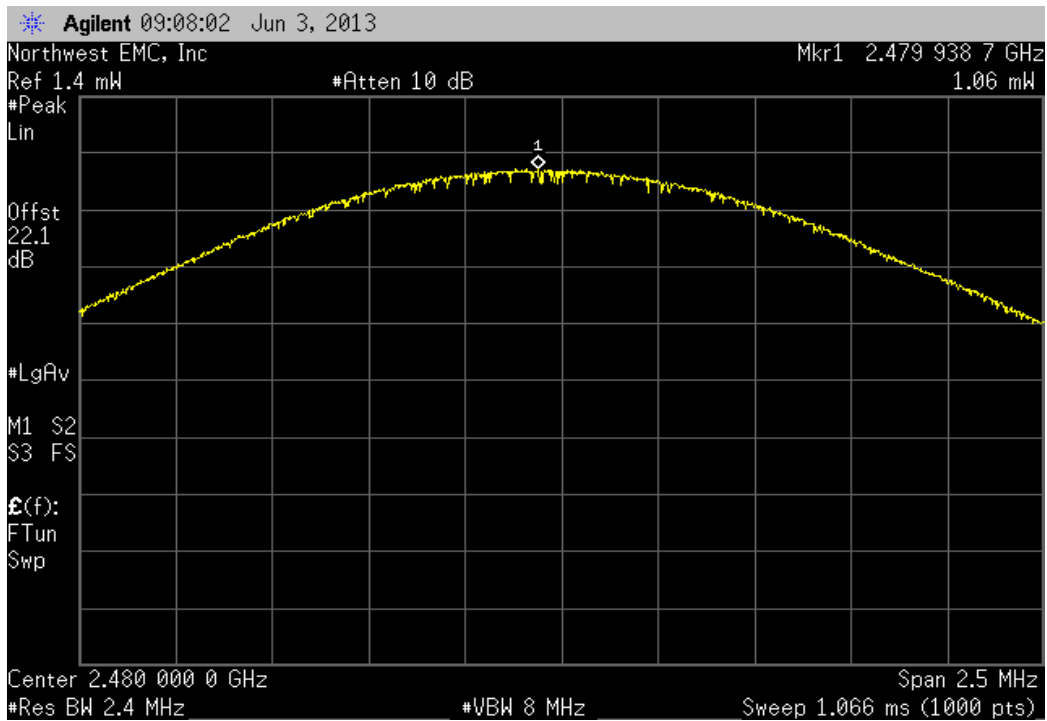
3DH5, 8-DPSK, Mid Channel

Value	Limit	Result
959.622 μ W	< 125 mW	Pass



3DH5, 8-DPSK, High Channel

Value	Limit	Result
1.065 mW	< 125 mW	Pass



Band Edge Compliance - Hopping Mode

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 band were measured with the EUT set to its normal pseudo-random hopping sequence. 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.



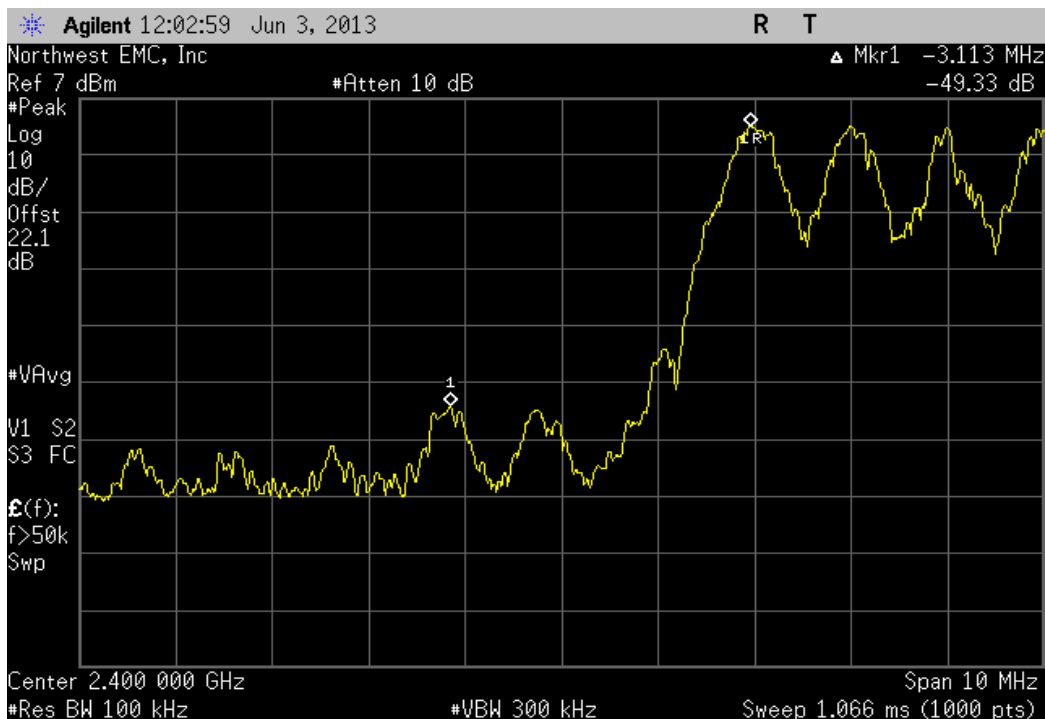
Band Edge Compliance -Hopping Mode

XMit 2013.02.28
PsaTx 2013.05.24

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			
FCC 15.247:2013		Test Method	
		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Trevor Buls</i>	
		Value	Limit
Hopping Mode			Result
DH5, GFSK			
Low Channel, 2402 MHz		-49.33 dBc	≤ -20 dBc
High Channel, 2480 MHz		-56.98 dBc	≤ -20 dBc
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz		-48.73 dBc	≤ -20 dBc
High Channel, 2480 MHz		-50.7 dBc	≤ -20 dBc
3DH5, 8-DPSK			
Low Channel, 2402 MHz		-48.32 dBc	≤ -20 dBc
High Channel, 2480 MHz		-46.84 dBc	≤ -20 dBc

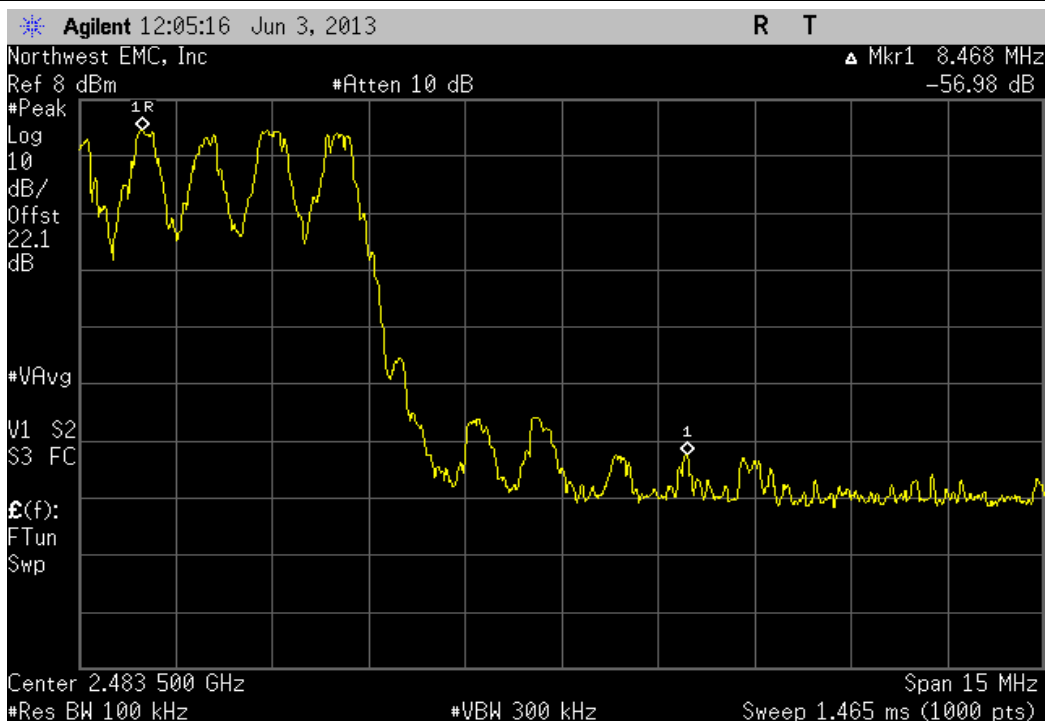
Hopping Mode, DH5, GFSK, Low Channel, 2402 MHz

Value	Limit	Result
-49.33 dBc	≤ -20 dBc	Pass



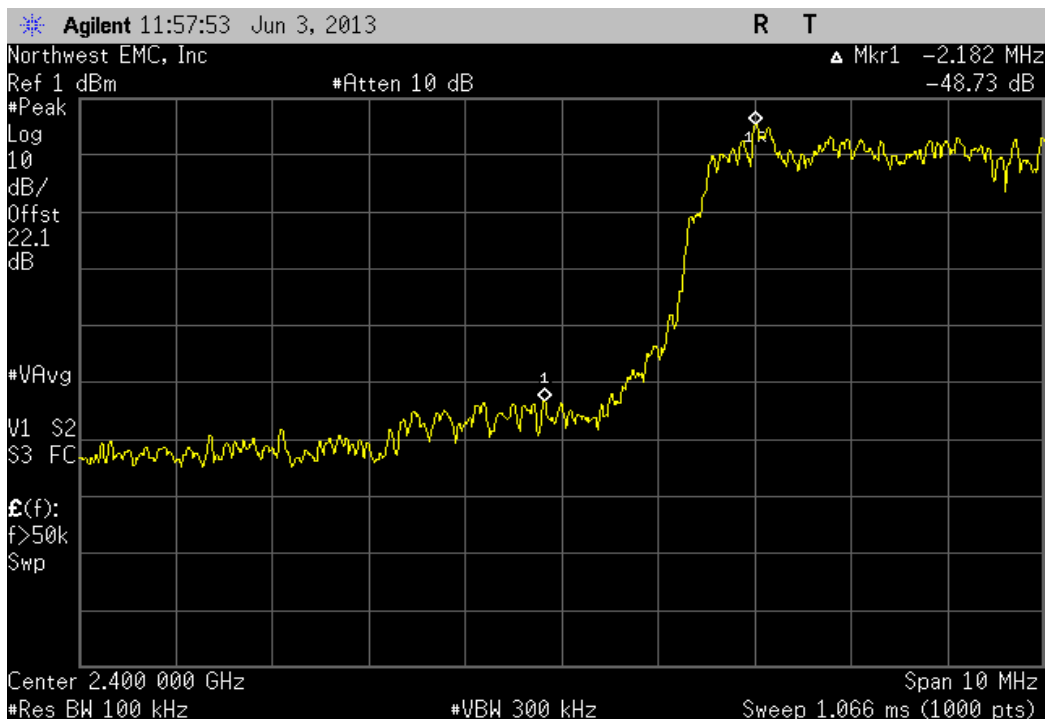
Hopping Mode, DH5, GFSK, High Channel, 2480 MHz

Value	Limit	Result
-56.98 dBc	≤ -20 dBc	Pass



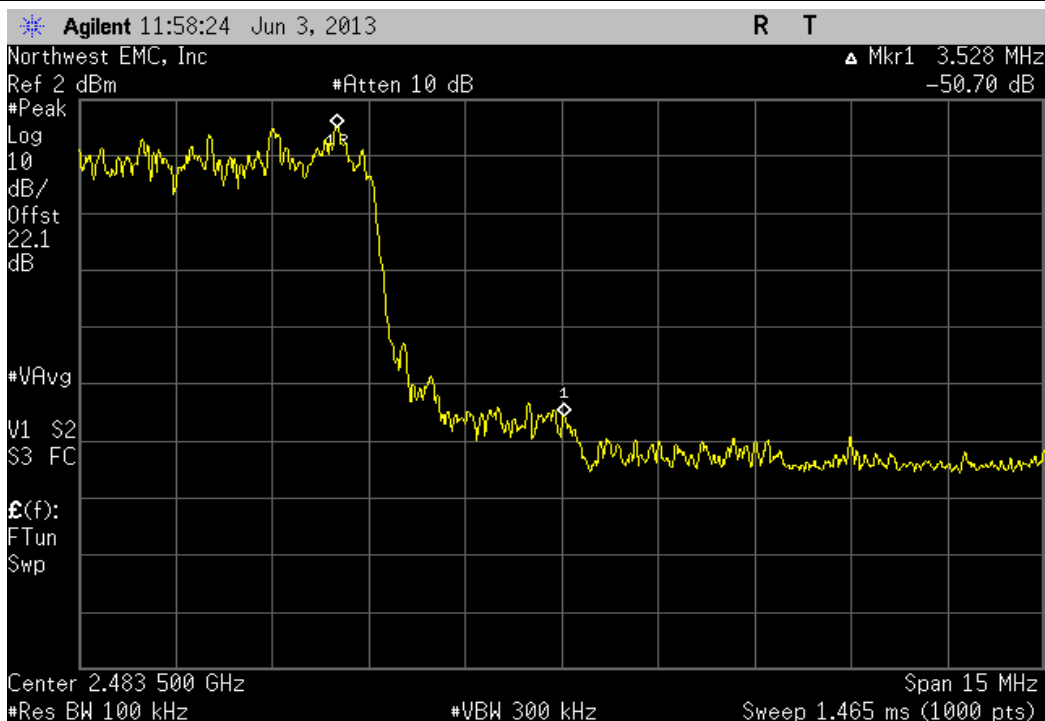
Hopping Mode, 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz

Value	Limit	Result
-48.73 dBc	≤ -20 dBc	Pass



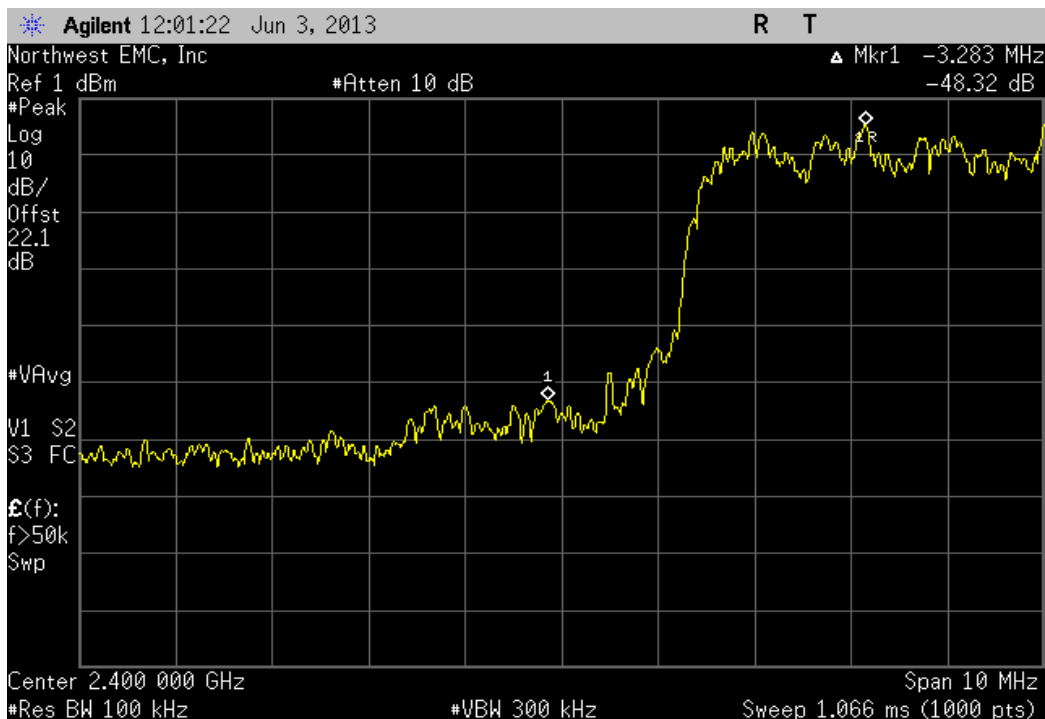
Hopping Mode, 2DH5, pi/4-DQPSK, High Channel, 2480 MHz

Value	Limit	Result
-50.7 dBc	≤ -20 dBc	Pass



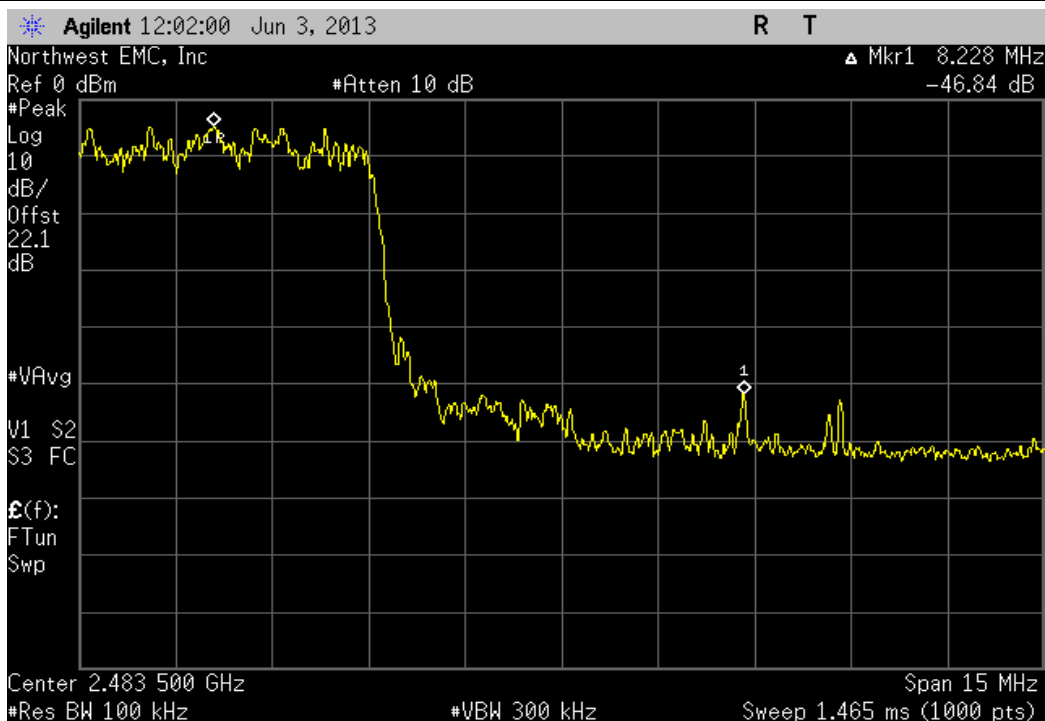
Hopping Mode, 3DH5, 8-DPSK, Low Channel, 2402 MHz

Value	Limit	Result
-48.32 dBc	≤ -20 dBc	Pass



Hopping Mode, 3DH5, 8-DPSK, High Channel, 2480 MHz

Value	Limit	Result
-46.84 dBc	≤ -20 dBc	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 band were measured with the EUT set to low 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 in a no hop mode. The channels closest to the band edges were selected.

