Care Innovations

Door Sensor

FCC 15.247:2013

Report #: CARE0015.2

Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

WTD 12.5.23

Last Date of Test: April 22, 2013
Care Innovations
Model: Door Sensor

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

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200630-0

Test Facility

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

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

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

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

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

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

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00 None			

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

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

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.

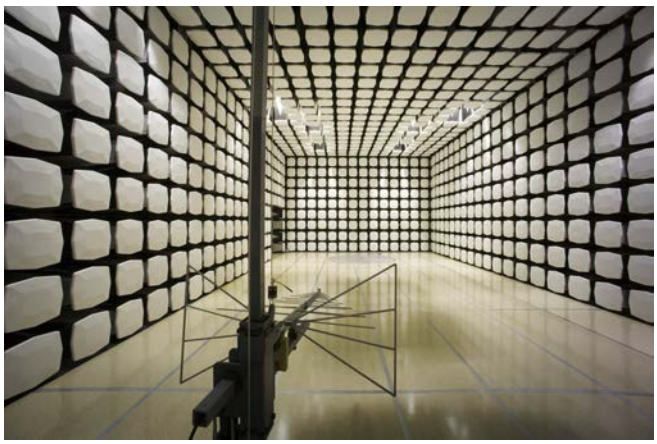
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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

LOCATIONS

REV 2013.02.26

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

WTD 12.5.23

Client and Equipment Under Test (EUT) Information

Company Name:	Care Innovations
Address:	20270 NW Amberglen Court
City, State, Zip:	Beaverton, OR 97006
Test Requested By:	Bill Morse
Model:	Door Sensor
First Date of Test:	April 19, 2013
Last Date of Test:	April 22, 2013
Receipt Date of Samples:	April 17, 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):
Wireless monitoring technology to the senior living community. It uses a 2.4 GHz ISM radio module, 802.15.4 compliant with 1 antenna. In actual use it is powered by a removable battery

Testing Objective:
To demonstrate compliance to FCC 15.247 requirements.

CONFIGURATIONS

Configuration CARE0015- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Door sensor	Care Innovations	QC101500-01	001D40000041005C

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude 2100	00196-063-869-320

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB to Radio Programmer	No	.5	No	Laptop	Coor/Router/Door
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration CARE0015- 5

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Door sensor	Care Innovations	QC101100-02	001D400000410059

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude 2100	00196-063-869-320

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB to Radio Programmer	No	.5	No	Laptop	Coor/Router/Door
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	4/19/2013	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	4/22/2013	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.
3	4/22/2013	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	4/22/2013	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	4/22/2013	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.
6	4/22/2013	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was competed.

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, 6dB	S.M. Electronics	18N-06	AWN	3/25/2013	12
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

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

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

Occupied Bandwidth

EUT:	Door Senor			**Work Order:**	CARE0015
Serial Number:	001D40000041005C			**Date:**	04/22/13
Customer:	Care Innovations			**Temperature:**	23°C
Attendees:	Bill Morse			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1032
Tested by:	Brandon Hobbs, Rod Peloquin	**Power:**	3VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle while under test.

DEVIATIONS FROM TEST STANDARD

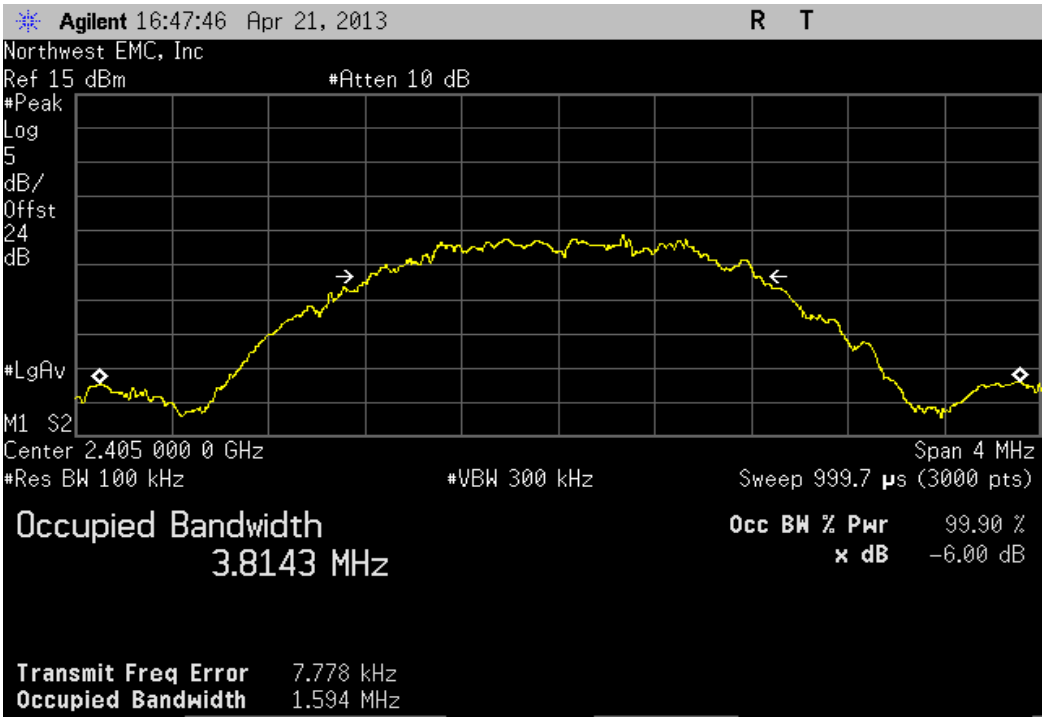
None

Configuration #	2	Signature

		Value	Limit	Result
2400 MHz - 2483.5 MHz Band				
	OQPSK			
	Low Channel 2405 MHz	1.594 MHz	> 500 kHz	Pass
	Mid Channel 2445 MHz	1.606 MHz	> 500 kHz	Pass
	High Channel 2480 MHz	1.544 MHz	> 500 kHz	Pass

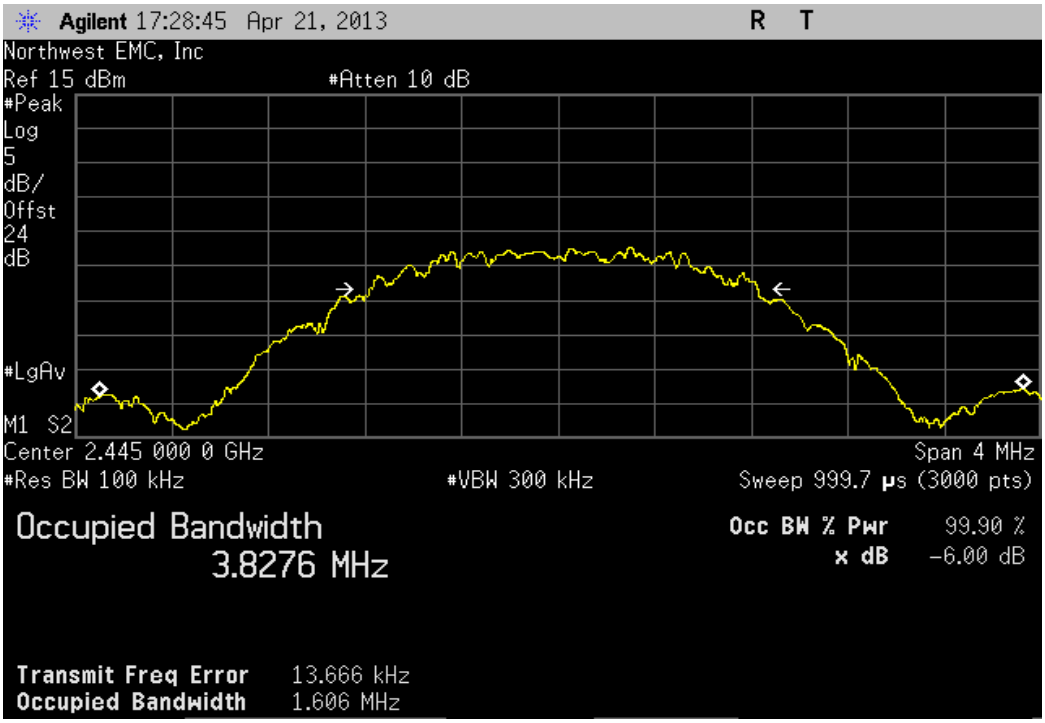
2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz

