NORTHWEST EMC

Centrica Connected Home Ltd

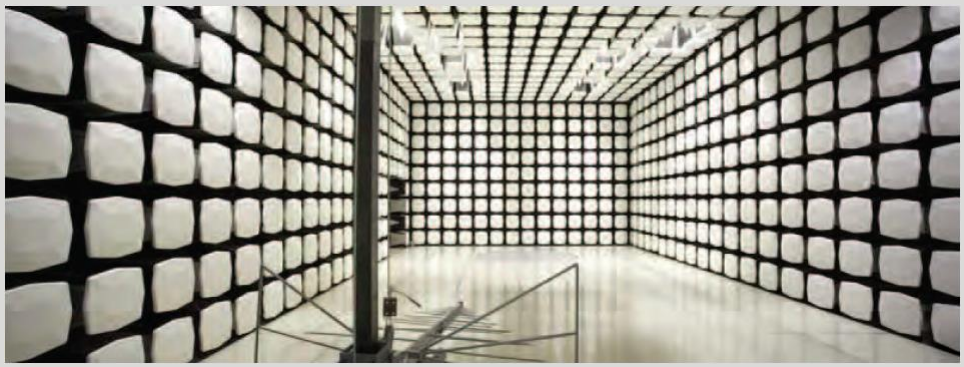
MOT

DWS

FCC 15.247:2016

2.4 GHz DTS Radio

Report # ELEM0006.1



NVLAP TESTING

NVLAP Lab Code: 201049-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: September 22, 2016
Centrica Connected Home Ltd
Models: MOT; DWS

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2016	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.2.2.4	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Jeremiah Darden, 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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2016.7.25

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

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Validated by the European Commission 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.2015.07.10

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 QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. 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.

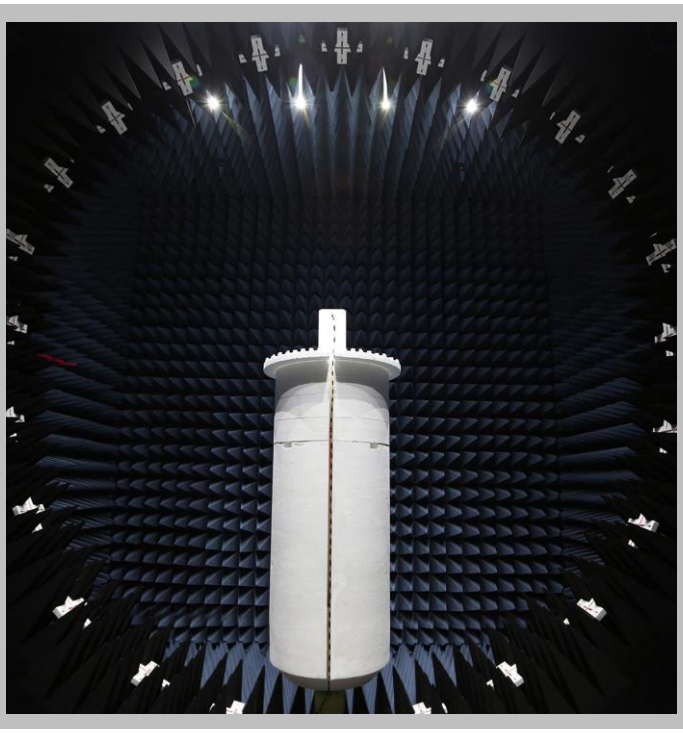
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

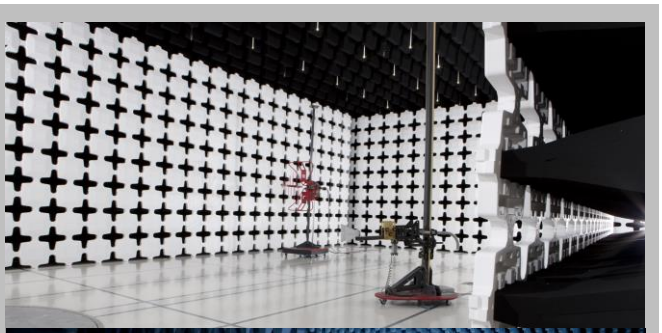
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.9 dB	-4.9 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

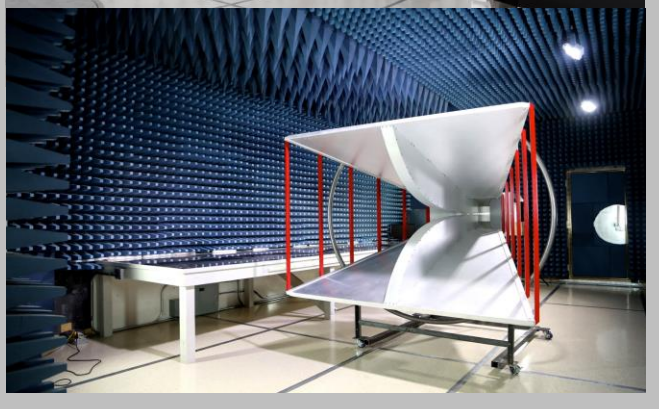
FACILITIES

NORTHWEST EMC
REV 2016.7.25

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 98011 (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
Innovation, Science and Economic Development 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

2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Centrica Connected Home Ltd
Address:	30 Station Road
City, State, Zip:	Cambridge CB1 2RE United Kingdom
Test Requested By:	Alex Toohie
Models:	FCC_Test_MOT001; FCC_Test_DWS#2
First Date of Test:	September 13, 2016
Last Date of Test:	September 22, 2016
Receipt Date of Samples:	September 12, 2016
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Contact sensor and motion sensor, each containing the following common features: small battery powered device powered by a single CR123A primary battery (user-replaceable), ZigBee radio using Channels 11 to 25 in the 2.4GHz ISM band (2MHz bandwidth, 5MHz channel spacing), internal wire antenna, and maximum Tx power + 5dBm.

Testing Objective:
To demonstrate compliance of the 2.4 GHz ISM radio to FCC 15.247 requirements.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ELEM0006- 1

Software/Firmware Running during test	
Description	**Version**
SmartRF Studio	2.4.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zigbee Radio	Centrica Connected Home Ltd	FCC_Test_MOT002	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SmartRF06 Evaluation Board	Texas Instruments	SMARTRF06EBK	0x116A7
Laptop Computer	Dell	E4200	None
AC/DC Adapter (Laptop)	Dell	LA65NS2-01	CN-0928G4-72438-1AH-0A24-A00

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon	No	0.3m	No	Zigbee Radio	SmartRF06 Evaluation Board
USB to Micro-USB	No	0.5m	No	Laptop Computer	SmartRF06 Evaluation Board
AC Power	No	0.8m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power	No	1.8m	Yes	AC/DC Adapter (Laptop)	Laptop Computer

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ELEM0006- 2

Software/Firmware Running during test	
Description	**Version**
SmartRF Studio	2.4.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zigbee Radio	Centrica Connected Home Ltd	FCC_Test_DWS#2	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SmartRF06 Evaluation Board	Texas Instruments	SMARTRF06EBK	0x116A7
Laptop Computer	Dell	E4200	None
AC/DC Adapter (Laptop)	Dell	LA65NS2-01	CN-0928G4-72438-1AH-0A24-A00

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon	No	0.3m	No	Zigbee Radio	SmartRF06 Evaluation Board
USB to Micro-USB	No	0.5m	No	Laptop Computer	SmartRF06 Evaluation Board
AC Power	No	0.8m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power	No	1.8m	Yes	AC/DC Adapter (Laptop)	Laptop Computer

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ELEM0006- 3

Software/Firmware Running during test	
Description	**Version**
SmartRF Studio	2.4.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zigbee Radio	Centrica Connected Home Ltd	FCC_Test_MOT001	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SmartRF06 Evaluation Board	Texas Instruments	SMARTRF06EBK	0x116A7
Laptop Computer	Dell	E4200	None
AC/DC Adapter (Laptop)	Dell	LA65NS2-01	CN-0928G4-72438-1AH-0A24-A00

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon	No	0.3m	No	Zigbee Radio	SmartRF06 Evaluation Board
USB to Micro-USB	No	0.5m	No	Laptop Computer	SmartRF06 Evaluation Board
AC Power	No	0.8m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power	No	1.8m	Yes	AC/DC Adapter (Laptop)	Laptop Computer
USB Extension	No	5.0m	No	USB to Micro-USB Cable	Laptop Computer

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration ELEM0006- 4

Software/Firmware Running during test	
Description	**Version**
SmartRF Studio	2.4.2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zigbee Radio	Centrica Connected Home Ltd	FCC_Test_DWS#1	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SmartRF06 Evaluation Board	Texas Instruments	SMARTRF06EBK	0x116A7
Laptop Computer	Dell	E4200	None
AC/DC Adapter (Laptop)	Dell	LA65NS2-01	CN-0928G4-72438-1AH-0A24-A00

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon	No	0.3m	No	Zigbee Radio	SmartRF06 Evaluation Board
USB to Micro-USB	No	0.5m	No	Laptop Computer	SmartRF06 Evaluation Board
AC Power	No	0.8m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power	No	1.8m	Yes	AC/DC Adapter (Laptop)	Laptop Computer
USB Extension	No	5.0m	No	USB to Micro-USB Cable	Laptop Computer

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/13/2016	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	9/15/2016	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	9/15/2016	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	9/15/2016	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	9/15/2016	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	9/15/2016	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	9/22/2016	Spurious Receiver Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2016.07.22

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

MODES OF OPERATION

Transmitting at Low, High Channel @ 2405, 2470 MHz
Transmitting at Low, Mid, High Channel @ 2405, 2440, 2470 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ELEM0006 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 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
Cable	Northwest EMC	18-40GHz	TXE	11/20/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	11/20/2015	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	8/5/2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	10/22/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	10/22/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	5/31/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJN	9/15/2016	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	5/31/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	9/12/2016	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	4/13/2016	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	5/31/2016	12 mo
Attenuator	Weinschel Corp	4H-20	AWB	3/9/2016	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	3/4/2016	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	8/5/2016	12 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 mo
Cable	Northwest EMC	8-18GHz	TXD	5/31/2016	12 mo

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

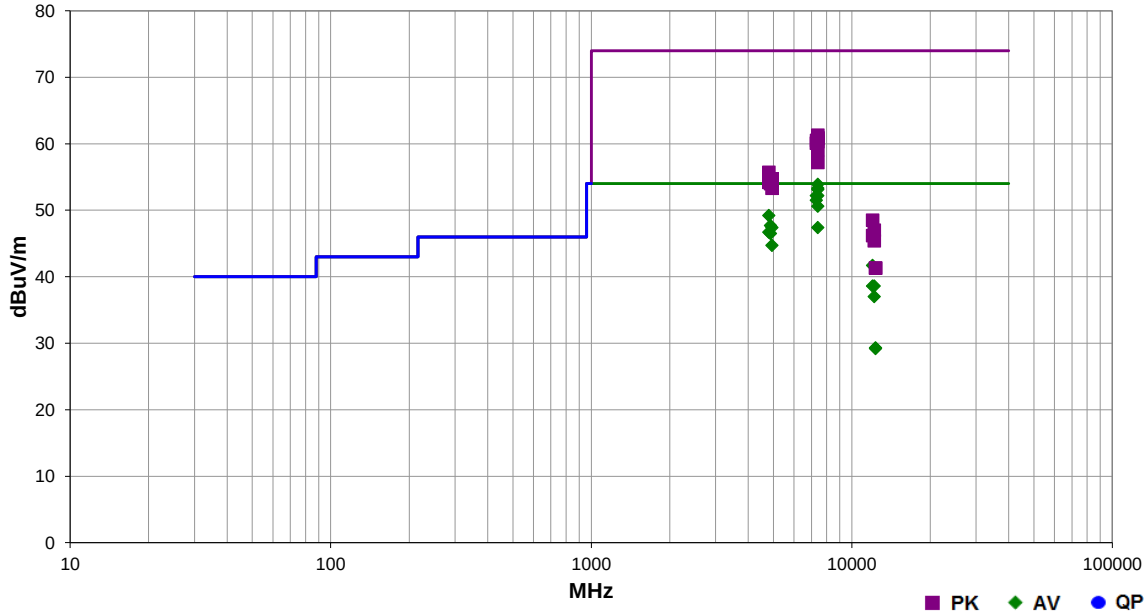
NORTHWEST EMC

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0006	**Date:**	09/22/16		
Project:	None	**Temperature:**	23.6 °C		
Job Site:	TX02	**Humidity:**	44.7% RH		
Serial Number:	None	**Barometric Pres.:**	1016 mbar	**Tested by:**	Jonathan Kiefer
EUT:	FCC_Test_MOT001				
Configuration:	3				
Customer:	Centrica Connected Home Ltd				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, Mid, High Channel @ 2405, 2440, 2470 MHz				
Deviations:	None				
Comments:	Harmonics. PK and AVG(RMS) data. TX power setting 2 dBm.				

Test Specifications	**Test Method**
FCC 15.247:2016	ANSI C63.10:2013

Run #	134	**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
7411.350	40.3	13.6	1.4	117.0	3.0	0.0	Horz	AV	0.0	53.9	54.0	-0.1	High Ch, EUT Vertical, 2dBm
7408.425	39.7	13.6	1.1	220.9	3.0	0.0	Horz	AV	0.0	53.3	54.0	-0.7	High Ch, EUT Horizontal, 2dBm
7408.517	39.5	13.6	1.0	79.0	3.0	0.0	Horz	AV	0.0	53.1	54.0	-0.9	High Ch, EUT On Side, 2dBm
7411.350	38.6	13.6	1.0	129.0	3.0	0.0	Vert	AV	0.0	52.2	54.0	-1.8	High Ch, EUT On Side, 2dBm
7318.500	38.6	13.6	1.8	177.9	3.0	0.0	Vert	AV	0.0	52.2	54.0	-1.8	Mid Ch, EUT On Side, 2dBm
7318.392	37.9	13.6	1.4	115.0	3.0	0.0	Horz	AV	0.0	51.5	54.0	-2.5	Mid Ch, EUT On Side, 2dBm
7411.400	37.0	13.6	2.2	105.9	3.0	0.0	Vert	AV	0.0	50.6	54.0	-3.4	High Ch, EUT Horizontal, 2dBm
4808.950	43.0	6.2	1.5	159.0	3.0	0.0	Horz	AV	0.0	49.2	54.0	-4.8	Low Ch, EUT Vertical, 2dBm
4879.058	41.3	6.4	2.3	37.0	3.0	0.0	Vert	AV	0.0	47.7	54.0	-6.3	Mid Ch, EUT On Side, 2dBm
7411.342	33.8	13.6	1.1	222.0	3.0	0.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, EUT Vertical, 2dBm
4940.925	41.0	6.4	1.6	54.0	3.0	0.0	Horz	AV	0.0	47.4	54.0	-6.6	High Ch, EUT Vertical, 2dBm
4808.925	40.5	6.2	1.0	68.0	3.0	0.0	Vert	AV	0.0	46.7	54.0	-7.3	Low Ch, EUT On Side, 2dBm
4878.942	40.1	6.4	1.2	27.9	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	Mid Ch, EUT Vertical, 2dBm
4939.033	38.2	6.5	1.8	12.0	3.0	0.0	Vert	AV	0.0	44.7	54.0	-9.3	High Ch, EUT On Side, 2dBm
12027.450	43.8	-2.1	3.2	3.0	3.0	0.0	Horz	AV	0.0	41.7	54.0	-12.3	Low Ch, EUT Vertical, 2dBm
7408.250	47.7	13.6	1.4	117.0	3.0	0.0	Horz	PK	0.0	61.3	74.0	-12.7	High Ch, EUT Vertical, 2dBm
7408.417	47.3	13.6	1.1	220.9	3.0	0.0	Horz	PK	0.0	60.9	74.0	-13.1	High Ch, EUT Horizontal, 2dBm
7411.225	47.2	13.6	1.0	79.0	3.0	0.0	Horz	PK	0.0	60.8	74.0	-13.2	High Ch, EUT On Side, 2dBm
7321.567	46.9	13.6	1.8	177.9	3.0	0.0	Vert	PK	0.0	60.5	74.0	-13.5	Mid Ch, EUT On Side, 2dBm
7411.250	46.7	13.6	1.0	129.0	3.0	0.0	Vert	PK	0.0	60.3	74.0	-13.7	High Ch, EUT On Side, 2dBm
7318.458	46.5	13.6	1.4	115.0	3.0	0.0	Horz	PK	0.0	60.1	74.0	-13.9	Mid Ch, EUT On Side, 2dBm
7408.533	45.5	13.6	2.2	105.9	3.0	0.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch, EUT Horizontal, 2dBm