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



Band Edge Compliance

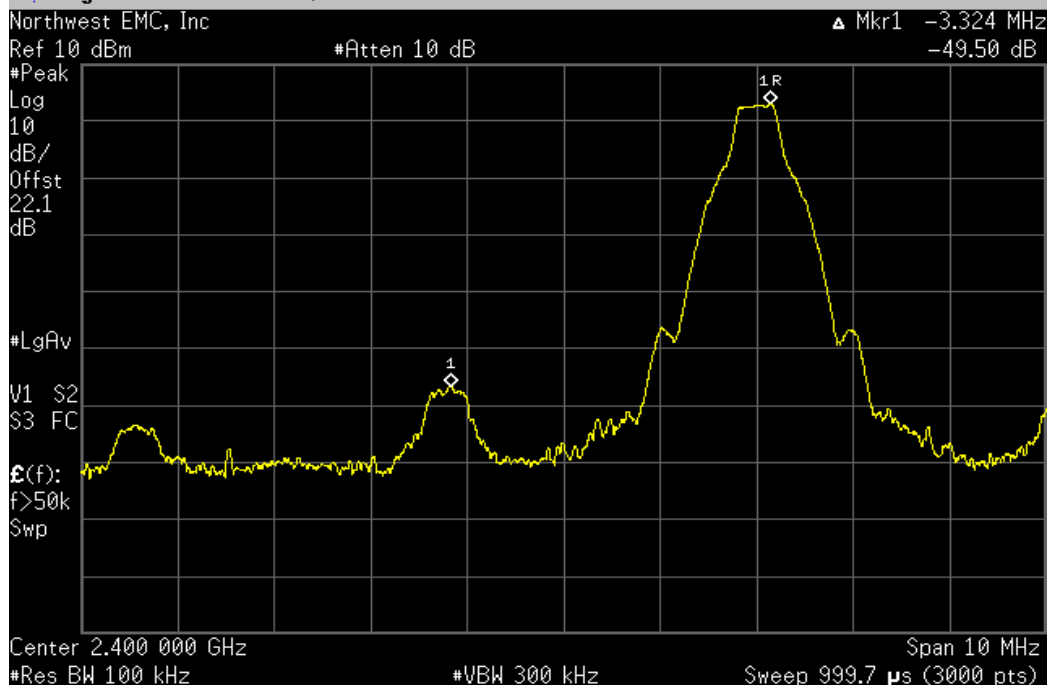
XMit 2013.02.28
PsaTx 2013.05.24

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
DH5, GFSK			Result
Low Channel		-49.5 dBc	≤ -20 dBc
High Channel		-55.09 dBc	≤ -20 dBc
2DH5, pi/4-DQPSK			Result
Low Channel		-46.25 dBc	≤ -20 dBc
High Channel		-46.69 dBc	≤ -20 dBc
3DH5, 8-DPSK			Result
Low Channel		-46.72 dBc	≤ -20 dBc
High Channel		-46.8 dBc	≤ -20 dBc

DH5, GFSK, Low Channel

Value	Limit	Result
-49.5 dBc	≤ -20 dBc	Pass

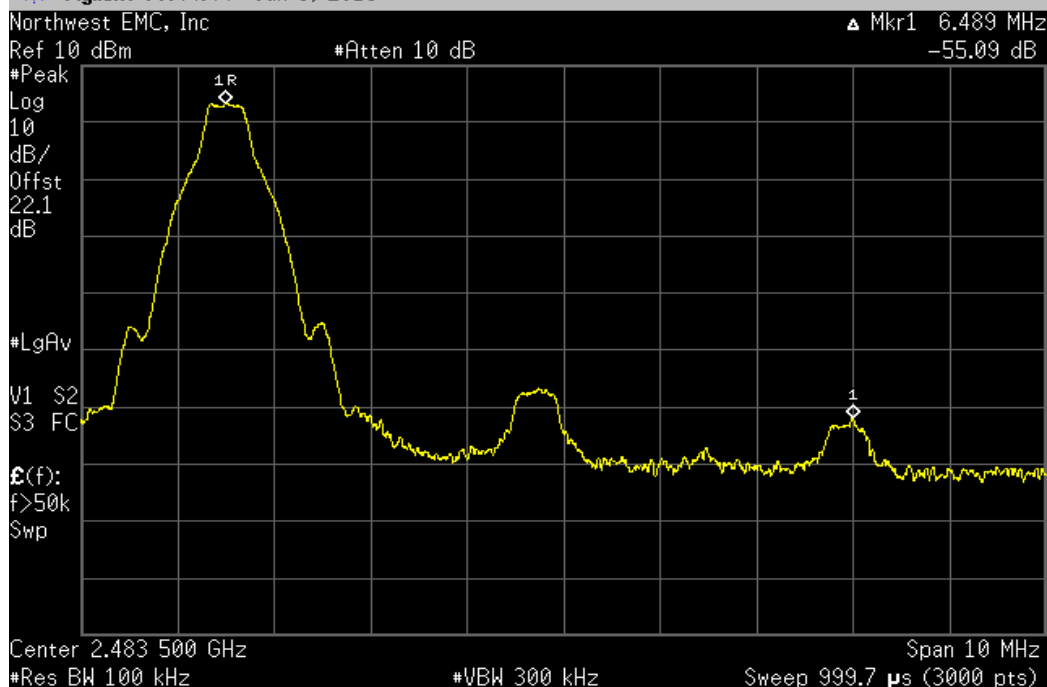
Agilent 08:37:37 Jun 3, 2013



DH5, GFSK, High Channel

Value	Limit	Result
-55.09 dBc	≤ -20 dBc	Pass

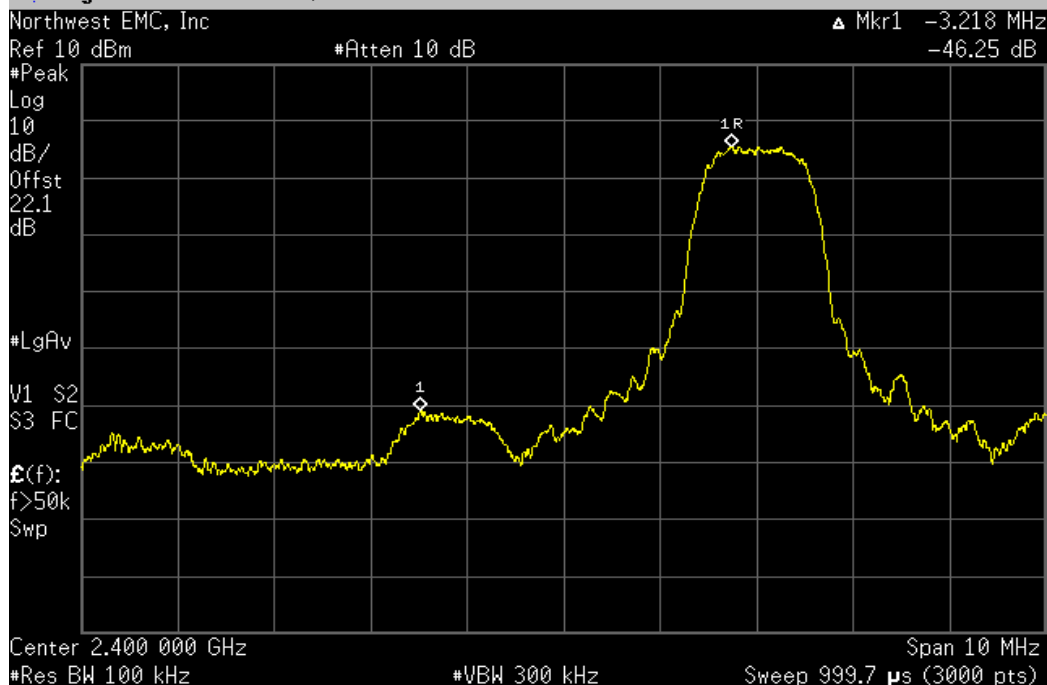
Agilent 08:44:44 Jun 3, 2013



2DH5, pi/4-DQPSK, Low Channel

Value	Limit	Result
-46.25 dBc	≤ -20 dBc	Pass

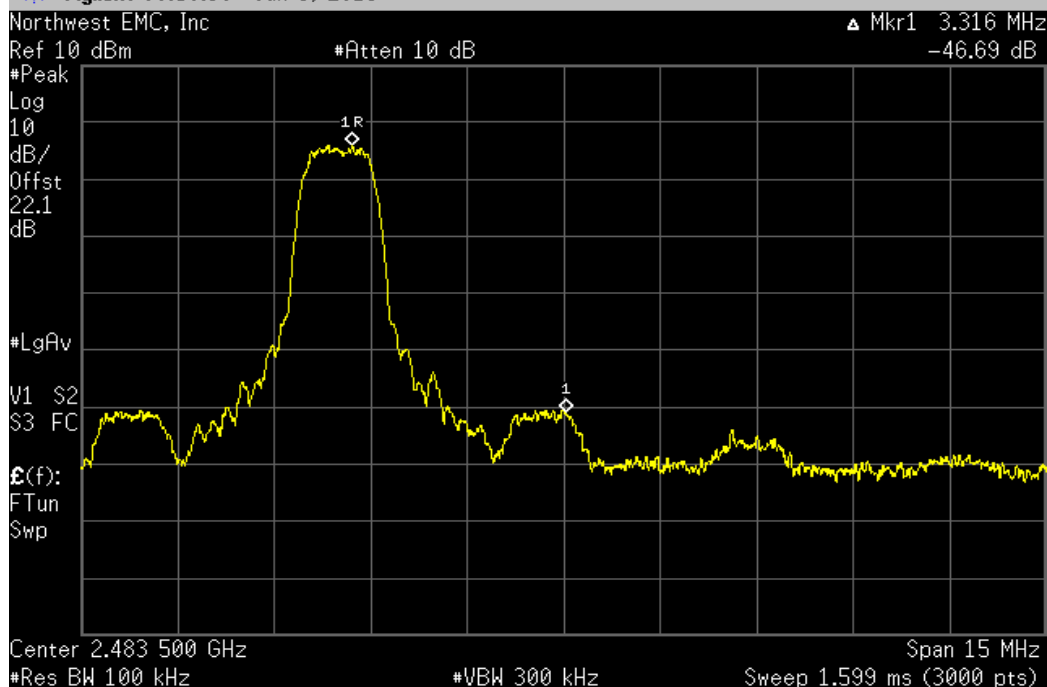
Agilent 08:48:51 Jun 3, 2013



2DH5, pi/4-DQPSK, High Channel

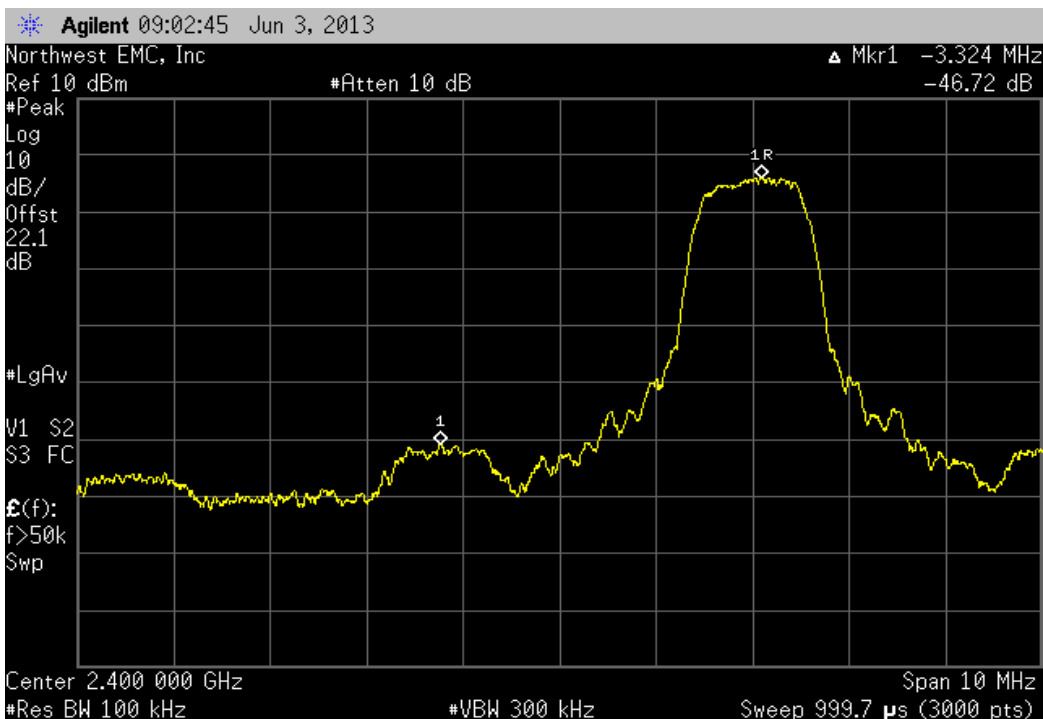
Value	Limit	Result
-46.69 dBc	≤ -20 dBc	Pass

Agilent 08:58:36 Jun 3, 2013



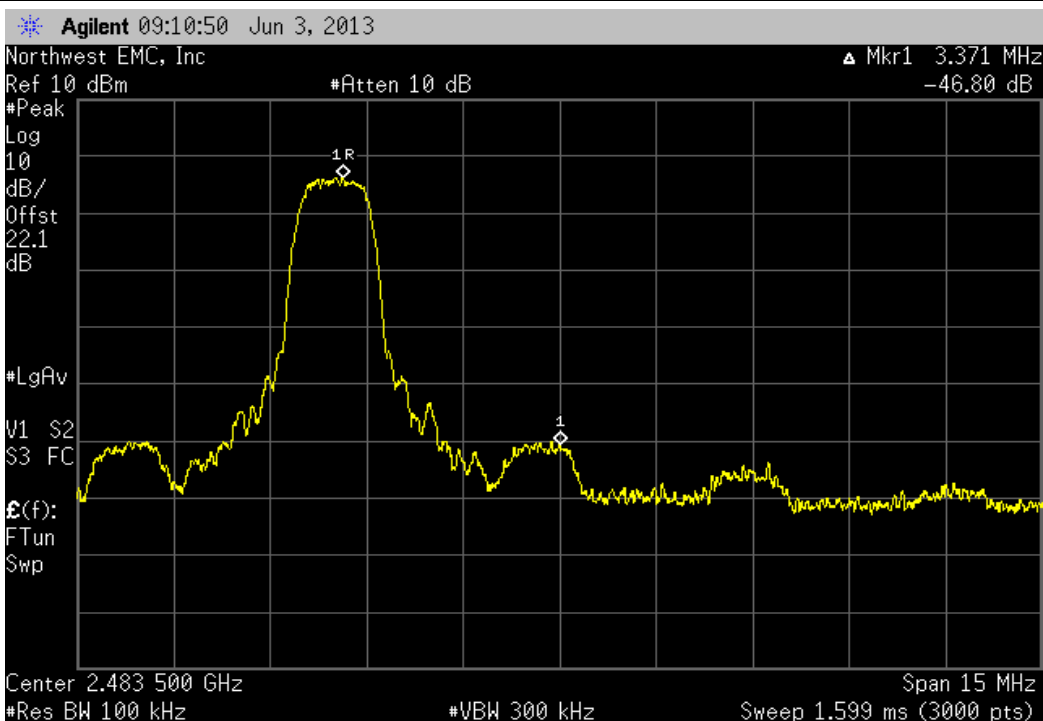
3DH5, 8-DPSK, Low Channel

Value	Limit	Result
-46.72 dBc	≤ -20 dBc	Pass



3DH5, 8-DPSK, High Channel

Value	Limit	Result
-46.8 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 in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

