NORTHWEST EMC

Select Comfort Corporation

Smart Outlet P/N: 121268

FCC 15.207:2015

FCC 15.247:2015

Report # SECF0021.1

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: May 01, 2015
Select Comfort Corporation
Model: Smart Outlet P/N: 121268

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2015	ANSI C63.10:2009
FCC 15.247:2015	ANSI C63.10:2009

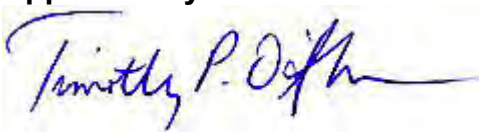
Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Band Edge Compliance	Yes	Pass	
6.7	Spurious Conducted Emissions	Yes	Pass	
6.9.1	Occupied Bandwidth	Yes	Pass	
6.10.2	Output Power	Yes	Pass	
6.11.2	Power Spectral Density	Yes	Pass	
7.5	Duty Cycle	Yes	N/A	Characterization of radio operation.

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager

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. 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

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2015.2.19

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 17065 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

MSIP / 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.

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2014.12.03

Measurement Uncertainty

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

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

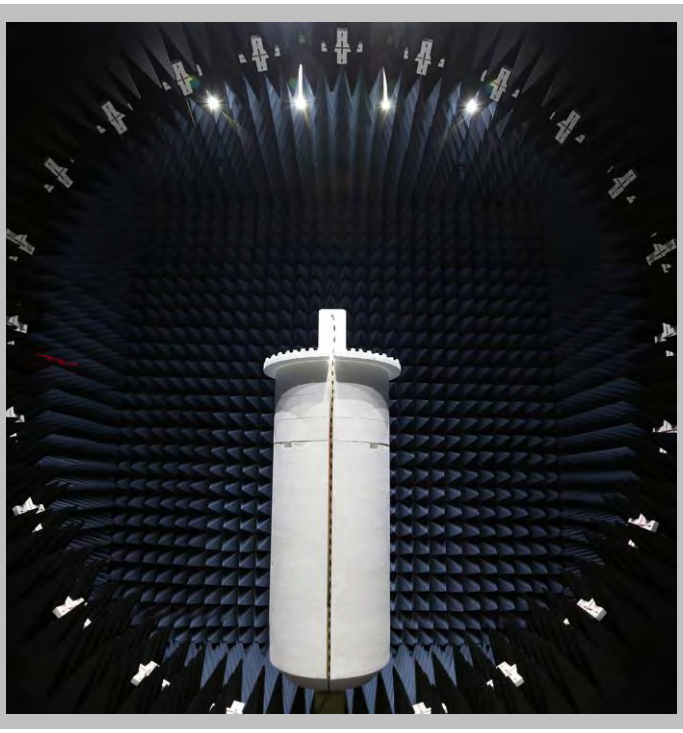
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

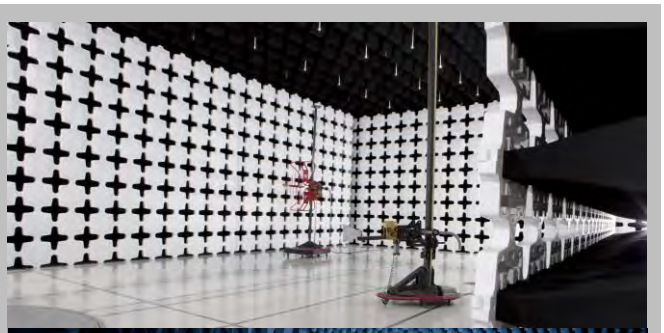
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.7 dB	-4.7 dB
AC Powerline Conducted Emissions (dB)	2.9 dB	-2.9 dB

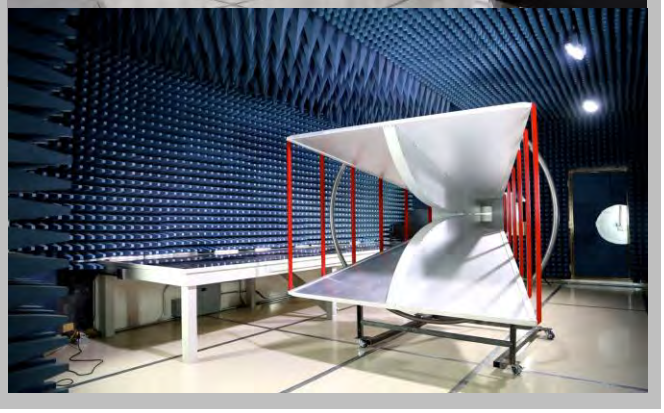
FACILITIES

NORTHWEST EMC
REV 2015.2.19

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







PRODUCT DESCRIPTION

NORTHWEST EMC
2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Select Comfort Corporation
Address:	9800 59th Avenue North
City, State, Zip:	Minneapolis, MN 55442
Test Requested By:	Nick Reynolds
Model:	Smart Outlet P/N: 121268
First Date of Test:	April 30, 2015
Last Date of Test:	May 01, 2015
Receipt Date of Samples:	April 15, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Smart switchable outlet which will be controlled by the Select Comfort FCC approved smart pump, and this outlet will also be transmitting status back to the pump via Bluetooth LE.

Testing Objective:
To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration SECF0021- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
BLE Outlet	Select Comfort Corporation	121268	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Light Puck	Select Comfort Corporation	Light Puck	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Power Cable	No	2m	No	BLE Outlet	Light Puck
AC Power	No	1.8m	No	BLE Outlet	AC Mains
AC Power	No	1.8m	No	BLE Outlet	Unterminated

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	4/30/2015	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.
2	4/30/2015	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	4/30/2015	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.
4	5/1/2015	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.
5	5/1/2015	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.
6	5/1/2015	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.
7	5/1/2015	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC 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.	Cal. Due
High Pass Filter	TTE	H97-100K-50-720B	HGN	5/23/2014	05/23/2015
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	7/22/2014	07/22/2015
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	11/20/2014	11/20/2015
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/23/2015	03/23/2016
Receiver	Rohde & Schwarz	ESR7	ARI	5/6/2014	05/06/2015

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

SECF0021-3

MODES INVESTIGATED

Bluetooth LE High Channel 2480 MHz
Bluetooth LE Low Channel 2402 MHz
Bluetooth LE Mid Channel 2442 MHz

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	4	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

None

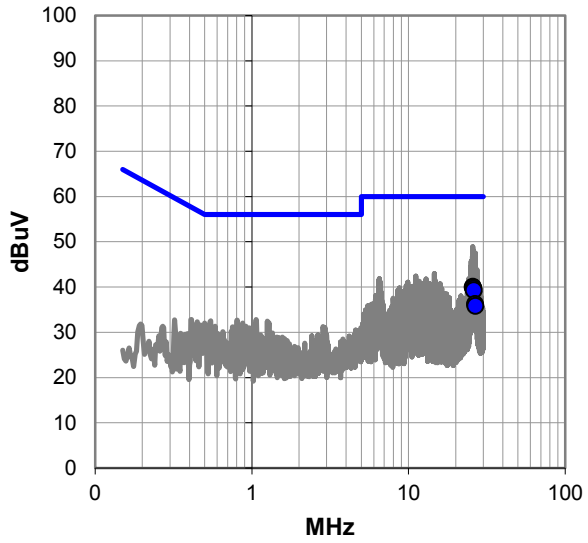
EUT OPERATING MODES

Bluetooth LE Low Channel 2402 MHz

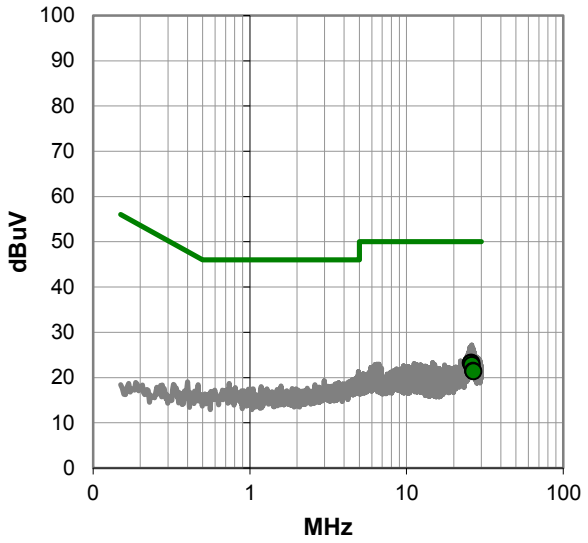
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.742	18.0	22.0	40.0	60.0	-20.0
25.800	17.9	22.0	39.9	60.0	-20.1
25.997	17.6	22.0	39.6	60.0	-20.4
26.166	17.2	22.1	39.3	60.0	-20.7
26.662	14.1	22.1	36.2	60.0	-23.8
26.753	13.7	22.1	35.8	60.0	-24.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.997	1.2	22.0	23.2	50.0	-26.8
25.800	1.2	22.0	23.2	50.0	-26.8
25.742	1.2	22.0	23.2	50.0	-26.8
26.166	0.7	22.1	22.8	50.0	-27.2
26.662	-0.6	22.1	21.5	50.0	-28.5
26.753	-0.8	22.1	21.3	50.0	-28.7

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	5	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