				Value	Limit	Result
				1.594 MHz	> 500 kHz	Pass



2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz

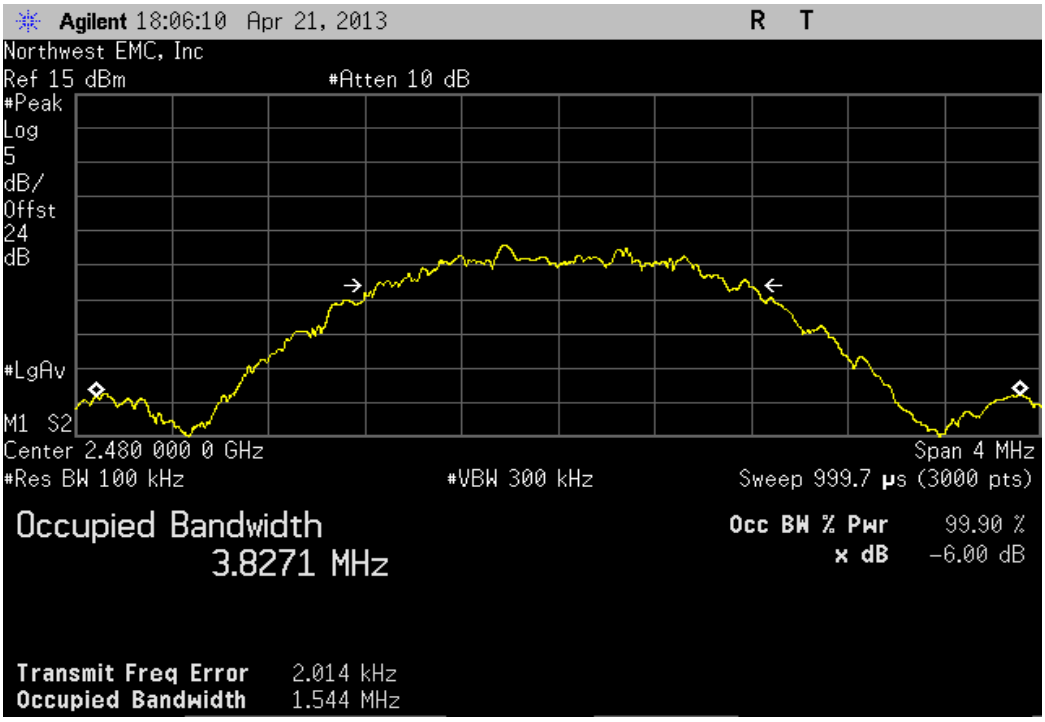
				Value	Limit	Result
				1.606 MHz	> 500 kHz	Pass



Occupied Bandwidth

2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz

				Value	Limit	Result
				1.544 MHz	> 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, 6dB	S.M. Electronics	18N-06	AWN	3/25/2013	12
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	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 9.1.1 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

EUT:	Door Senor			**Work Order:**	CARE0015
Serial Number:	001D40000041005C			**Date:**	04/22/13
Customer:	Care Innovations			**Temperature:**	23°C
Attendees:	Bill Morse			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1032
Tested by:	Brandon Hobbs, Rod Peloquin	**Power:**	3VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle while under test.

DEVIATIONS FROM TEST STANDARD

None

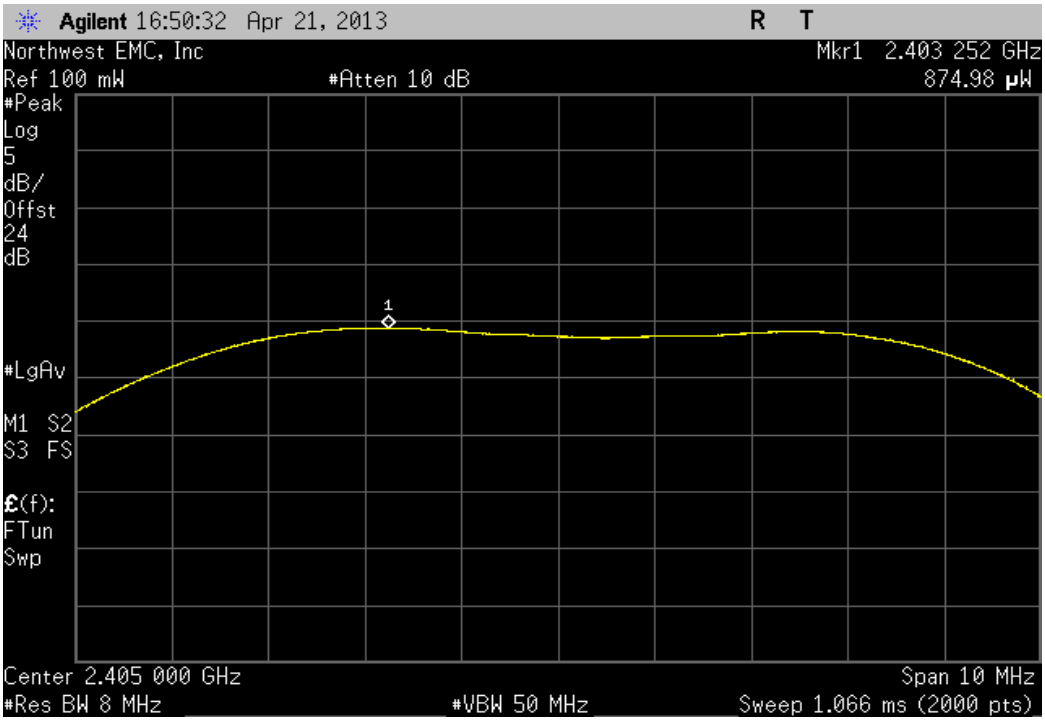
Configuration #	2	Signature

		Value	Limit	Result
2400 MHz - 2483.5 MHz Band				
OQPSK				
	Low Channel 2405 MHz	874.984 uW	< 1 W	Pass
	Mid Channel 2445 MHz	646.398 uW	< 1 W	Pass
	High Channel 2480 MHz	525.654 uW	< 1 W	Pass

Output Power

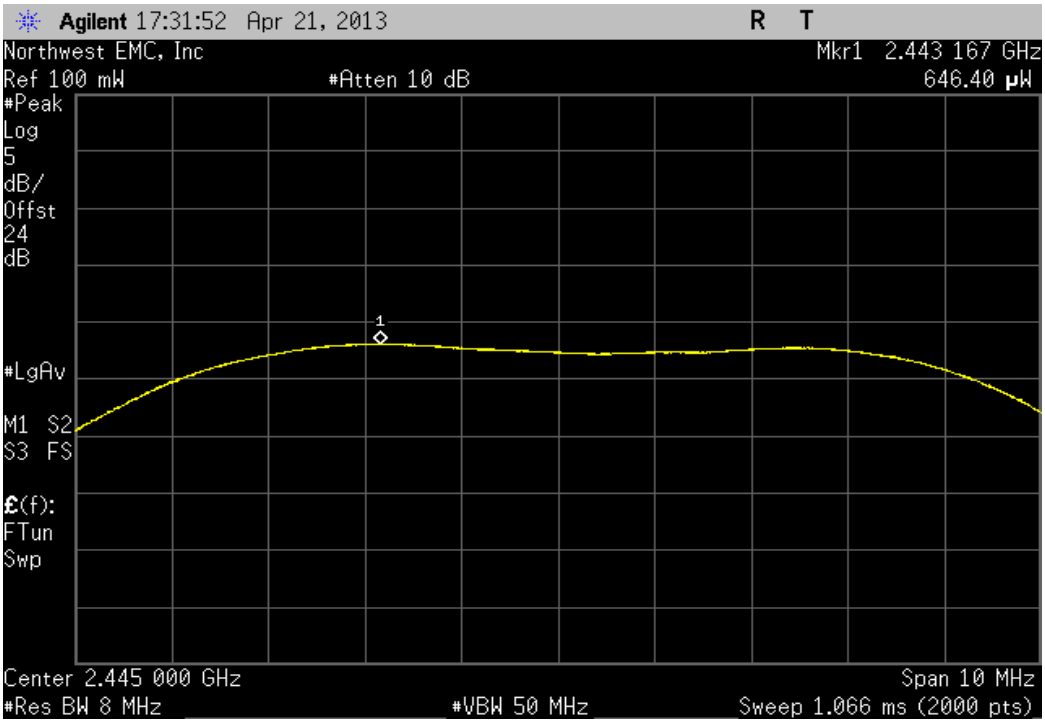
2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz

Value	Limit	Result
874.984 uW	< 1 W	Pass



2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz

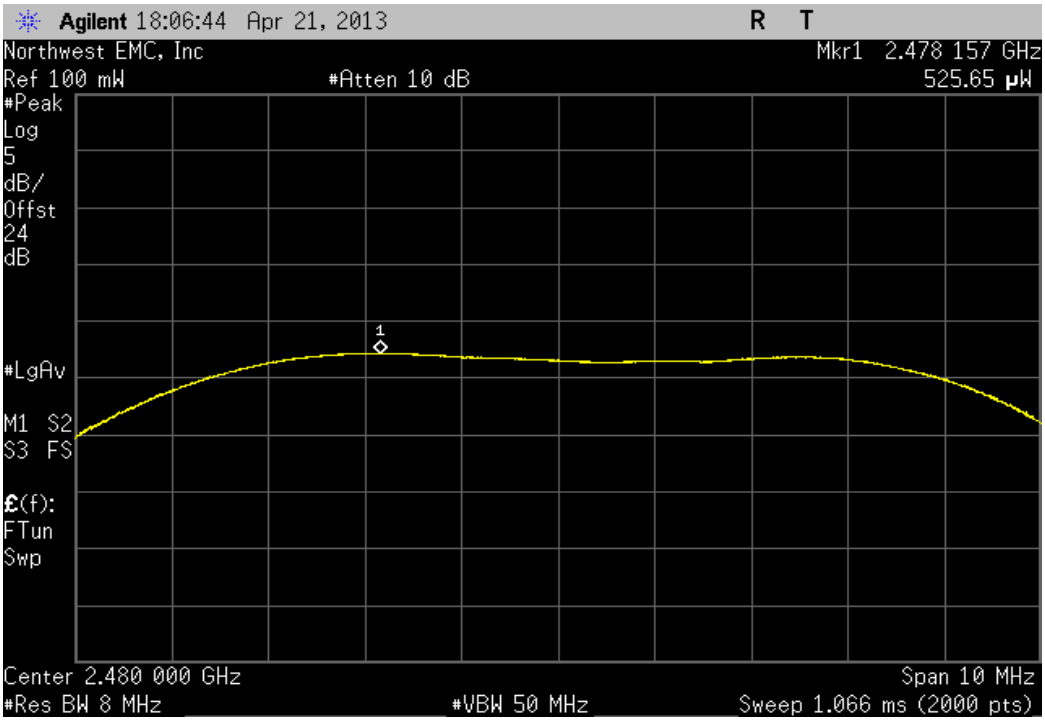
Value	Limit	Result
646.398 uW	< 1 W	Pass



Output Power

2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz

				Value	Limit	Result
				525.654 uW	< 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, 6dB	S.M. Electronics	18N-06	AWN	3/25/2013	12
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

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

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

Band Edge Compliance

EUT:	Door Senor			**Work Order:**	CARE0015
Serial Number:	001D40000041005C			**Date:**	04/22/13
Customer:	Care Innovations			**Temperature:**	23°C
Attendees:	Bill Morse			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1032
Tested by:	Brandon Hobbs, Rod Peloquin	**Power:**	3VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle while under test.