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
12027.430	40.7	-2.1	1.2	2.0	3.0	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Low Ch, EUT On Side, 2dBm
12202.460	40.4	-1.8	1.2	278.0	3.0	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Mid Ch, EUT On Side, 2dBm
7411.300	43.6	13.6	1.1	222.0	3.0	0.0	Vert	PK	0.0	57.2	74.0	-16.8	High Ch, EUT Vertical, 2dBm
12202.380	38.8	-1.8	3.1	15.0	3.0	0.0	Horz	AV	0.0	37.0	54.0	-17.0	Mid Ch, EUT Vertical, 2dBm
4808.867	49.5	6.2	1.5	159.0	3.0	0.0	Horz	PK	0.0	55.7	74.0	-18.3	Low Ch, EUT Vertical, 2dBm
4941.075	48.3	6.4	1.6	54.0	3.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	High Ch, EUT Vertical, 2dBm
4878.717	48.1	6.4	2.3	37.0	3.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	Mid Ch, EUT On Side, 2dBm
4808.775	48.0	6.2	1.0	68.0	3.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Low Ch, EUT On Side, 2dBm
4878.892	47.6	6.4	1.2	27.9	3.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, EUT Vertical, 2dBm
4940.833	46.9	6.4	1.8	12.0	3.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	High Ch, EUT On Side, 2dBm
12349.160	30.2	-0.9	1.2	57.0	3.0	0.0	Vert	AV	0.0	29.3	54.0	-24.7	High Ch, EUT On Side, 2dBm
12349.490	30.1	-0.9	1.2	322.9	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	High Ch, EUT Vertical, 2dBm
12022.560	50.6	-2.1	3.2	3.0	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch, EUT Vertical, 2dBm
12202.250	48.8	-1.8	1.2	278.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Mid Ch, EUT On Side, 2dBm
12027.480	48.3	-2.1	1.2	2.0	3.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	Low Ch, EUT On Side, 2dBm
12202.170	47.2	-1.8	3.1	15.0	3.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	Mid Ch, EUT Vertical, 2dBm
12347.530	42.2	-0.9	1.2	57.0	3.0	0.0	Vert	PK	0.0	41.3	74.0	-32.7	High Ch, EUT On Side, 2dBm
12349.490	42.2	-0.9	1.2	322.9	3.0	0.0	Horz	PK	0.0	41.3	74.0	-32.7	High Ch, EUT Vertical, 2dBm

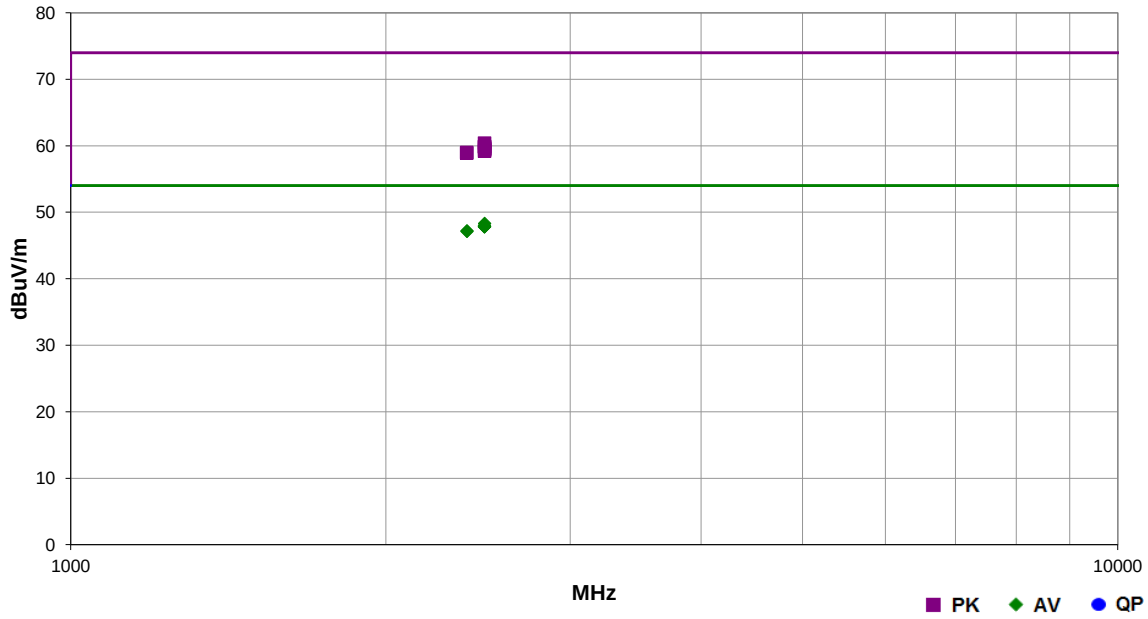
SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0006	**Date:**	09/22/16	Jonathan Kiefer	
Project:	None	**Temperature:**	23.6 °C		
Job Site:	TX02	**Humidity:**	44.7% RH		
Serial Number:	None	**Barometric Pres.:**	1016 mbar	**Tested by:**	Jonathan Kiefer
EUT:	FCC_Test_MOT001				
Configuration:	3				
Customer:	Centrica Connected Home Ltd				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, High Channel @ 2405, 2470 MHz				
Deviations:	None				
Comments:	Transmit Band Edge. PK and AVG(RMS) data. TX power setting 2 dBm.				

Test Specifications	**Test Method**
FCC 15.247:2016	ANSI C63.10:2013

Run #	136	**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
2485.010	33.0	-4.7	1.2	111.0	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	High Ch, EUT Vertical, 2dBm
2484.203	32.7	-4.7	1.2	286.9	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Vertical, 2dBm
2484.423	32.6	-4.7	1.2	289.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch, EUT On Side, 2dBm
2484.163	32.5	-4.7	3.6	99.9	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	High Ch, EUT On Side, 2dBm
2484.903	32.5	-4.7	2.4	200.0	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	High Ch, EUT Horizontal, 2dBm
2484.237	32.5	-4.7	1.2	220.9	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	High Ch, EUT Horizontal, 2dBm
2390.592	32.6	-5.4	1.2	132.0	3.0	20.0	Vert	AV	0.0	47.2	54.0	-6.8	Low Ch, EUT Vertical, 2dBm
2390.525	32.5	-5.4	1.2	76.9	3.0	20.0	Horz	AV	0.0	47.1	54.0	-6.9	Low Ch, EUT Vertical, 2dBm
2484.483	45.1	-4.7	1.2	111.0	3.0	20.0	Horz	PK	0.0	60.4	74.0	-13.6	High Ch, EUT Vertical, 2dBm
2484.493	44.6	-4.7	1.2	289.0	3.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch, EUT On Side, 2dBm
2484.263	44.5	-4.7	2.4	200.0	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch, EUT Horizontal, 2dBm
2484.790	44.3	-4.7	1.2	286.9	3.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, EUT Vertical, 2dBm
2484.963	44.1	-4.7	1.2	220.9	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch, EUT Horizontal, 2dBm
2484.227	43.9	-4.7	3.6	99.9	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch, EUT On Side, 2dBm
2388.367	44.4	-5.4	1.2	132.0	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch, EUT Vertical, 2dBm
2388.650	44.3	-5.4	1.2	76.9	3.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	Low Ch, EUT Vertical, 2dBm

SPURIOUS RADIATED EMISSIONS

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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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting at Low, High Channel @ 2405, 2470 MHz

Transmitting at Low, Mid, High Channel @ 2405, 2440, 2470 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

ELEM0006 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 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
Cable	Northwest EMC	18-40GHz	TXE	11/20/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	11/20/2015	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	8/5/2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	10/22/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	10/22/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	5/31/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJN	9/15/2016	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	5/31/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	9/12/2016	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	4/13/2016	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	5/31/2016	12 mo
Attenuator	Weinschel Corp	4H-20	AWB	3/9/2016	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	3/4/2016	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	8/5/2016	12 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 mo
Cable	Northwest EMC	8-18GHz	TXD	5/31/2016	12 mo

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

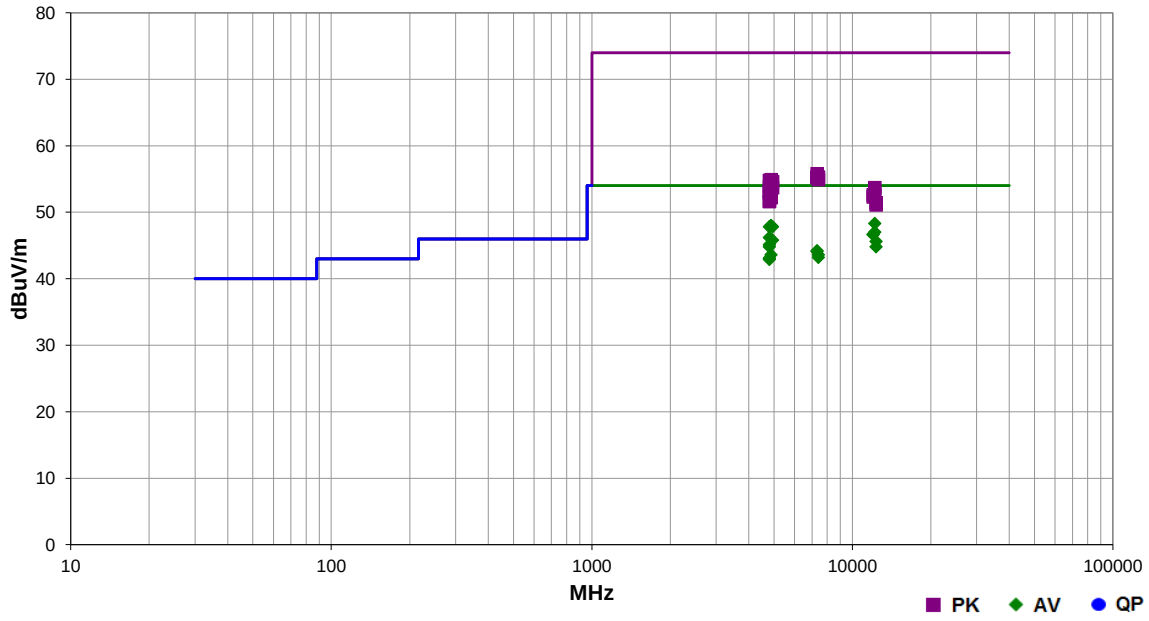
NORTHWEST EMC

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0006	**Date:**	09/13/16		
Project:	None	**Temperature:**	23.4 °C		
Job Site:	TX02	**Humidity:**	48.1% RH		
Serial Number:	None	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jonathan Kiefer
EUT:	FCC_Test_DWS#1				
Configuration:	4				
Customer:	Centrica Connected Home Ltd				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, Mid, High Channel @ 2405, 2440, 2470 MHz				
Deviations:	None				
Comments:	Harmonics. PK and AVG(RMS) data. TX Power setting at 5dBm.				

Test Specifications	**Test Method**
FCC 15.247:2016	ANSI C63.10:2013

Run #	29	**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
12197.520	50.1	-1.8	1.3	223.0	3.0	0.0	Vert	AV	0.0	48.3	54.0	-5.7	Mid Ch, EUT Horizontal, 5dBm
4879.133	41.7	6.3	1.5	268.9	3.0	0.0	Horz	AV	0.0	48.0	54.0	-6.0	Mid Ch, EUT On Side, 5dBm
4809.083	41.7	6.1	2.0	259.0	3.0	0.0	Horz	AV	0.0	47.8	54.0	-6.2	Low Ch, EUT On Side, 5dBm
4939.000	41.3	6.5	1.5	268.9	3.0	0.0	Horz	AV	0.0	47.8	54.0	-6.2	High Ch, EUT On Side, 5dBm
12197.500	48.8	-1.8	2.2	139.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Mid Ch, EUT On Side, 5dBm
12022.560	48.8	-2.1	2.2	132.0	3.0	0.0	Horz	AV	0.0	46.7	54.0	-7.3	Low Ch, EUT On Side, 5dBm
12022.580	48.7	-2.1	1.2	223.0	3.0	0.0	Vert	AV	0.0	46.6	54.0	-7.4	Low Ch, EUT Horizontal, 5dBm
4809.025	40.1	6.1	2.5	75.9	3.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Low Ch, EUT Horizontal, 5dBm
4939.017	39.3	6.5	2.6	34.9	3.0	0.0	Vert	AV	0.0	45.8	54.0	-8.2	High Ch, EUT Horizontal, 5dBm
12347.500	46.7	-1.1	1.2	222.0	3.0	0.0	Vert	AV	0.0	45.6	54.0	-8.4	High Ch, EUT Horizontal, 5dBm
4808.958	39.0	6.1	1.0	356.0	3.0	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Low Ch, EUT Horizontal, 5dBm
4809.000	38.7	6.1	3.3	296.0	3.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	Low Ch, EUT On Side, 5dBm
12347.510	45.9	-1.1	1.9	128.0	3.0	0.0	Horz	AV	0.0	44.8	54.0	-9.2	High Ch, EUT On Side, 5dBm
7321.492	30.9	13.3	1.2	19.0	3.0	0.0	Vert	AV	0.0	44.2	54.0	-9.8	Mid Ch, EUT Horizontal, 5dBm
7321.575	30.8	13.3	1.2	162.0	3.0	0.0	Horz	AV	0.0	44.1	54.0	-9.9	Mid Ch, EUT On Side, 5dBm
7411.417	30.2	13.4	1.2	297.9	3.0	0.0	Horz	AV	0.0	43.6	54.0	-10.4	High Ch, EUT On Side, 5dBm
4879.000	37.3	6.3	1.0	62.0	3.0	0.0	Vert	AV	0.0	43.6	54.0	-10.4	Mid Ch, EUT Horizontal, 5dBm
7411.742	29.8	13.4	1.2	267.9	3.0	0.0	Vert	AV	0.0	43.2	54.0	-10.8	High Ch, EUT Horizontal, 5dBm
4808.917	37.0	6.1	1.5	271.0	3.0	0.0	Horz	AV	0.0	43.1	54.0	-10.9	Low Ch, EUT Vertical, 5dBm
4809.025	36.8	6.1	1.0	154.9	3.0	0.0	Vert	AV	0.0	42.9	54.0	-11.1	Low Ch, EUT Vertical, 5dBm
7321.167	42.5	13.3	1.2	162.0	3.0	0.0	Horz	PK	0.0	55.8	74.0	-18.2	Mid Ch, EUT On Side, 5dBm
7408.800	41.9	13.4	1.2	267.9	3.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High Ch, EUT Horizontal, 5dBm