None

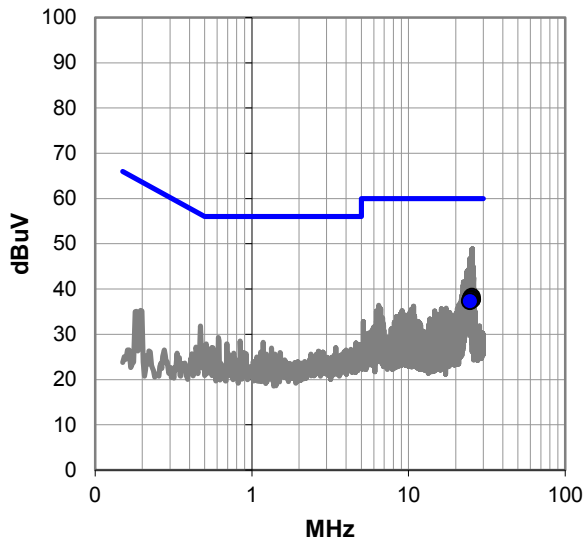
EUT OPERATING MODES

Bluetooth LE Low Channel 2402 MHz

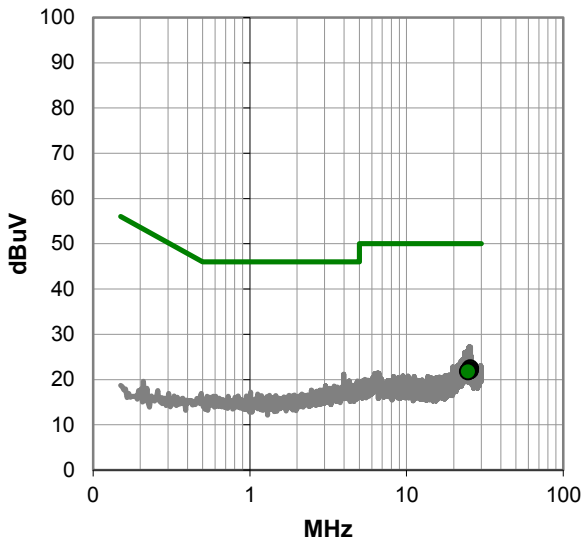
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.368	16.3	22.0	38.3	60.0	-21.7
25.035	16.0	21.9	37.9	60.0	-22.1
25.598	15.7	22.0	37.7	60.0	-22.3
25.433	15.7	22.0	37.7	60.0	-22.3
24.964	15.7	21.9	37.6	60.0	-22.4
24.698	15.4	21.9	37.3	60.0	-22.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.598	0.5	22.0	22.5	50.0	-27.5
25.368	0.1	22.0	22.1	50.0	-27.9
25.433	0.0	22.0	22.0	50.0	-28.0
25.035	0.0	21.9	21.9	50.0	-28.1
24.964	0.0	21.9	21.9	50.0	-28.1
24.698	-0.1	21.9	21.8	50.0	-28.2

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	6	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

None

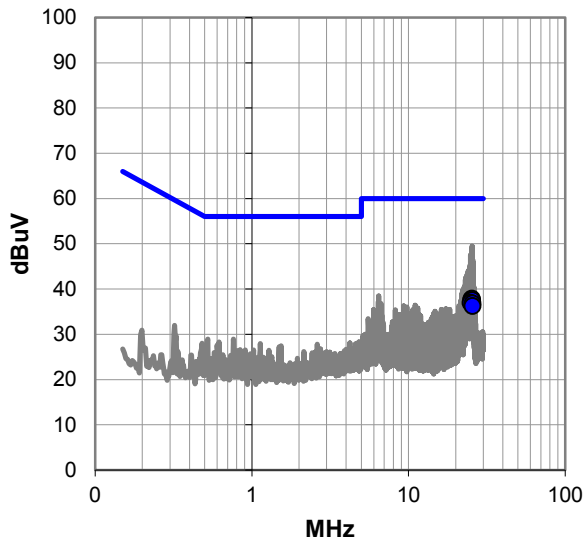
EUT OPERATING MODES

Bluetooth LE Mid Channel 2442 MHz

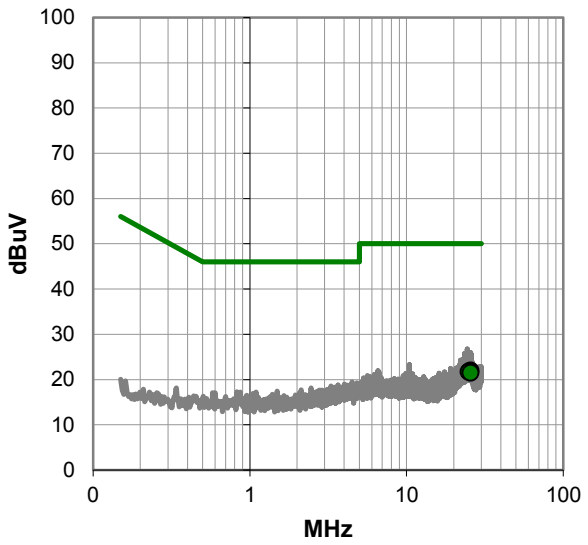
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.406	15.9	22.0	37.9	60.0	-22.1
25.187	15.7	21.9	37.6	60.0	-22.4
25.510	15.5	22.0	37.5	60.0	-22.5
24.906	15.0	21.9	36.9	60.0	-23.1
25.605	14.8	22.0	36.8	60.0	-23.2
25.720	14.2	22.0	36.2	60.0	-23.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.605	0.0	22.0	22.0	50.0	-28.0
25.406	-0.1	22.0	21.9	50.0	-28.1
25.510	-0.2	22.0	21.8	50.0	-28.2
25.187	-0.2	21.9	21.7	50.0	-28.3
24.906	-0.2	21.9	21.7	50.0	-28.3
25.720	-0.5	22.0	21.5	50.0	-28.5

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	7	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

None

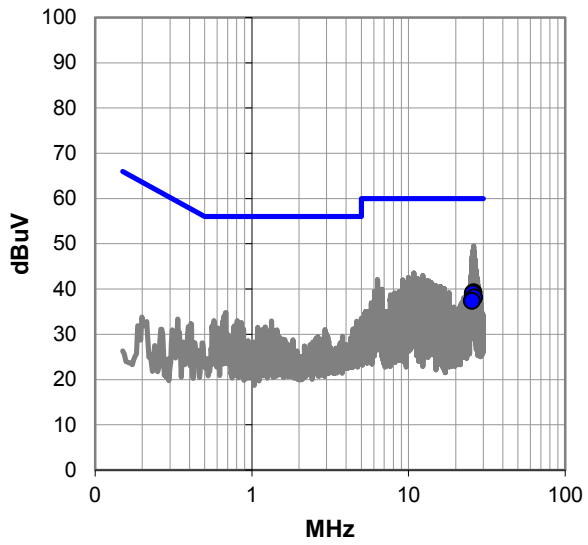
EUT OPERATING MODES

Bluetooth LE Mid Channel 2442 MHz

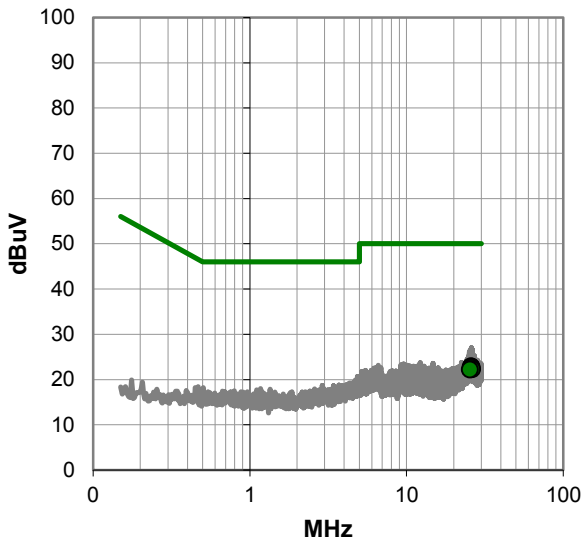
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.990	17.2	22.0	39.2	60.0	-20.8
26.084	17.0	22.0	39.0	60.0	-21.0
25.882	17.0	22.0	39.0	60.0	-21.0
25.782	17.0	22.0	39.0	60.0	-21.0
26.245	16.1	22.1	38.2	60.0	-21.8
25.438	15.4	22.0	37.4	60.0	-22.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.782	0.9	22.0	22.9	50.0	-27.1
25.990	0.8	22.0	22.8	50.0	-27.2
25.882	0.7	22.0	22.7	50.0	-27.3
26.084	0.6	22.0	22.6	50.0	-27.4
26.245	0.2	22.1	22.3	50.0	-27.7
25.438	0.2	22.0	22.2	50.0	-27.8

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	8	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

None

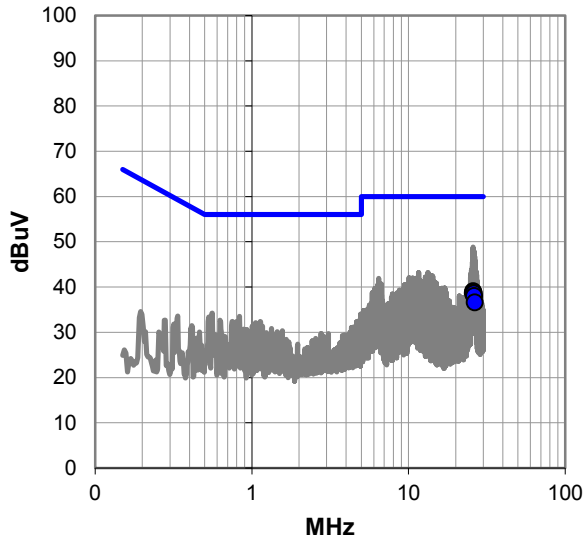
EUT OPERATING MODES

Bluetooth LE High Channel 2480 MHz

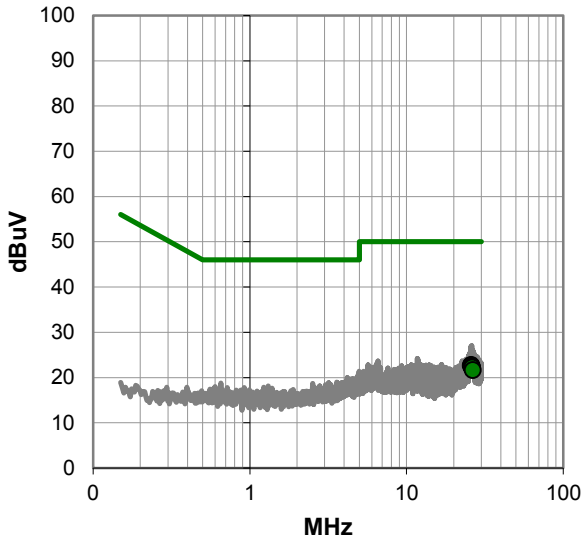
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #8

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.910	17.0	22.0	39.0	60.0	-21.0
26.021	16.7	22.0	38.7	60.0	-21.3
25.769	16.6	22.0	38.6	60.0	-21.4
26.189	16.5	22.1	38.6	60.0	-21.4
26.302	15.9	22.1	38.0	60.0	-22.0
26.506	14.5	22.1	36.6	60.0	-23.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.910	0.7	22.0	22.7	50.0	-27.3
25.769	0.6	22.0	22.6	50.0	-27.4
26.021	0.5	22.0	22.5	50.0	-27.5
26.189	0.3	22.1	22.4	50.0	-27.6
26.302	0.1	22.1	22.2	50.0	-27.8
26.506	-0.5	22.1	21.6	50.0	-28.4