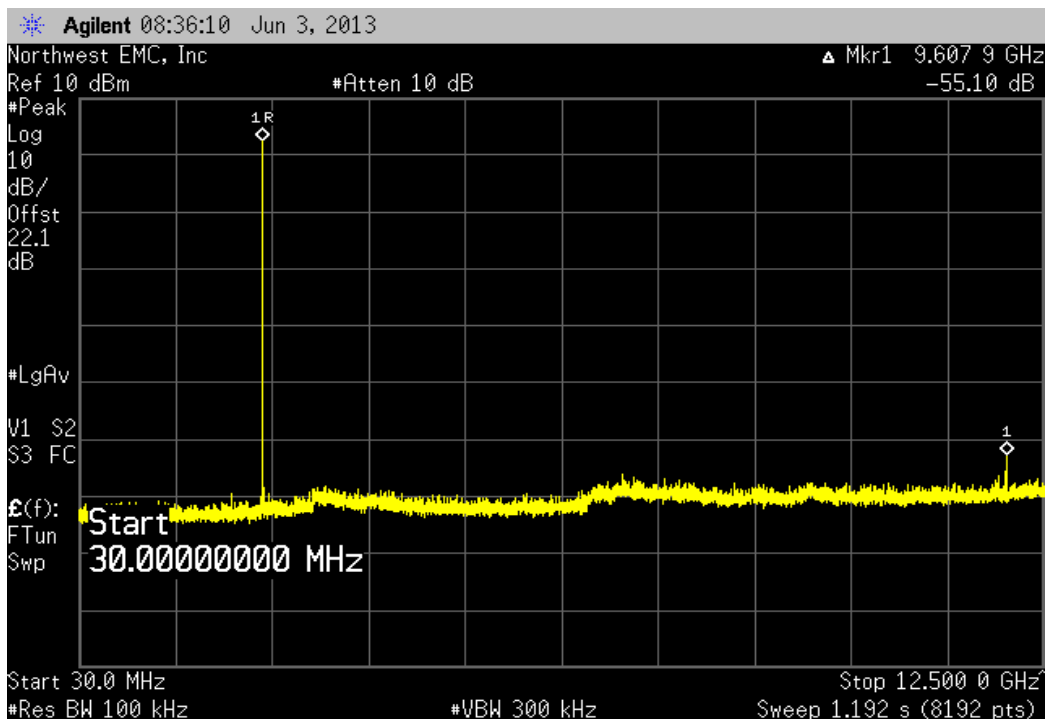


Spurious Conducted Emissions

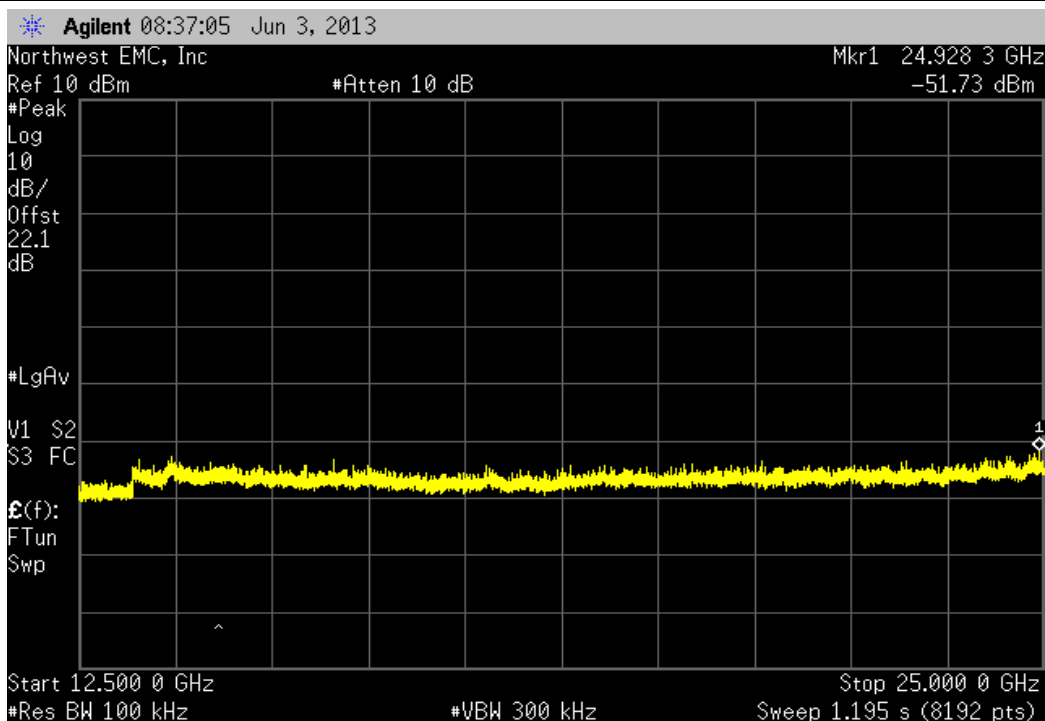
XMit 2013.02.28
PsaTx 2013.05.24

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
DH5, GFSK					
	Low Channel	30 MHz - 12.5 GHz	-55.1 dBc	≤ -20 dBc	Pass
	Low Channel	12.5 GHz - 25 GHz	-54.16 dBc	≤ -20 dBc	Pass
	Mid Channel	30 MHz - 12.5 GHz	-58.9 dBc	≤ -20 dBc	Pass
	Mid Channel	12.5 GHz - 25 GHz	-53.83 dBc	≤ -20 dBc	Pass
	High Channel	30 MHz - 12.5 GHz	-56.37 dBc	≤ -20 dBc	Pass
	High Channel	12.5 GHz - 25 GHz	-56.13 dBc	≤ -20 dBc	Pass
2DH5, pi/4-DQPSK					
	Low Channel	30 MHz - 12.5 GHz	-51.02 dBc	≤ -20 dBc	Pass
	Low Channel	12.5 GHz - 25 GHz	-46.85 dBc	≤ -20 dBc	Pass
	Mid Channel	30 MHz - 12.5 GHz	-51.92 dBc	≤ -20 dBc	Pass
	Mid Channel	12.5 GHz - 25 GHz	-47.71 dBc	≤ -20 dBc	Pass
	High Channel	30 MHz - 12.5 GHz	-50.76 dBc	≤ -20 dBc	Pass
	High Channel	12.5 GHz - 25 GHz	-47.36 dBc	≤ -20 dBc	Pass
3DH5, 8-DPSK					
	Low Channel	30 MHz - 12.5 GHz	-51.62 dBc	≤ -20 dBc	Pass
	Low Channel	12.5 GHz - 25 GHz	-47.92 dBc	≤ -20 dBc	Pass
	Mid Channel	30 MHz - 12.5 GHz	-50.59 dBc	≤ -20 dBc	Pass
	Mid Channel	12.5 GHz - 25 GHz	-45.87 dBc	≤ -20 dBc	Pass
	High Channel	30 MHz - 12.5 GHz	-51.25 dBc	≤ -20 dBc	Pass
	High Channel	12.5 GHz - 25 GHz	-48.03 dBc	≤ -20 dBc	Pass

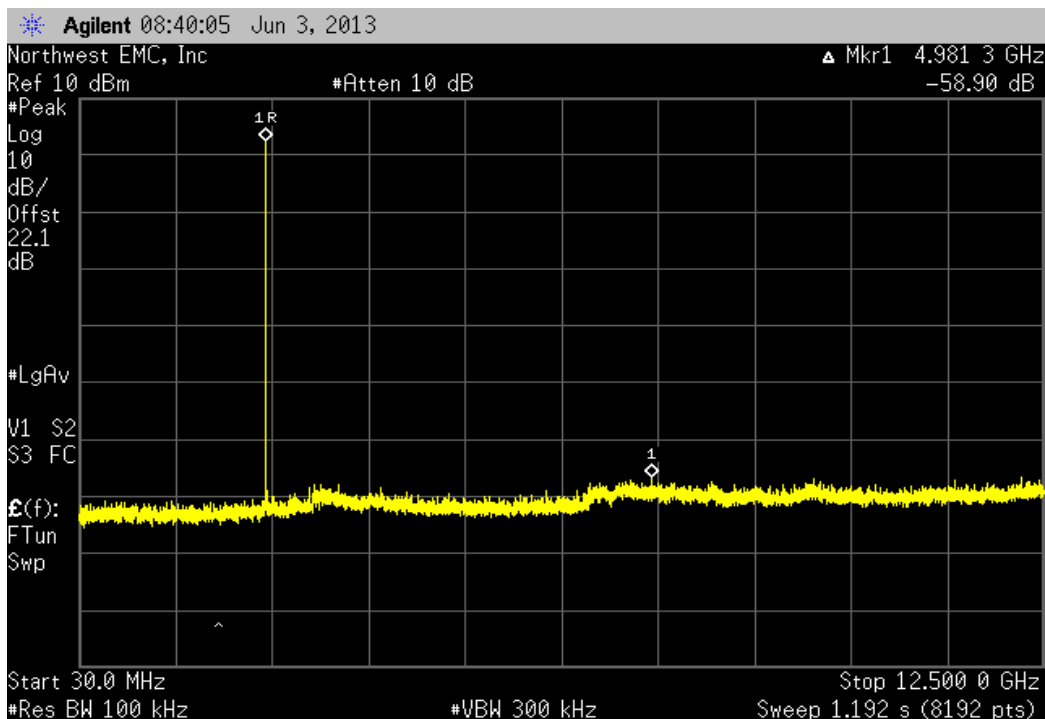
DH5, GFSK, Low Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-55.1 dBc	≤ -20 dBc	Pass	



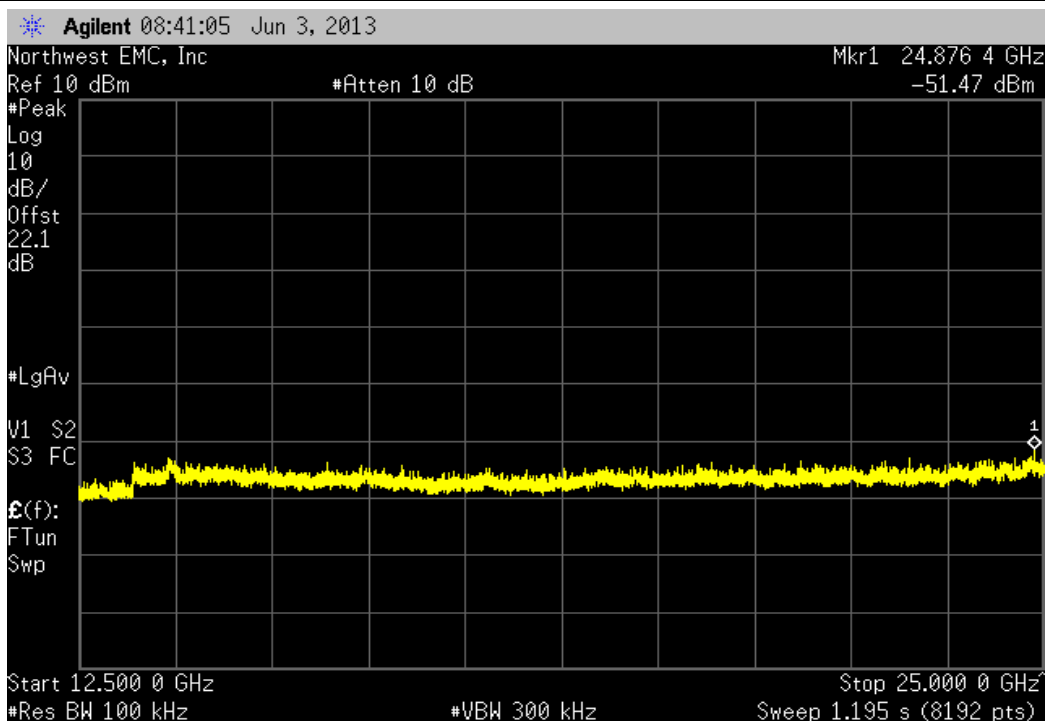
DH5, GFSK, Low Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-54.16 dBc	≤ -20 dBc	Pass	



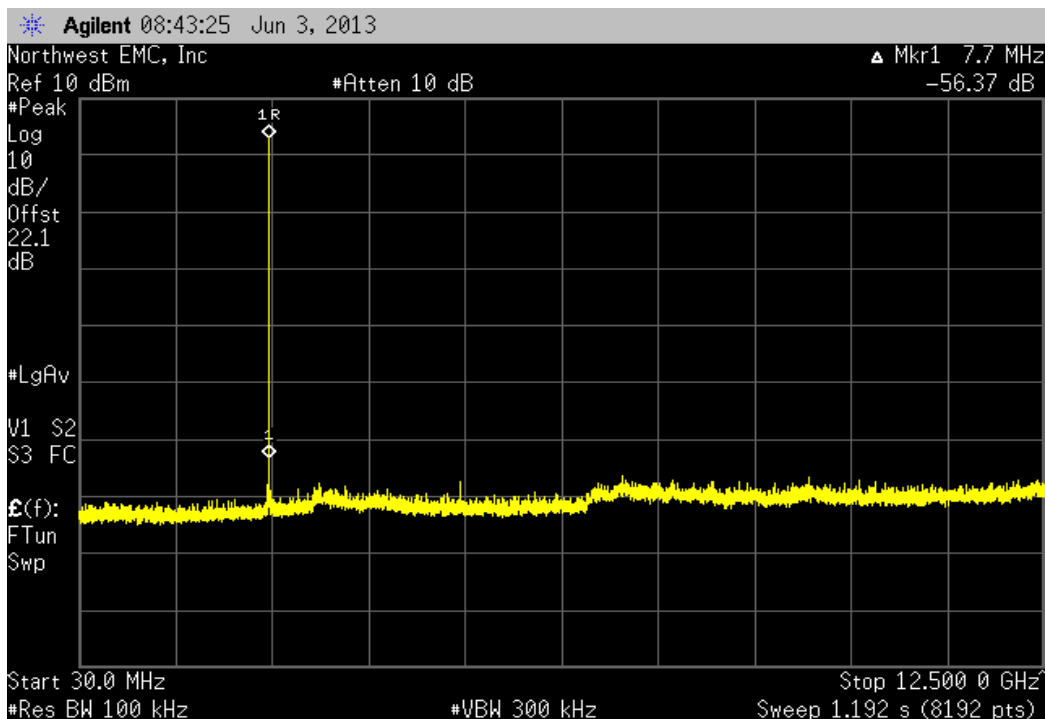
DH5, GFSK, Mid Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-58.9 dBc	≤ -20 dBc	Pass	



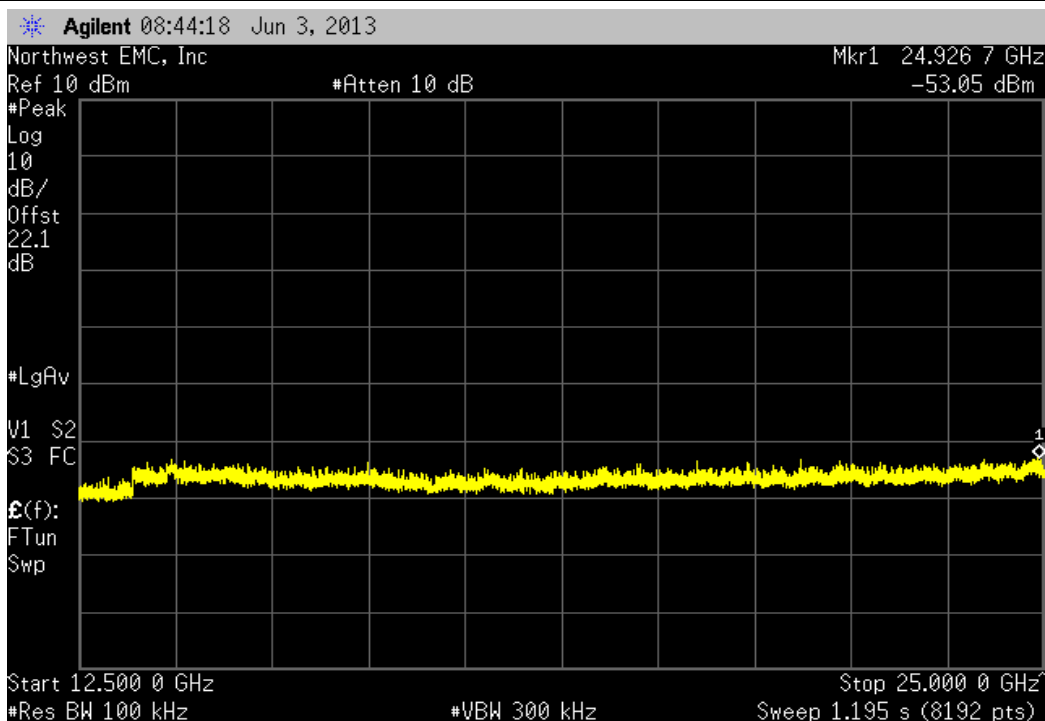
DH5, GFSK, Mid Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-53.83 dBc	≤ -20 dBc	Pass	