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
7318.392	41.9	13.3	1.2	19.0	3.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	Mid Ch, EUT Horizontal, 5dBm
7408.742	41.5	13.4	1.2	297.9	3.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	High Ch, EUT On Side, 5dBm
4878.875	48.6	6.3	1.5	268.9	3.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	Mid Ch, EUT On Side, 5dBm
4809.008	48.7	6.1	2.0	259.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	Low Ch, EUT On Side, 5dBm
4941.025	48.2	6.4	1.5	268.9	3.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	High Ch, EUT On Side, 5dBm
4809.117	47.7	6.1	2.5	75.9	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	Low Ch, EUT Horizontal, 5dBm
4938.750	47.2	6.5	2.6	34.9	3.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	High Ch, EUT Horizontal, 5dBm
12197.510	55.5	-1.8	1.3	223.0	3.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	Mid Ch, EUT Horizontal, 5dBm
4809.058	47.0	6.1	1.0	356.0	3.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Low Ch, EUT Horizontal, 5dBm
4808.792	46.8	6.1	3.3	296.0	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Low Ch, EUT On Side, 5dBm
12202.470	54.5	-1.8	2.2	139.0	3.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Mid Ch, EUT On Side, 5dBm
12022.530	54.7	-2.1	1.2	223.0	3.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	Low Ch, EUT Horizontal, 5dBm
12022.560	54.4	-2.1	2.2	132.0	3.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Low Ch, EUT On Side, 5dBm
4878.775	45.9	6.3	1.0	62.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Mid Ch, EUT Horizontal, 5dBm
4809.117	45.6	6.1	1.5	271.0	3.0	0.0	Horz	PK	0.0	51.7	74.0	-22.3	Low Ch, EUT Vertical, 5dBm
4808.950	45.5	6.1	1.0	154.9	3.0	0.0	Vert	PK	0.0	51.6	74.0	-22.4	Low Ch, EUT Vertical, 5dBm
12347.780	52.5	-1.1	1.2	222.0	3.0	0.0	Vert	PK	0.0	51.4	74.0	-22.6	High Ch, EUT Horizontal, 5dBm
12347.620	52.2	-1.1	1.9	128.0	3.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	High Ch, EUT On Side, 5dBm

SPURIOUS RADIATED EMISSIONS

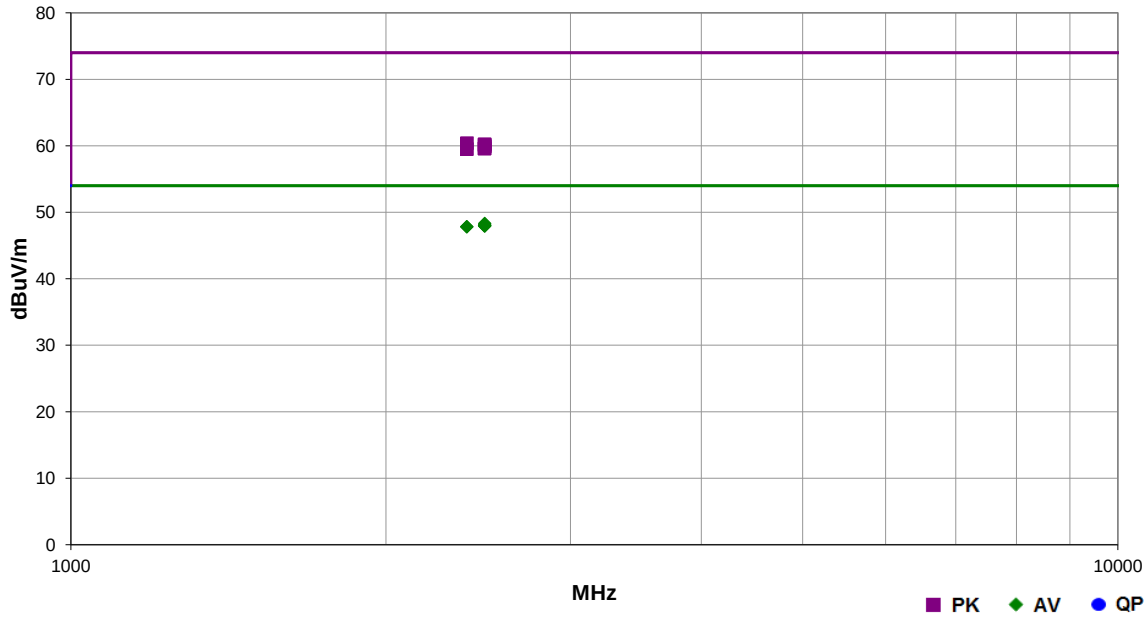
NORTHWEST EMC

PSA-ESCI 2016.07.22
EmiR5 2016.07.22.1

Work Order:	ELEM0006	**Date:**	09/14/16	Jonathan Kiefer	
Project:	None	**Temperature:**	23.5 °C		
Job Site:	TX02	**Humidity:**	49.3% RH		
Serial Number:	None	**Barometric Pres.:**	1022 mbar	**Tested by:**	Jonathan Kiefer
EUT:	FCC_Test_DWS#1				
Configuration:	4				
Customer:	Centrica Connected Home Ltd				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, High Channel @ 2405, 2470 MHz				
Deviations:	None				
Comments:	Transmit Band Edge. PK and AVG(RMS) data. TX Power setting at 5dBm.				

Test Specifications	**Test Method**
FCC 15.247:2016	ANSI C63.10:2013

Run #	39	**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
2485.410	33.0	-4.7	3.7	192.0	3.0	20.0	Horz	AV	0.0	48.3	54.0	-5.7	High Ch, EUT On Side, 5dBm
2484.697	32.8	-4.7	1.2	79.0	3.0	20.0	Vert	AV	0.0	48.1	54.0	-5.9	High Ch, EUT On Side, 5dBm
2483.660	32.7	-4.7	1.2	355.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Vertical, 5dBm
2485.287	32.7	-4.7	1.2	210.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Horizontal, 5dBm
2484.473	32.7	-4.7	1.2	309.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Horizontal, 5dBm
2484.683	32.6	-4.7	1.2	274.9	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vertical, 5dBm
2389.380	32.7	-4.9	1.2	272.0	3.0	20.0	Horz	AV	0.0	47.8	54.0	-6.2	Low Ch, EUT On Side, 5dBm
2388.457	32.7	-4.9	1.2	52.9	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Low Ch, EUT On Side, 5dBm
2389.203	45.3	-4.9	1.2	52.9	3.0	20.0	Vert	PK	0.0	60.4	74.0	-13.6	Low Ch, EUT On Side, 5dBm
2484.947	44.9	-4.7	3.7	192.0	3.0	20.0	Horz	PK	0.0	60.2	74.0	-13.8	High Ch, EUT On Side, 5dBm
2483.507	44.9	-4.7	1.2	79.0	3.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, EUT On Side, 5dBm
2484.220	44.7	-4.7	1.2	274.9	3.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	High Ch, EUT Vertical, 5dBm
2485.447	44.6	-4.7	1.2	309.0	3.0	20.0	Vert	PK	0.0	59.9	74.0	-14.1	High Ch, EUT Horizontal, 5dBm
2483.607	44.3	-4.7	1.2	355.0	3.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, EUT Vertical, 5dBm
2483.570	44.3	-4.7	1.2	210.0	3.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch, EUT Horizontal, 5dBm
2389.220	44.4	-4.9	1.2	272.0	3.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	Low Ch, EUT On Side, 5dBm

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.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

The EUT operates at 100% Duty Cycle.

OCCUPIED BANDWIDTH

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_MOT002			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.5 °C
Attendees:	None			**Humidity:**	46.6% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 2dBm setting.

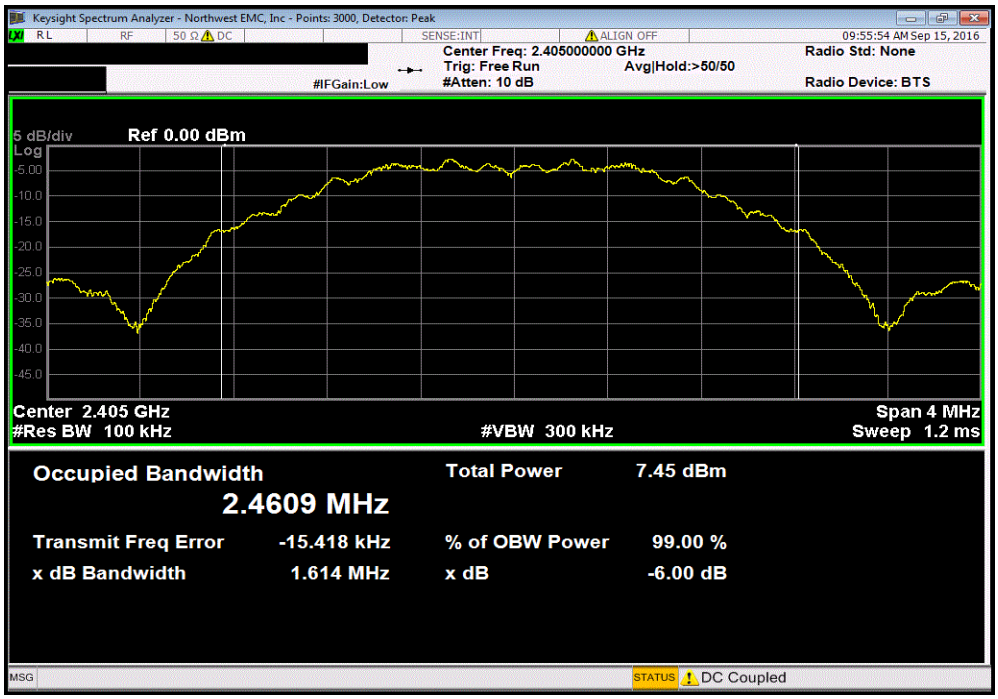
DEVIATIONS FROM TEST STANDARD

None

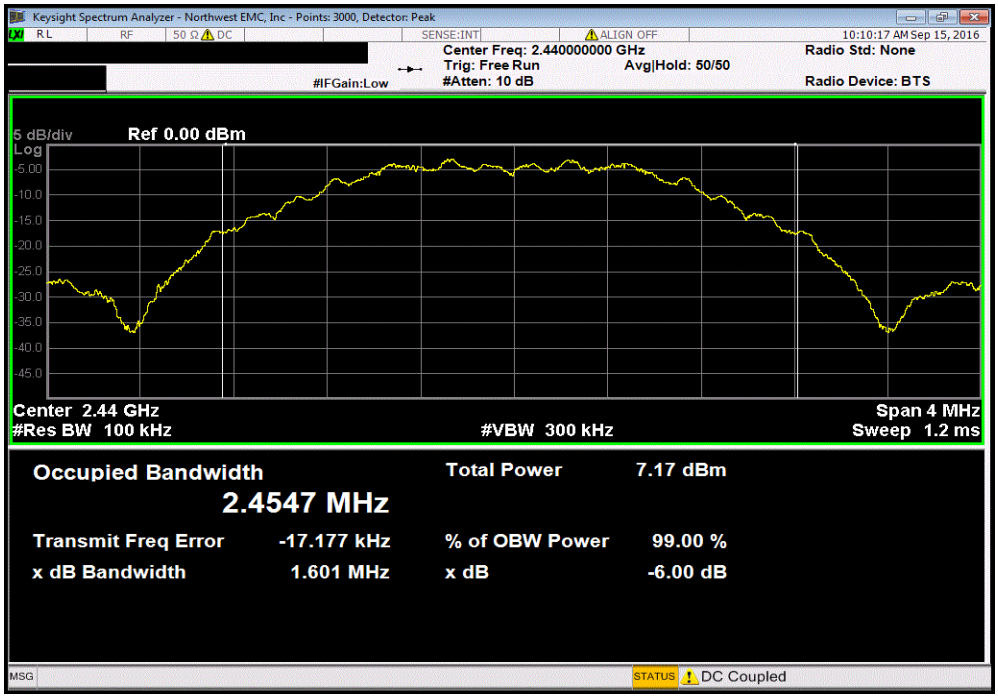
Configuration #	1	Signature	Jonathan Kiefer

	Value	Limit (>)	Result
Low Channel, 2405 MHz	1.614 MHz	500 kHz	Pass
Mid Channel, 2440 MHz	1.601 MHz	500 kHz	Pass
High Channel, 2470 MHz	1.607 MHz	500 kHz	Pass

Low Channel, 2405 MHz						
				Value	Limit (>)	Result
				1.614 MHz	500 kHz	Pass



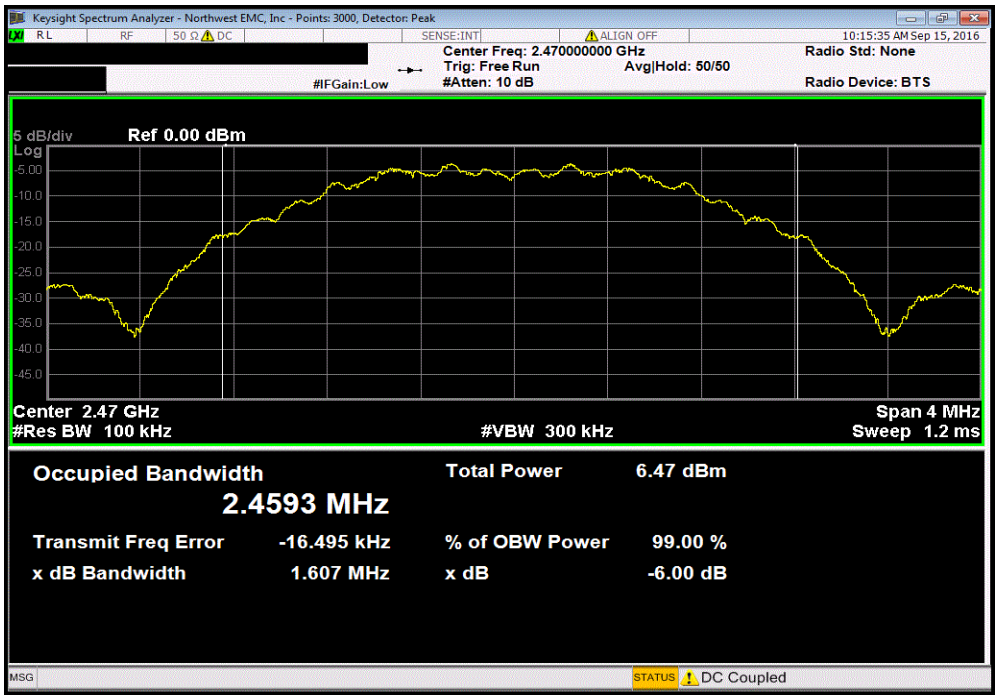
Mid Channel, 2440 MHz						
				Value	Limit (>)	Result
				1.601 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

XMit 2016.05.06

High Channel, 2470 MHz						
				Value	Limit (>)	Result
				1.607 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_DWS#2			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.1 °C
Attendees:	None			**Humidity:**	47.2% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 5dBm setting.