CONCLUSION

Pass

Trevor Buls

Tested By

POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

EUT:	Smart Outlet P/N: 121268	Work Order:	SECF0021
Serial Number:	None	Date:	05/01/2015
Customer:	Select Comfort Corporation	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	29.2%
Customer Project:	None	Bar. Pressure:	987.9 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	SECF0021-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	9	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

None

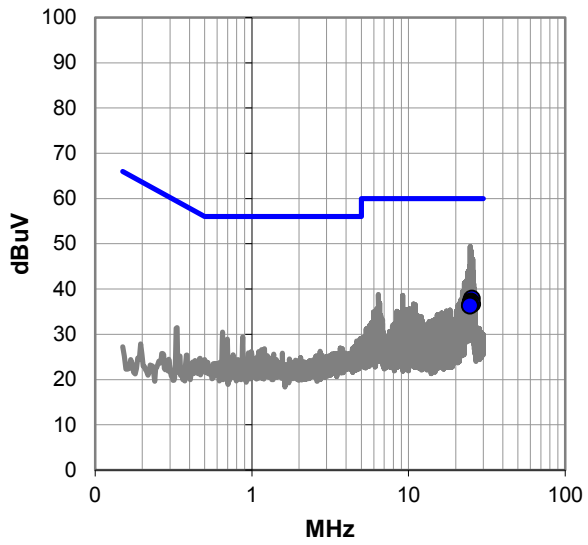
EUT OPERATING MODES

Bluetooth LE High Channel 2480 MHz

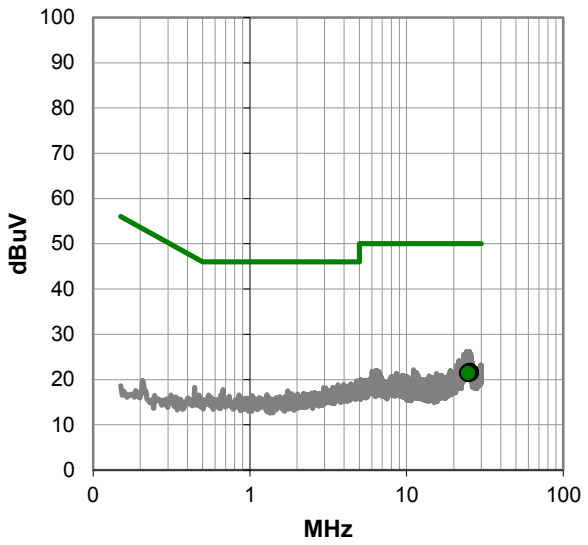
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2015.03.10
PSA-ESCI 2015.03.03, EmiR5 2015.03.19.1

RESULTS - Run #9

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.448	15.9	22.0	37.9	60.0	-22.1
25.104	15.3	21.9	37.2	60.0	-22.8
25.146	15.1	21.9	37.0	60.0	-23.0
25.593	14.7	22.0	36.7	60.0	-23.3
24.796	14.7	21.9	36.6	60.0	-23.4
24.692	14.4	21.9	36.3	60.0	-23.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
25.448	-0.3	22.0	21.7	50.0	-28.3
25.146	-0.3	21.9	21.6	50.0	-28.4
25.104	-0.3	21.9	21.6	50.0	-28.4
25.593	-0.5	22.0	21.5	50.0	-28.5
24.796	-0.5	21.9	21.4	50.0	-28.6
24.692	-0.5	21.9	21.4	50.0	-28.6

CONCLUSION

Pass

Trevor Buls

Tested By

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

Bluetooth LE Low, Mid High channel: 2402, 2442, 2480 MHz (see comments)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

SECF0021 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HGQ	3/2/2015	12 mo
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGK	3/2/2015	12 mo
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	3/2/2015	12 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	10/3/2014	12 mo
MN05 Cable	N/A	18-26GHz Standard Gain Horn Cable	MNP	10/3/2014	12 mo
Antenna, Horn	ETS	3160-09	AHG	NCR	0 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	3/2/2015	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	3/30/2015	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/30/2015	12 mo
Antenna, Horn	ETS	3115	AJA	6/3/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/30/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 mo

MEASUREMENT BANDWIDTHS

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

TEST DESCRIPTION

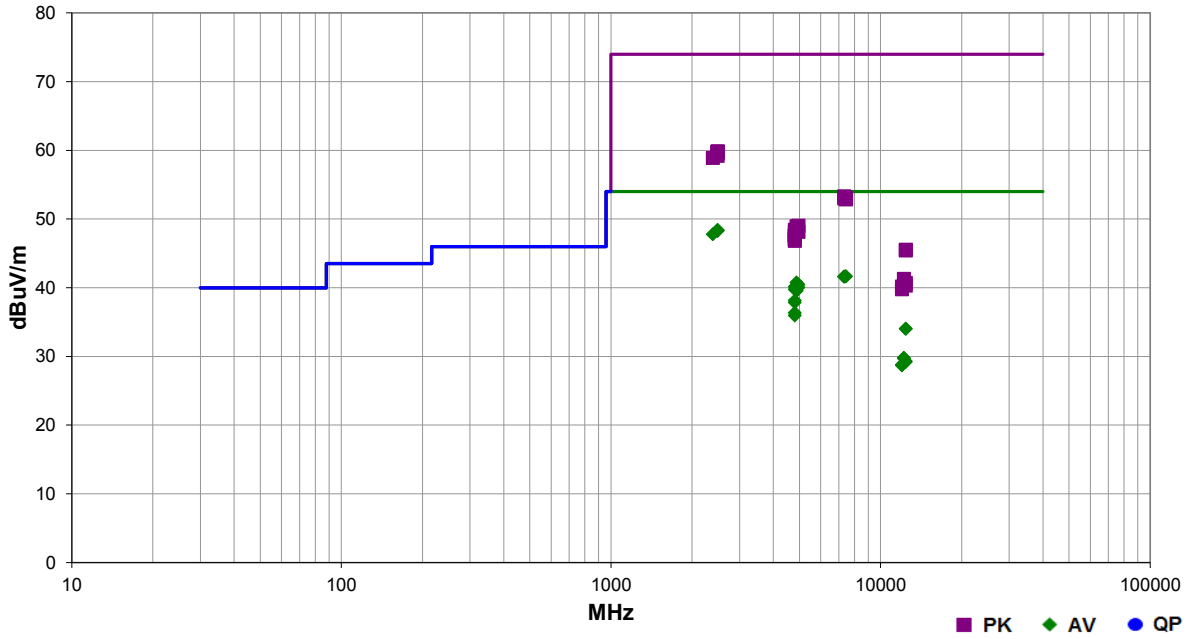
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify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

SPURIOUS RADIATED EMISSIONS

Work Order:	SECF0021	**Date:**	04/30/15	Trevor Buls	
Project:	None	**Temperature:**	22.9 °C		
Job Site:	MN05	**Humidity:**	28.3% RH		
Serial Number:	None	**Barometric Pres.:**	988.4 mbar	**Tested by:**	Trevor Buls
EUT:	Smart Outlet P/N: 121268				
Configuration:	3				
Customer:	Select Comfort Corporation				
Attendees:	Jason Ortberg, John Cebula				
EUT Power:	110VAC/60Hz				
Operating Mode:	Bluetooth LE Low, Mid High channel: 2402, 2442, 2480 MHz (see comments)				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2015	ANSI C63.10:2009

Run #	12	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



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
2488.325	31.3	-2.9	1.0	229.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	EUT Vertical, High Ch
2486.825	31.2	-2.9	1.0	340.0	3.0	20.0	Vert	AV	0.0	48.3	54.0	-5.7	EUT Horizontal, High Ch
2486.525	31.2	-2.9	1.0	137.1	3.0	20.0	Vert	AV	0.0	48.3	54.0	-5.7	EUT on Side, High Ch
2485.983	31.2	-2.9	3.7	319.9	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT Vertical, High Ch
2484.683	31.2	-2.9	1.0	115.0	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT on Side, High Ch
2483.867	31.2	-2.9	1.0	101.1	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	EUT Horizontal, High Ch
2386.433	31.0	-3.2	1.0	242.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	EUT Vertical, Low Ch
7437.792	28.4	13.3	2.1	326.9	3.0	0.0	Vert	AV	0.0	41.7	54.0	-12.3	EUT on Side, High Ch
7437.525	28.4	13.3	1.2	146.0	3.0	0.0	Horz	AV	0.0	41.7	54.0	-12.3	EUT Vertical, High Ch
7326.400	28.8	12.8	3.6	195.1	3.0	0.0	Horz	AV	0.0	41.6	54.0	-12.4	EUT Vertical, Mid Ch
7325.758	28.8	12.8	1.0	229.9	3.0	0.0	Vert	AV	0.0	41.6	54.0	-12.4	EUT on Side, Mid Ch
4882.033	35.8	5.0	1.1	307.0	3.0	0.0	Vert	AV	0.0	40.8	54.0	-13.2	EUT on Side, Mid Ch
4957.967	35.3	5.1	1.0	288.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	EUT Vertical, High Ch
4803.950	35.0	5.1	1.0	89.0	3.0	0.0	Horz	AV	0.0	40.1	54.0	-13.9	EUT Vertical, Low Ch
4958.050	34.9	5.1	1.0	325.0	3.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	EUT on Side, High Ch
2488.017	42.7	-2.9	1.0	137.1	3.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	EUT on Side, High Ch
2486.508	42.7	-2.9	1.0	229.0	3.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	EUT Vertical, High Ch
2485.325	42.7	-2.9	1.0	101.1	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	EUT Horizontal, High Ch
4804.133	34.6	5.1	1.0	12.1	3.0	0.0	Vert	AV	0.0	39.7	54.0	-14.3	EUT on Side, Low Ch
2484.683	42.6	-2.9	1.0	115.0	3.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	EUT on Side, High Ch
2487.067	42.5	-2.9	3.7	319.9	3.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	EUT Vertical, High Ch
4883.933	34.6	4.9	1.0	315.0	3.0	0.0	Horz	AV	0.0	39.5	54.0	-14.5	EUT Vertical, Mid Ch