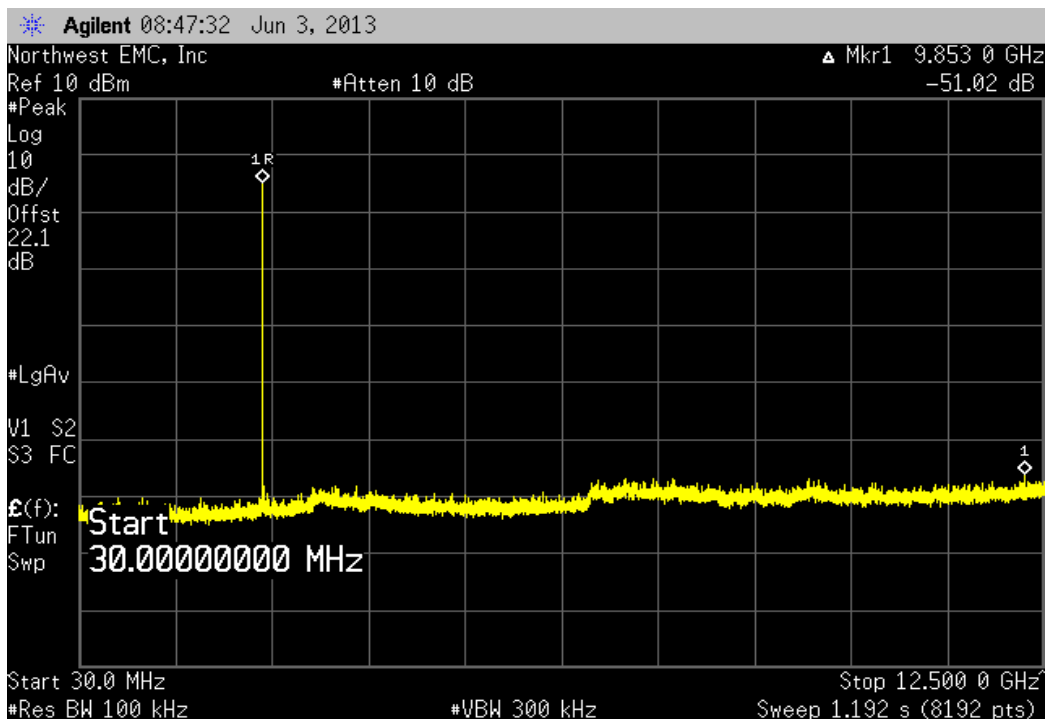
DH5, GFSK, High Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-56.37 dBc	≤ -20 dBc	Pass	



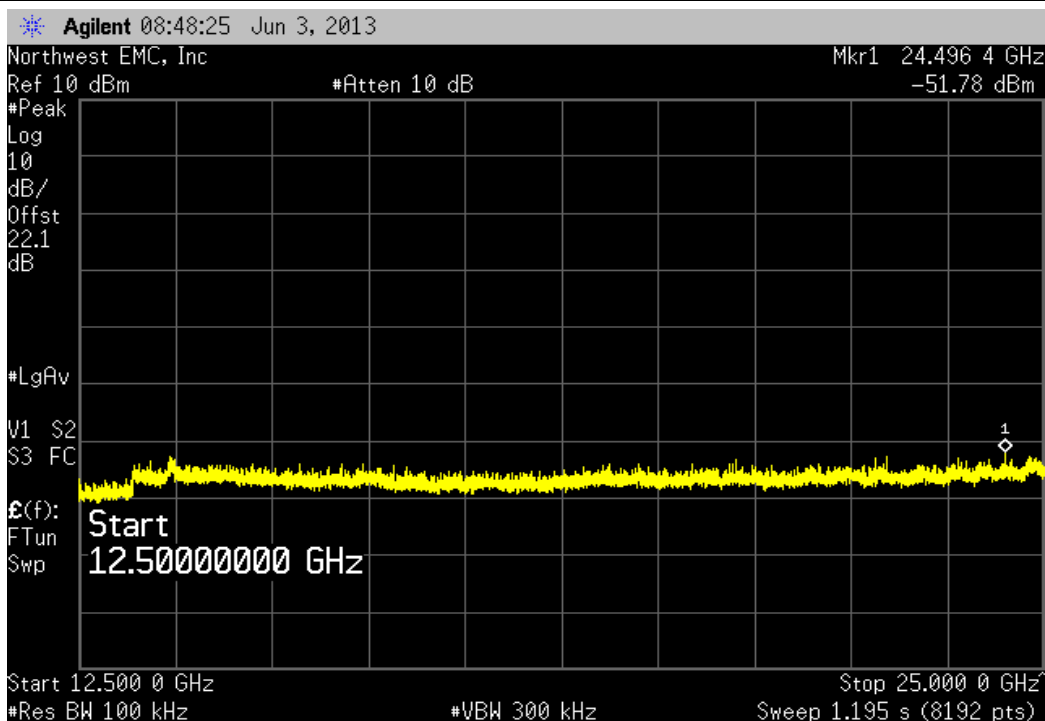
DH5, GFSK, High Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-56.13 dBc	≤ -20 dBc	Pass	



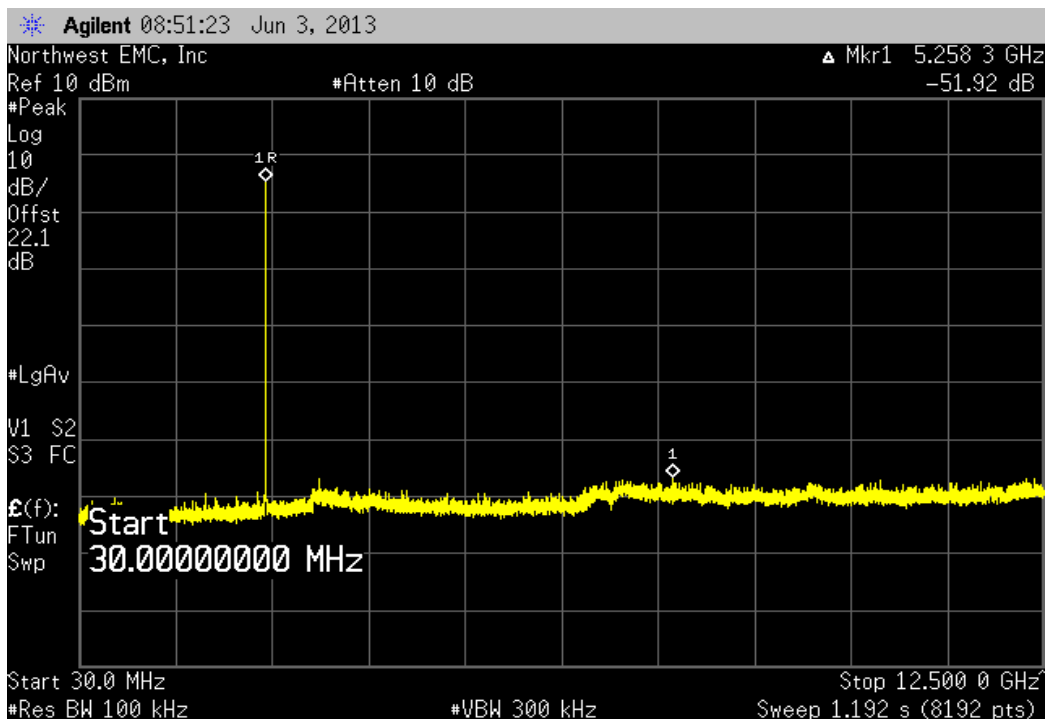
2DH5, pi/4-DQPSK, Low Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.02 dBc	≤ -20 dBc	Pass	



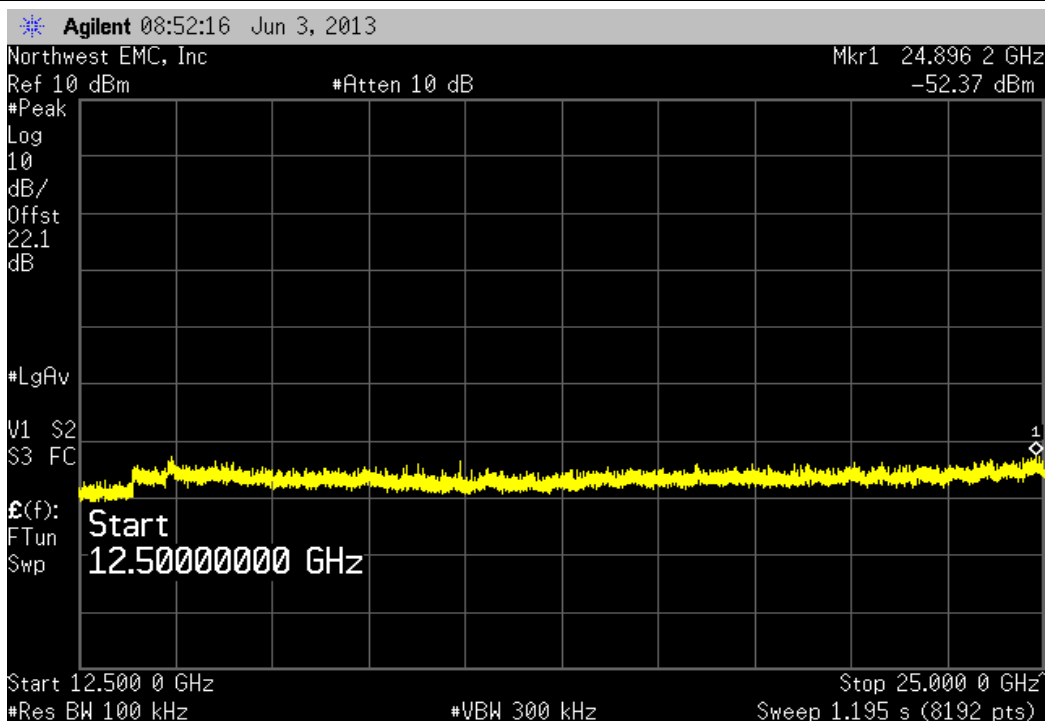
2DH5, pi/4-DQPSK, Low Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-46.85 dBc	≤ -20 dBc	Pass	



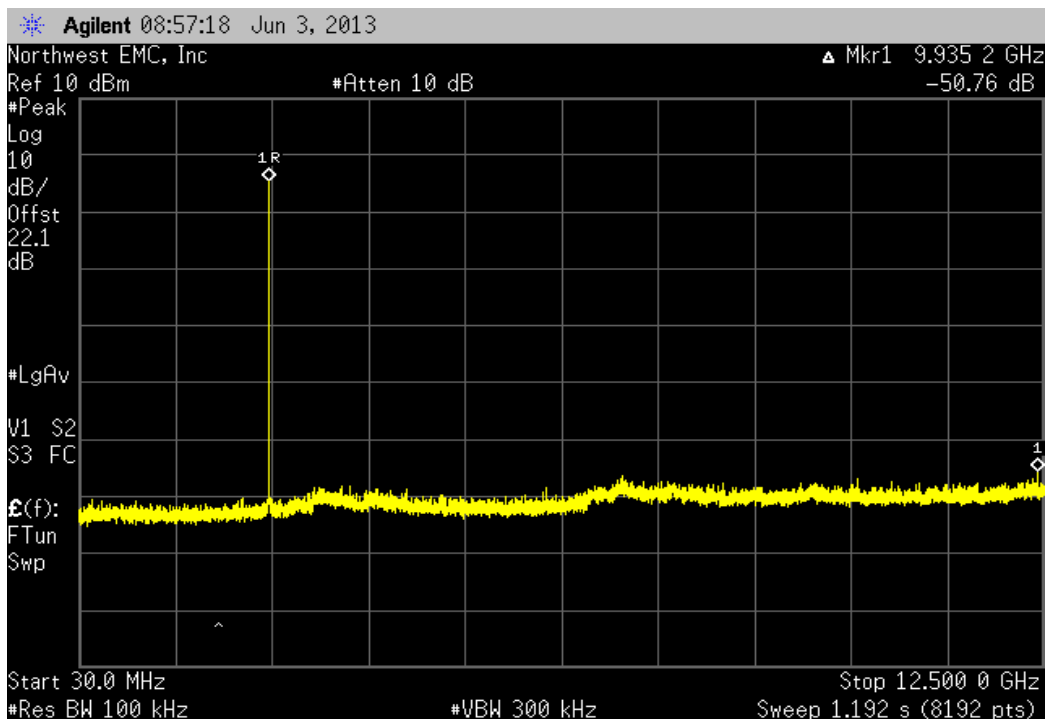
2DH5, pi/4-DQPSK, Mid Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.92 dBc	≤ -20 dBc	Pass	



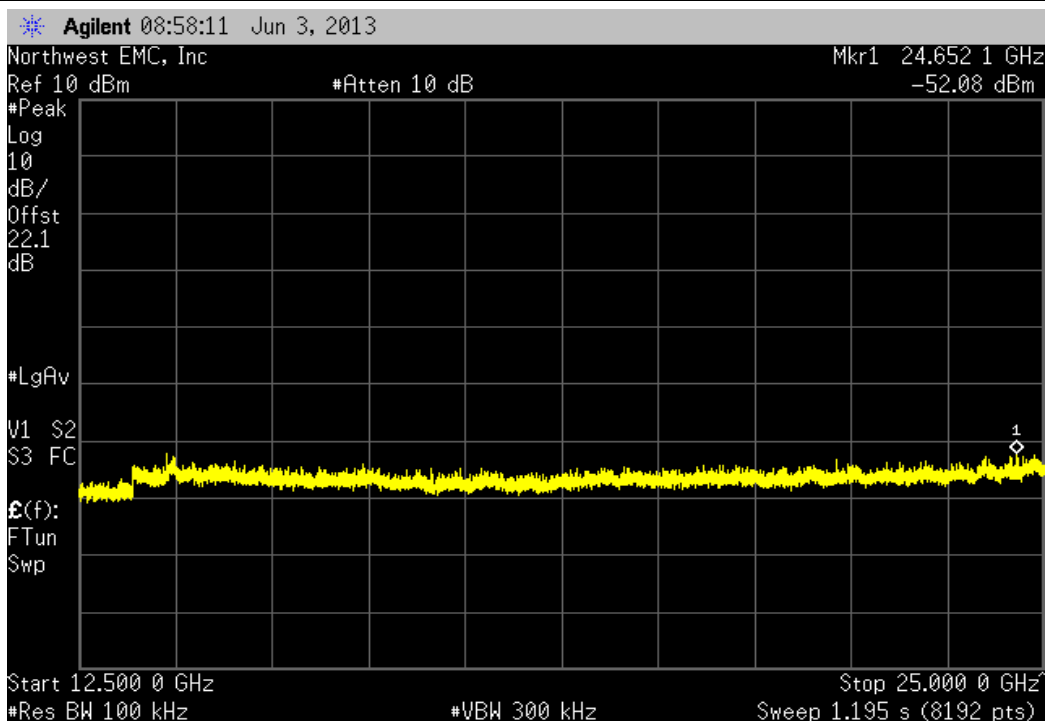
2DH5, pi/4-DQPSK, Mid Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-47.71 dBc	≤ -20 dBc	Pass	



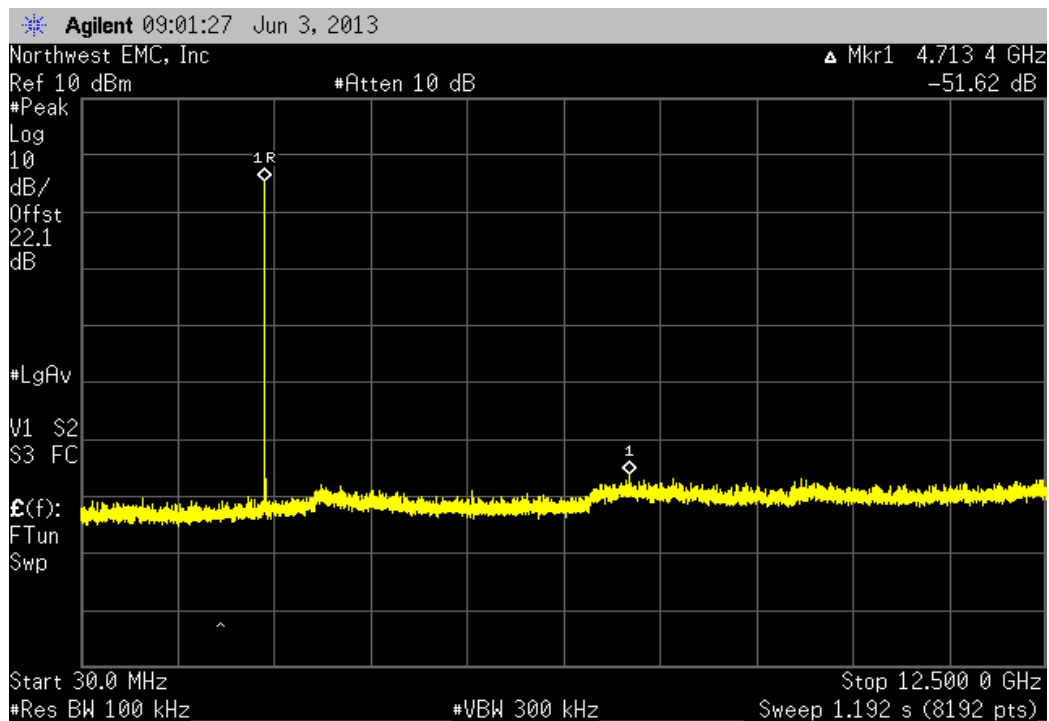
2DH5, pi/4-DQPSK, High Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-50.76 dBc	≤ -20 dBc	Pass	