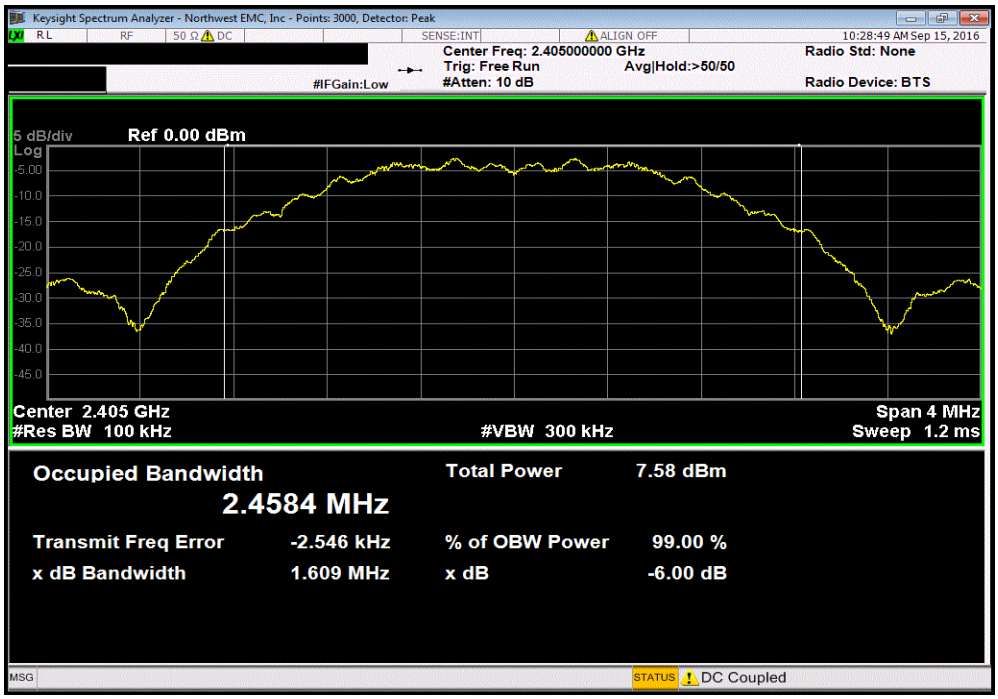
DEVIATIONS FROM TEST STANDARD

None

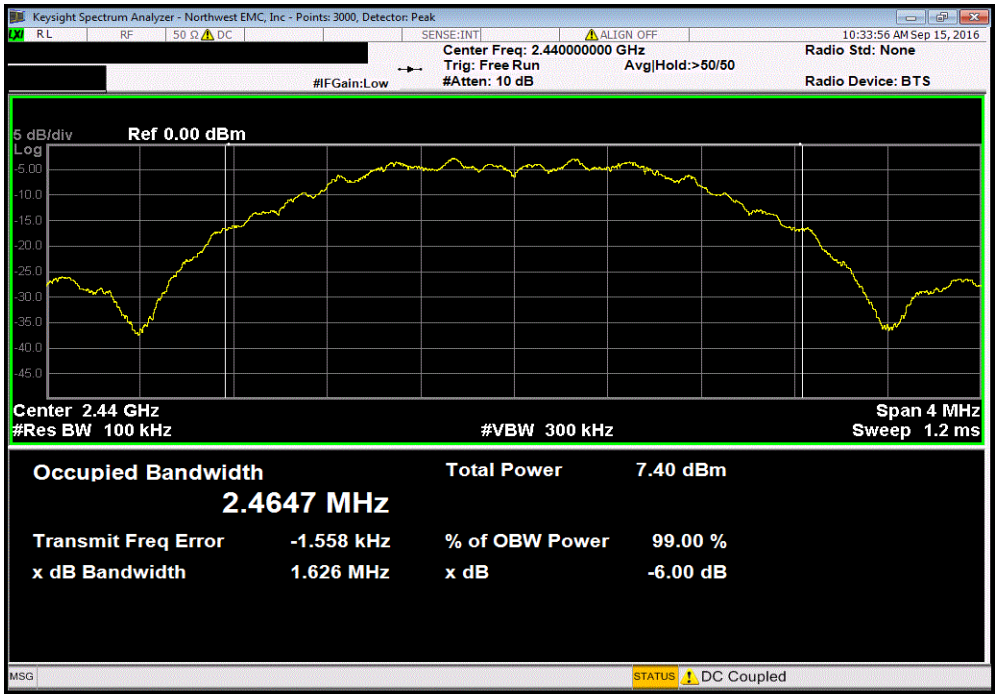
Configuration #	2	Signature	Jonathan Kiefer

	Value	Limit (>)	Result
Low Channel, 2405 MHz	1.609 MHz	500 kHz	Pass
Mid Channel, 2440 MHz	1.626 MHz	500 kHz	Pass
High Channel, 2470 MHz	1.624 MHz	500 kHz	Pass

Low Channel, 2405 MHz						
				Value	Limit (>)	Result
				1.609 MHz	500 kHz	Pass



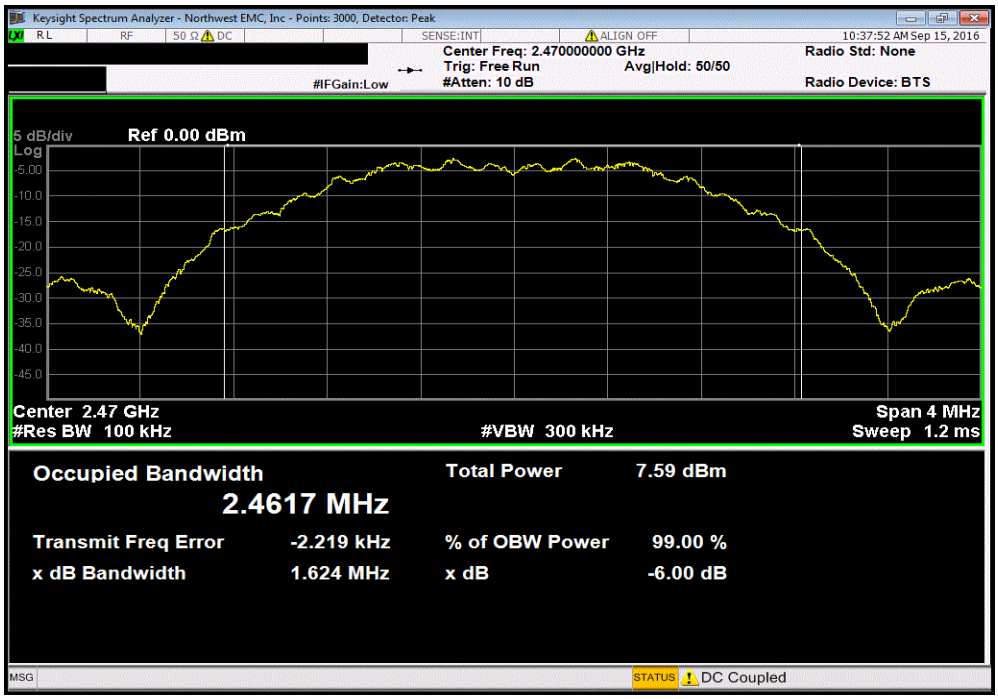
Mid Channel, 2440 MHz						
				Value	Limit (>)	Result
				1.626 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

XMit 2016.05.06

High Channel, 2470 MHz						
				Value	Limit (>)	Result
				1.624 MHz	500 kHz	Pass



OUTPUT POWER

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

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 ANSI C63.10:2013 Section 11.9.2.2.4 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio..

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_MOT002			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.3 °C
Attendees:	None			**Humidity:**	46.7% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 2dBm setting.

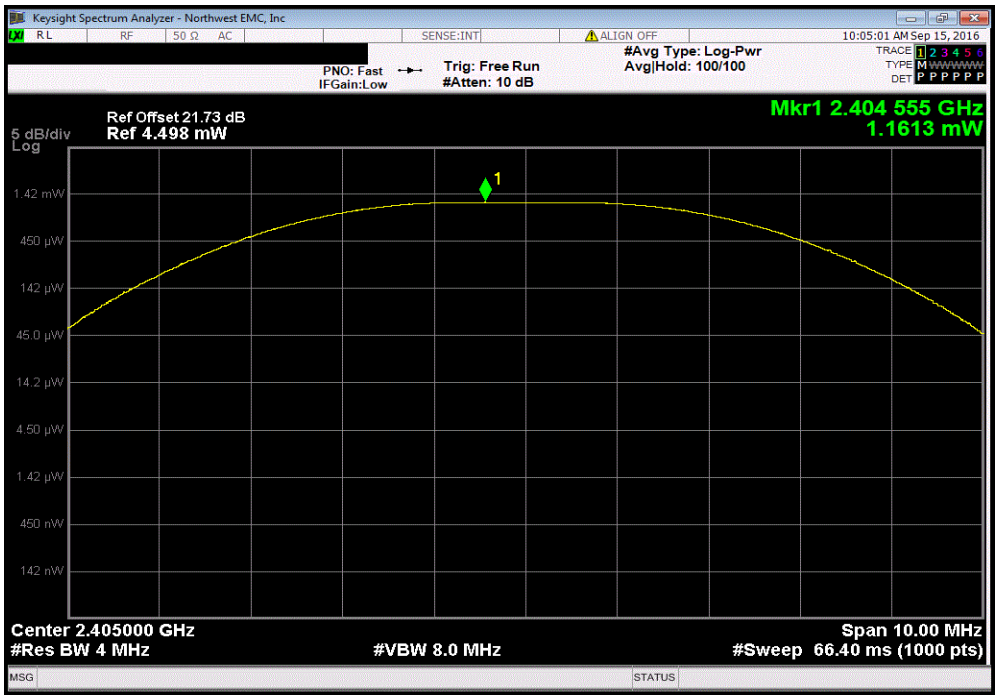
DEVIATIONS FROM TEST STANDARD

None

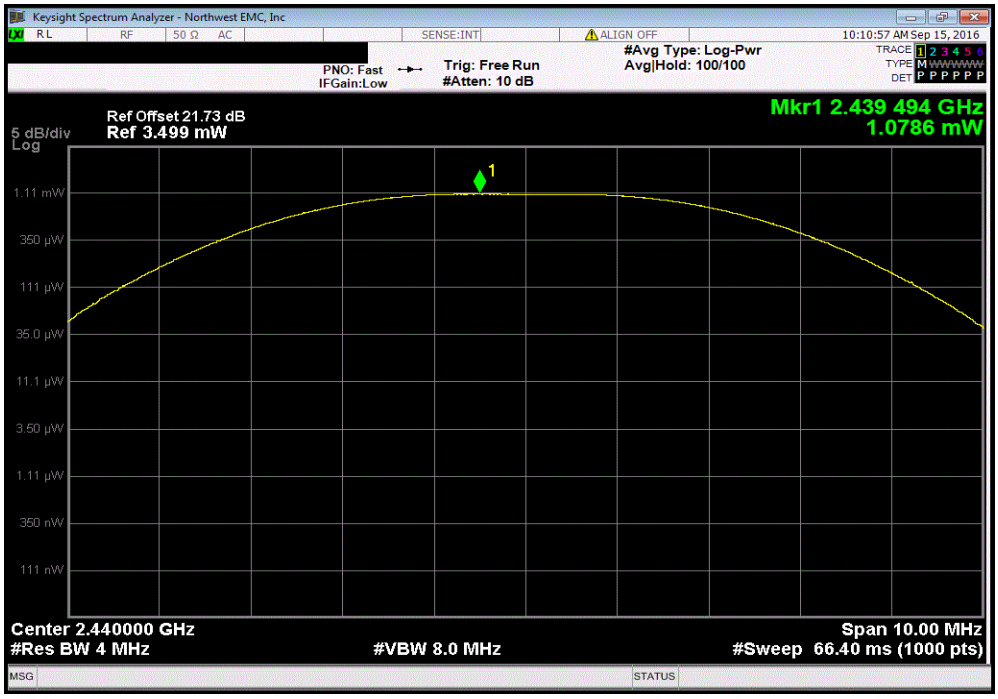
Configuration #	1	Signature Jonathan Kiefer

	Value	Limit (<)	Result
Low Channel, 2405 MHz	1.161 mW	1 W	Pass
Mid Channel, 2440 MHz	1.079 mW	1 W	Pass
High Channel, 2470 MHz	924.45 uW	1 W	Pass

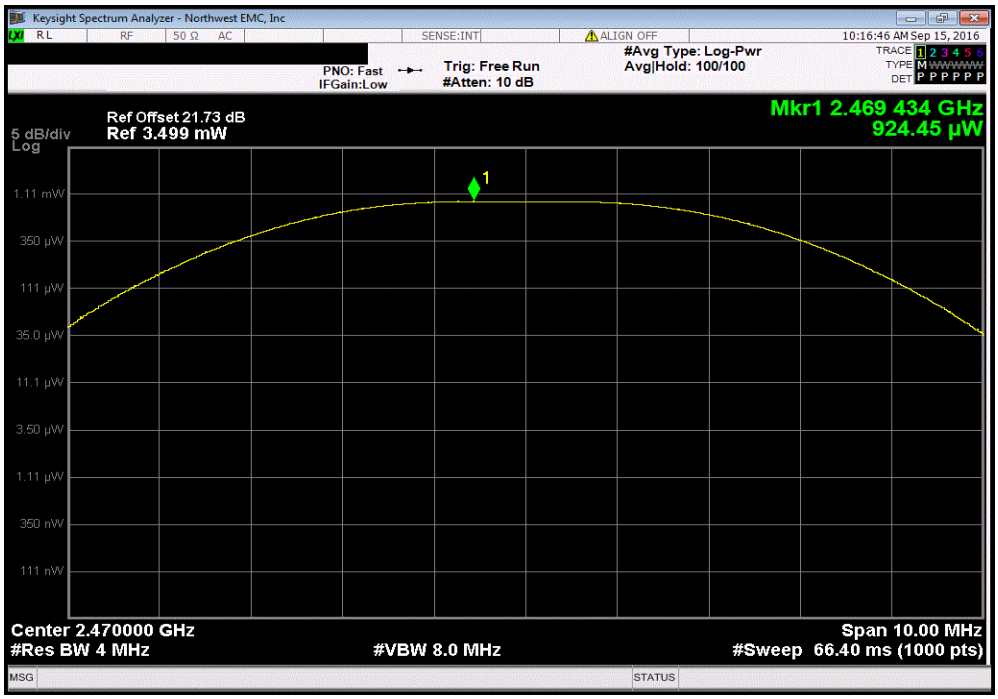
Low Channel, 2405 MHz						
				Value	Limit (<)	Result
				1.161 mW	1 W	Pass



Mid Channel, 2440 MHz						
				Value	Limit (<)	Result
				1.079 mW	1 W	Pass



High Channel, 2470 MHz						
				Value	Limit (<)	Result
				924.45 uW	1 W	Pass



OUTPUT POWER

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

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 ANSI C63.10:2013 Section 11.9.2.2.4 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio..

OUTPUT POWER

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_DWS#2			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.2 °C
Attendees:	None			**Humidity:**	46.9% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 5dBm setting.

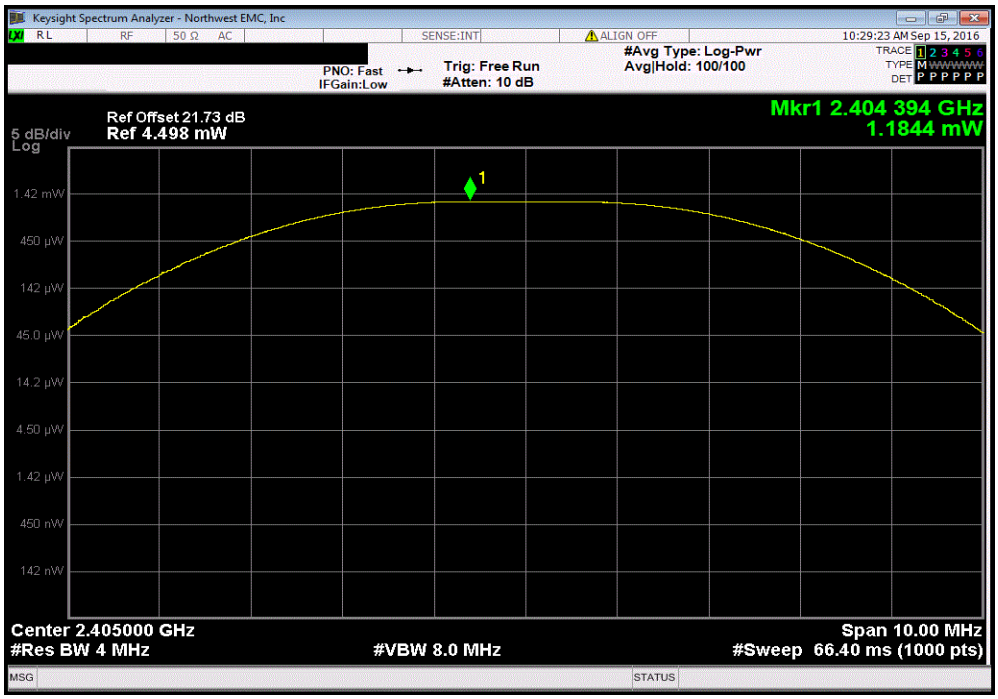
DEVIATIONS FROM TEST STANDARD

None

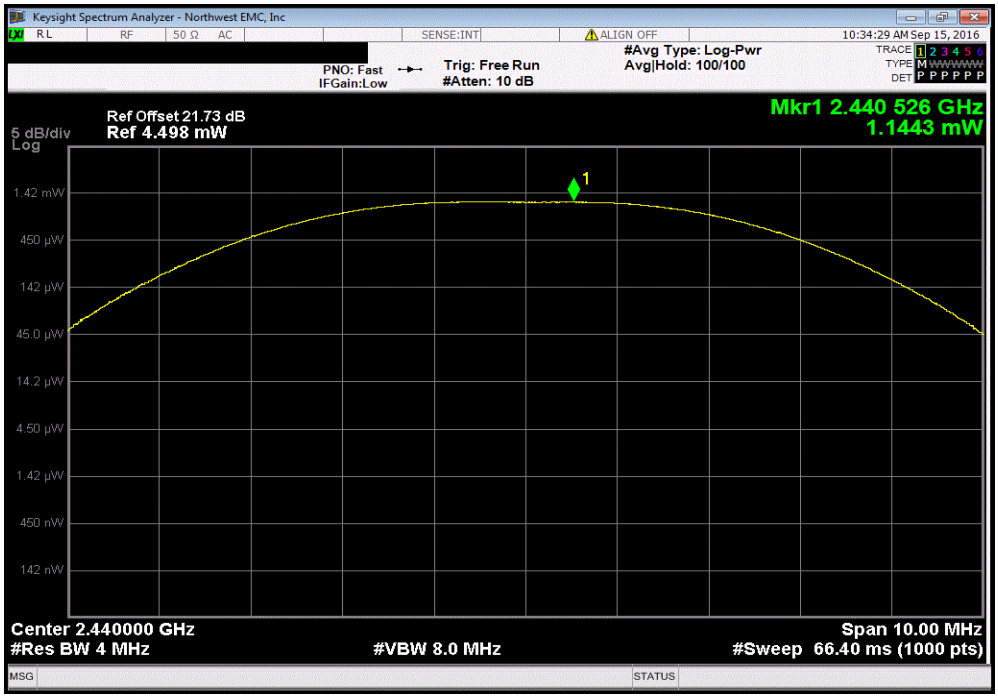
Configuration #	2	Signature	Jonathan Kiefer