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.333	42.1	-2.9	1.0	340.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	EUT Horizontal, High Ch
2385.500	42.1	-3.2	1.0	242.0	3.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	EUT Vertical, Low Ch
4803.942	33.0	5.1	1.1	42.0	3.0	0.0	Horz	AV	0.0	38.1	54.0	-15.9	EUT Horizontal, Low Ch
4803.842	32.7	5.1	1.0	40.1	3.0	0.0	Horz	AV	0.0	37.8	54.0	-16.2	EUT on Side, Low Ch
4804.042	31.2	5.1	1.0	169.0	3.0	0.0	Vert	AV	0.0	36.3	54.0	-17.7	EUT Horizontal, Low Ch
4803.933	30.8	5.1	1.0	311.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	EUT Vertical, Low Ch
12400.200	33.8	0.2	1.0	67.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	EUT on Side, High Ch
12400.030	33.8	0.2	1.0	92.0	3.0	0.0	Horz	AV	0.0	34.0	54.0	-20.0	EUT Vertical, High Ch
7327.400	40.5	12.8	3.6	195.1	3.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	EUT Vertical, Mid Ch
7442.117	39.8	13.3	1.2	146.0	3.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	EUT Vertical, High Ch
7325.883	40.2	12.8	1.0	229.9	3.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	EUT on Side, Mid Ch
7441.575	39.6	13.3	2.1	326.9	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	EUT on Side, High Ch
12209.500	34.5	-4.7	1.0	175.0	3.0	0.0	Vert	AV	0.0	29.8	54.0	-24.2	EUT on Side, Mid Ch
12211.630	34.4	-4.7	1.8	8.1	3.0	0.0	Horz	AV	0.0	29.7	54.0	-24.3	EUT Vertical, Mid Ch
12399.130	34.0	-4.7	1.0	263.0	3.0	0.0	Horz	AV	0.0	29.3	54.0	-24.7	EUT Vertical, High Ch
12398.570	33.9	-4.7	1.0	272.9	3.0	0.0	Vert	AV	0.0	29.2	54.0	-24.8	EUT on Side, High Ch
4958.242	43.9	5.1	1.0	325.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	EUT on Side, High Ch
4881.900	44.0	5.0	1.0	315.0	3.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	EUT Vertical, Mid Ch
12011.000	34.1	-5.3	1.0	294.9	3.0	0.0	Vert	AV	0.0	28.8	54.0	-25.2	EUT on Side, Low Ch
12009.280	34.0	-5.3	1.0	54.0	3.0	0.0	Horz	AV	0.0	28.7	54.0	-25.3	EUT Vertical, Low Ch
4804.492	43.3	5.1	1.0	89.0	3.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	EUT Vertical, Low Ch
4884.800	43.3	4.9	1.1	307.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	EUT on Side, Mid Ch
4958.433	43.0	5.1	1.0	288.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	EUT Vertical, High Ch
4804.725	43.0	5.1	1.0	12.1	3.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	EUT on Side, Low Ch
4803.592	42.5	5.1	1.0	40.1	3.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	EUT on Side, Low Ch
4803.392	42.4	5.1	1.1	42.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	EUT Horizontal, Low Ch
4803.242	41.9	5.1	1.0	311.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	EUT Vertical, Low Ch
4806.092	41.7	5.1	1.0	169.0	3.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	EUT Horizontal, Low Ch
12401.280	45.3	0.2	1.0	92.0	3.0	0.0	Horz	PK	0.0	45.5	74.0	-28.5	EUT Vertical, High Ch
12401.700	45.2	0.2	1.0	67.0	3.0	0.0	Vert	PK	0.0	45.4	74.0	-28.6	EUT on Side, High Ch
12207.980	46.0	-4.7	1.0	175.0	3.0	0.0	Vert	PK	0.0	41.3	74.0	-32.7	EUT on Side, Mid Ch
12397.810	45.4	-4.7	1.0	263.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	EUT Vertical, High Ch
12211.630	45.4	-4.7	1.8	8.1	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	EUT Vertical, Mid Ch
12398.710	45.0	-4.7	1.0	272.9	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	EUT on Side, High Ch
12009.730	45.5	-5.3	1.0	294.9	3.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	EUT on Side, Low Ch
12009.520	45.1	-5.3	1.0	54.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	EUT Vertical, Low Ch

BAND EDGE COMPLIANCE

XMit 2015.01.14

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 (mo)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Near Field Probe Set	ETS Lindgren	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

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

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

BAND EDGE COMPLIANCE

NORTHWEST EMC

XMit 2015.01.14

EUT:	Smart Outlet P/N: 121268			**Work Order:**	SECF0021
Serial Number:	None			**Date:**	05/01/15
Customer:	Select Comfort Corporation			**Temperature:**	23.7°C
Attendees:	None			**Humidity:**	24%
Project:	None			**Barometric Pres.:**	988.7
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

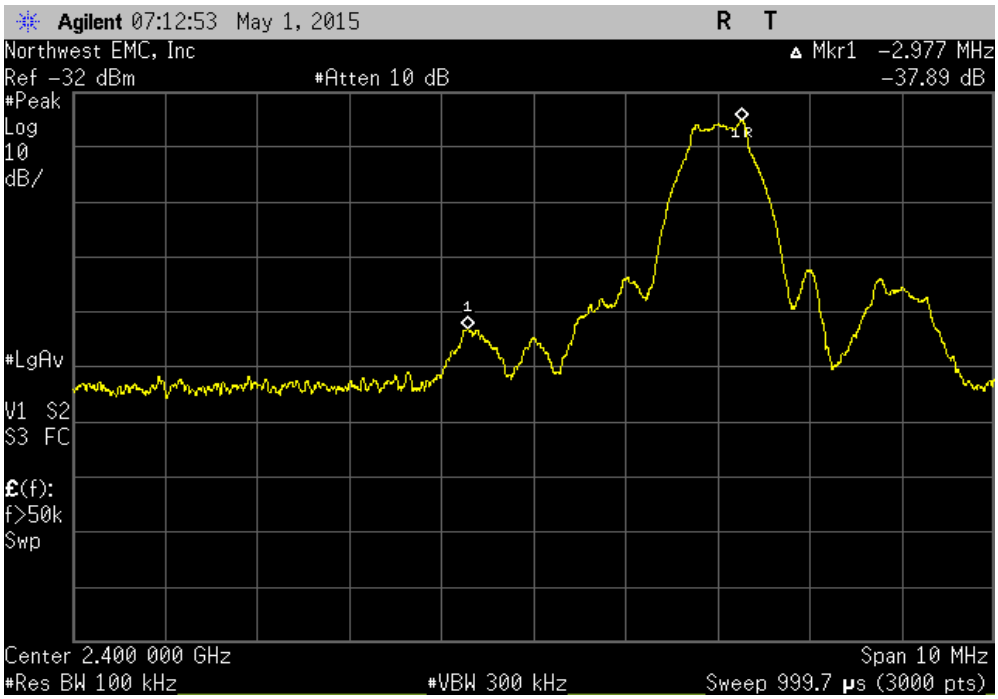
DEVIATIONS FROM TEST STANDARD

None

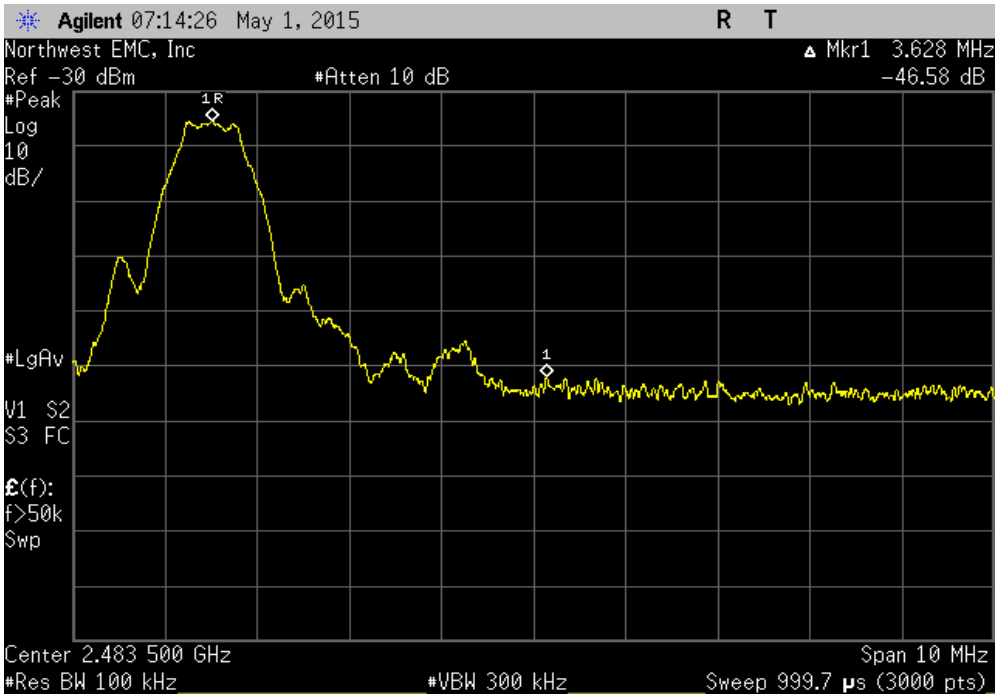
Configuration #	3	Signature	Trevor Buls

	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2402 MHz	-37.89	-20	Pass
High Channel, 2480 MHz	-46.58	-20	Pass

Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.89	-20	Pass



High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.58	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2015.01.14

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 (mo)
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/30/2015	12
Antenna, Horn	ETS	3115	AJA	6/3/2014	24
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a 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

NORTHWEST EMC

XMit 2015.01.14

EUT:	Smart Outlet P/N: 121268			**Work Order:**	SECF0021
Serial Number:	None			**Date:**	05/01/15
Customer:	Select Comfort Corporation			**Temperature:**	23.7°C
Attendees:	None			**Humidity:**	24%
Project:	None			**Barometric Pres.:**	988.7
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN05