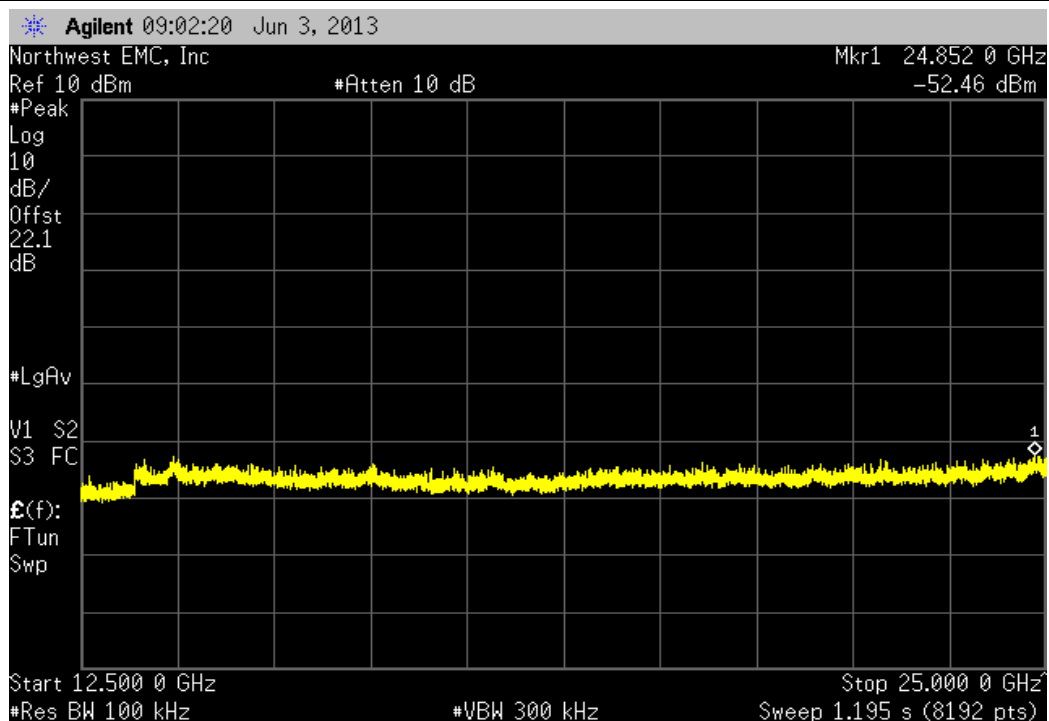
2DH5, pi/4-DQPSK, High Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-47.36 dBc	≤ -20 dBc	Pass	



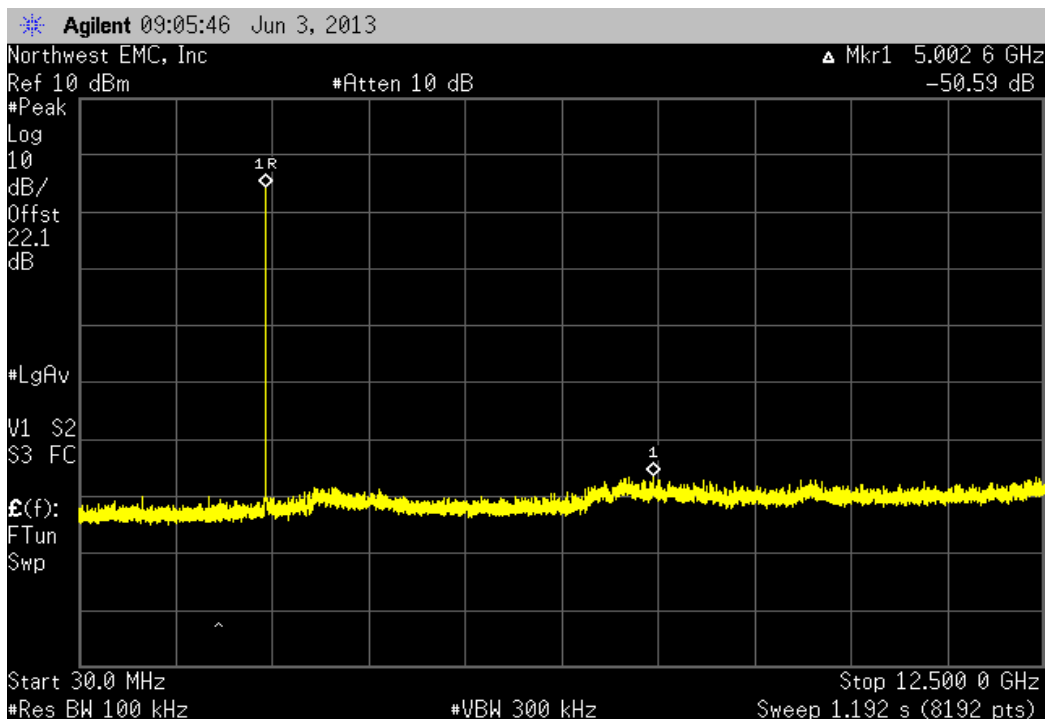
3DH5, 8-DPSK, Low Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.62 dBc	≤ -20 dBc	Pass	



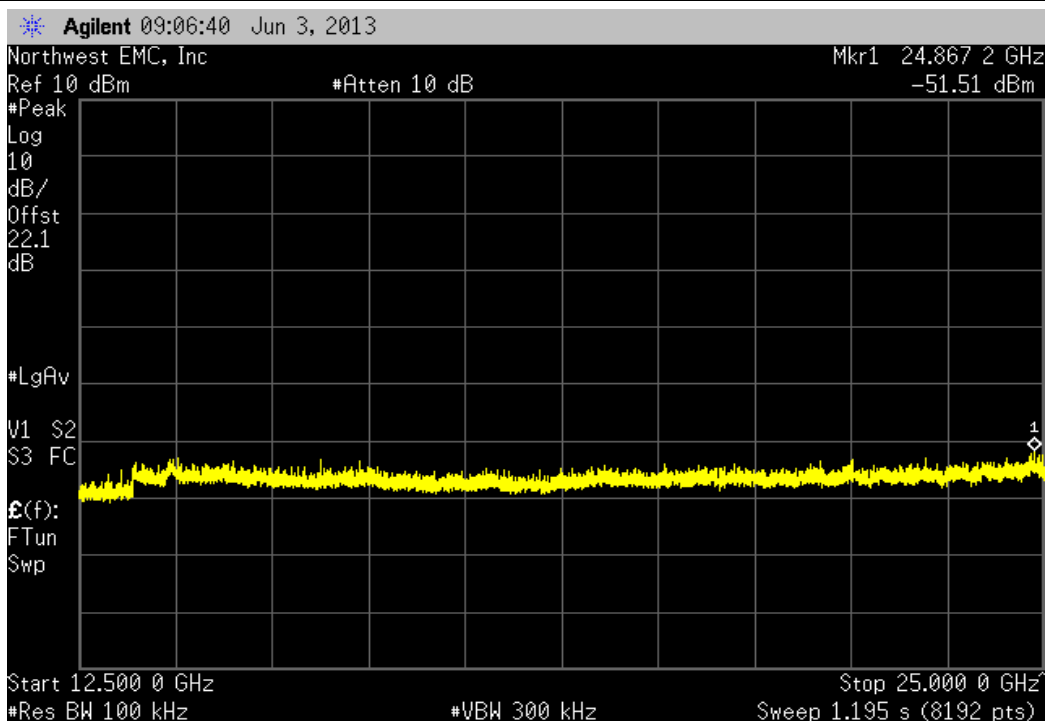
3DH5, 8-DPSK, Low Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-47.92 dBc	≤ -20 dBc	Pass	



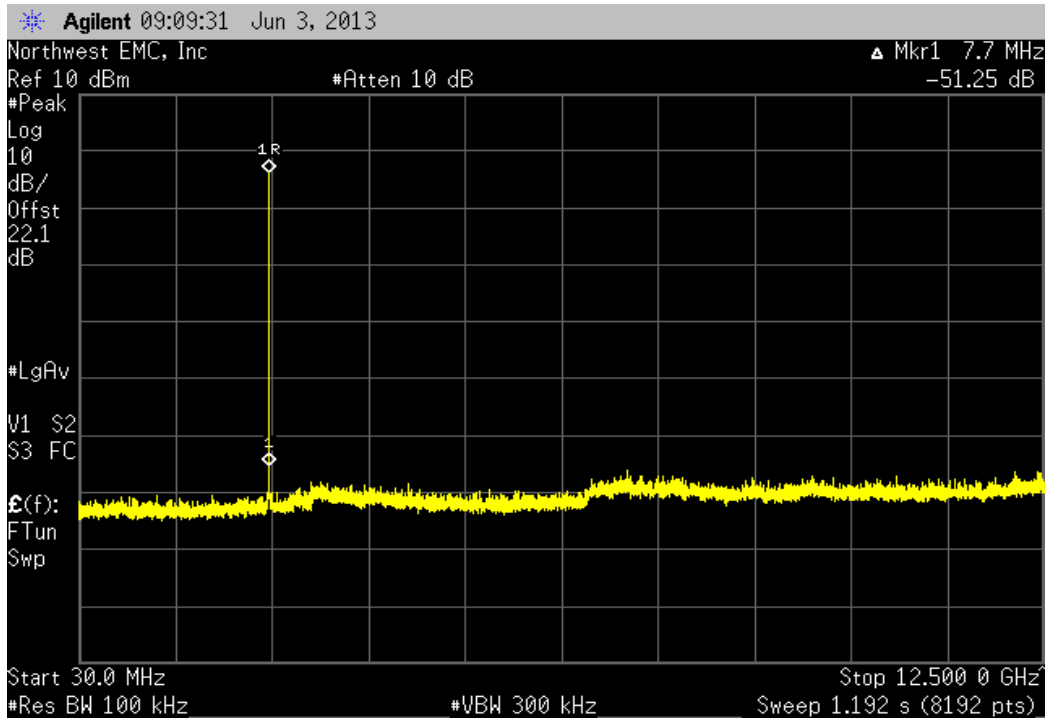
3DH5, 8-DPSK, Mid Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-50.59 dBc	≤ -20 dBc	Pass	



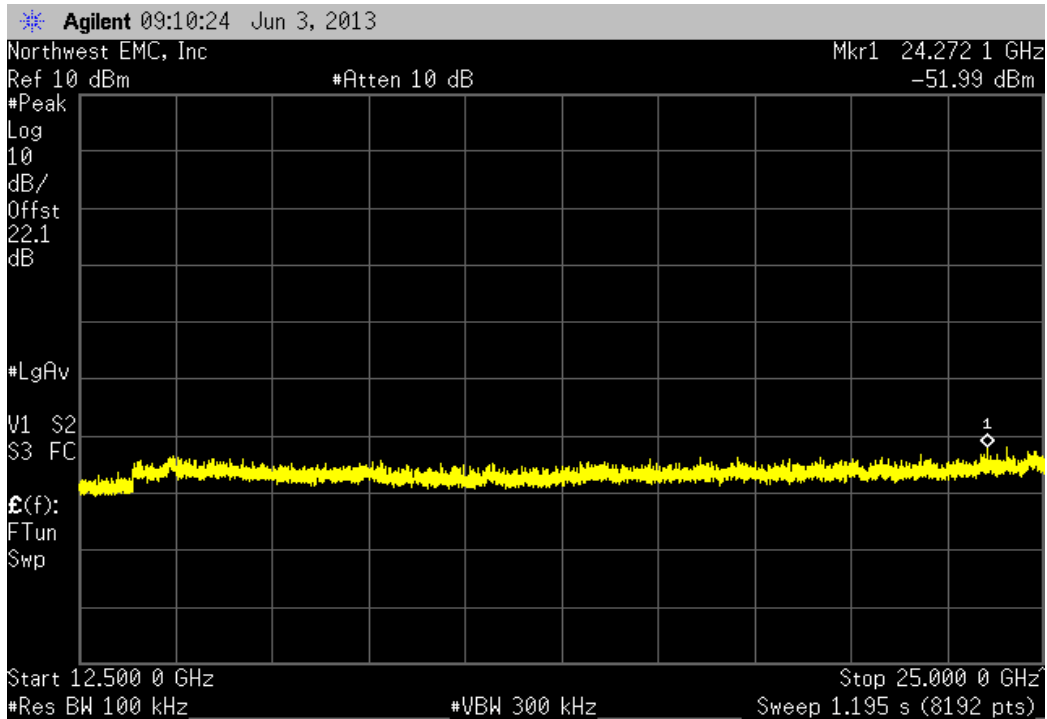
3DH5, 8-DPSK, Mid Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-45.87 dBc	≤ -20 dBc	Pass	



3DH5, 8-DPSK, High Channel				
Frequency Range	Value	Limit	Result	
30 MHz - 12.5 GHz	-51.25 dBc	≤ -20 dBc	Pass	



3DH5, 8-DPSK, High Channel				
Frequency Range	Value	Limit	Result	
12.5 GHz - 25 GHz	-48.03 dBc	≤ -20 dBc	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 Bluetooth EDR, Low, Mid, High (2402, 2440, 2480 MHz) at DH5, 2DH5, 3DH5 -PIFA (see comments)
Transmitting Bluetooth EDR, Low, Mid, High (2402, 2440, 2480 MHz) at DH5, 2DH5, 3DH5 -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
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
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	5GHz Standard Gain Horn C	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.	uble Ridge Guide Horn Cab	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