	Value	Limit (<)	Result
Low Channel, 2405 MHz	1.184 mW	1 W	Pass
Mid Channel, 2440 MHz	1.144 mW	1 W	Pass
High Channel, 2470 MHz	1.185 mW	1 W	Pass

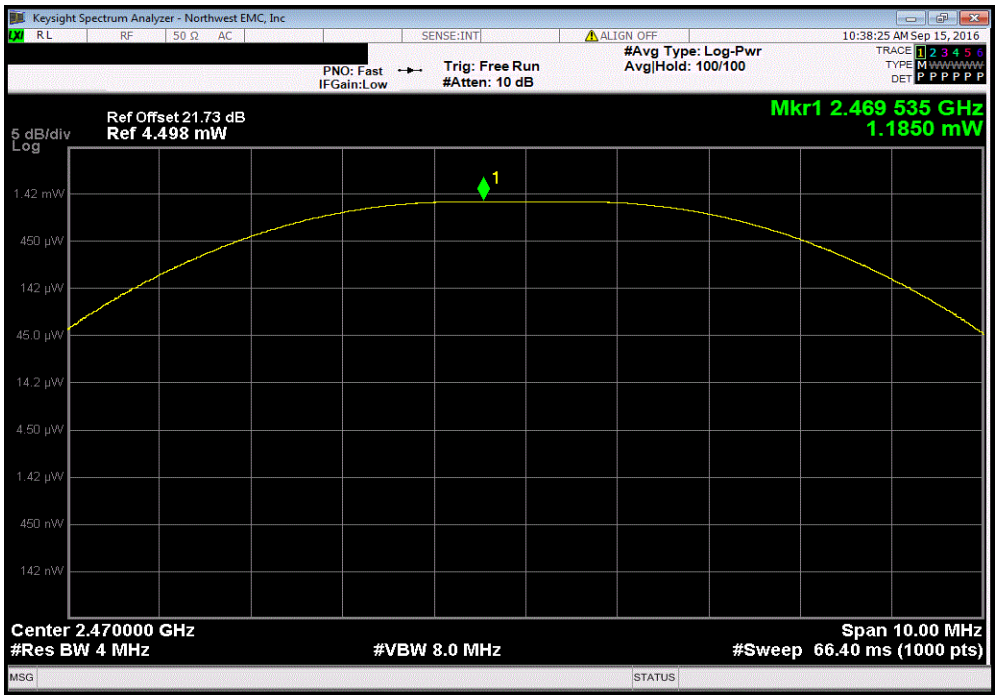
Low Channel, 2405 MHz						
				Value	Limit (<)	Result
				1.184 mW	1 W	Pass



Mid Channel, 2440 MHz						
				Value	Limit (<)	Result
				1.144 mW	1 W	Pass



High Channel, 2470 MHz						
				Value	Limit (<)	Result
				1.185 mW	1 W	Pass



POWER SPECTRAL DENSITY

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_MOT002			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.3 °C
Attendees:	None			**Humidity:**	46.7% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 2dBm setting.

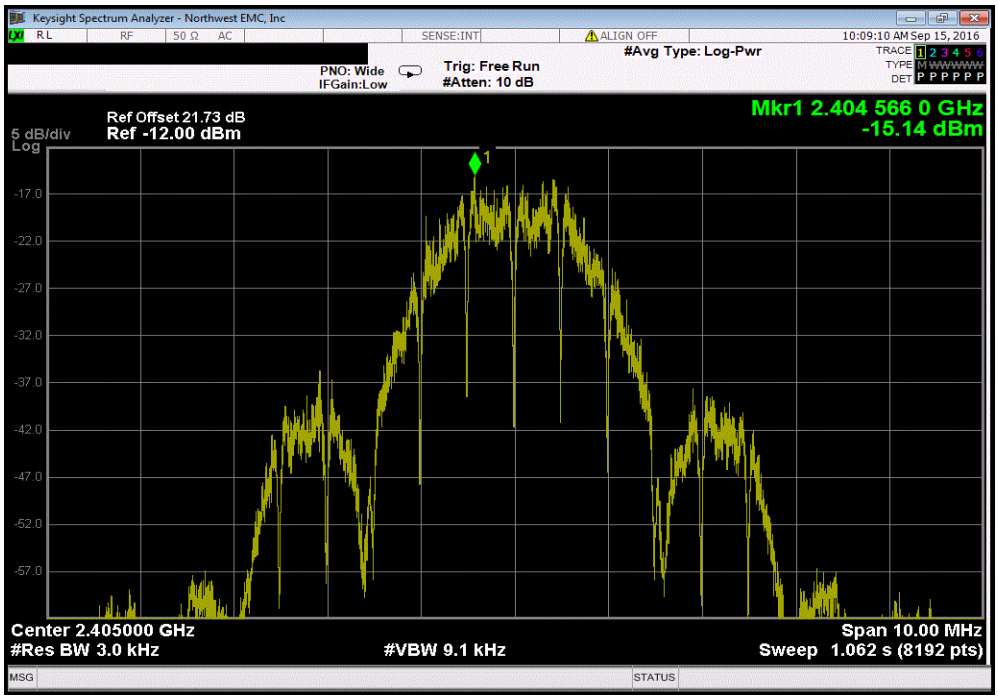
DEVIATIONS FROM TEST STANDARD

None

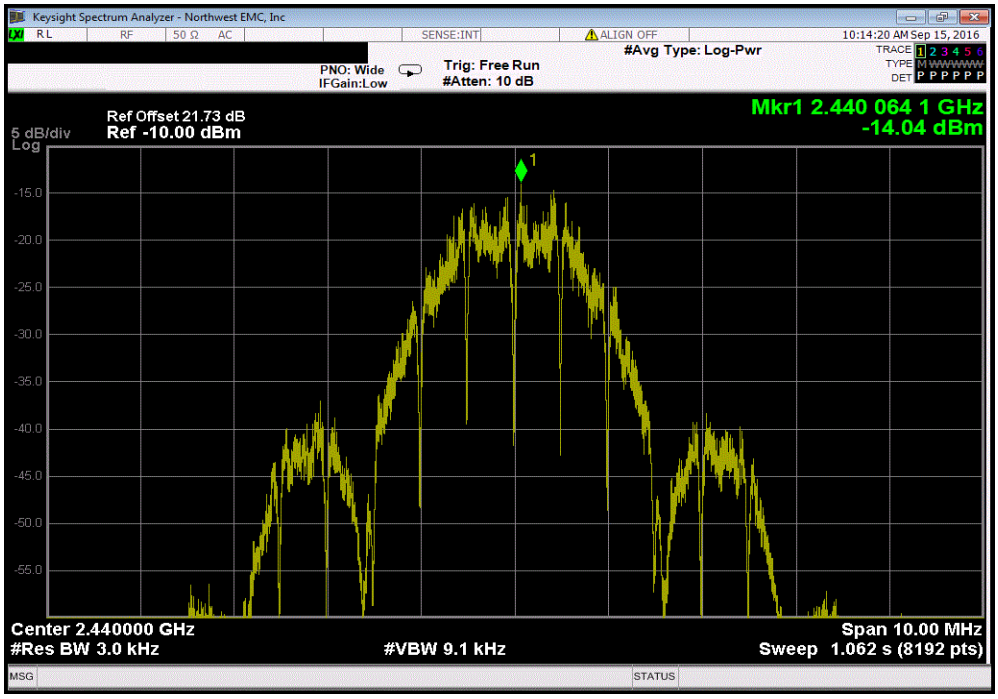
Configuration #	1	Signature	Jonathan Kiefer

	Value dBm/3kHz	Limit < dBm/3kHz	Results
Low Channel, 2405 MHz	-15.143	8	Pass
Mid Channel, 2440 MHz	-14.039	8	Pass
High Channel, 2470 MHz	-15.379	8	Pass

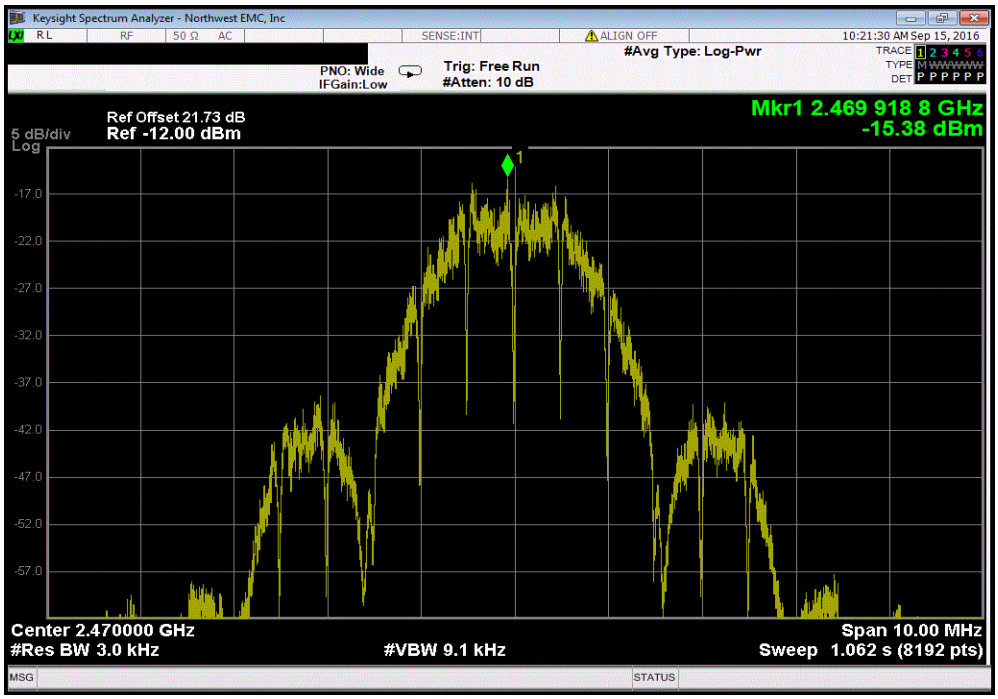
Low Channel, 2405 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-15.143	8	Pass



Mid Channel, 2440 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.039	8	Pass



High Channel, 2470 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-15.379	8	Pass



POWER SPECTRAL DENSITY

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

NORTHWEST EMC

XMit 2016.05.06

EUT:	FCC_Test_DWS#2			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.2 °C
Attendees:	None			**Humidity:**	46.9% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 5dBm setting.

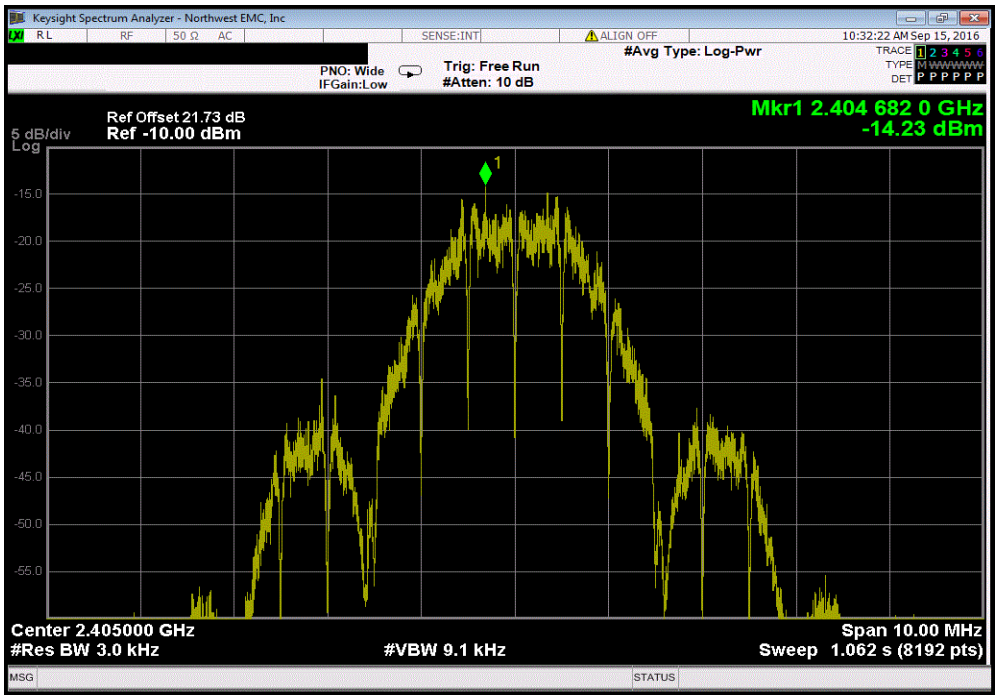
DEVIATIONS FROM TEST STANDARD

None

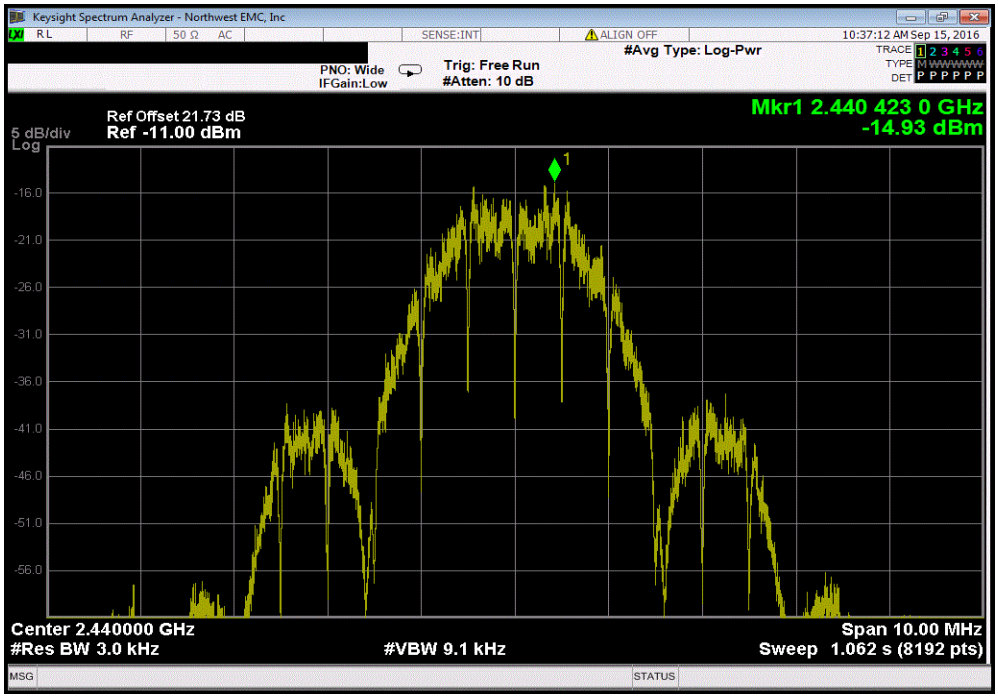
Configuration #	2	Signature	Jonathan Kiefer