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

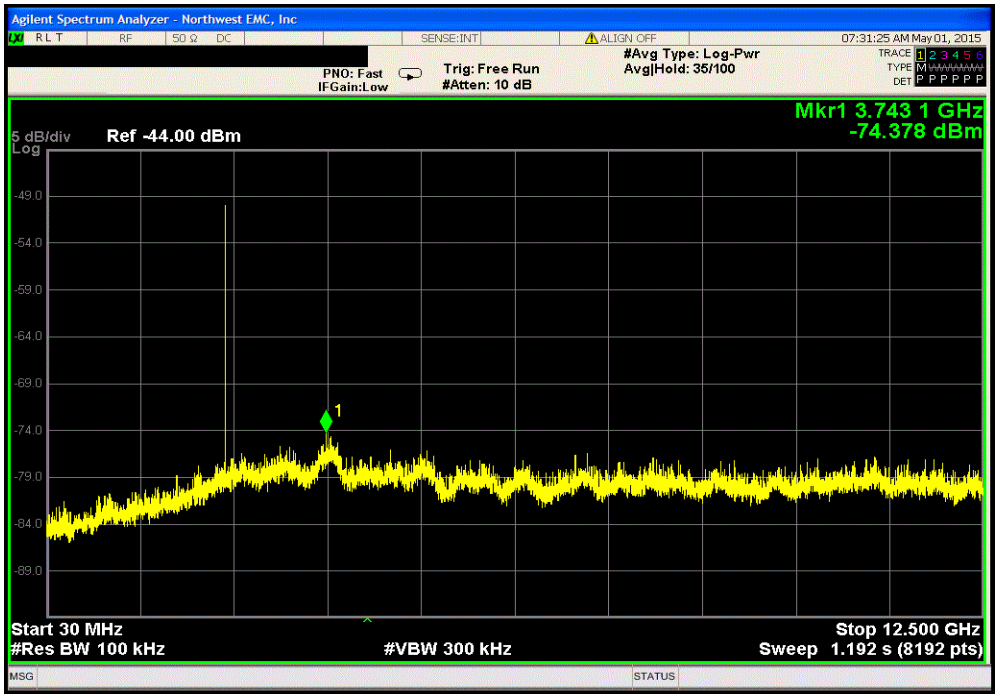
None

Configuration #	3	Signature	Trevor Buls

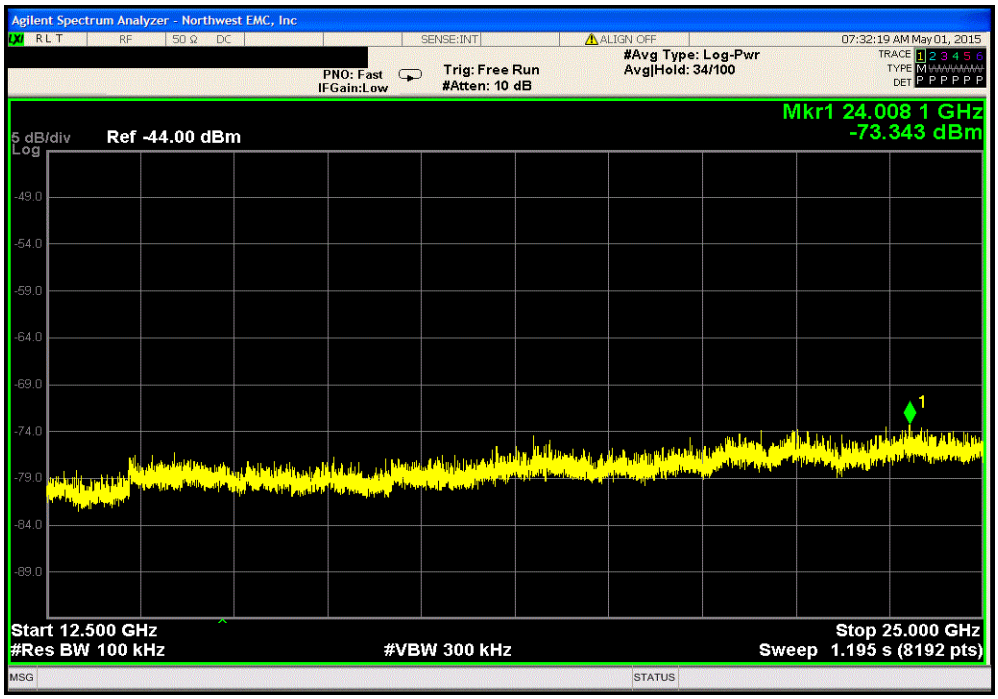
	Frequency Range	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2402 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2402 MHz	30 MHz - 12.5 GHz	-25.46	-20	Pass
Low Channel, 2402 MHz	12.5 GHz - 25 GHz	-24.42	-20	Pass
Mid Channel, 2442 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2442 MHz	30 MHz - 12.5 GHz	-26.89	-20	Pass
Mid Channel, 2442 MHz	12.5 GHz - 25 GHz	-25.64	-20	Pass
High Channel, 2480 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2480 MHz	30 MHz - 12.5 GHz	-25.1	-20	Pass
High Channel, 2480 MHz	12.5 GHz - 25 GHz	-23.15	-20	Pass

Low Channel, 2402 MHz						
	Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A

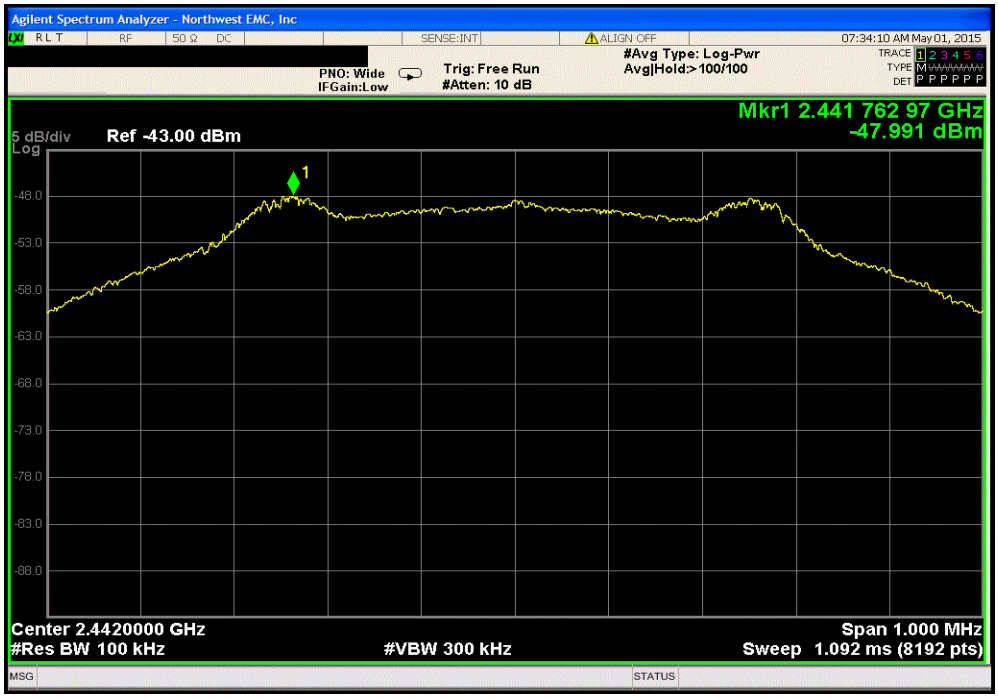
Low Channel, 2402 MHz					
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-25.46	-20	Pass



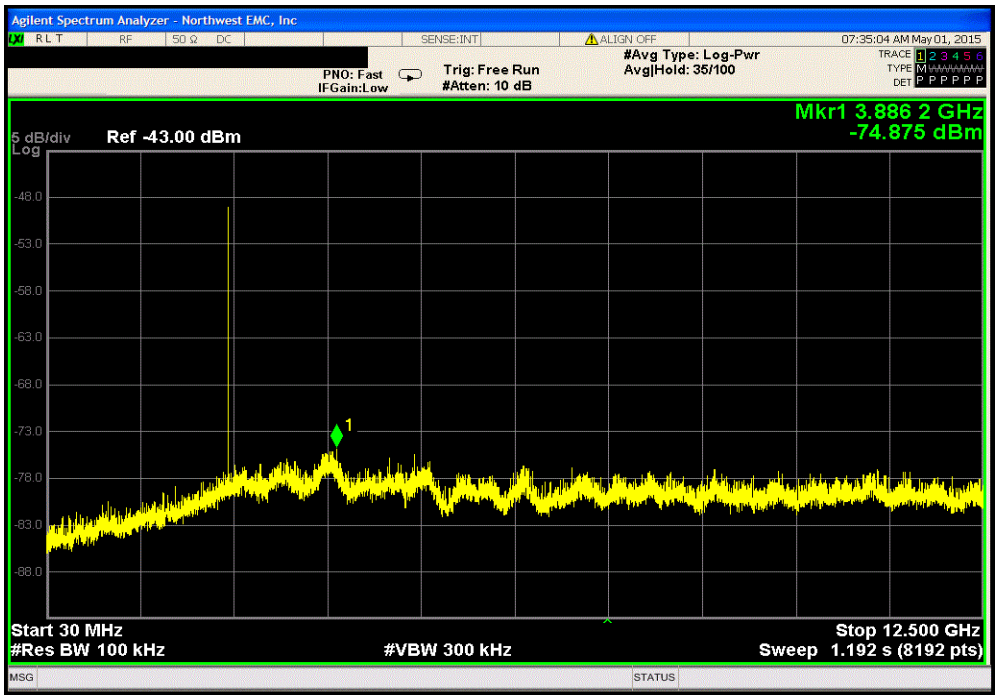
Low Channel, 2402 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-24.42	-20	Pass