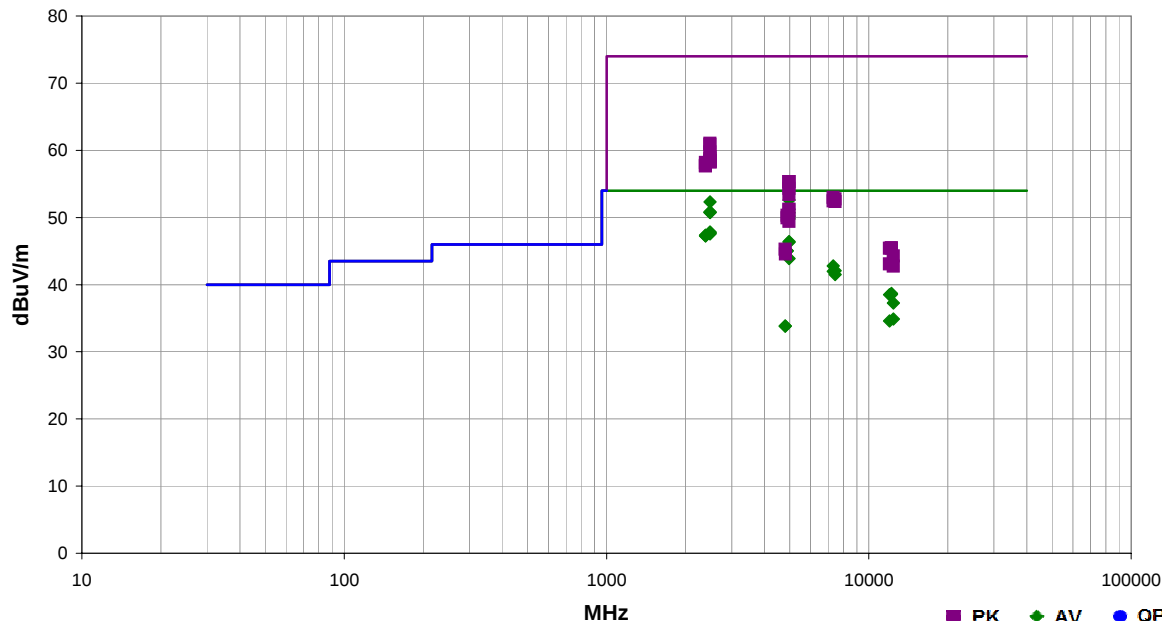
TEST DESCRIPTION

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:	05/21/13	<i>Trevor Buls</i>
Project:	None	Temperature:	22.2 °C	
Job Site:	MN05	Humidity:	48.5% RH	
Serial Number:	1413M00359	Barometric Pres.:	1000 mbar	
EUT:		37x Torpedo + Wireless SOM -31		
Configuration: 1				
Customer:		Logic PD, Inc.		
Attendees:		None		
EUT Power:		110VAC/60Hz		
Operating Mode:		Transmitting Bluetooth EDR, Low, Mid, High (2402, 2440, 2480 MHz) at DH5, 2DH5, 3DH5 -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 #	14	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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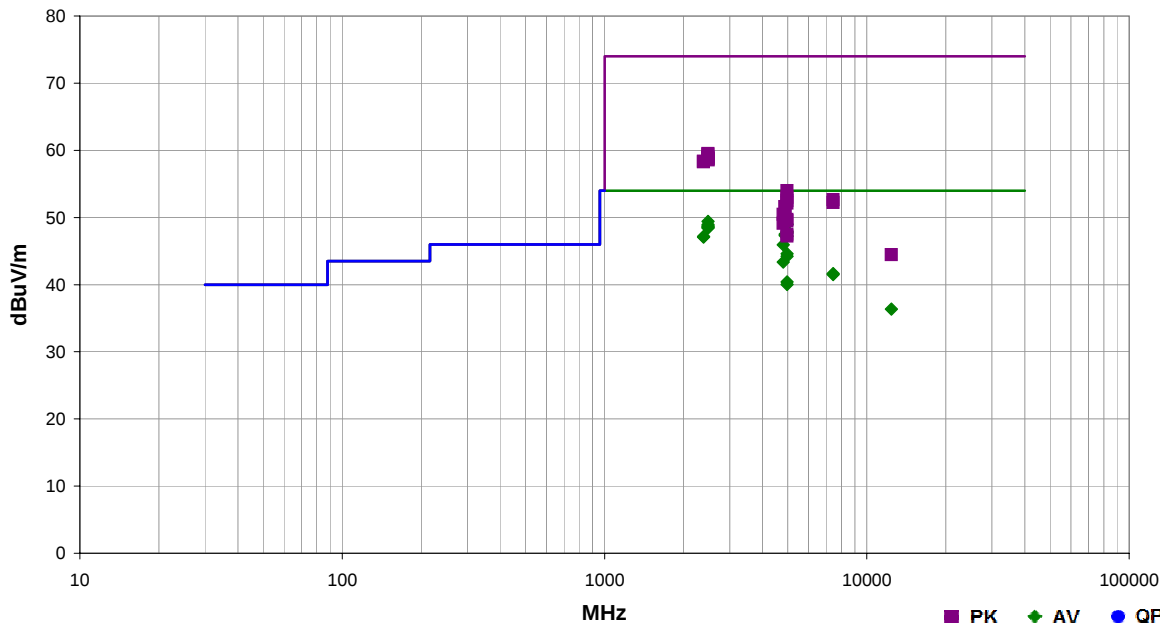
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4959.967	47.5	5.1	1.2	318.0	3.0	0.0	Horz	AV	0.0	52.6	54.0	-1.4	EUT on Side. High Ch, DH5
2483.508	35.9	-3.6	1.0	247.0	3.0	20.0	Vert	AV	0.0	52.3	54.0	-1.7	EUT Vertical. High Ch, DH5
4960.008	46.1	5.1	1.0	319.0	3.0	0.0	Horz	AV	0.0	51.2	54.0	-2.8	EUT Horizontal. High Ch, DH5
2483.508	34.4	-3.6	1.0	247.0	3.0	20.0	Vert	AV	0.0	50.8	54.0	-3.2	EUT Vertical. High Ch, 3DH5
2483.550	34.3	-3.6	1.0	247.0	3.0	20.0	Vert	AV	0.0	50.7	54.0	-3.3	EUT Vertical. High Ch, 2DH5
2483.508	34.3	-3.6	1.0	39.0	3.0	20.0	Horz	AV	0.0	50.7	54.0	-3.3	EUT Horizontal. High Ch, DH5
4960.000	45.6	5.1	1.4	229.0	3.0	0.0	Vert	AV	0.0	50.7	54.0	-3.3	EUT Vertical. High Ch, DH5
4960.042	45.0	5.1	1.1	325.0	3.0	0.0	Horz	AV	0.0	50.1	54.0	-3.9	EUT on Side. High Ch, 3DH5
4960.075	44.7	5.1	1.1	325.0	3.0	0.0	Horz	AV	0.0	49.8	54.0	-4.2	EUT on Side. High Ch, 2DH5
2483.508	31.4	-3.6	1.0	156.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	EUT Horizontal. High Ch, DH5
2483.592	31.3	-3.6	3.1	66.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	EUT Vertical. High Ch, DH5
2483.858	31.2	-3.6	1.0	346.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	EUT on Side. High Ch, DH5
2484.058	31.1	-3.6	4.0	97.0	3.0	20.0	Horz	AV	0.0	47.5	54.0	-6.5	EUT on Side. High Ch, DH5
2385.633	31.2	-3.8	1.0	51.0	3.0	20.0	Vert	AV	0.0	47.4	54.0	-6.6	EUT Vertical. Low Ch, 2DH5
2385.183	31.1	-3.8	1.0	51.0	3.0	20.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT Vertical. Low Ch, 3DH5
2386.450	31.1	-3.8	1.0	51.0	3.0	20.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT Vertical. Low Ch, DH5
4959.983	41.3	5.1	1.0	244.0	3.0	0.0	Horz	AV	0.0	46.4	54.0	-7.6	EUT Vertical. High Ch, DH5
4960.008	41.2	5.1	1.0	353.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	EUT Horizontal. High Ch, DH5
4880.025	40.3	4.7	1.0	325.0	3.0	0.0	Horz	AV	0.0	45.0	54.0	-9.0	EUT on Side. Mid Ch, DH5
4880.017	40.3	4.7	1.4	234.0	3.0	0.0	Vert	AV	0.0	45.0	54.0	-9.0	EUT Vertical. Mid Ch, DH5
4960.017	38.8	5.1	1.3	316.0	3.0	0.0	Vert	AV	0.0	43.9	54.0	-10.1	EUT on Side. High Ch, DH5
7320.033	30.3	12.5	1.0	275.0	3.0	0.0	Vert	AV	0.0	42.8	54.0	-11.2	EUT Vertical. Mid Ch, DH5
7440.083	28.6	13.5	1.1	278.0	3.0	0.0	Vert	AV	0.0	42.1	54.0	-11.9	EUT Vertical. High Ch, DH5
7320.075	29.5	12.5	1.0	116.0	3.0	0.0	Horz	AV	0.0	42.0	54.0	-12.0	EUT on Side. Mid Ch, DH5

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
7442.175	28.0	13.5	4.0	336.0	3.0	0.0	Horz	AV	0.0	41.5	54.0	-12.5	EUT on Side, High Ch, DH5
2483.625	44.6	-3.6	1.0	247.0	3.0	20.0	Vert	PK	0.0	61.0	74.0	-13.0	EUT Vertical, High Ch, DH5
2483.833	44.4	-3.6	1.0	247.0	3.0	20.0	Vert	PK	0.0	60.8	74.0	-13.2	EUT Vertical, High Ch, 2DH5
2483.775	43.3	-3.6	1.0	247.0	3.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	EUT Vertical, High Ch, 3DH5
2485.450	42.6	-3.6	1.0	346.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	EUT on Side, High Ch, DH5
2483.508	42.3	-3.6	1.0	39.0	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	EUT Horizontal, High Ch, DH5
12199.230	44.9	-6.2	1.0	256.0	3.0	0.0	Vert	AV	0.0	38.7	54.0	-15.3	EUT Vertical, Mid Ch, DH5
12199.440	44.8	-6.2	1.0	230.0	3.0	0.0	Horz	AV	0.0	38.6	54.0	-15.4	EUT on Side, Mid Ch, DH5
12009.360	45.2	-6.7	1.0	222.0	3.0	0.0	Horz	AV	0.0	38.5	54.0	-15.5	EUT on Side, Low Ch, DH5
2488.283	42.0	-3.5	3.8	97.0	3.0	20.0	Horz	PK	0.0	58.5	74.0	-15.5	EUT on Side, High Ch, DH5
2485.942	41.9	-3.6	3.1	66.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	EUT Vertical, High Ch, DH5
2485.058	41.8	-3.6	1.0	156.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	EUT Horizontal, High Ch, DH5
2388.533	42.0	-3.8	1.0	51.0	3.0	20.0	Vert	PK	0.0	58.2	74.0	-15.8	EUT Vertical, Low Ch, 3DH5
2388.583	41.6	-3.8	1.0	51.0	3.0	20.0	Vert	PK	0.0	57.8	74.0	-16.2	EUT Vertical, Low Ch, DH5
2388.133	41.5	-3.8	1.0	51.0	3.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	EUT Vertical, Low Ch, 2DH5
12399.270	43.0	-5.7	1.1	256.0	3.0	0.0	Vert	AV	0.0	37.3	54.0	-16.7	EUT Vertical, High Ch, DH5
4960.250	50.2	5.1	1.2	318.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT on Side, High Ch, DH5
4960.008	50.2	5.1	1.1	325.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT on Side, High Ch, 3DH5
4959.608	50.2	5.1	1.1	325.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT on Side, High Ch, 2DH5
12399.310	40.6	-5.7	1.0	278.0	3.0	0.0	Horz	AV	0.0	34.9	54.0	-19.1	EUT on Side, High Ch, DH5
12009.330	41.3	-6.7	1.0	247.0	3.0	0.0	Vert	AV	0.0	34.6	54.0	-19.4	EUT Vertical, Low Ch, DH5
4960.117	49.2	5.1	1.0	319.0	3.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	EUT Horizontal, High Ch, DH5
4806.167	29.5	4.4	2.3	0.0	3.0	0.0	Vert	AV	0.0	33.9	54.0	-20.1	EUT Vertical, Low Ch, DH5
4806.067	29.5	4.3	1.0	291.0	3.0	0.0	Horz	AV	0.0	33.8	54.0	-20.2	EUT on Side, Low Ch, DH5
4960.100	48.3	5.1	1.5	225.0	3.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	EUT Vertical, High Ch, DH5
7320.817	40.5	12.5	1.0	275.0	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	EUT Vertical, Mid Ch, DH5
7438.908	39.3	13.5	1.1	278.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	EUT Vertical, High Ch, DH5
7318.942	40.0	12.5	1.0	116.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT on Side, Mid Ch, DH5
7440.225	38.9	13.5	4.0	336.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	EUT on Side, High Ch, DH5
4960.325	46.1	5.1	1.0	244.0	3.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	EUT Vertical, High Ch, DH5
4959.733	46.0	5.1	1.0	353.0	3.0	0.0	Vert	PK	0.0	51.1	74.0	-22.9	EUT Horizontal, High Ch, DH5
4880.167	45.6	4.7	1.4	234.0	3.0	0.0	Vert	PK	0.0	50.3	74.0	-23.7	EUT Vertical, Mid Ch, DH5
4880.267	45.2	4.7	1.0	325.0	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	EUT on Side, Mid Ch, DH5
4960.167	44.3	5.1	1.3	316.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	EUT on Side, High Ch, DH5
12200.940	51.7	-6.2	1.0	230.0	3.0	0.0	Horz	PK	0.0	45.5	74.0	-28.5	EUT on Side, Mid Ch, DH5
12200.710	51.7	-6.2	1.0	256.0	3.0	0.0	Vert	PK	0.0	45.5	74.0	-28.5	EUT Vertical, Mid Ch, DH5
12009.300	52.1	-6.7	1.0	222.0	3.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	EUT on Side, Low Ch, DH5
4805.867	40.9	4.3	1.0	291.0	3.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8	EUT on Side, Low Ch, DH5
4808.592	40.2	4.4	2.3	0.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	EUT Vertical, Low Ch, DH5
12399.190	50.0	-5.7	1.1	256.0	3.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	EUT Vertical, High Ch, DH5
12009.230	49.8	-6.7	1.0	247.0	3.0	0.0	Vert	PK	0.0	43.1	74.0	-30.9	EUT Vertical, Low Ch, DH5
12399.330	48.5	-5.7	1.0	278.0	3.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	EUT on Side, High Ch, DH5

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			Tested by: Trevor Buls
Configuration:	1			
Customer:	Logic PD, Inc.			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting Bluetooth EDR, Low, Mid, High (2402, 2440, 2480 MHz) at DH5, 2DH5, 3DH5 -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 #	11	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	2.1	232.0	3.0	20.0	Vert	AV	0.0	49.4	54.0	-4.6	EUT Vertical, High Ch, DH5
4960.000	43.9	5.1	1.0	295.0	3.0	0.0	Horz	AV	0.0	49.0	54.0	-5.0	EUT on Side, High Ch, DH5
2483.508	32.5	-3.6	1.0	226.0	3.0	20.0	Horz	AV	0.0	48.9	54.0	-5.1	EUT on Side, High Ch, DH5
2483.500	32.3	-3.6	2.1	232.0	3.0	20.0	Vert	AV	0.0	48.7	54.0	-5.3	EUT Vertical, High Ch, 3DH5
2483.500	32.2	-3.6	2.1	232.0	3.0	20.0	Vert	AV	0.0	48.6	54.0	-5.4	EUT Vertical, High Ch, 2DH5
2483.575	32.0	-3.6	1.0	226.0	3.0	20.0	Horz	AV	0.0	48.4	54.0	-5.6	EUT on Side, High Ch, 3DH5
2483.500	32.0	-3.6	1.0	226.0	3.0	20.0	Horz	AV	0.0	48.4	54.0	-5.6	EUT on Side, High Ch, 2DH5
4959.950	42.8	5.1	1.0	291.0	3.0	0.0	Horz	AV	0.0	47.9	54.0	-6.1	EUT on Side, High Ch, 3DH5
4959.975	42.6	5.1	1.2	252.0	3.0	0.0	Vert	AV	0.0	47.7	54.0	-6.3	EUT Vertical, High Ch, DH5
4879.967	42.8	4.7	1.0	300.0	3.0	0.0	Horz	AV	0.0	47.5	54.0	-6.5	EUT on Side, Mid Ch, DH5
4879.983	42.6	4.7	1.0	251.0	3.0	0.0	Vert	AV	0.0	47.3	54.0	-6.7	EUT Vertical, Mid Ch, DH5
4960.108	42.1	5.1	1.0	291.0	3.0	0.0	Horz	AV	0.0	47.2	54.0	-6.8	EUT on Side, High Ch, 2DH5
2385.833	31.0	-3.8	1.0	202.0	3.0	20.0	Horz	AV	0.0	47.2	54.0	-6.8	EUT on Side, Low Ch, DH5
2386.675	30.9	-3.8	1.0	121.0	3.0	20.0	Vert	AV	0.0	47.1	54.0	-6.9	EUT Vertical, Low Ch, DH5
4804.058	41.6	4.3	1.0	302.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	EUT on Side, Low Ch, DH5
4959.975	39.5	5.1	1.0	75.0	3.0	0.0	Horz	AV	0.0	44.6	54.0	-9.4	EUT Horizontal, High Ch, DH5
4959.967	39.1	5.1	1.0	216.0	3.0	0.0	Vert	AV	0.0	44.2	54.0	-9.8	EUT Horizontal, High Ch, DH5
4803.958	39.0	4.3	1.0	247.0	3.0	0.0	Vert	AV	0.0	43.3	54.0	-10.7	EUT Vertical, Low Ch, DH5
7433.708	28.2	13.4	1.0	106.0	3.0	0.0	Horz	AV	0.0	41.6	54.0	-12.4	EUT on Side, High Ch, DH5
7431.692	28.1	13.4	1.0	104.0	3.0	0.0	Vert	AV	0.0	41.5	54.0	-12.5	EUT Vertical, High Ch, DH5
4959.942	35.3	5.1	1.0	238.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	EUT Vertical, High Ch, DH5
4960.000	34.9	5.1	1.4	236.0	3.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	EUT on Side, High Ch, DH5
2483.650	43.1	-3.6	1.0	226.0	3.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	EUT on Side, High Ch, DH5
2483.833	43.0	-3.6	2.1	232.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	EUT Vertical, High Ch, DH5

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
2483.975	42.6	-3.6	2.1	232.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	EUT Vertical, High Ch, 2DH5
2484.292	42.5	-3.6	1.0	226.0	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	EUT on Side, High Ch, 2DH5
2486.750	42.3	-3.6	1.0	226.0	3.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	EUT on Side, High Ch, 3DH5
2485.442	42.1	-3.6	2.1	232.0	3.0	20.0	Vert	PK	0.0	58.5	74.0	-15.5	EUT Vertical, High Ch, 3DH5
2387.975	42.2	-3.8	1.0	121.0	3.0	20.0	Vert	PK	0.0	58.4	74.0	-15.6	EUT Vertical, Low Ch, DH5
2385.908	42.1	-3.8	1.0	202.0	3.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	EUT on Side, Low Ch, DH5
12399.380	42.1	-5.7	1.2	239.0	3.0	0.0	Horz	AV	0.0	36.4	54.0	-17.6	EUT on Side, High Ch, DH5
4960.008	48.9	5.1	1.0	291.0	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	EUT on Side, High Ch, 3DH5
4960.233	47.9	5.1	1.0	291.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT on Side, High Ch, 2DH5
7434.333	39.2	13.4	1.0	104.0	3.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	EUT Vertical, High Ch, DH5
4960.275	47.4	5.1	1.0	295.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT on Side, High Ch, DH5
7434.667	38.8	13.4	1.0	106.0	3.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	EUT on Side, High Ch, DH5
4960.467	47.0	5.1	1.2	252.0	3.0	0.0	Vert	PK	0.0	52.1	74.0	-21.9	EUT Vertical, High Ch, DH5
4880.225	46.9	4.7	1.0	251.0	3.0	0.0	Vert	PK	0.0	51.6	74.0	-22.4	EUT Vertical, Mid Ch, DH5
4880.167	46.9	4.7	1.0	300.0	3.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	EUT on Side, Mid Ch, DH5
4803.500	46.1	4.3	1.0	302.0	3.0	0.0	Horz	PK	0.0	50.4	74.0	-23.6	EUT on Side, Low Ch, DH5
4960.250	44.6	5.1	1.0	75.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	EUT Horizontal, High Ch, DH5
4960.292	44.4	5.1	1.0	216.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	EUT Horizontal, High Ch, DH5
4804.433	44.8	4.3	1.0	247.0	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	EUT Vertical, Low Ch, DH5
4959.883	42.4	5.1	1.0	238.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	EUT Vertical, High Ch, DH5
4960.108	42.1	5.1	1.4	236.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	EUT on Side, High Ch, DH5
12399.180	50.2	-5.7	1.2	239.0	3.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	EUT on Side, High Ch, DH5