DEVIATIONS FROM TEST STANDARD

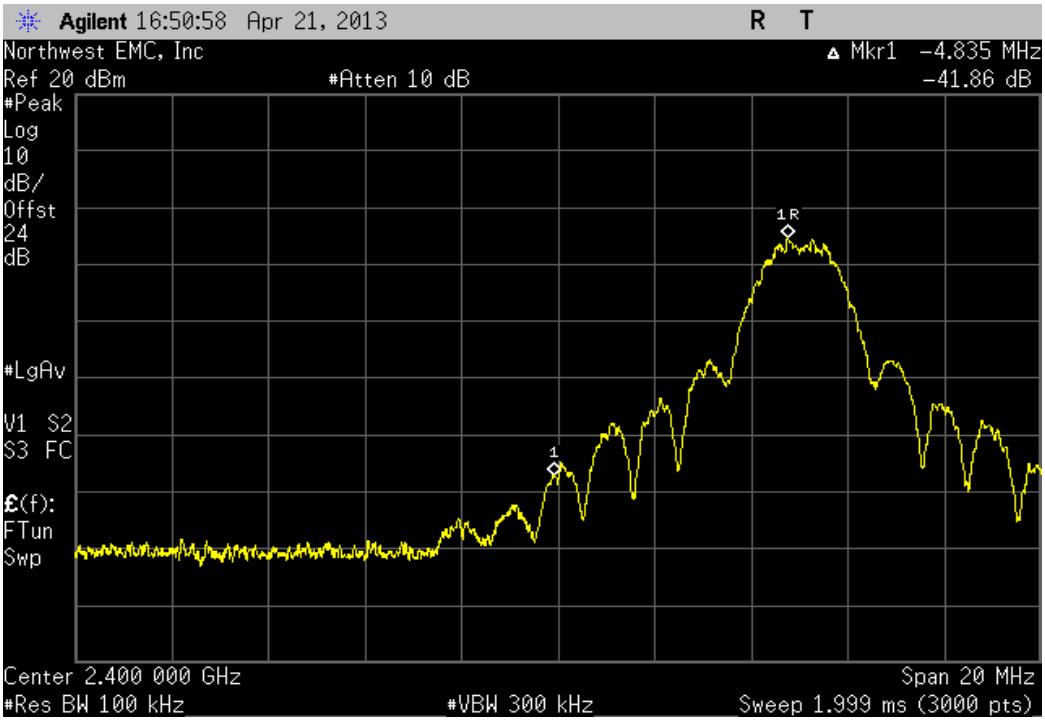
None

Configuration #	2	Signature

		Value	Limit	Result
2400 MHz - 2483.5 MHz Band				
	OQPSK			
	Low Channel 2405 MHz	-41.86 dBc	≤ -20 dBc	Pass
	High Channel 2480 MHz	-32.47 dBc	≤ -20 dBc	Pass

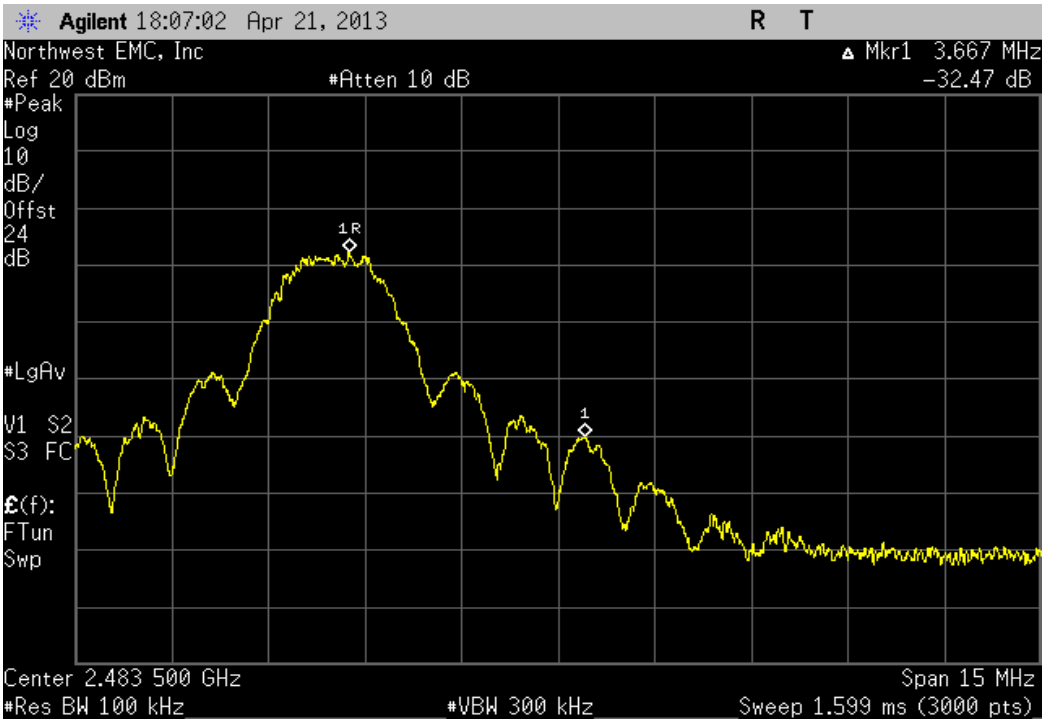
2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz

				Value	Limit	Result
				-41.86 dBc	≤ -20 dBc	Pass



2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz

				Value	Limit	Result
				-32.47 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, 6dB	S.M. Electronics	18N-06	AWN	3/25/2013	12
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	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

EUT:	Door Senor			**Work Order:**	CARE0015
Serial Number:	001D40000041005C			**Date:**	04/22/13
Customer:	Care Innovations			**Temperature:**	23°C
Attendees:	Bill Morse			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1032
Tested by:	Brandon Hobbs, Rod Peloquin	**Power:**	3VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle while under test.