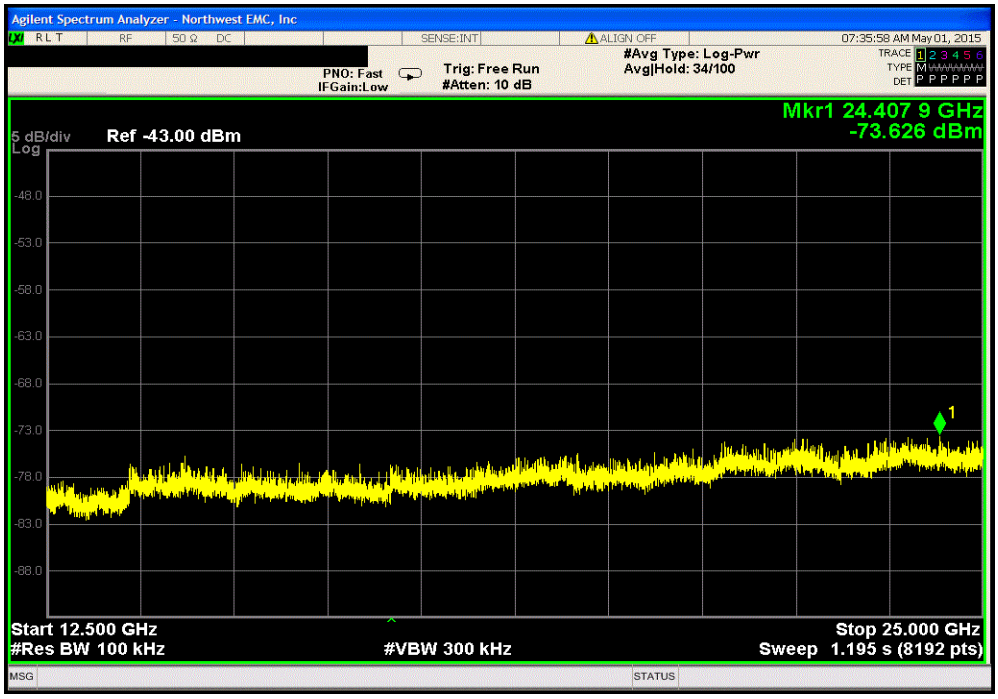
Mid Channel, 2442 MHz						
Frequency Range				Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



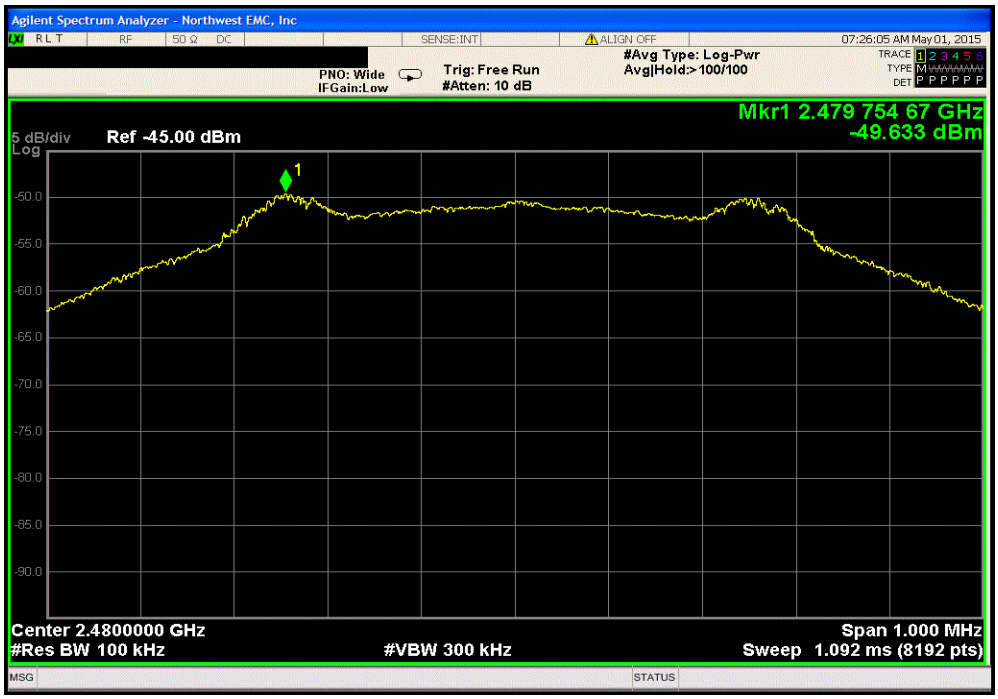
Mid Channel, 2442 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-26.89	-20	Pass



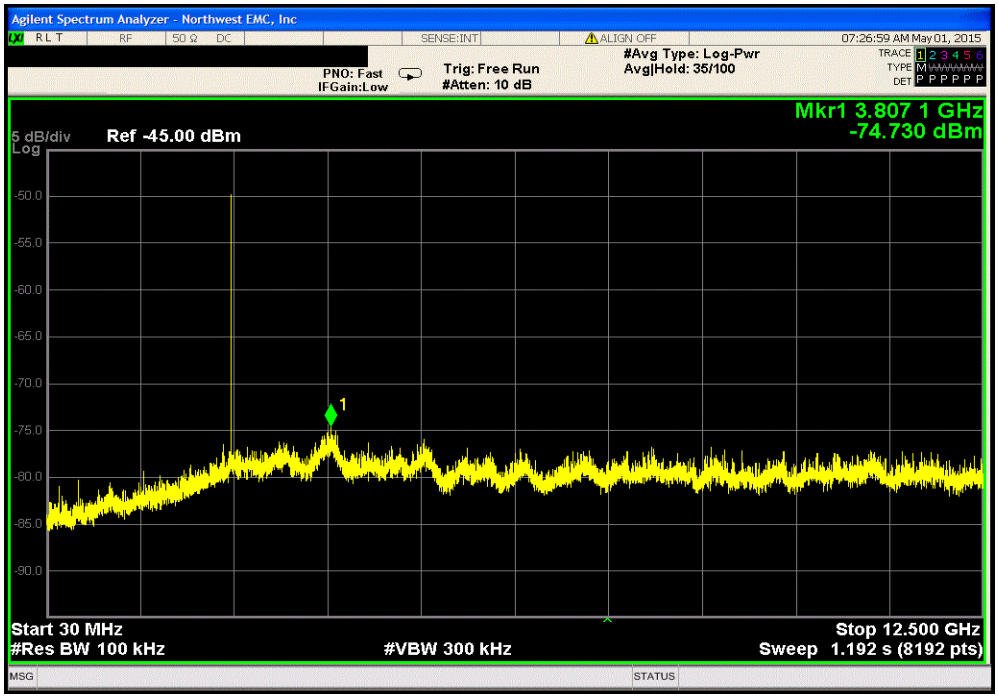
Mid Channel, 2442 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-25.64	-20	Pass



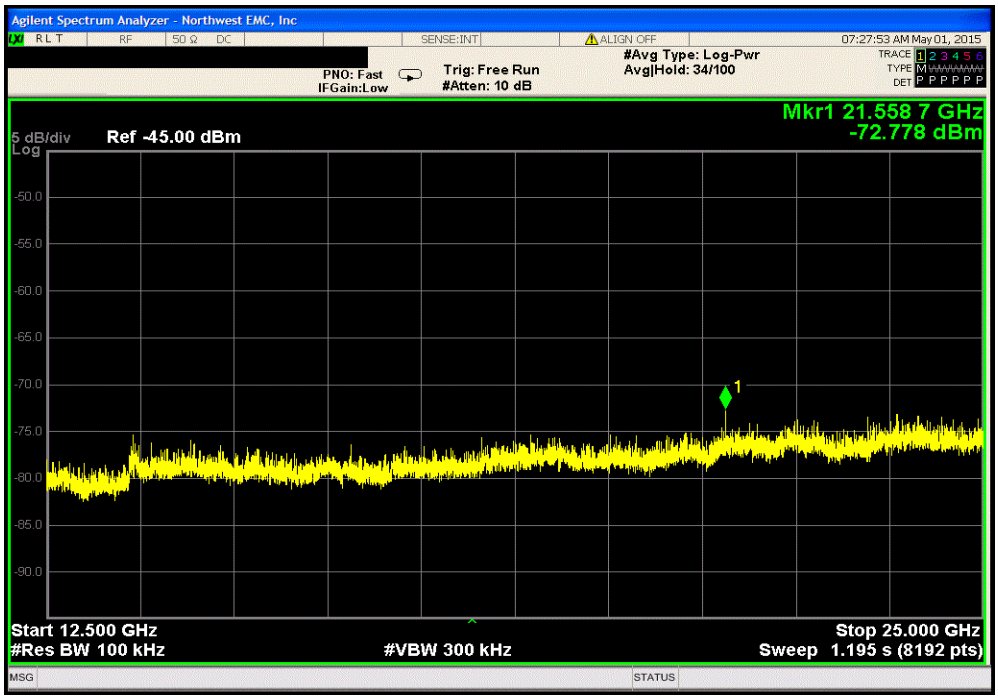
High Channel, 2480 MHz						
	Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



High Channel, 2480 MHz					
Frequency Range			Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz			-25.1	-20	Pass



High Channel, 2480 MHz				
Frequency Range		Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-23.15	-20	Pass



OCCUPIED BANDWIDTH

XMit 2015.01.14

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 (mo)
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Near Field Probe Set	ETS Lindgren	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	E4440A	AAX	4/20/2015	12

TEST DESCRIPTION

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

The EUT was set to low, medium and high transmit frequencies. The measurement was made in a radiated configuration. The EUT was transmitting at the data rate(s) listed in the datasheet.

OCCUPIED BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

EUT:	Smart Outlet P/N: 121268			**Work Order:**	SECF0021
Serial Number:	None			**Date:**	05/01/15
Customer:	Select Comfort Corporation			**Temperature:**	23.7°C
Attendees:	None			**Humidity:**	24%
Project:	None			**Barometric Pres.:**	988.7
Tested by:	Trevor Buls	**Power:**	110VAC/60Hz	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