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 EDR, High Ch
Transmitting BT EDR, Low Ch
Transmitting BT EDR, 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	Job Site:	MN03
Power:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	17	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

None

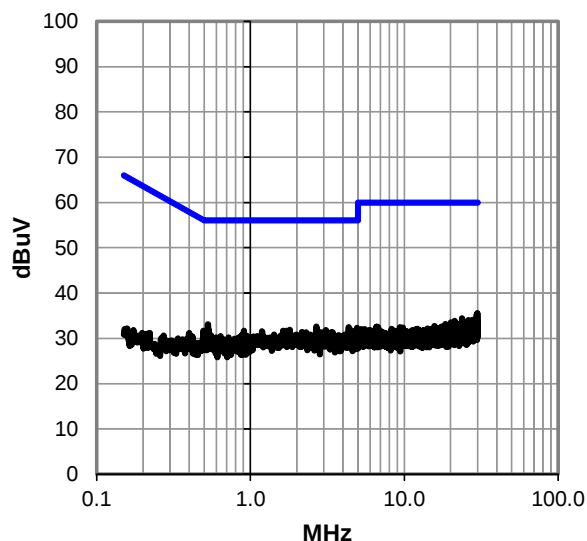
EUT OPERATING MODES

Transmitting BT EDR, Low Ch

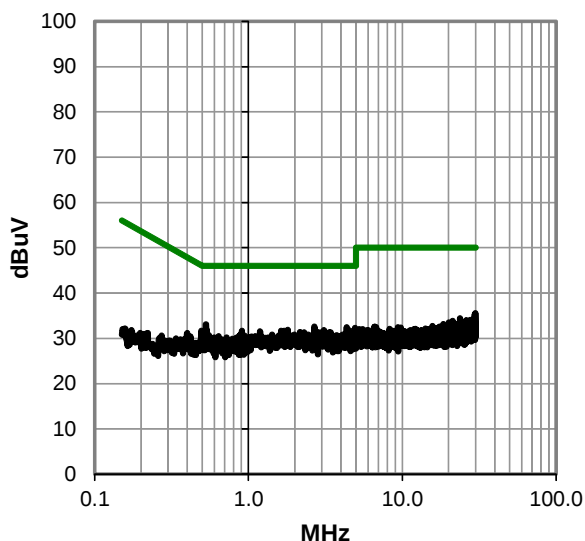
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #17

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	12.9	20.2	33.1	56.0	-22.9
2.680	12.3	20.3	32.6	56.0	-23.4
4.344	12.1	20.4	32.5	56.0	-23.5
4.928	11.9	20.4	32.3	56.0	-23.7
1.800	11.6	20.3	31.9	56.0	-24.1
3.096	11.5	20.3	31.8	56.0	-24.2
4.544	11.4	20.4	31.8	56.0	-24.2
0.906	11.5	20.2	31.7	56.0	-24.3
1.712	11.4	20.3	31.7	56.0	-24.3
29.960	13.2	22.4	35.6	60.0	-24.4
0.493	11.5	20.2	31.7	56.1	-24.4
1.184	11.3	20.2	31.5	56.0	-24.5
2.808	11.1	20.3	31.4	56.0	-24.6
2.160	11.1	20.3	31.4	56.0	-24.6
3.416	11.0	20.3	31.3	56.0	-24.7
3.344	11.0	20.3	31.3	56.0	-24.7
2.960	11.0	20.3	31.3	56.0	-24.7
29.660	12.9	22.4	35.3	60.0	-24.7
4.656	10.6	20.4	31.0	56.0	-25.0
0.889	10.7	20.2	30.9	56.0	-25.1
2.448	10.5	20.3	30.8	56.0	-25.2
3.744	10.3	20.4	30.7	56.0	-25.3
29.590	12.3	22.4	34.7	60.0	-25.3
3.512	10.3	20.4	30.7	56.0	-25.3
0.874	10.4	20.2	30.6	56.0	-25.4
0.942	10.4	20.2	30.6	56.0	-25.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	12.9	20.2	33.1	46.0	-12.9
2.680	12.3	20.3	32.6	46.0	-13.4
4.344	12.1	20.4	32.5	46.0	-13.5
4.928	11.9	20.4	32.3	46.0	-13.7
1.800	11.6	20.3	31.9	46.0	-14.1
3.096	11.5	20.3	31.8	46.0	-14.2
4.544	11.4	20.4	31.8	46.0	-14.2
0.906	11.5	20.2	31.7	46.0	-14.3
1.712	11.4	20.3	31.7	46.0	-14.3
29.960	13.2	22.4	35.6	50.0	-14.4
0.493	11.5	20.2	31.7	46.1	-14.4
1.184	11.3	20.2	31.5	46.0	-14.5
2.808	11.1	20.3	31.4	46.0	-14.6
2.160	11.1	20.3	31.4	46.0	-14.6
3.416	11.0	20.3	31.3	46.0	-14.7
3.344	11.0	20.3	31.3	46.0	-14.7
2.960	11.0	20.3	31.3	46.0	-14.7
29.660	12.9	22.4	35.3	50.0	-14.7
4.656	10.6	20.4	31.0	46.0	-15.0
0.889	10.7	20.2	30.9	46.0	-15.1
2.448	10.5	20.3	30.8	46.0	-15.2
3.744	10.3	20.4	30.7	46.0	-15.3
29.590	12.3	22.4	34.7	50.0	-15.3
3.512	10.3	20.4	30.7	46.0	-15.3
0.874	10.4	20.2	30.6	46.0	-15.4
0.942	10.4	20.2	30.6	46.0	-15.4

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:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	18	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

None

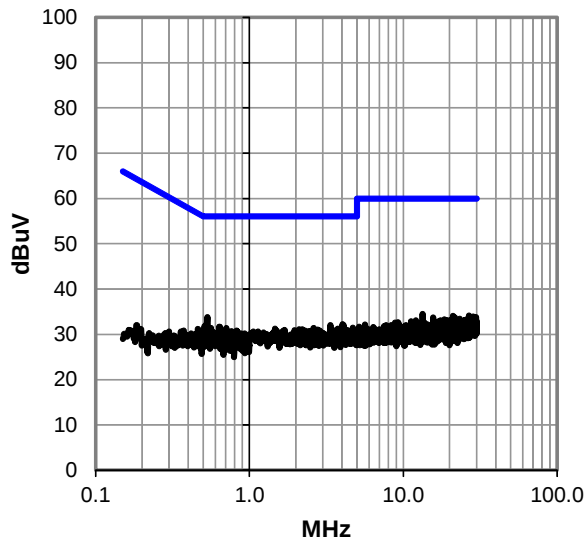
EUT OPERATING MODES

Transmitting BT EDR, Low Ch

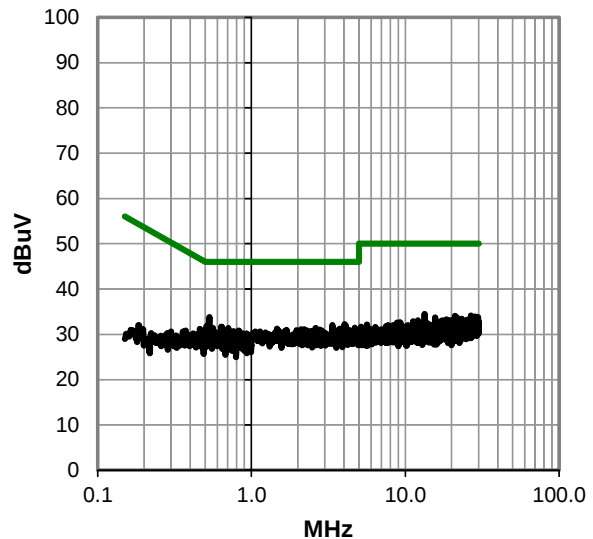
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #18

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.534	13.6	20.2	33.8	56.0	-22.2
4.032	11.9	20.4	32.3	56.0	-23.7
4.080	11.7	20.4	32.1	56.0	-23.9
3.352	11.7	20.3	32.0	56.0	-24.0
0.510	11.6	20.2	31.8	56.0	-24.2
0.640	11.5	20.2	31.7	56.0	-24.3
4.704	11.1	20.4	31.5	56.0	-24.5
2.616	11.1	20.3	31.4	56.0	-24.6
0.563	11.2	20.2	31.4	56.0	-24.6
0.708	11.2	20.2	31.4	56.0	-24.6
3.744	10.9	20.4	31.3	56.0	-24.7
1.464	11.0	20.2	31.2	56.0	-24.8
2.200	10.8	20.3	31.1	56.0	-24.9
2.104	10.8	20.3	31.1	56.0	-24.9
4.208	10.7	20.4	31.1	56.0	-24.9
2.768	10.7	20.3	31.0	56.0	-25.0
4.304	10.6	20.4	31.0	56.0	-25.0
1.696	10.7	20.3	31.0	56.0	-25.0
3.576	10.5	20.4	30.9	56.0	-25.1
2.872	10.5	20.3	30.8	56.0	-25.2
2.296	10.5	20.3	30.8	56.0	-25.2
0.823	10.6	20.2	30.8	56.0	-25.2
2.440	10.4	20.3	30.7	56.0	-25.3
0.764	10.5	20.2	30.7	56.0	-25.3
1.136	10.4	20.2	30.6	56.0	-25.4
0.672	10.4	20.2	30.6	56.0	-25.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.534	13.6	20.2	33.8	46.0	-12.2
4.032	11.9	20.4	32.3	46.0	-13.7
4.080	11.7	20.4	32.1	46.0	-13.9
3.352	11.7	20.3	32.0	46.0	-14.0
0.510	11.6	20.2	31.8	46.0	-14.2
0.640	11.5	20.2	31.7	46.0	-14.3
4.704	11.1	20.4	31.5	46.0	-14.5
2.616	11.1	20.3	31.4	46.0	-14.6
0.563	11.2	20.2	31.4	46.0	-14.6
0.708	11.2	20.2	31.4	46.0	-14.6
3.744	10.9	20.4	31.3	46.0	-14.7
1.464	11.0	20.2	31.2	46.0	-14.8
2.200	10.8	20.3	31.1	46.0	-14.9
2.104	10.8	20.3	31.1	46.0	-14.9
4.208	10.7	20.4	31.1	46.0	-14.9
2.768	10.7	20.3	31.0	46.0	-15.0
4.304	10.6	20.4	31.0	46.0	-15.0
1.696	10.7	20.3	31.0	46.0	-15.0
3.576	10.5	20.4	30.9	46.0	-15.1
2.872	10.5	20.3	30.8	46.0	-15.2
2.296	10.5	20.3	30.8	46.0	-15.2
0.823	10.6	20.2	30.8	46.0	-15.2
2.440	10.4	20.3	30.7	46.0	-15.3
0.764	10.5	20.2	30.7	46.0	-15.3
1.136	10.4	20.2	30.6	46.0	-15.4
0.672	10.4	20.2	30.6	46.0	-15.4

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:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	19	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

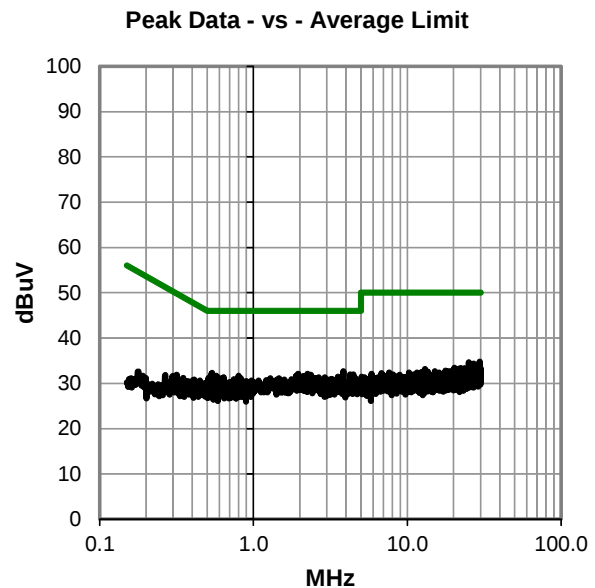
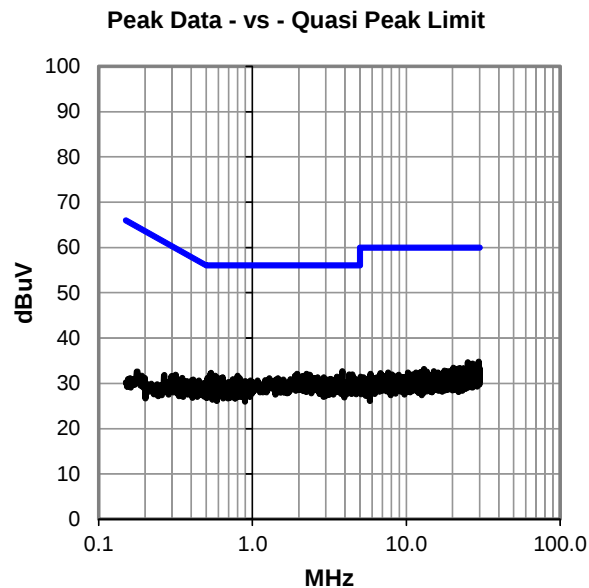
None

EUT OPERATING MODES

Transmitting BT EDR, Mid Ch

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #19

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
3.840	12.3	20.4	32.7	56.0	-23.3
0.538	12.1	20.2	32.3	56.0	-23.7
2.240	11.8	20.3	32.1	56.0	-23.9
1.952	11.8	20.3	32.1	56.0	-23.9
4.464	11.6	20.4	32.0	56.0	-24.0
4.256	11.6	20.4	32.0	56.0	-24.0
2.360	11.6	20.3	31.9	56.0	-24.1
0.572	11.5	20.2	31.7	56.0	-24.3
0.801	11.5	20.2	31.7	56.0	-24.3
1.888	11.4	20.3	31.7	56.0	-24.3
2.120	11.3	20.3	31.6	56.0	-24.4
3.544	11.1	20.4	31.5	56.0	-24.5
2.904	11.0	20.3	31.3	56.0	-24.7
2.656	11.0	20.3	31.3	56.0	-24.7
0.590	11.1	20.2	31.3	56.0	-24.7
0.640	11.1	20.2	31.3	56.0	-24.7
4.336	10.9	20.4	31.3	56.0	-24.7
0.510	11.0	20.2	31.2	56.0	-24.8
4.592	10.8	20.4	31.2	56.0	-24.8
1.464	10.9	20.2	31.1	56.0	-24.9
1.288	10.9	20.2	31.1	56.0	-24.9
0.827	10.9	20.2	31.1	56.0	-24.9
3.624	10.7	20.4	31.1	56.0	-24.9
3.232	10.6	20.3	30.9	56.0	-25.1
0.745	10.7	20.2	30.9	56.0	-25.1
3.104	10.5	20.3	30.8	56.0	-25.2

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
3.840	12.3	20.4	32.7	46.0	-13.3
0.538	12.1	20.2	32.3	46.0	-13.7
2.240	11.8	20.3	32.1	46.0	-13.9
1.952	11.8	20.3	32.1	46.0	-13.9
4.464	11.6	20.4	32.0	46.0	-14.0
4.256	11.6	20.4	32.0	46.0	-14.0
2.360	11.6	20.3	31.9	46.0	-14.1
0.572	11.5	20.2	31.7	46.0	-14.3
0.801	11.5	20.2	31.7	46.0	-14.3
1.888	11.4	20.3	31.7	46.0	-14.3
2.120	11.3	20.3	31.6	46.0	-14.4
3.544	11.1	20.4	31.5	46.0	-14.5
2.904	11.0	20.3	31.3	46.0	-14.7
2.656	11.0	20.3	31.3	46.0	-14.7
0.590	11.1	20.2	31.3	46.0	-14.7
0.640	11.1	20.2	31.3	46.0	-14.7
4.336	10.9	20.4	31.3	46.0	-14.7
0.510	11.0	20.2	31.2	46.0	-14.8
4.592	10.8	20.4	31.2	46.0	-14.8
1.464	10.9	20.2	31.1	46.0	-14.9
1.288	10.9	20.2	31.1	46.0	-14.9
0.827	10.9	20.2	31.1	46.0	-14.9
3.624	10.7	20.4	31.1	46.0	-14.9
3.232	10.6	20.3	30.9	46.0	-15.1
0.745	10.7	20.2	30.9	46.0	-15.1
3.104	10.5	20.3	30.8	46.0	-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:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