	Value dBm/3kHz	Limit < dBm/3kHz	Results
Low Channel, 2405 MHz	-14.228	8	Pass
Mid Channel, 2440 MHz	-14.933	8	Pass
High Channel, 2470 MHz	-14.382	8	Pass

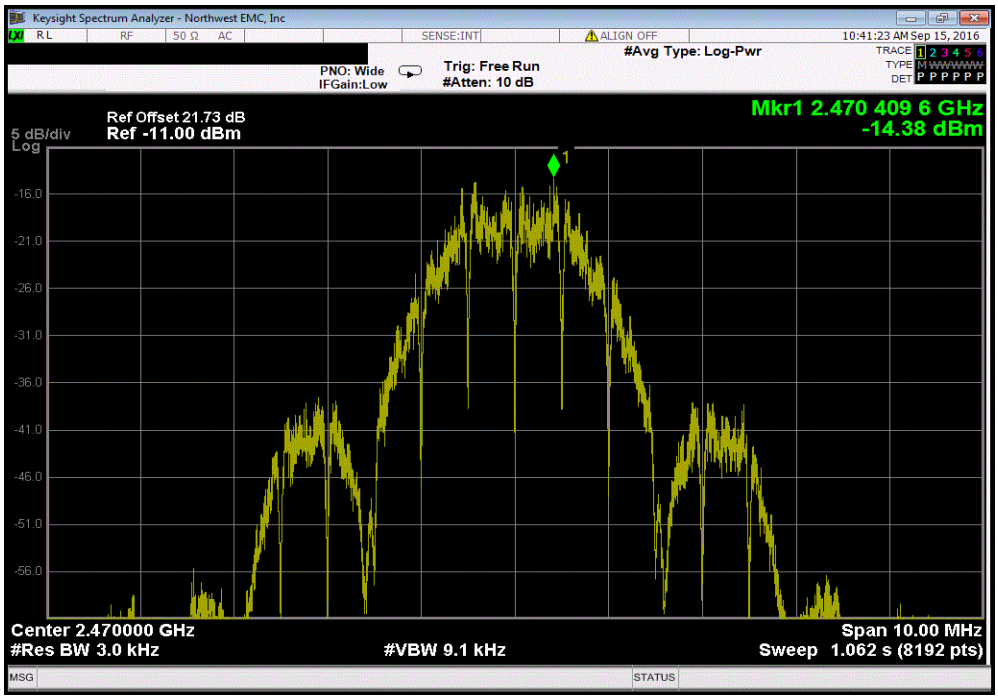
Low Channel, 2405 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.228	8	Pass



Mid Channel, 2440 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.933	8	Pass



High Channel, 2470 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-14.382	8	Pass



BAND EDGE COMPLIANCE

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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 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 2016.05.06

EUT:	FCC_Test_MOT002			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.6 °C
Attendees:	None			**Humidity:**	46.5% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 2dBm setting.

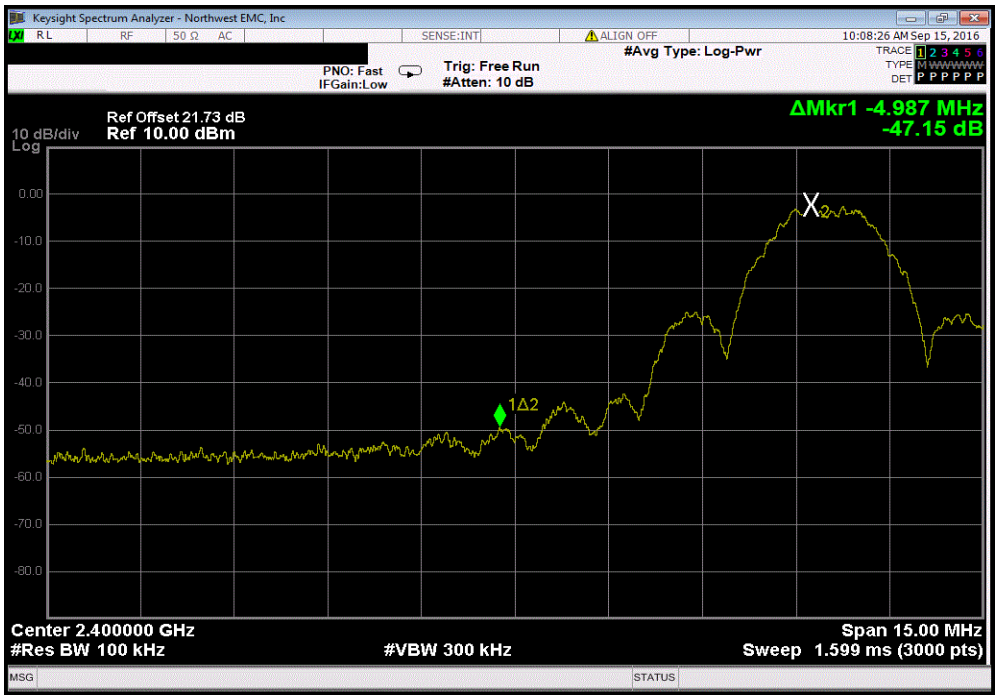
DEVIATIONS FROM TEST STANDARD

None

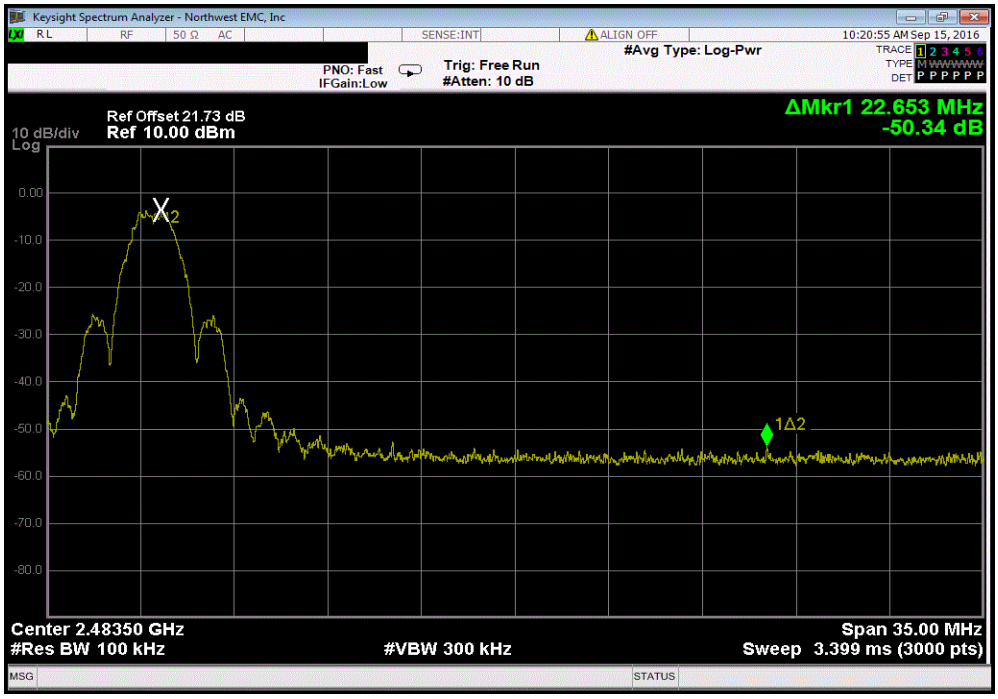
Configuration #	1	Signature Jonathan Kiefer

	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2405 MHz	-47.15	-20	Pass
High Channel, 2470 MHz	-50.34	-20	Pass

Low Channel, 2405 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.15	-20	Pass



High Channel, 2470 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.34	-20	Pass



BAND EDGE COMPLIANCE

XMit 2016.05.06

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.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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 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 2016.05.06

EUT:	FCC_Test_DWS#2			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23 °C
Attendees:	None			**Humidity:**	47.4% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 5dBm setting.

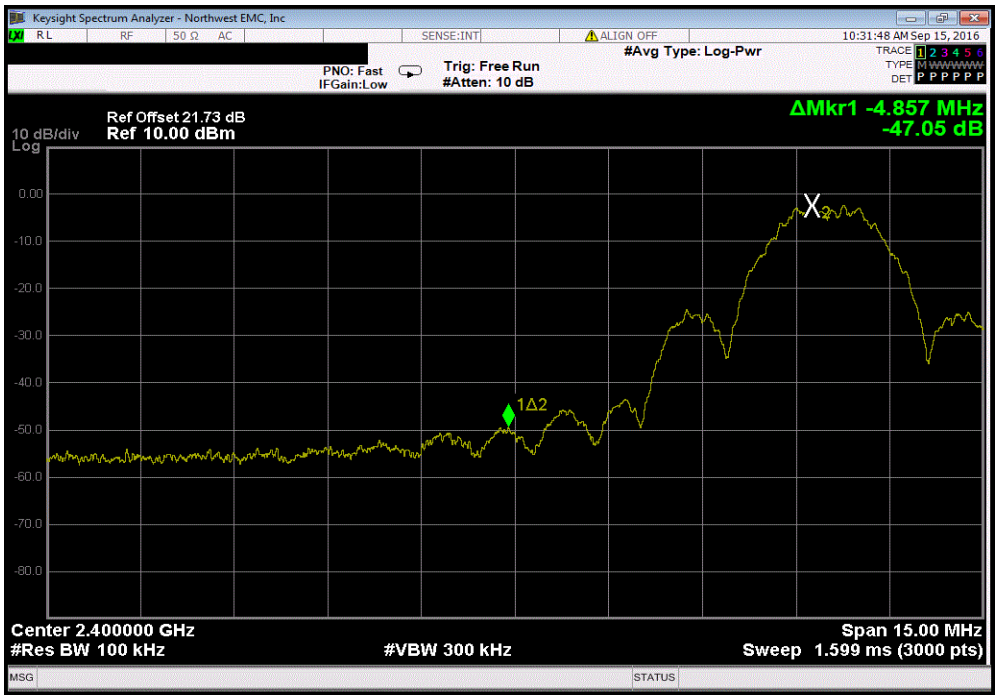
DEVIATIONS FROM TEST STANDARD

None

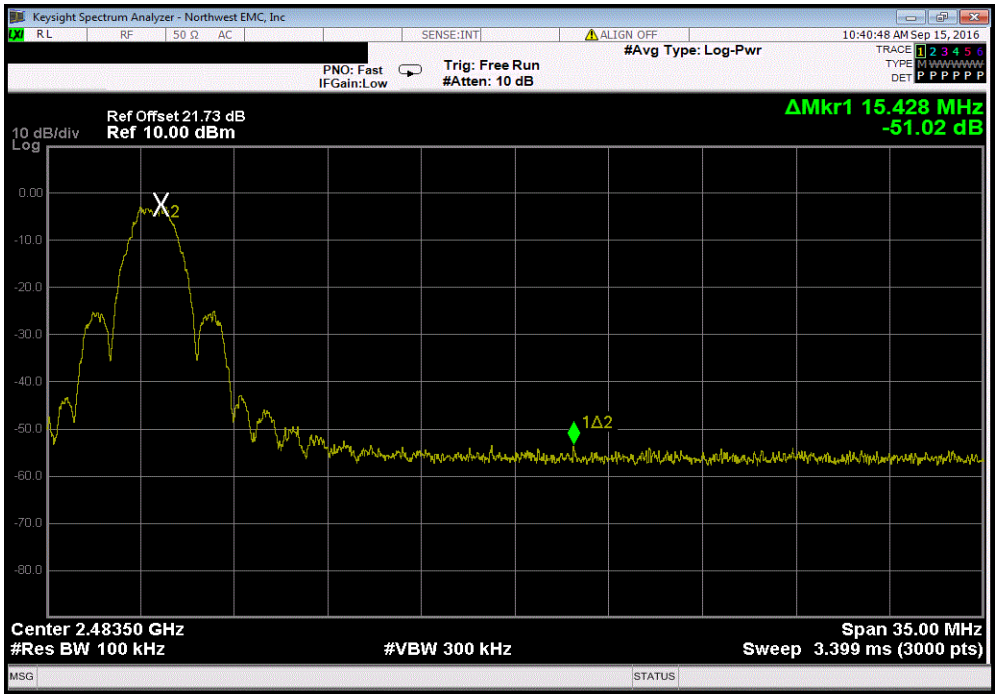
Configuration #	2	Signature Jonathan Kiefer

	Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2405 MHz	-47.06	-20	Pass
High Channel, 2470 MHz	-51.02	-20	Pass

Low Channel, 2405 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.06	-20	Pass



High Channel, 2470 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-51.02	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2016.05.06

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. 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 2016.05.06

EUT:	FCC_Test_MOT002			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.1 °C
Attendees:	None			**Humidity:**	46.7% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 2dBm setting.

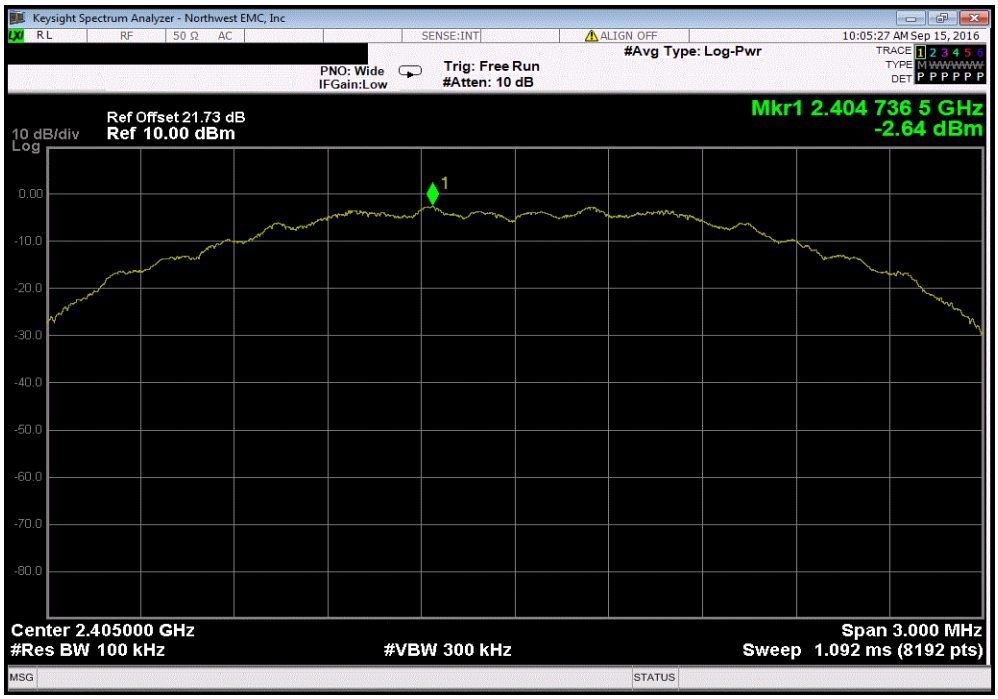
DEVIATIONS FROM TEST STANDARD

None

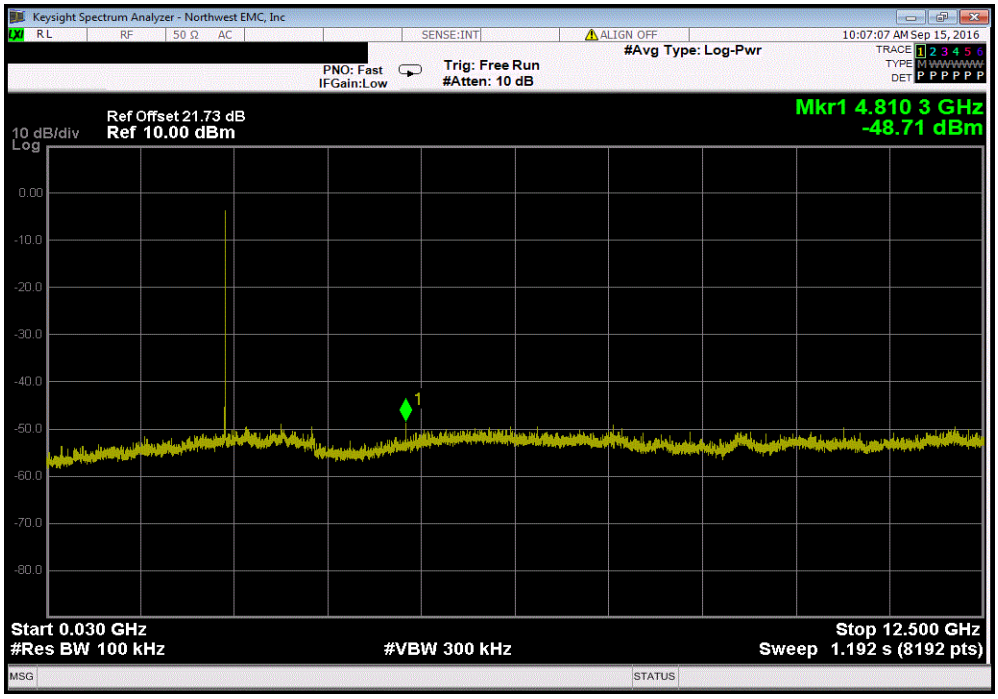
Configuration #	1	Signature	Jonathan Kiefer

	Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2405 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2405 MHz	30 MHz - 12.5 GHz	-46.07	-20	Pass
Low Channel, 2405 MHz	12.5 GHz - 25 GHz	-35.03	-20	Pass
Mid Channel, 2440 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	-46.64	-20	Pass
Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	-35.9	-20	Pass
High Channel, 2470 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2470 MHz	30 MHz - 12.5 GHz	-44.99	-20	Pass
High Channel, 2470 MHz	12.5 GHz - 25 GHz	-35.35	-20	Pass

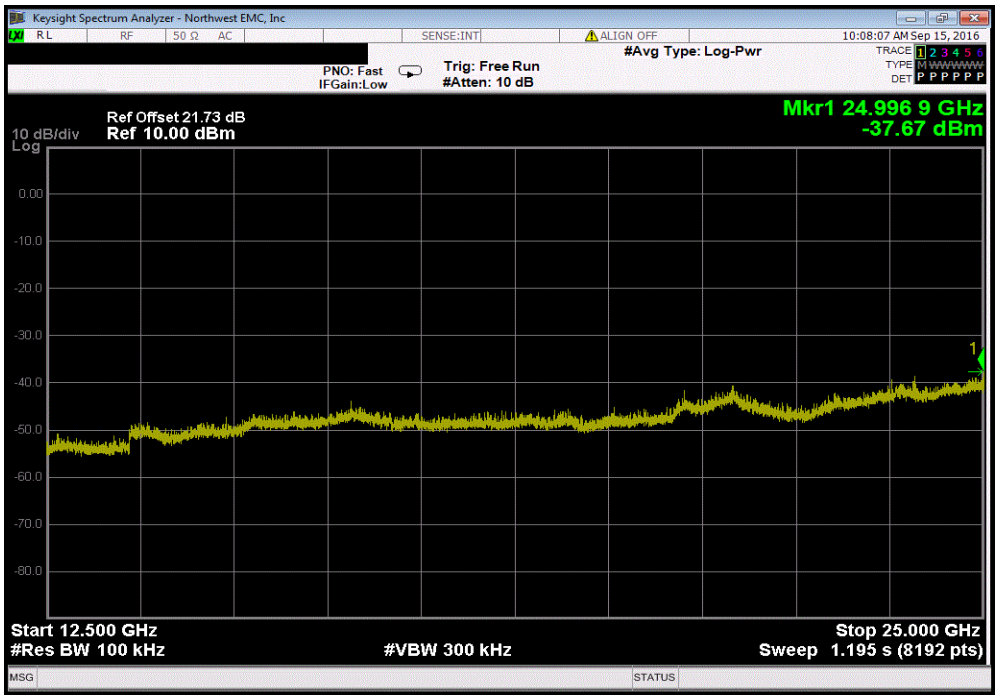
Low Channel, 2405 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



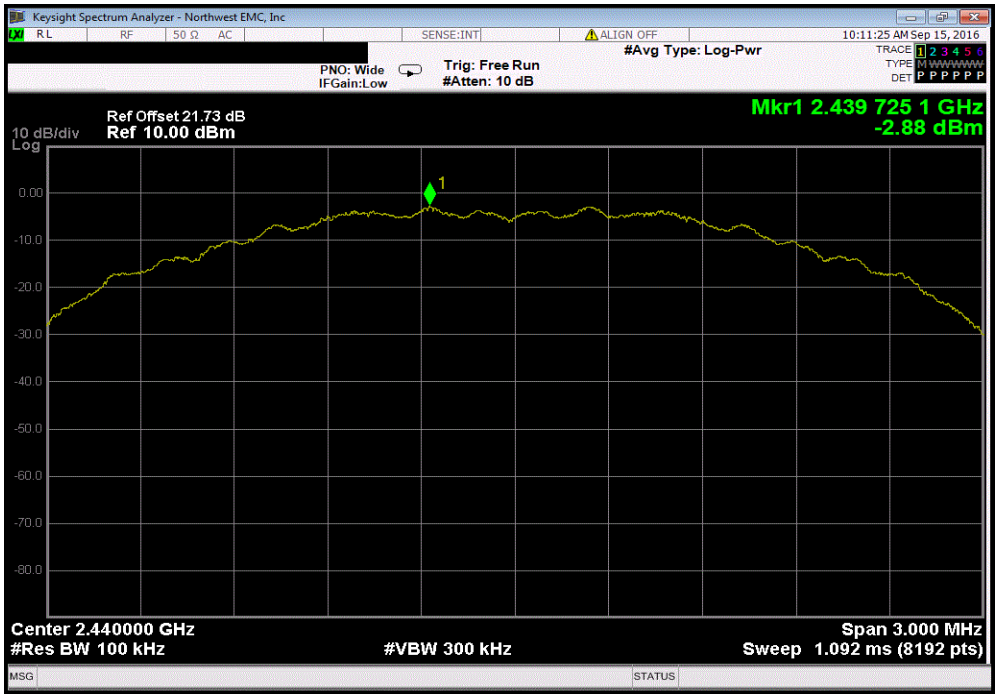
Low Channel, 2405 MHz					
Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz			-46.07	-20	Pass



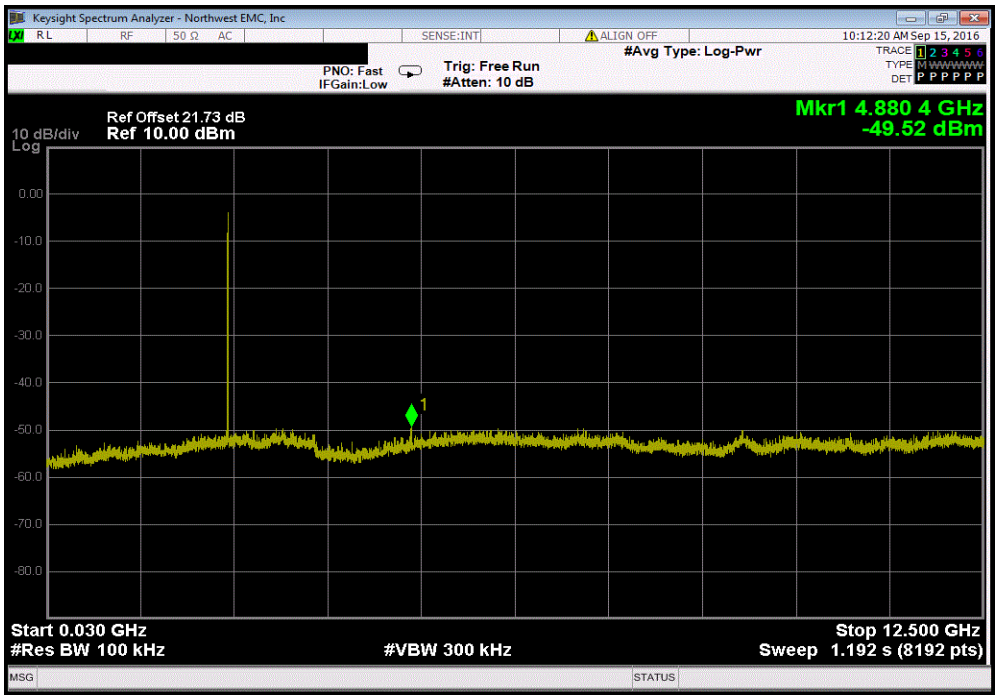
Low Channel, 2405 MHz					
Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz			-35.03	-20	Pass



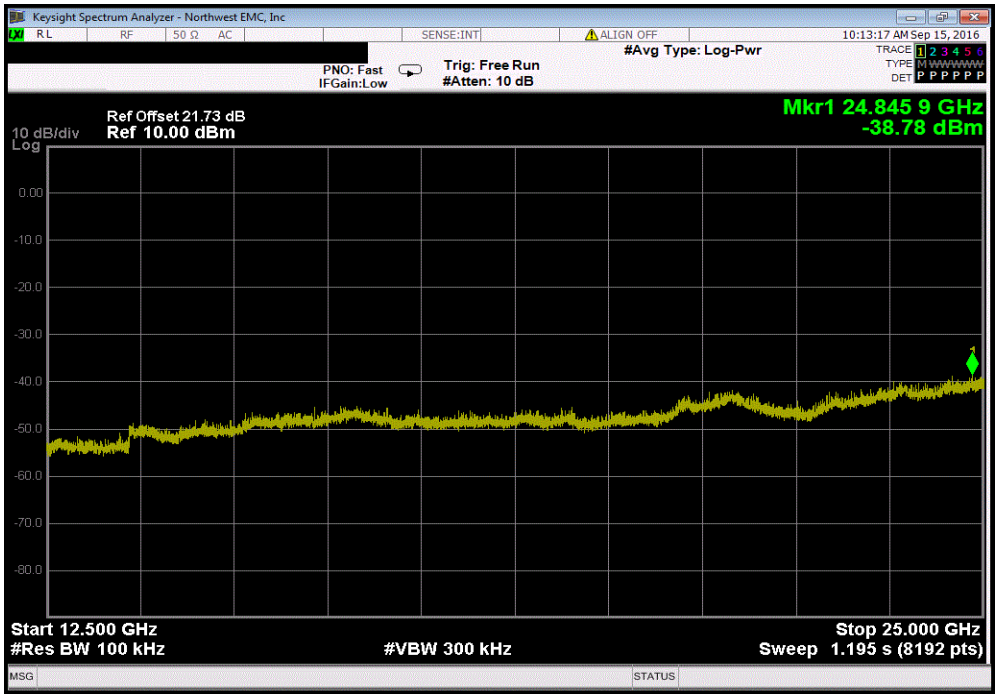
Mid Channel, 2440 MHz						
Frequency Range				Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



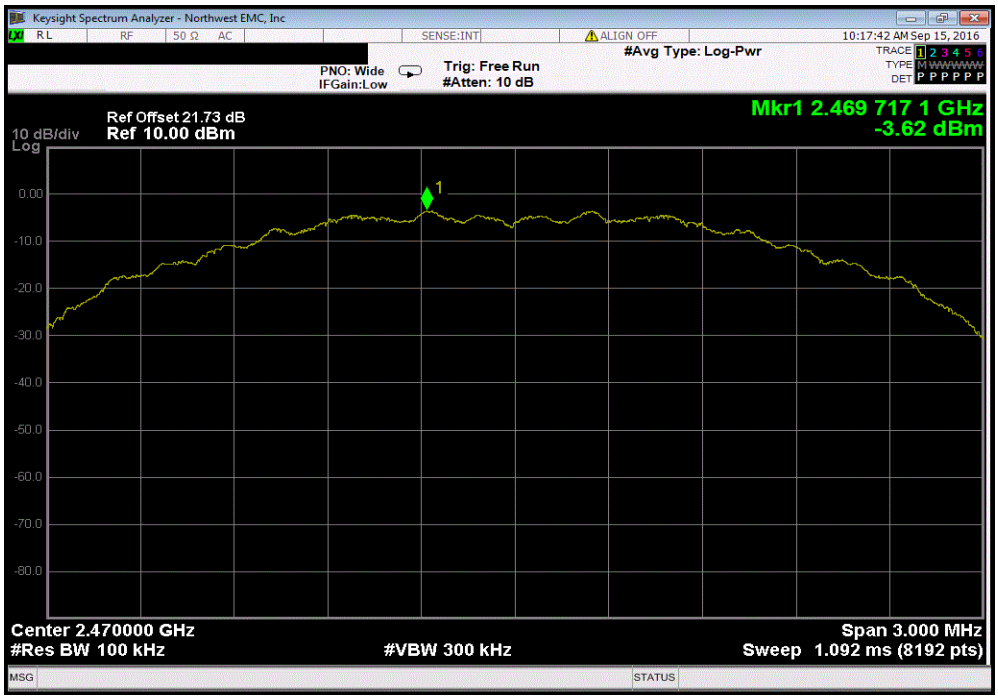
Mid Channel, 2440 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-46.64	-20	Pass



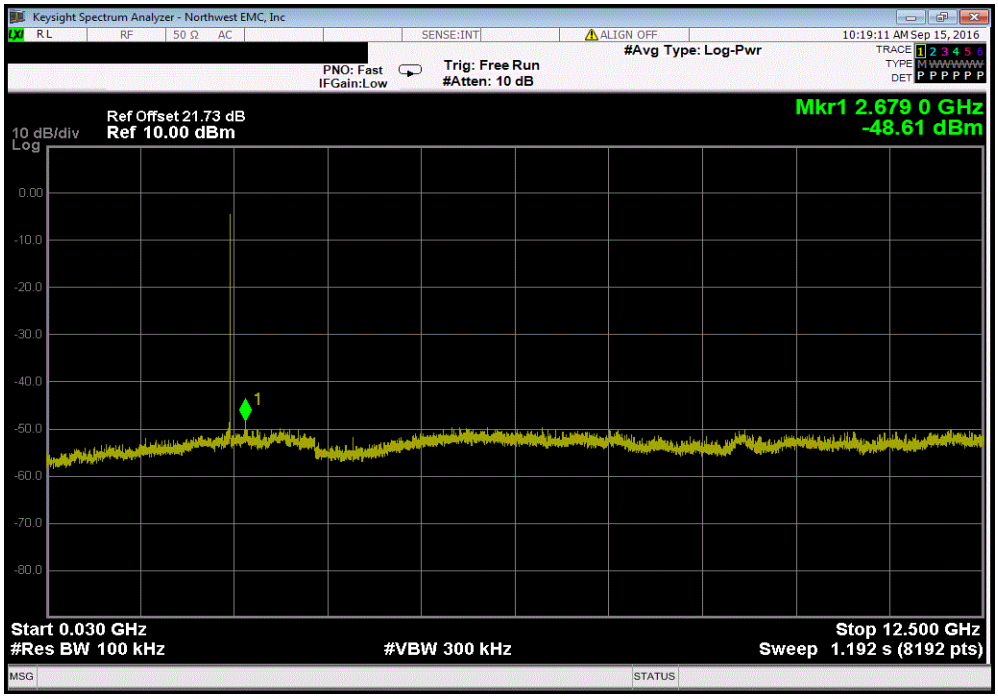
Mid Channel, 2440 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-35.9	-20	Pass



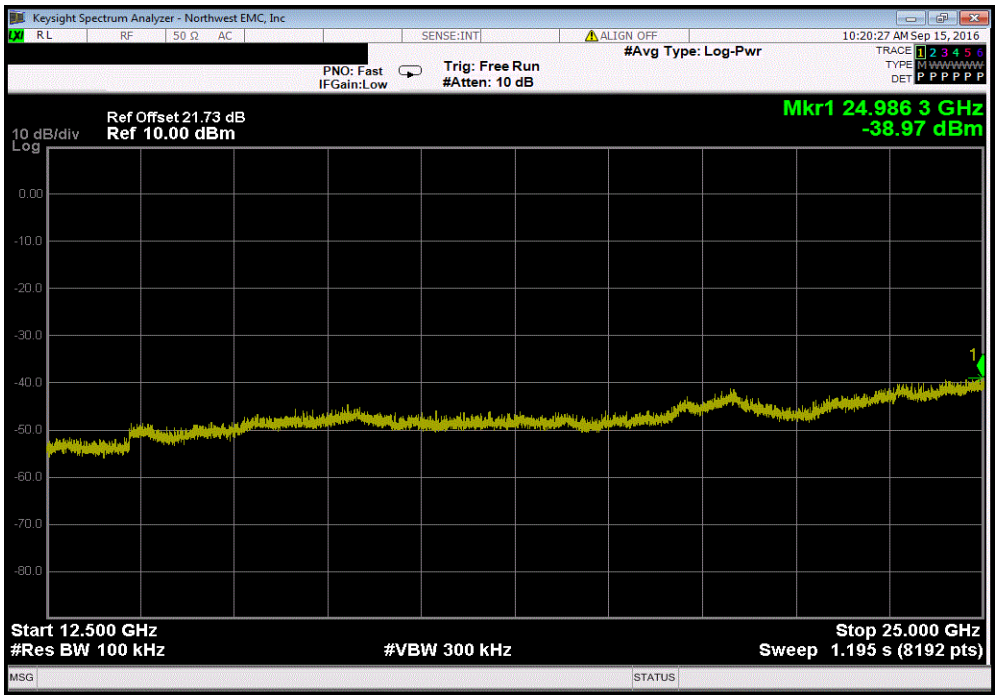
High Channel, 2470 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



High Channel, 2470 MHz					
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-44.99	-20	Pass



High Channel, 2470 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-35.35	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2016.05.06

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Cable	Fairview Microwave	SCK0963-60	TXF	11/3/2015	11/3/2016
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	3/15/2017

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. 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 2016.05.06

EUT:	FCC_Test_DWS#2			**Work Order:**	ELEM0006
Serial Number:	None			**Date:**	09/15/16
Customer:	Centrica Connected Home Ltd			**Temperature:**	23.3 °C
Attendees:	None			**Humidity:**	47.1% RH
Project:	None			**Barometric Pres.:**	1021 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2016	ANSI C63.10:2013

COMMENTS

TX Power 5dBm setting.