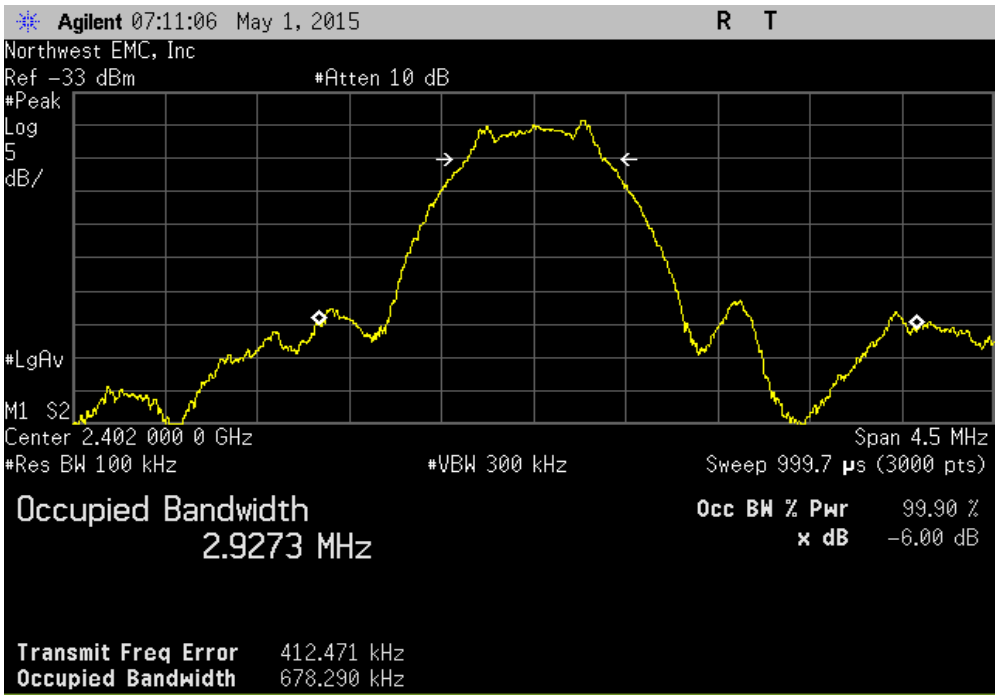
DEVIATIONS FROM TEST STANDARD

None

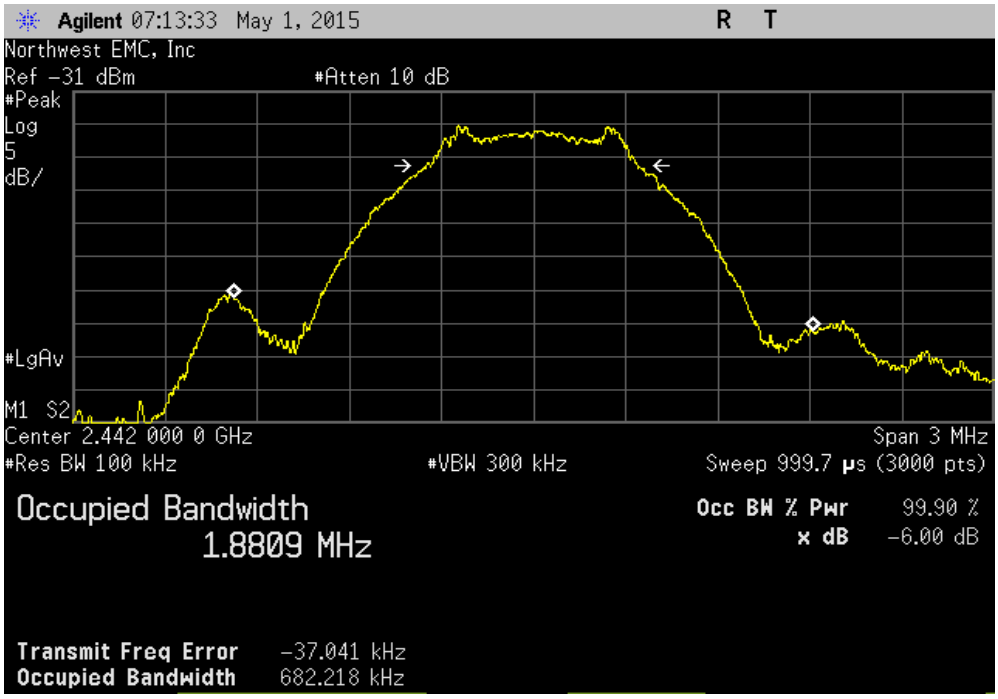
Configuration #	3	Signature	Trevor Buls

	Value	Limit (≥)	Result
Low Channel, 2402 MHz	678.29 kHz	500 kHz	Pass
Mid Channel, 2442 MHz	682.218 kHz	500 kHz	Pass
High Channel, 2480 MHz	665.593 kHz	500 kHz	Pass

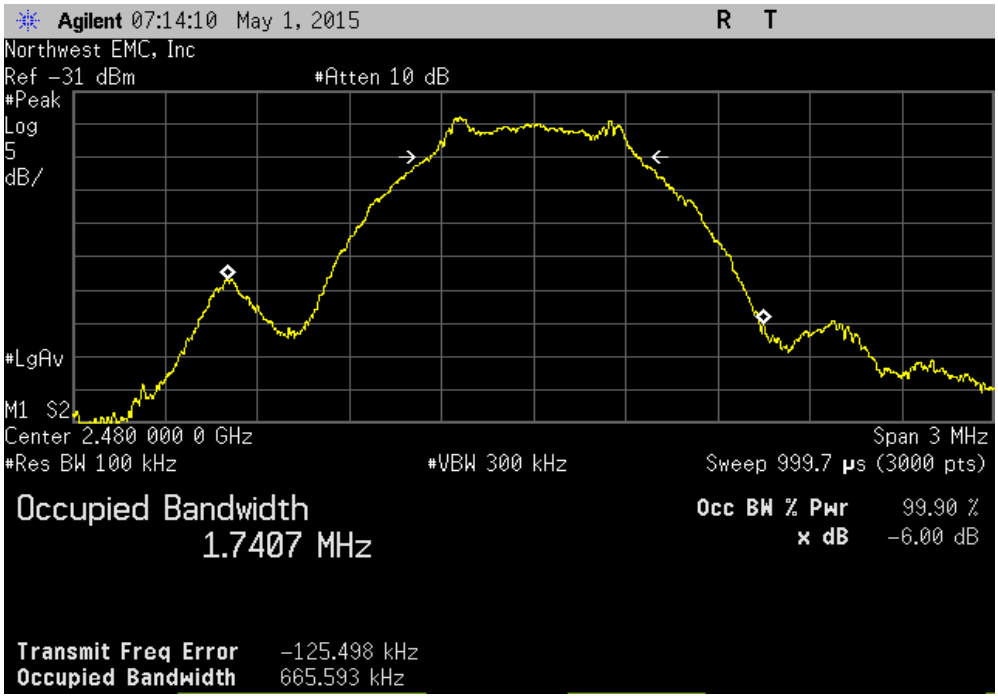
Low Channel, 2402 MHz						
				Value	Limit (≥)	Result
				678.29 kHz	500 kHz	Pass



Mid Channel, 2442 MHz						
				Value	Limit (≥)	Result
				682.218 kHz	500 kHz	Pass



High Channel, 2480 MHz						
				Value	Limit (≥)	Result
				665.593 kHz	500 kHz	Pass



OUTPUT POWER

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

MODES OF OPERATION

Bluetooth LE Low, Mid, High channel: 2402, 2442, 2480 MHz (see comments)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

SECF0021 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	2400 MHz	Stop Frequency	2483.5 MHz

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 (mo)
Power Sensor	Agilent	N8481A	SQN	8/22/2014	12 mo
Power Meter	Agilent	N1913A	SQL	8/22/2014	12 mo
Signal Generator	Agilent	E4422B	TGQ	3/23/2015	36 mo
Antenna, Horn	ETS	3115	AIB	8/12/2014	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/30/2015	12 mo
Antenna, Horn	ETS	3115	AJA	6/3/2014	24 mo

TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

Prior to measuring peak transmit power the DTS bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method found in KDB 558074 DTS D01 Measurement Section 9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

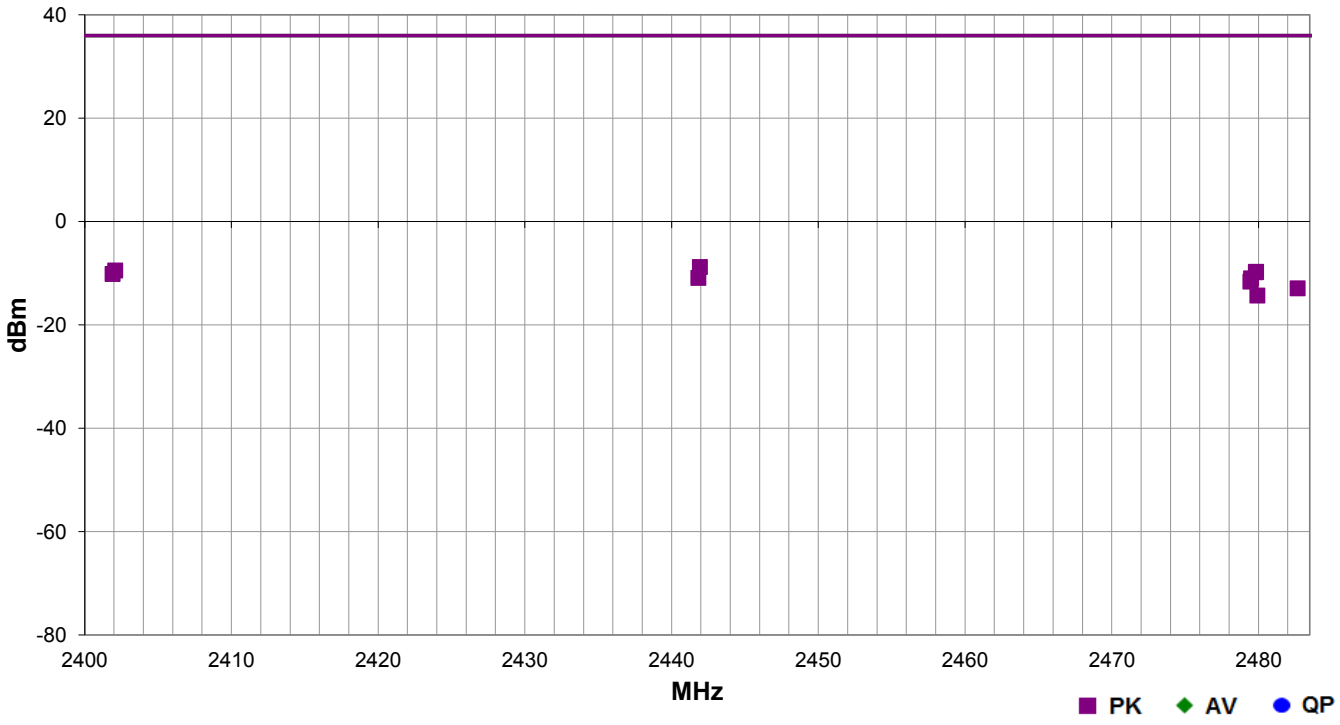
De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

Work Order:	SECF0021	**Date:**	04/30/15	Trevor Buls	
Project:	None	**Temperature:**	22.9 °C		
Job Site:	MN05	**Humidity:**	28.3% RH		
Serial Number:	None	**Barometric Pres.:**	988.4 mbar	**Tested by:**	Trevor Buls
EUT:	Smart Outlet P/N: 121268				
Configuration:	3				
Customer:	Select Comfort Corp.				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Bluetooth LE Low, Mid, High channel: 2402, 2442, 2480 MHz (see comments)				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2015	ANSI C63.10:2009