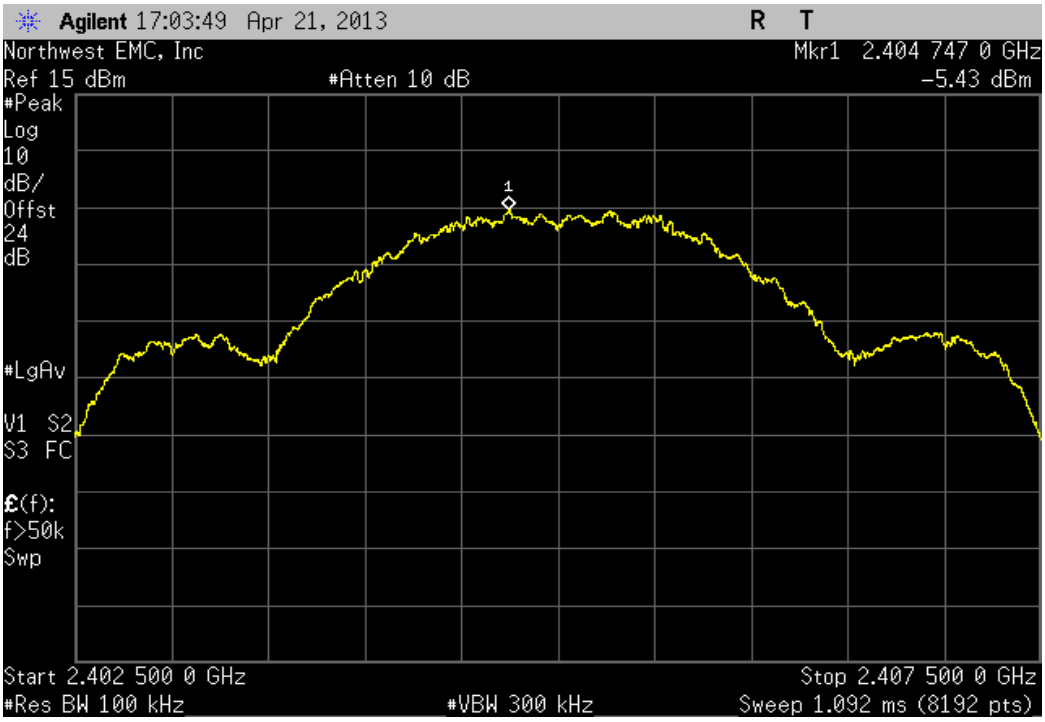
DEVIATIONS FROM TEST STANDARD

None

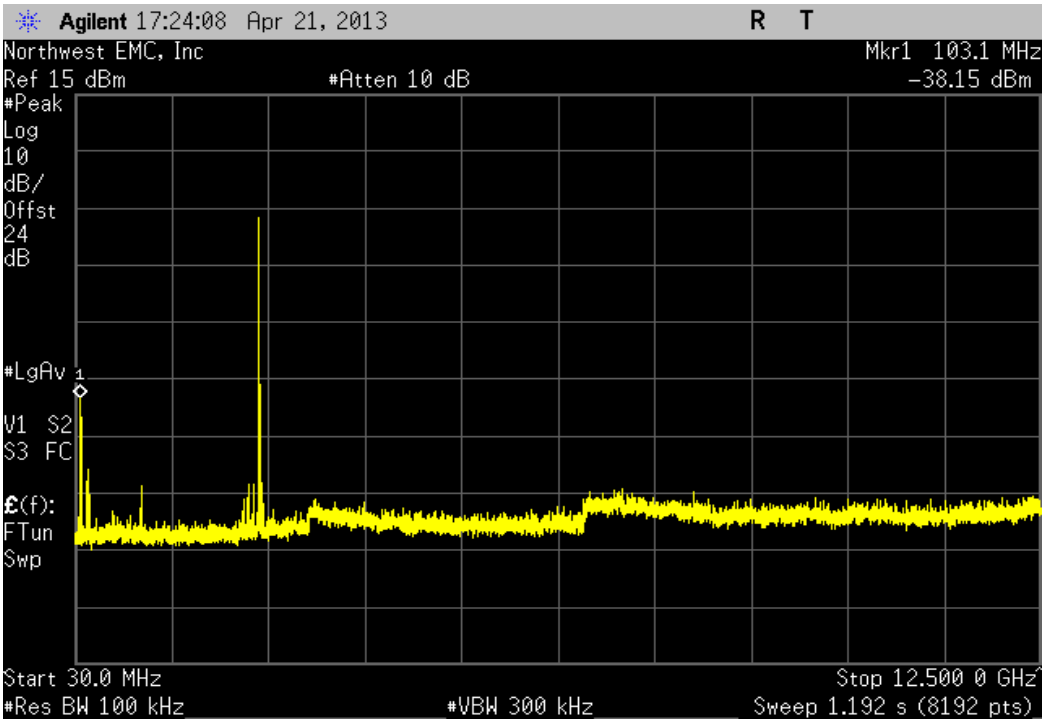
Configuration #	2	Signature

	Frequency Range	Value	Limit	Result
2400 MHz - 2483.5 MHz Band				
OQPSK				
Low Channel 2405 MHz	Fundamental	N/A	N/A	N/A
Low Channel 2405 MHz	30 MHz - 12.5 GHz	-32.72 dBc	≤ -20 dBc	Pass
Low Channel 2405 MHz	12.5 GHz - 25 GHz	-45.95 dBc	≤ -20 dBc	Pass
Mid Channel 2445 MHz	Fundamental	N/A	N/A	N/A
Mid Channel 2445 MHz	30 MHz - 12.5 GHz	-31.29 dBc	≤ -20 dBc	Pass
Mid Channel 2445 MHz	12.5 GHz - 25 GHz	-44.76 dBc	≤ -20 dBc	Pass
High Channel 2480 MHz	Fundamental	N/A	N/A	N/A
High Channel 2480 MHz	30 MHz - 12.5 GHz	-32.82 dBc	≤ -20 dBc	Pass
High Channel 2480 MHz	12.5 GHz - 25 GHz	-43.72 dBc	≤ -20 dBc	Pass

2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz						
	Frequency Range			Value	Limit	Result
	Fundamental			N/A	N/A	N/A

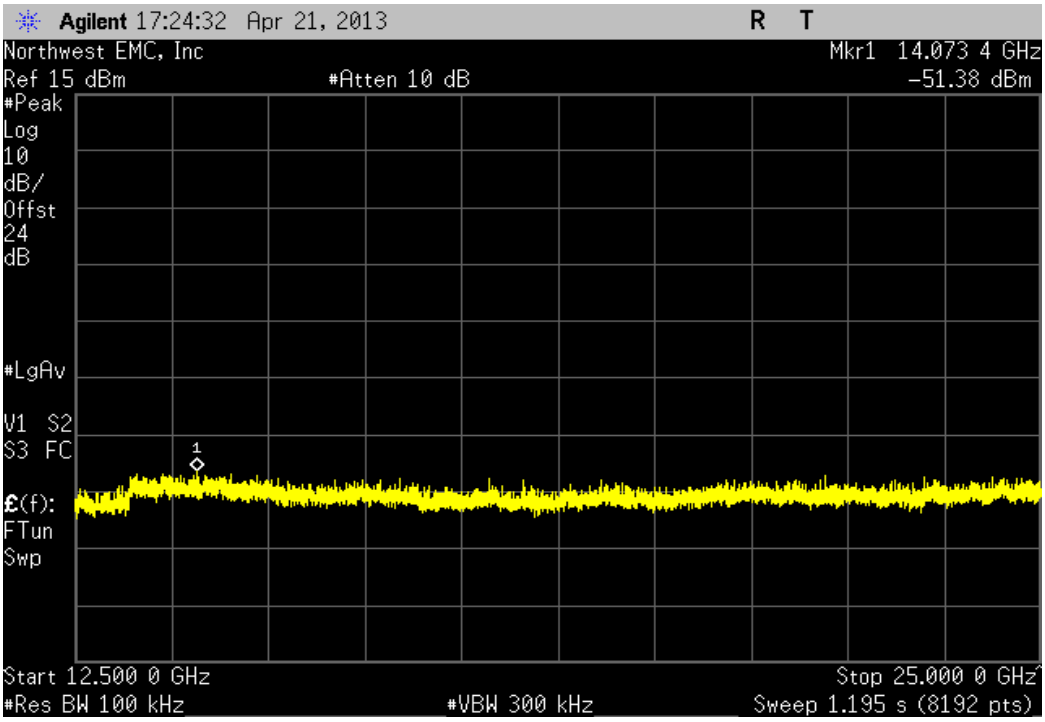


2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz					
Frequency Range			Value	Limit	Result
30 MHz - 12.5 GHz			-32.72 dBc	≤ -20 dBc	Pass



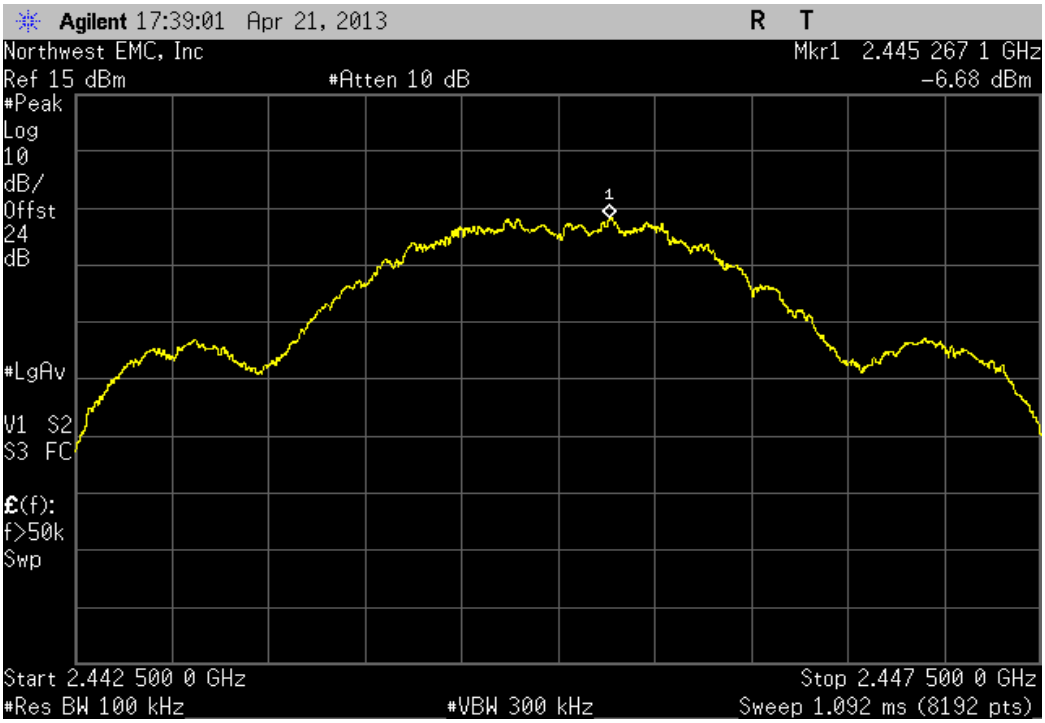
2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz

Frequency Range		Value	Limit	Result
12.5 GHz - 25 GHz		-45.95 dBc	≤ -20 dBc	Pass

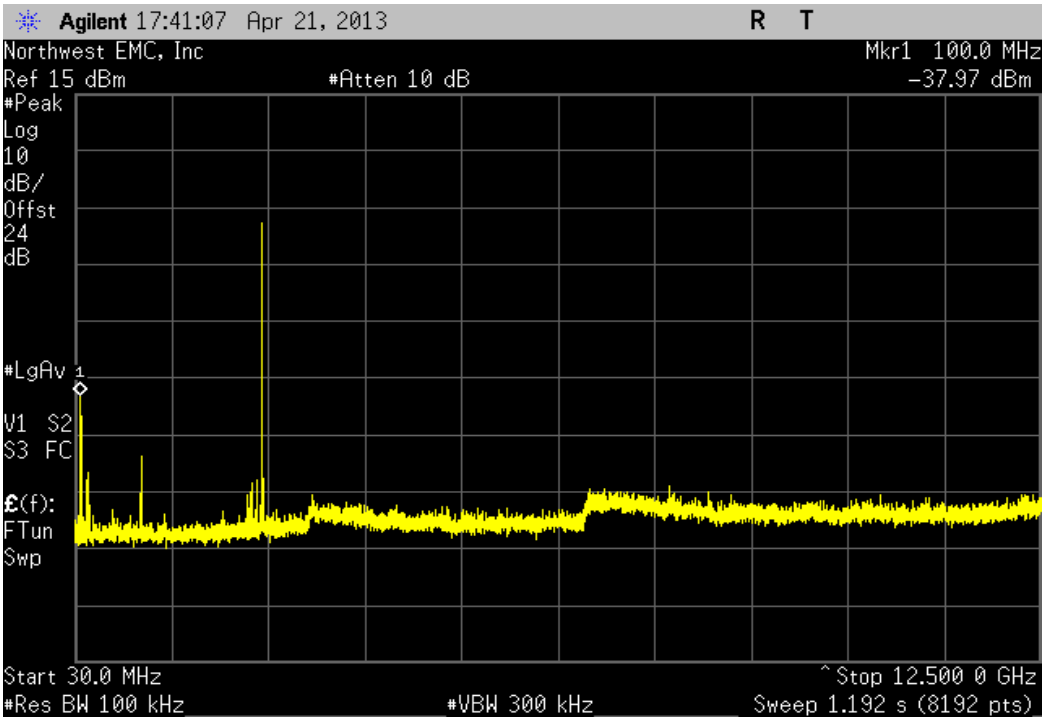


2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz

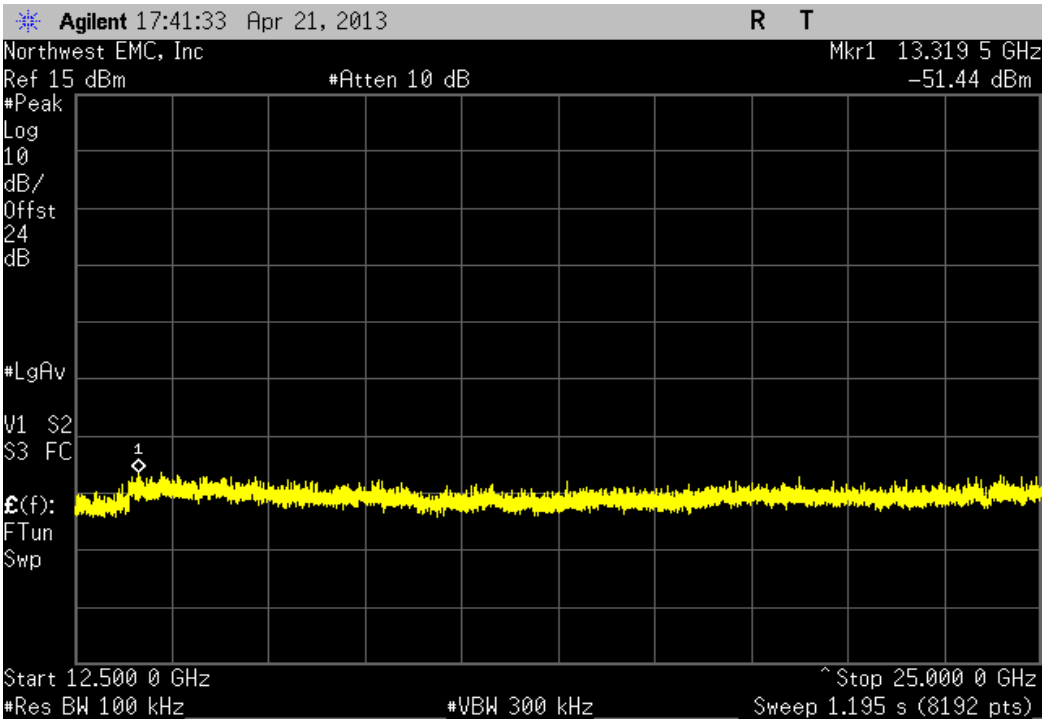
Frequency Range				Value	Limit	Result
	Fundamental			N/A	N/A	N/A



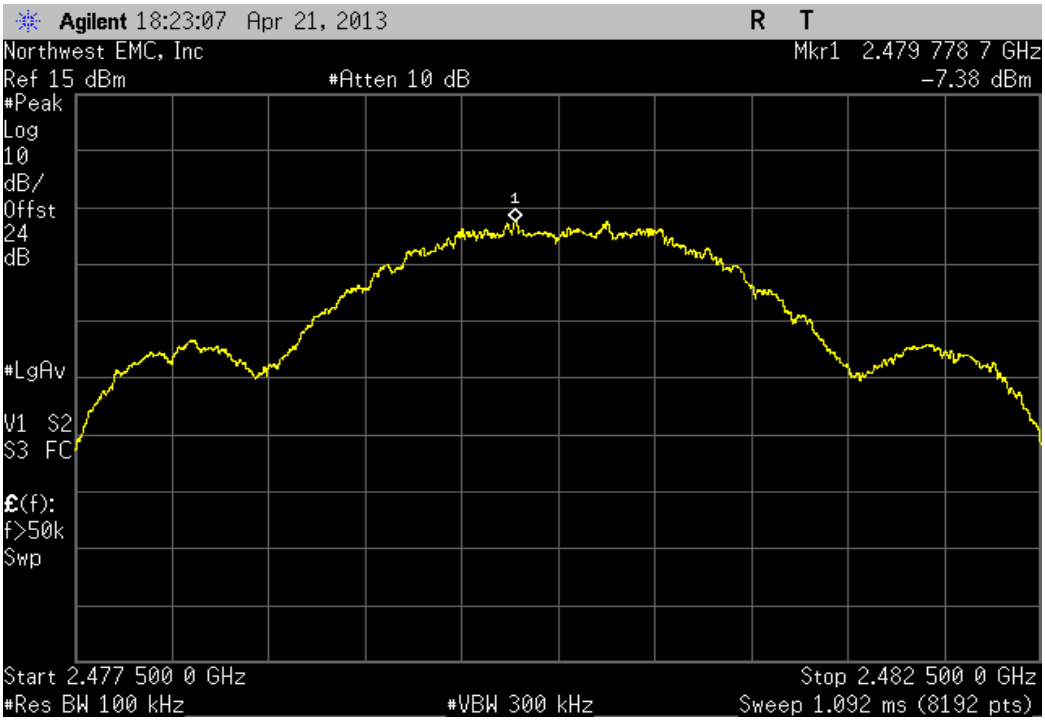
2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 12.5 GHz		-31.29 dBc	≤ -20 dBc	Pass



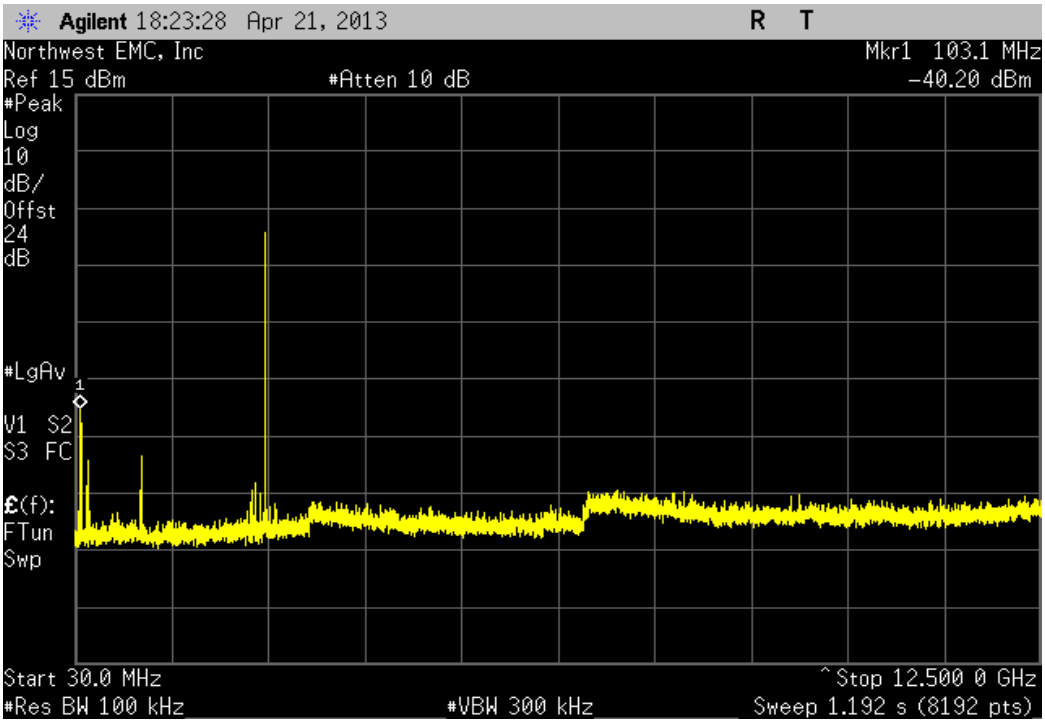
2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz				
Frequency Range		Value	Limit	Result
12.5 GHz - 25 GHz		-44.76 dBc	≤ -20 dBc	Pass