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

None

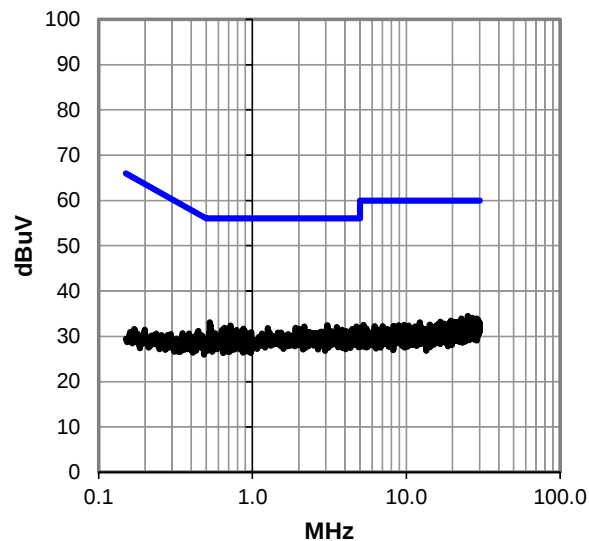
EUT OPERATING MODES

Transmitting BT EDR, Mid Ch

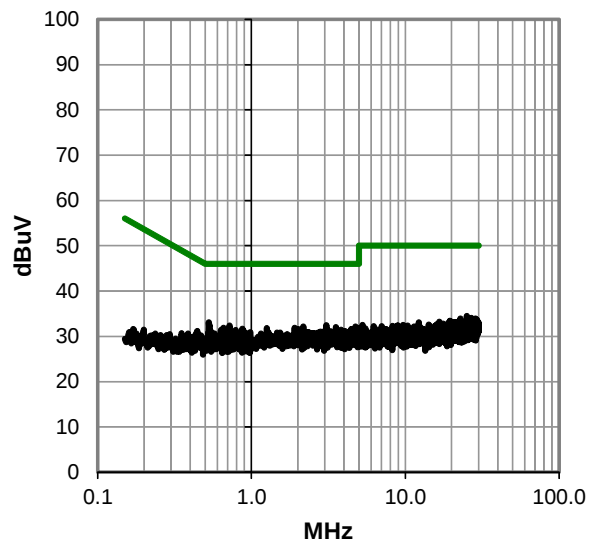
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #20

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	12.9	20.2	33.1	56.0	-22.9
3.064	12.1	20.3	32.4	56.0	-23.6
0.719	12.2	20.2	32.4	56.0	-23.6
2.176	11.9	20.3	32.2	56.0	-23.8
4.744	11.8	20.4	32.2	56.0	-23.8
3.536	11.7	20.4	32.1	56.0	-23.9
0.657	11.7	20.2	31.9	56.0	-24.1
1.904	11.6	20.3	31.9	56.0	-24.1
1.256	11.6	20.2	31.8	56.0	-24.2
4.912	11.4	20.4	31.8	56.0	-24.2
0.874	11.5	20.2	31.7	56.0	-24.3
2.008	11.3	20.3	31.6	56.0	-24.4
4.520	11.2	20.4	31.6	56.0	-24.4
0.640	11.3	20.2	31.5	56.0	-24.5
3.824	11.1	20.4	31.5	56.0	-24.5
0.791	11.2	20.2	31.4	56.0	-24.6
4.384	10.9	20.4	31.3	56.0	-24.7
0.889	11.0	20.2	31.2	56.0	-24.8
4.040	10.8	20.4	31.2	56.0	-24.8
2.936	10.7	20.3	31.0	56.0	-25.0
2.808	10.7	20.3	31.0	56.0	-25.0
3.864	10.6	20.4	31.0	56.0	-25.0
2.352	10.6	20.3	30.9	56.0	-25.1
0.981	10.7	20.2	30.9	56.0	-25.1
1.536	10.6	20.3	30.9	56.0	-25.1
1.152	10.4	20.2	30.6	56.0	-25.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	12.9	20.2	33.1	46.0	-12.9
3.064	12.1	20.3	32.4	46.0	-13.6
0.719	12.2	20.2	32.4	46.0	-13.6
2.176	11.9	20.3	32.2	46.0	-13.8
4.744	11.8	20.4	32.2	46.0	-13.8
3.536	11.7	20.4	32.1	46.0	-13.9
0.657	11.7	20.2	31.9	46.0	-14.1
1.904	11.6	20.3	31.9	46.0	-14.1
1.256	11.6	20.2	31.8	46.0	-14.2
4.912	11.4	20.4	31.8	46.0	-14.2
0.874	11.5	20.2	31.7	46.0	-14.3
2.008	11.3	20.3	31.6	46.0	-14.4
4.520	11.2	20.4	31.6	46.0	-14.4
0.640	11.3	20.2	31.5	46.0	-14.5
3.824	11.1	20.4	31.5	46.0	-14.5
0.791	11.2	20.2	31.4	46.0	-14.6
4.384	10.9	20.4	31.3	46.0	-14.7
0.889	11.0	20.2	31.2	46.0	-14.8
4.040	10.8	20.4	31.2	46.0	-14.8
2.936	10.7	20.3	31.0	46.0	-15.0
2.808	10.7	20.3	31.0	46.0	-15.0
3.864	10.6	20.4	31.0	46.0	-15.0
2.352	10.6	20.3	30.9	46.0	-15.1
0.981	10.7	20.2	30.9	46.0	-15.1
1.536	10.6	20.3	30.9	46.0	-15.1
1.152	10.4	20.2	30.6	46.0	-15.4

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:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	21	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

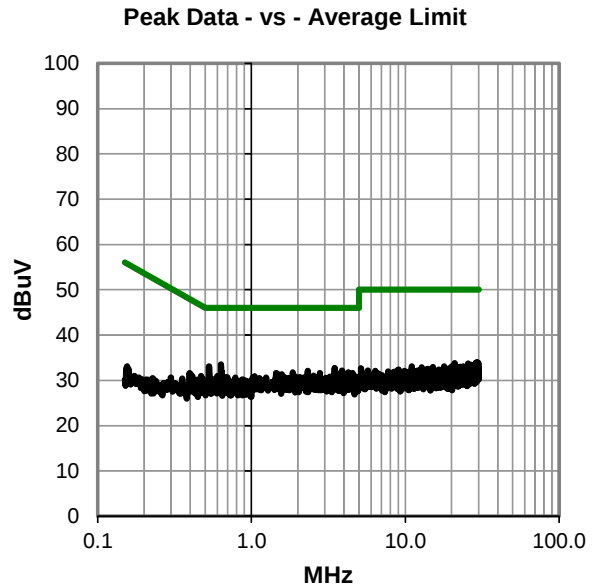
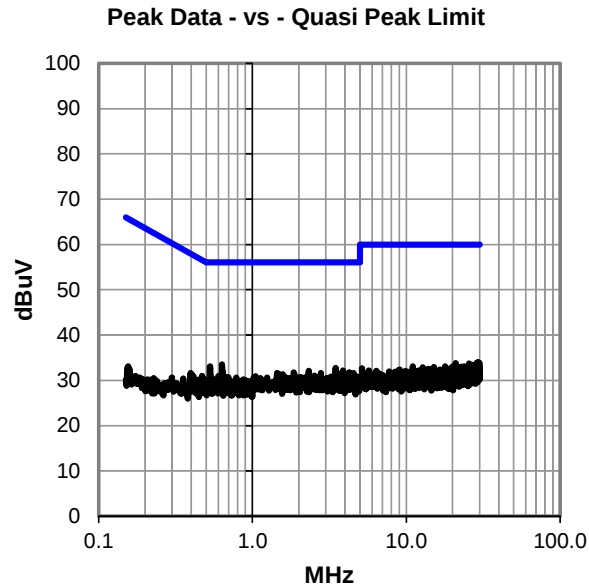
None

EUT OPERATING MODES

Transmitting BT EDR, High Ch

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #21

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.635	13.3	20.2	33.5	56.0	-22.5
0.531	12.9	20.2	33.1	56.0	-22.9
3.472	12.4	20.3	32.7	56.0	-23.3
3.872	11.8	20.4	32.2	56.0	-23.8
2.320	11.8	20.3	32.1	56.0	-23.9
1.856	11.5	20.3	31.8	56.0	-24.2
4.240	11.4	20.4	31.8	56.0	-24.2
4.296	11.3	20.4	31.7	56.0	-24.3
1.448	11.4	20.2	31.6	56.0	-24.4
2.784	11.3	20.3	31.6	56.0	-24.4
4.552	11.2	20.4	31.6	56.0	-24.4
3.696	11.1	20.4	31.5	56.0	-24.5
1.480	11.2	20.2	31.4	56.0	-24.6
1.576	11.1	20.3	31.4	56.0	-24.6
3.656	11.0	20.4	31.4	56.0	-24.6
2.536	10.7	20.3	31.0	56.0	-25.0
0.601	10.8	20.2	31.0	56.0	-25.0
4.024	10.6	20.4	31.0	56.0	-25.0
1.048	10.7	20.2	30.9	56.0	-25.1
4.728	10.5	20.4	30.9	56.0	-25.1
3.240	10.5	20.3	30.8	56.0	-25.2
2.216	10.4	20.3	30.7	56.0	-25.3
0.672	10.5	20.2	30.7	56.0	-25.3
0.697	10.5	20.2	30.7	56.0	-25.3
0.786	10.4	20.2	30.6	56.0	-25.4
0.470	10.8	20.2	31.0	56.5	-25.5

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.635	13.3	20.2	33.5	46.0	-12.5
0.531	12.9	20.2	33.1	46.0	-12.9
3.472	12.4	20.3	32.7	46.0	-13.3
3.872	11.8	20.4	32.2	46.0	-13.8
2.320	11.8	20.3	32.1	46.0	-13.9
1.856	11.5	20.3	31.8	46.0	-14.2
4.240	11.4	20.4	31.8	46.0	-14.2
4.296	11.3	20.4	31.7	46.0	-14.3
1.448	11.4	20.2	31.6	46.0	-14.4
2.784	11.3	20.3	31.6	46.0	-14.4
4.552	11.2	20.4	31.6	46.0	-14.4
3.696	11.1	20.4	31.5	46.0	-14.5
1.480	11.2	20.2	31.4	46.0	-14.6
1.576	11.1	20.3	31.4	46.0	-14.6
3.656	11.0	20.4	31.4	46.0	-14.6
2.536	10.7	20.3	31.0	46.0	-15.0
0.601	10.8	20.2	31.0	46.0	-15.0
4.024	10.6	20.4	31.0	46.0	-15.0
1.048	10.7	20.2	30.9	46.0	-15.1
4.728	10.5	20.4	30.9	46.0	-15.1
3.240	10.5	20.3	30.8	46.0	-15.2
2.216	10.4	20.3	30.7	46.0	-15.3
0.672	10.5	20.2	30.7	46.0	-15.3
0.697	10.5	20.2	30.7	46.0	-15.3
0.786	10.4	20.2	30.6	46.0	-15.4
0.470	10.8	20.2	31.0	46.5	-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:	5 VDC	Configuration:	LGPD0096-2

TEST SPECIFICATIONS

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

TEST PARAMETERS

Run #:	22	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

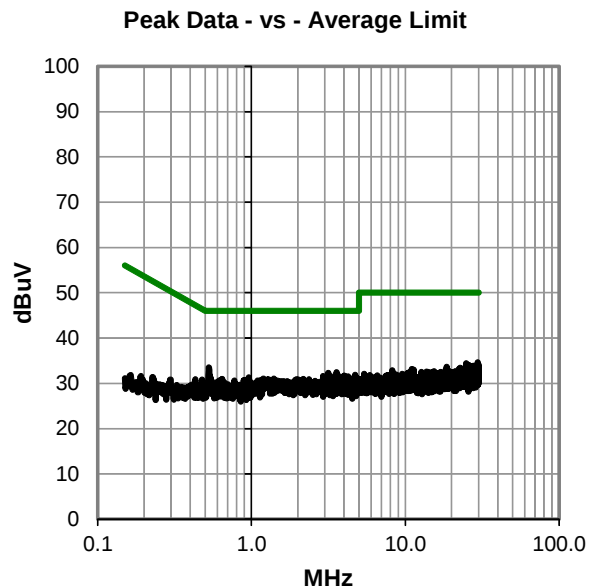
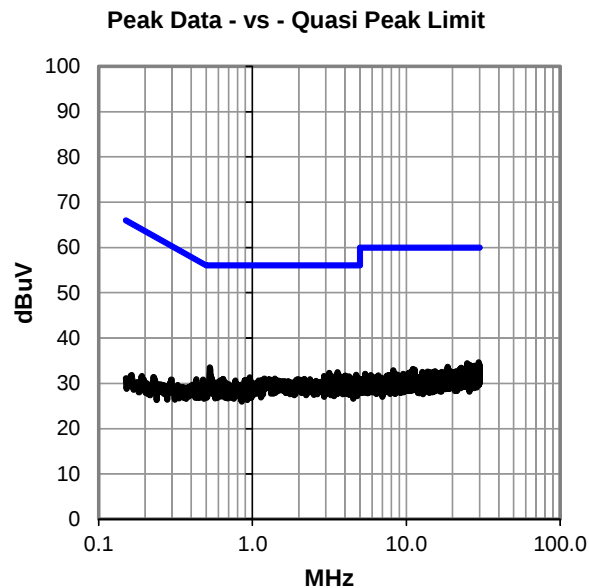
None

EUT OPERATING MODES

Transmitting BT EDR, High Ch

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #22

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	13.3	20.2	33.5	56.0	-22.5
3.568	12.1	20.4	32.5	56.0	-23.5
3.152	12.0	20.3	32.3	56.0	-23.7
4.720	11.5	20.4	31.9	56.0	-24.1
4.024	11.3	20.4	31.7	56.0	-24.3
2.920	11.3	20.3	31.6	56.0	-24.4
4.240	11.2	20.4	31.6	56.0	-24.4
3.728	11.2	20.4	31.6	56.0	-24.4
3.344	11.1	20.3	31.4	56.0	-24.6
3.680	11.0	20.4	31.4	56.0	-24.6
0.961	11.1	20.2	31.3	56.0	-24.7
4.344	10.8	20.4	31.2	56.0	-24.8
3.288	10.8	20.3	31.1	56.0	-24.9
1.400	10.8	20.2	31.0	56.0	-25.0
1.200	10.8	20.2	31.0	56.0	-25.0
2.176	10.7	20.3	31.0	56.0	-25.0
0.645	10.8	20.2	31.0	56.0	-25.0
4.512	10.6	20.4	31.0	56.0	-25.0
2.368	10.6	20.3	30.9	56.0	-25.1
1.144	10.5	20.2	30.7	56.0	-25.3
0.896	10.5	20.2	30.7	56.0	-25.3
0.971	10.5	20.2	30.7	56.0	-25.3
29.590	12.3	22.4	34.7	60.0	-25.3
1.096	10.4	20.2	30.6	56.0	-25.4
0.614	10.4	20.2	30.6	56.0	-25.4
0.774	10.4	20.2	30.6	56.0	-25.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.529	13.3	20.2	33.5	46.0	-12.5
3.568	12.1	20.4	32.5	46.0	-13.5
3.152	12.0	20.3	32.3	46.0	-13.7
4.720	11.5	20.4	31.9	46.0	-14.1
4.024	11.3	20.4	31.7	46.0	-14.3
2.920	11.3	20.3	31.6	46.0	-14.4
4.240	11.2	20.4	31.6	46.0	-14.4
3.728	11.2	20.4	31.6	46.0	-14.4
3.344	11.1	20.3	31.4	46.0	-14.6
3.680	11.0	20.4	31.4	46.0	-14.6
0.961	11.1	20.2	31.3	46.0	-14.7
4.344	10.8	20.4	31.2	46.0	-14.8
3.288	10.8	20.3	31.1	46.0	-14.9
1.400	10.8	20.2	31.0	46.0	-15.0
1.200	10.8	20.2	31.0	46.0	-15.0
2.176	10.7	20.3	31.0	46.0	-15.0
0.645	10.8	20.2	31.0	46.0	-15.0
4.512	10.6	20.4	31.0	46.0	-15.0
2.368	10.6	20.3	30.9	46.0	-15.1
1.144	10.5	20.2	30.7	46.0	-15.3
0.896	10.5	20.2	30.7	46.0	-15.3
0.971	10.5	20.2	30.7	46.0	-15.3
29.590	12.3	22.4	34.7	50.0	-15.3
1.096	10.4	20.2	30.6	46.0	-15.4
0.614	10.4	20.2	30.6	46.0	-15.4
0.774	10.4	20.2	30.6	46.0	-15.4

CONCLUSION

Pass

Trevor Buls
Tested_By