Run #	18	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2441.933	1.5	282.0	Horz	PK	1.32E-04	-8.8	36.0	-44.8	EUT Vertical, Mid Ch
	2402.083	2.0	292.0	Horz	PK	1.14E-04	-9.4	36.0	-45.4	EUT Vertical, Low Ch
	2479.833	1.4	296.0	Vert	PK	1.07E-04	-9.7	36.0	-45.7	EUT on Side, High Ch
	2479.817	1.9	294.9	Horz	PK	1.05E-04	-9.8	36.0	-45.8	EUT Vertical, High Ch
	2401.900	1.1	289.9	Vert	PK	9.68E-05	-10.1	36.0	-46.1	EUT on Side, Low Ch
	2441.833	1.0	288.0	Vert	PK	8.15E-05	-10.9	36.0	-46.9	EUT on Side, Mid Ch
	2479.500	1.0	175.0	Horz	PK	7.96E-05	-11.0	36.0	-47.0	EUT Horizontal, High Ch
	2479.450	1.4	306.0	Horz	PK	6.93E-05	-11.6	36.0	-47.6	EUT on Side, High Ch
	2482.667	1.1	340.9	Vert	PK	5.14E-05	-12.9	36.0	-48.9	EUT Vertical, High Ch
	2479.933	1.0	35.0	Vert	PK	3.72E-05	-14.3	36.0	-50.3	EUT Horizontal, High Ch

POWER SPECTRAL DENSITY

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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 (mo)
Antenna, Horn	ETS	3115	AJA	6/3/2014	24
MN05 Cables	ESM Cable Corp.	uble Ridge Guide Horn Cab	MNI	3/30/2015	12
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12

TEST DESCRIPTION

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

The final data was converted from a field strength to a radiated power value. Equation 5 found in ANSI C63.10:2009, was used to derive this conversion formula:

dBm/m (field strength) + 11.77 = dBm EIRP

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

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

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

POWER SPECTRAL DENSITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	**Smart Outlet P/N: 121268**			**Work Order:**	**SECF0021**
Serial Number:	**None**			**Date:**	**04/30/15**
Customer:	**Select Comfort Corporation**			**Temperature:**	**24.1°C**
Attendees:	**None**			**Humidity:**	**25%**
Project:	**None**			**Barometric Pres.:**	**988.1**
Tested by:	**Trevor Buls**	**Power:**	**110VAC/60Hz**	**Job Site:**	**MN05**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2015	ANSI C63.10:2009

COMMENTS

None

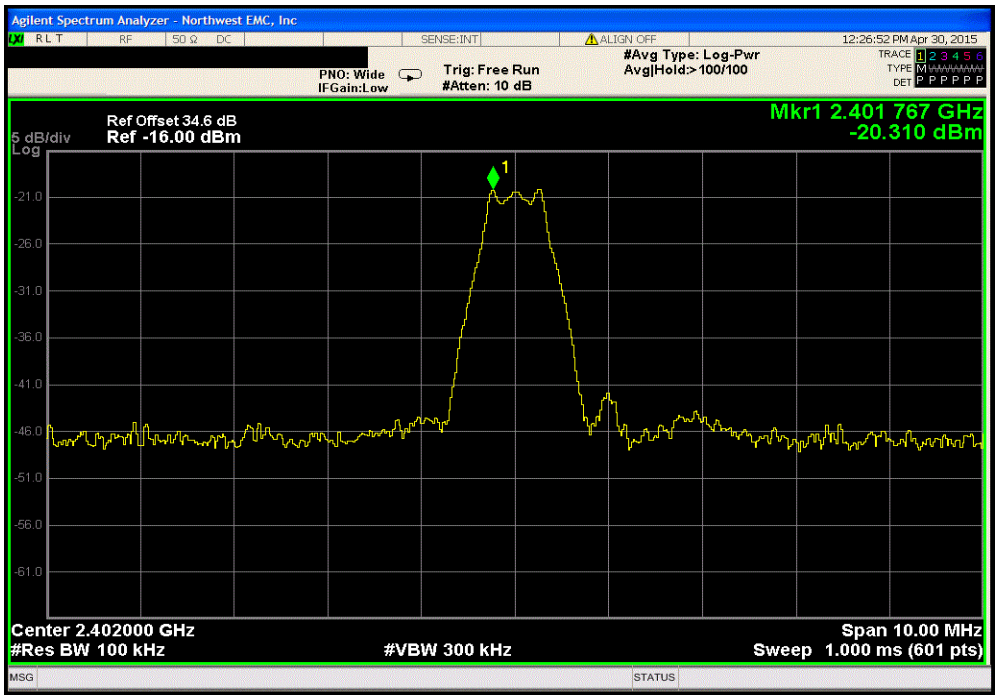
DEVIATIONS FROM TEST STANDARD

None

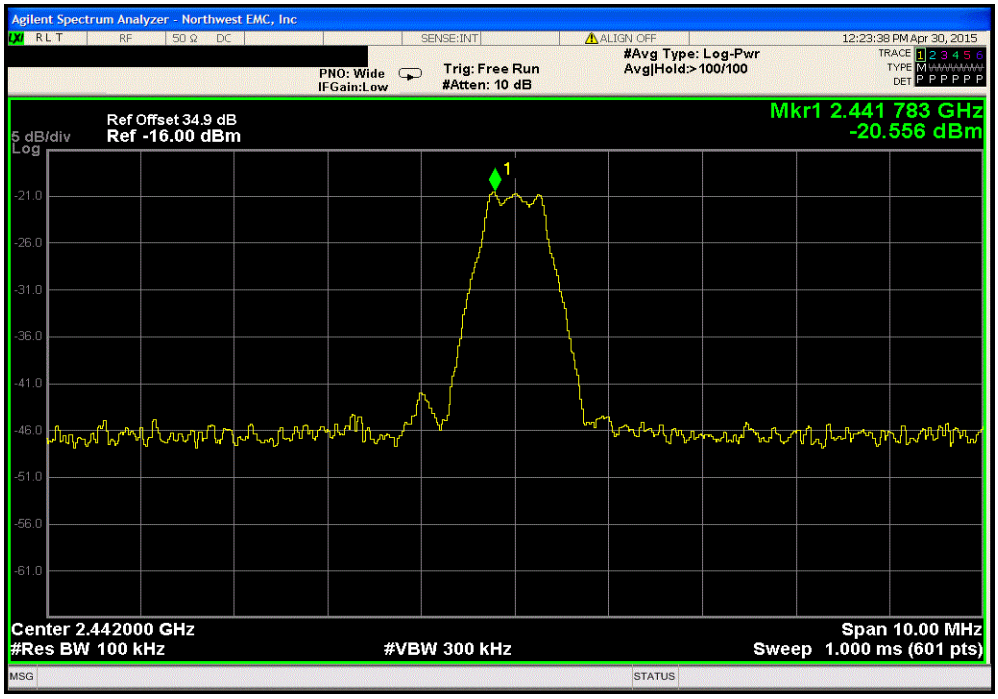
Configuration #	**3**	*Signature* Trevor Buls

	Value dBm/100kHz	dBm/m to dBm	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
Low Channel, 2402 MHz	-20.31	11.77	-15.2	-23.74	8	Pass
Mid Channel, 2442 MHz	-20.556	11.77	-15.2	-23.986	8	Pass
High Channel, 2480 MHz	-21.339	11.77	-15.2	-24.769	8	Pass

Low Channel, 2402 MHz						
	Value dBm/100kHz	dBm/m to dBm	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
	-20.31	11.77	-15.2	-23.74	8	Pass



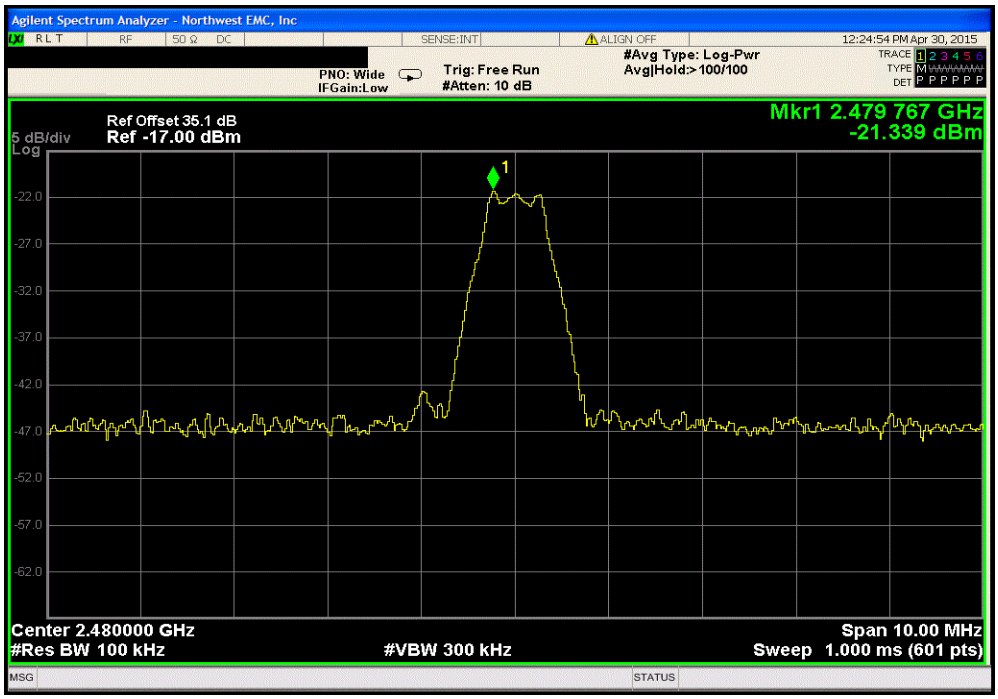
Mid Channel, 2442 MHz						
	Value dBm/100kHz	dBm/m to dBm	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
	-20.556	11.77	-15.2	-23.986	8	Pass



POWER SPECTRAL DENSITY

XMit 2015.01.14

High Channel, 2480 MHz						
	Value dBm/100kHz	dBm/m to dBm	dBm/100kHz To dBm/3kHz	Value dBm/3kHz	Limit dBm/3kHz	Results
	-21.339	11.77	-15.2	-24.769	8	Pass



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.