2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz						
	Frequency Range			Value	Limit	Result
	Fundamental			N/A	N/A	N/A

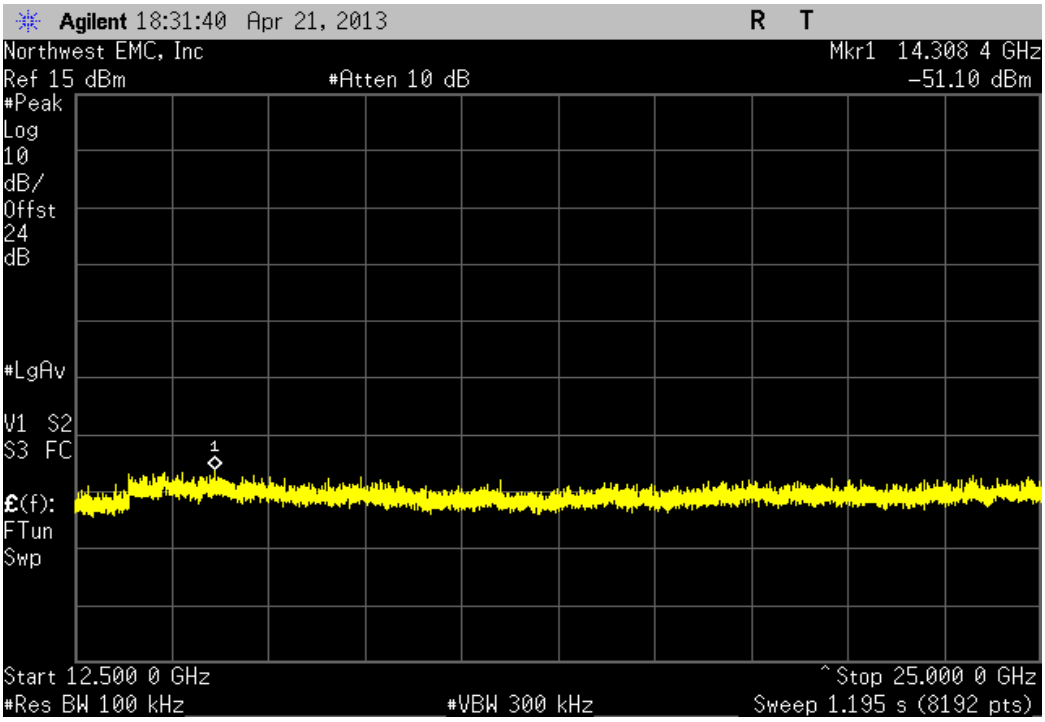


2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz					
	Frequency Range		Value	Limit	Result
	30 MHz - 12.5 GHz		-32.82 dBc	≤ -20 dBc	Pass



Spurious Conducted Emissions

2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-43.72 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
Attenuator, 6dB	S.M. Electronics	18N-06	AWN	3/25/2013	12
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	6/25/2012	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	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 (v03r01) Section 10.2, the spectrum analyzer was used as follows:

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

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

BWCF = 10*LOG (3 kHz / 100 kHz) = -15.2 dB

Power Spectral Density

EUT:	Door Senor			**Work Order:**	CARE0015
Serial Number:	001D40000041005C			**Date:**	04/22/13
Customer:	Care Innovations			**Temperature:**	23°C
Attendees:	Bill Morse			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1032
Tested by:	Brandon Hobbs, Rod Peloquin	**Power:**	3VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle while under test.

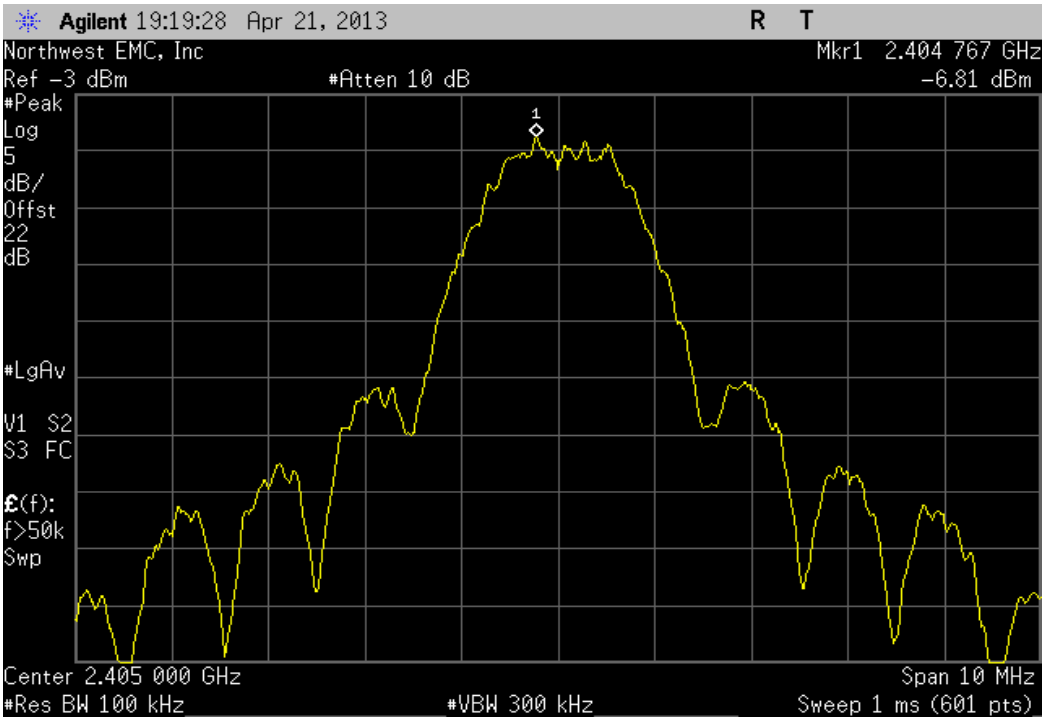
DEVIATIONS FROM TEST STANDARD

None

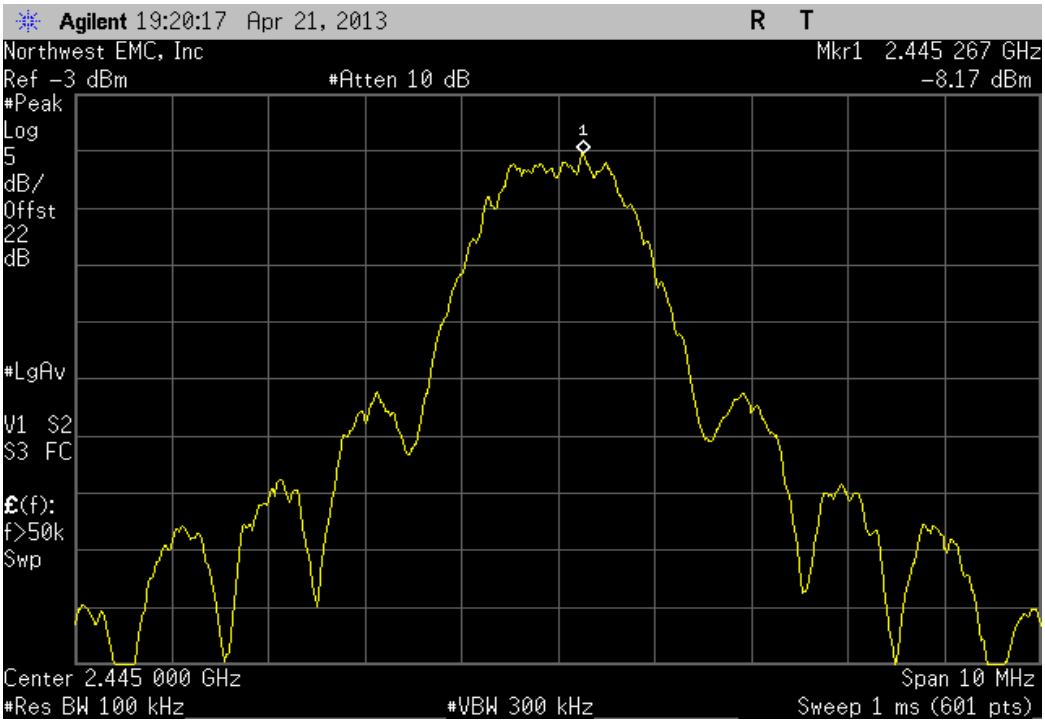
Configuration #	2	Signature

	Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
2400 MHz - 2483.5 MHz Band					
OQPSK					
Low Channel 2405 MHz	-6.813	-15.2	-22.013	8	Pass
Mid Channel 2445 MHz	-8.168	-15.2	-23.368	8	Pass
High Channel 2480 MHz	-8.846	-15.2	-24.046	8	Pass

2400 MHz - 2483.5 MHz Band, OQPSK, Low Channel 2405 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
		-6.813	-15.2	-22.013	8	Pass

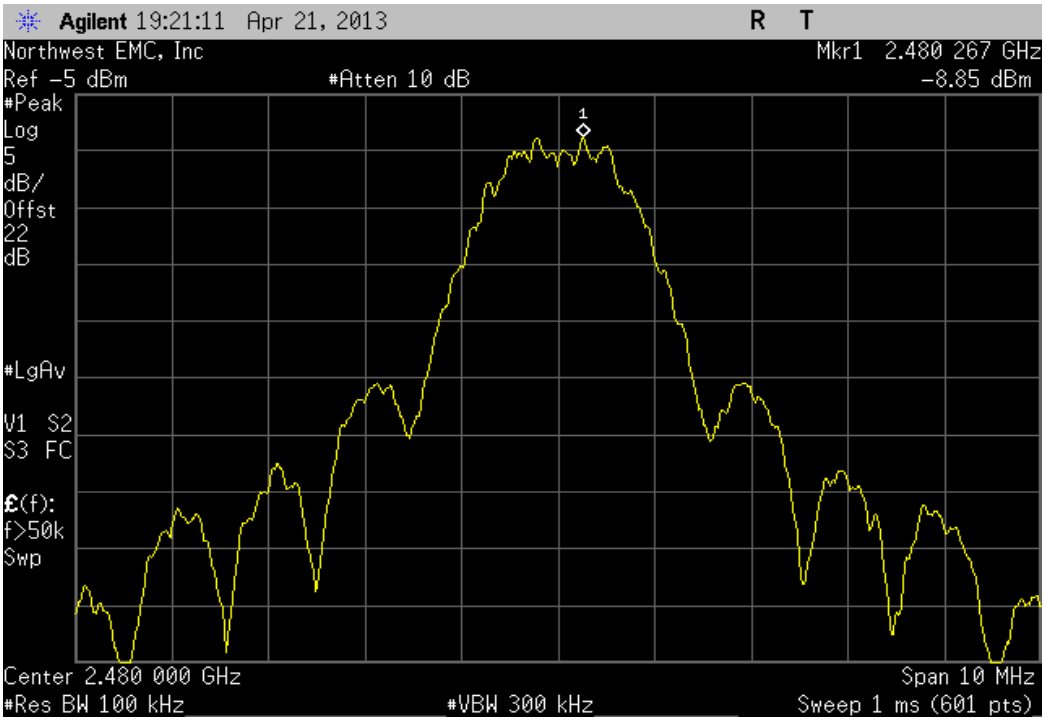


2400 MHz - 2483.5 MHz Band, OQPSK, Mid Channel 2445 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
		-8.168	-15.2	-23.368	8	Pass



Power Spectral Density

2400 MHz - 2483.5 MHz Band, OQPSK, High Channel 2480 MHz						
		Value dBm/100kHz	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Result
		-8.846	-15.2	-24.046	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

On transmitting 802.11 Zigbee

POWER SETTINGS INVESTIGATED

3 VDC

CONFIGURATIONS INVESTIGATED

CARE0015 - 2

CARE0015 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/27/2013	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	36 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/27/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/27/2013	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	36 mo
LP Filter	Micro-Tronics	LPM50004	LFD	7/6/2012	24 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	7/6/2012	24 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	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

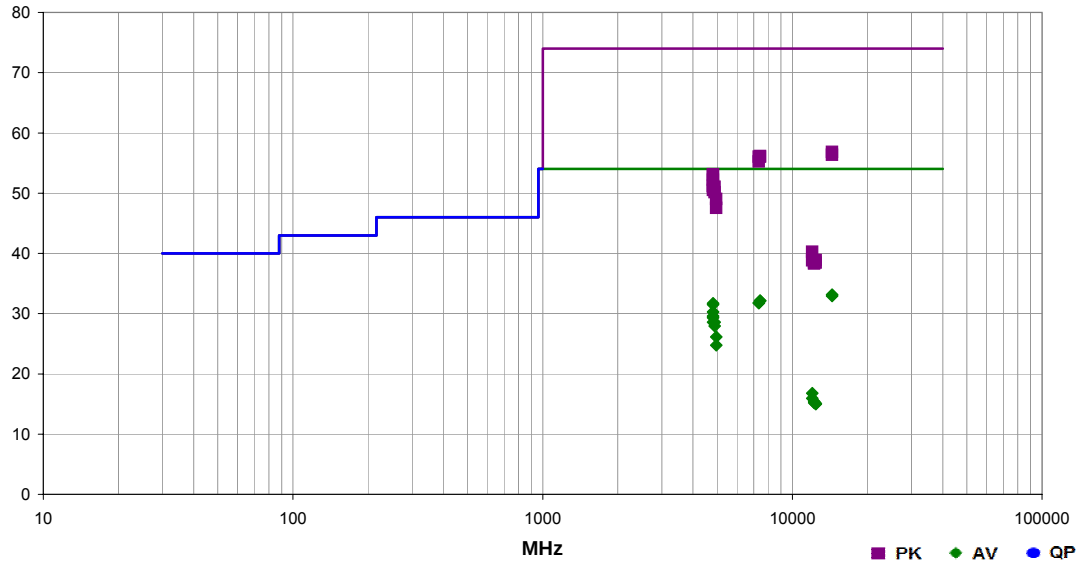
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify 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.

Spurious Radiated Emissions

Work Order:	CARE0015	**Date:**	04/19/13		
Project:	None	**Temperature:**	22.9 °C		
Job Site:	EV01	**Humidity:**	37.5% RH		
Serial Number:	001D400000410059	**Barometric Pres.:**	1021 mbar	**Tested by:**	Brandon Hobbs
EUT:	Door sensor				
Configuration:	5				
Customer:	Care Innovations				
Attendees:	Bill Morse Stan Telson				
EUT Power:	3VDC				
Operating Mode:	On transmitting 802.11 Zigbee				
Deviations:	None				
Comments:	Please reference the data comments for EUT frequency and orientation. The EUT is operating at 100% duty cycle. a 10Hz video average was used for all average measurements				

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

Run #	53	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
14430.770	39.0	17.9	1.0	248.0	0.0	0.0	Vert	PK	0.0	56.9	74.0	-17.1	Low Ch. 2405 MHz, EUT Vert
14430.330	38.5	17.9	3.9	66.0	0.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	Low Ch. 2405 MHz, EUT Horz
7438.160	36.7	19.5	1.0	181.0	0.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	High Ch. 2480 MHz, EUT Horz
7336.447	37.0	19.1	1.0	59.0	0.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	Mid Ch. 2445 MHz, EUT Vert
7438.647	36.6	19.5	1.0	132.0	0.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	High Ch. 2480 MHz, EUT Vert
7334.173	36.2	19.1	1.0	112.0	0.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	Mid Ch. 2445 MHz, EUT Horz
14428.430	26.1	17.9	1.0	248.0	-10.8	0.0	Vert	AV	0.0	33.2	54.0	-20.8	(10Hz), Low Ch. 2405 MHz, EUT Vert
4811.113	42.9	10.2	1.1	146.0	0.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	Low Ch. 2405 MHz, EUT Horz
4809.173	42.9	10.2	1.6	352.0	0.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Low Ch. 2405 MHz, EUT Vert
14430.720	25.9	17.9	3.9	66.0	-10.8	0.0	Horz	AV	0.0	33.0	54.0	-21.0	(10Hz), Low Ch. 2405 MHz, EUT Horz
4809.167	42.0	10.2	1.0	179.0	0.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	Low Ch. 2405 MHz, EUT On side
7438.760	23.5	19.5	1.0	181.0	-10.8	0.0	Horz	AV	0.0	32.2	54.0	-21.8	(10Hz) High Ch. 2480 MHz, EUT Horz
7438.133	23.5	19.5	1.0	132.0	-10.8	0.0	Vert	AV	0.0	32.2	54.0	-21.8	(10Hz) High Ch. 2480 MHz, EUT Vert
7333.607	23.5	19.1	1.0	112.0	-10.8	0.0	Horz	AV	0.0	31.8	54.0	-22.2	(10Hz), Mid Ch. 2445 MHz, EUT Horz
7333.060	23.5	19.0	1.0	59.0	-10.8	0.0	Vert	AV	0.0	31.7	54.0	-22.3	(10Hz), Mid Ch. 2445 MHz, EUT Vert
4809.220	32.3	10.2	1.6	352.0	-10.8	0.0	Vert	AV	0.0	31.7	54.0	-22.3	(10Hz), Low Ch. 2405 MHz, EUT Vert
4809.133	32.1	10.2	1.1	146.0	-10.8	0.0	Horz	AV	0.0	31.5	54.0	-22.5	(10Hz), Low Ch. 2405 MHz, EUT Horz
4809.073	41.0	10.2	3.5	109.0	0.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	Low Ch. 2405 MHz, EUT On side
4810.873	40.9	10.2	1.5	134.0	0.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	Low Ch. 2405 MHz, EUT Vert
4891.047	40.6	10.5	1.0	147.0	0.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	Mid Ch. 2445 MHz, EUT Horz
4809.053	40.3	10.2	1.3	343.0	0.0	0.0	Vert	PK	0.0	50.5	74.0	-23.5	Low Ch. 2405 MHz, EUT Horz
4809.100	30.9	10.2	1.0	179.0	-10.8	0.0	Horz	AV	0.0	30.3	54.0	-23.7	(10Hz), Low Ch. 2405 MHz, EUT On Side
4890.827	39.7	10.5	2.1	106.0	0.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Mid Ch. 2445 MHz, EUT Vert
4809.140	30.2	10.2	1.5	134.0	-10.8	0.0	Horz	AV	0.0	29.6	54.0	-24.4	(10Hz), Low Ch. 2405 MHz, EUT Vert
4809.107	29.9	10.2	3.5	109.0	-10.8	0.0	Vert	AV	0.0	29.3	54.0	-24.7	(10Hz), Low Ch. 2405 MHz, EUT On Side
4959.107	38.3	10.7	1.0	146.0	0.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	High Ch. 2480 MHz, EUT Horz
4809.227	29.2	10.2	1.3	343.0	-10.8	0.0	Vert	AV	0.0	28.6	54.0	-25.4	(10Hz), Low Ch. 2405 MHz, EUT Horz
4890.960	28.9	10.5	1.0	147.0	-10.8	0.0	Horz	AV	0.0	28.6	54.0	-25.4	(10Hz), Mid Ch. 2445 MHz, EUT Horz
4889.120	28.3	10.5	2.1	106.0	-10.8	0.0	Vert	AV	0.0	28.0	54.0	-26.0	(10Hz), Mid Ch. 2445 MHz, EUT Vert
4959.387	36.8	10.7	1.0	26.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	High Ch. 2480 MHz, EUT Vert
4959.140	26.2	10.7	1.0	146.0	-10.8	0.0	Horz	AV	0.0	26.1	54.0	-27.9	(10Hz) High Ch. 2480 MHz, EUT Horz
4959.853	24.8	10.7	1.0	26.0	-10.8	0.0	Vert	AV	0.0	24.7	54.0	-29.3	(10Hz) High Ch. 2480 MHz, EUT Vert
12026.830	44.6	-4.3	1.0	129.0	0.0	0.0	Horz	PK	0.0	40.3	74.0	-33.7	Low Ch. 2405 MHz, EUT Horz
12398.260	42.0	-3.1	1.0	346.0	0.0	0.0	Vert	PK	0.0	38.9	74.0	-35.1	High Ch. 2480 MHz, EUT Vert

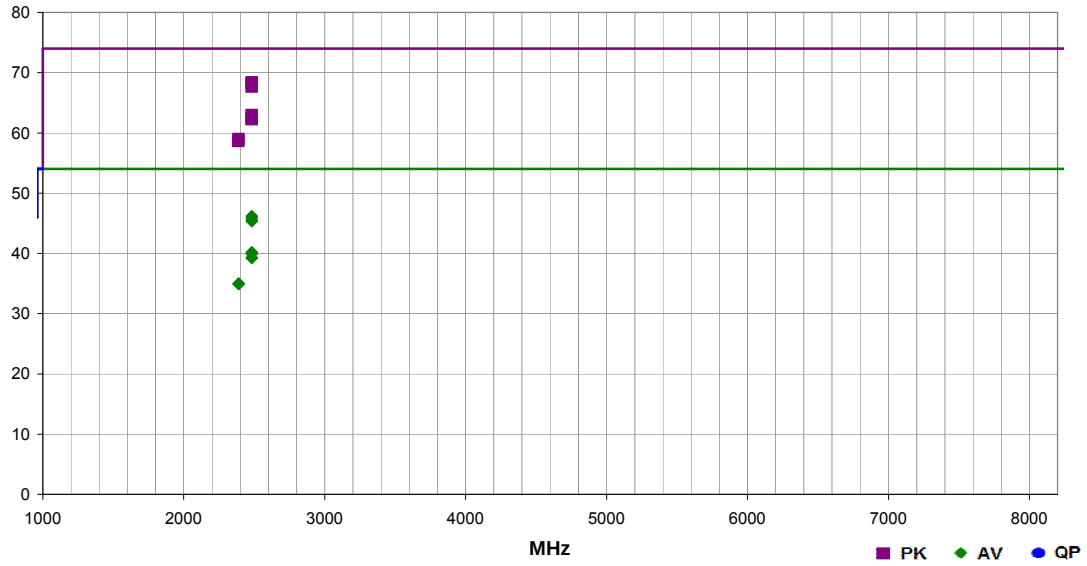
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12024.560	43.2	-4.3	1.0	346.0	0.0	0.0	Vert	PK	0.0	38.9	74.0	-35.1	Low Ch. 2405 MHz, EUT Vert
12225.930	42.2	-3.7	1.0	356.0	0.0	0.0	Horz	PK	0.0	38.5	74.0	-35.5	Mid Ch. 2445 MHz, EUT Horz
12400.450	41.6	-3.1	1.0	157.0	0.0	0.0	Horz	PK	0.0	38.5	74.0	-35.5	High Ch. 2480 MHz, EUT Horz
12224.020	42.0	-3.7	1.0	223.0	0.0	0.0	Vert	PK	0.0	38.3	74.0	-35.7	Mid Ch. 2445 MHz, EUT Vert
12027.000	31.9	-4.3	1.0	129.0	-10.8	0.0	Horz	AV	0.0	16.8	54.0	-37.2	(10Hz), Low Ch. 2405 MHz, EUT Horz
12026.990	31.1	-4.3	1.0	346.0	-10.8	0.0	Vert	AV	0.0	16.0	54.0	-38.0	(10Hz), Low Ch. 2405 MHz, EUT Vert
12223.000	29.9	-3.7	1.0	356.0	-10.8	0.0	Horz	AV	0.0	15.4	54.0	-38.6	(10Hz) Mid Ch. 2445 MHz, EUT Horz
12223.060	29.7	-3.7	1.0	223.0	-10.8	0.0	Vert	AV	0.0	15.2	54.0	-38.8	(10Hz) Mid Ch. 2445 MHz, EUT Vert
12398.000	29.0	-3.1	1.0	346.0	-10.8	0.0	Vert	AV	0.0	15.1	54.0	-38.9	(10Hz) High Ch. 2480 MHz, EUT Vert
12398.000	28.9	-3.1	1.0	157.0	-10.8	0.0	Horz	AV	0.0	15.0	54.0	-39.0	(10Hz) High Ch. 2480 MHz, EUT Horz

Spurious Radiated Emissions

Work Order:	CARE0015	**Date:**	04/19/13		
Project:	None	**Temperature:**	22.9 °C		
Job Site:	EV01	**Humidity:**	37.5% RH		
Serial Number:	001D40000041005C	**Barometric Pres.:**	1021 mbar	**Tested by:**	Brandon Hobbs
EUT:	Door sensor				
Configuration:	2				
Customer:	Care Innovations				
Attendees:	Bill Morse Stan Telson				
EUT Power:	3VDC				
Operating Mode:	On transmitting 802.11 Zigbee				
Deviations:	None				
Comments:	Please reference the data comments for EUT frequency and orientation. The EUT is operating at 100% duty cycle. a 10Hz video average was used for all average measurements				

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

Run #	55	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.553	46.5	1.9	1.6	56.0	0.0	20.0	Vert	PK	0.0	68.4	74.0	-5.6	Band Edge EUT Vert
2483.530	46.4	1.9	1.0	194.0	0.0	20.0	Horz	PK	0.0	68.3	74.0	-5.7	Band Edge EUT On Side
2483.577	45.8	1.9	1.0	26.0	0.0	20.0	Horz	PK	0.0	67.7	74.0	-6.3	Band Edge EUT Horz
2483.500	35.1	1.9	1.6	56.0	-10.8	20.0	Vert	AV	0.0	46.2	54.0	-7.8	Band Edge (10Hz) EUT Vert
2483.500	34.7	1.9	1.0	194.0	-10.8	20.0	Horz	AV	0.0	45.8	54.0	-8.2	Band Edge (10Hz) EUT On Side
2483.500	34.3	1.9	1.0	26.0	-10.8	20.0	Horz	AV	0.0	45.4	54.0	-8.6	Band Edge (10Hz) EUT Horz
2483.673	41.1	1.9	1.0	284.0	0.0	20.0	Vert	PK	0.0	63.0	74.0	-11.0	Band Edge EUT Horz
2483.683	40.6	1.9	1.0	233.0	0.0	20.0	Horz	PK	0.0	62.5	74.0	-11.5	Band Edge EUT Vert
2483.783	40.4	1.9	1.0	306.0	0.0	20.0	Vert	PK	0.0	62.3	74.0	-11.7	Band Edge EUT On Side
2483.500	29.1	1.9	1.0	284.0	-10.8	20.0	Vert	AV	0.0	40.2	54.0	-13.8	Band Edge (10Hz) EUT Horz
2483.500	28.9	1.9	1.0	233.0	-10.8	20.0	Horz	AV	0.0	40.0	54.0	-14.0	Band Edge (10Hz) EUT Vert
2483.500	28.2	1.9	1.0	306.0	-10.8	20.0	Vert	AV	0.0	39.3	54.0	-14.7	Band Edge (10Hz) EUT On Side
2389.250	37.4	1.5	1.0	49.0	0.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	Band Edge EUT On Side
2388.213	37.1	1.6	1.0	143.0	0.0	20.0	Vert	PK	0.0	58.7	74.0	-15.3	Band Edge EUT Vert
2388.930	24.2	1.6	1.0	143.0	-10.8	20.0	Vert	AV	0.0	35.0	54.0	-19.0	Band Edge (10Hz) EUT Vert
2389.830	24.2	1.5	1.0	49.0	-10.8	20.0	Horz	AV	0.0	35.0	54.0	-19.0	Band Edge (10Hz) EUT On Side