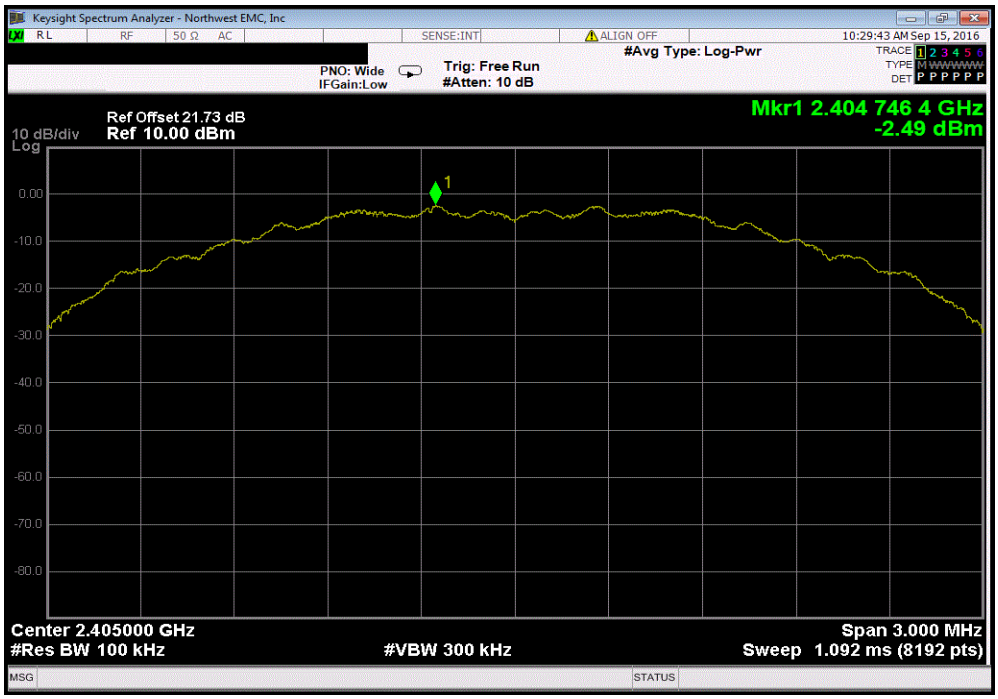
DEVIATIONS FROM TEST STANDARD

None

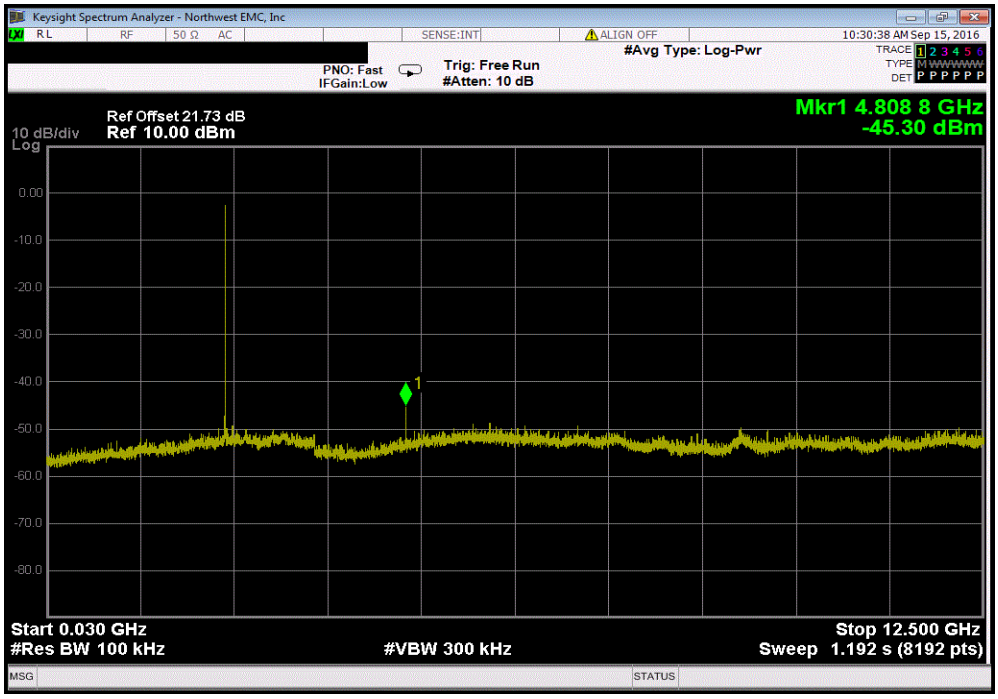
Configuration #	2	Signature	Jonathan Kiefer

	Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 2405 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2405 MHz	30 MHz - 12.5 GHz	-42.81	-20	Pass
Low Channel, 2405 MHz	12.5 GHz - 25 GHz	-36.45	-20	Pass
Mid Channel, 2440 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2440 MHz	30 MHz - 12.5 GHz	-43.35	-20	Pass
Mid Channel, 2440 MHz	12.5 GHz - 25 GHz	-35.85	-20	Pass
High Channel, 2470 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2470 MHz	30 MHz - 12.5 GHz	-45.49	-20	Pass
High Channel, 2470 MHz	12.5 GHz - 25 GHz	-35.46	-20	Pass

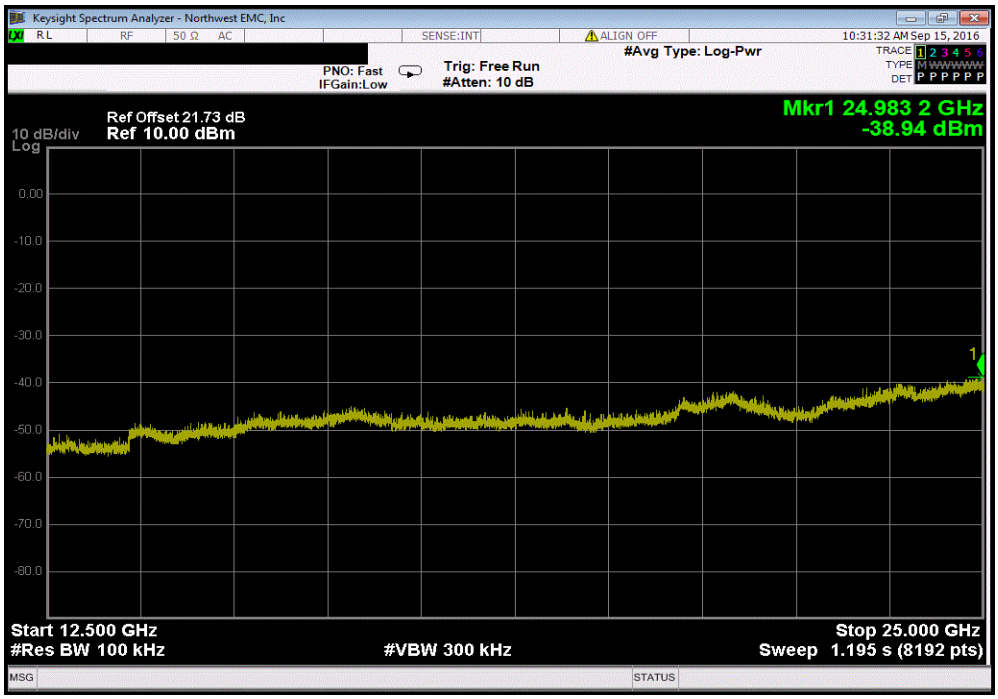
Low Channel, 2405 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



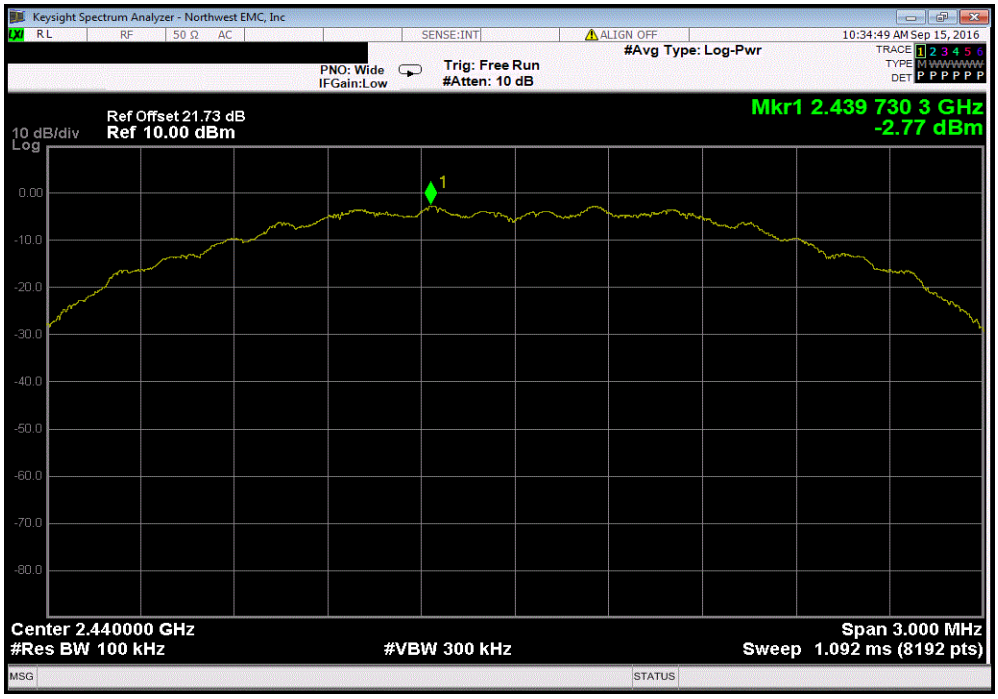
Low Channel, 2405 MHz					
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-42.81	-20	Pass



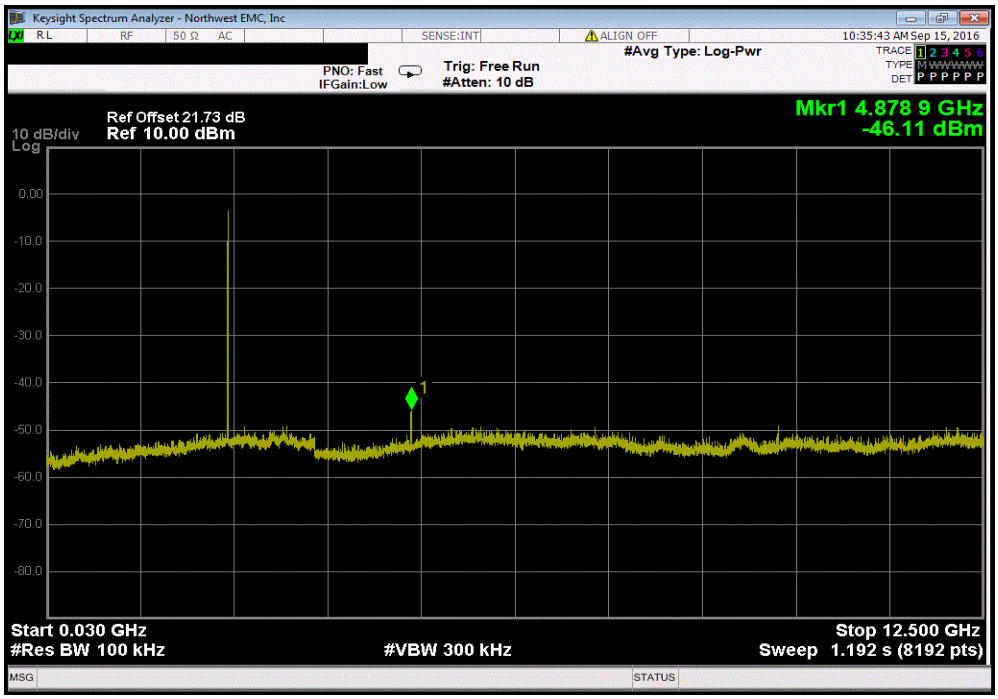
Low Channel, 2405 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-36.45	-20	Pass



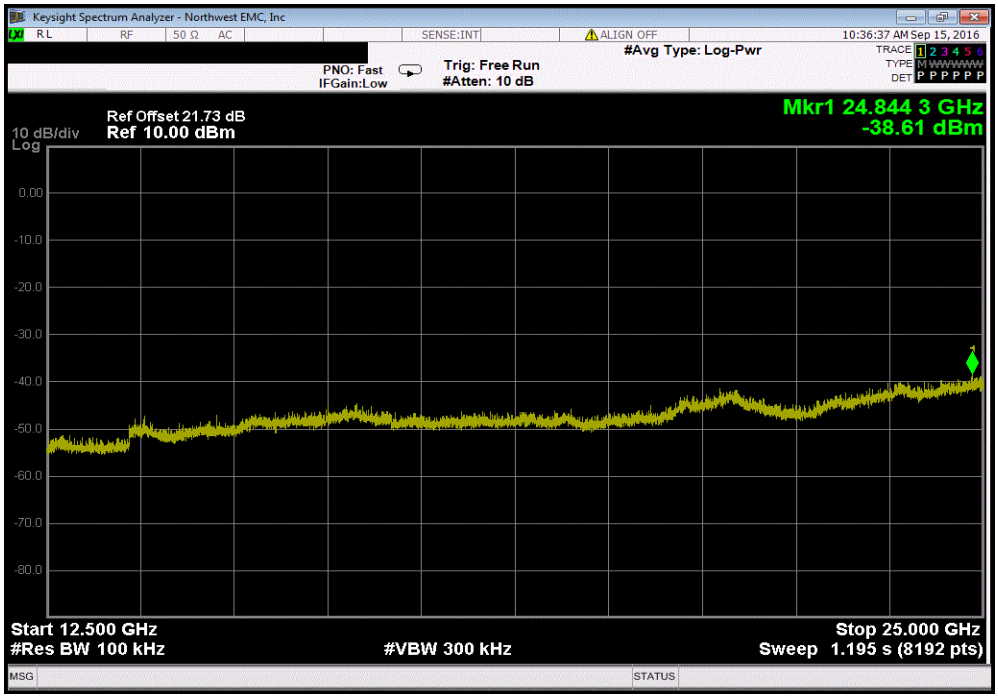
Mid Channel, 2440 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



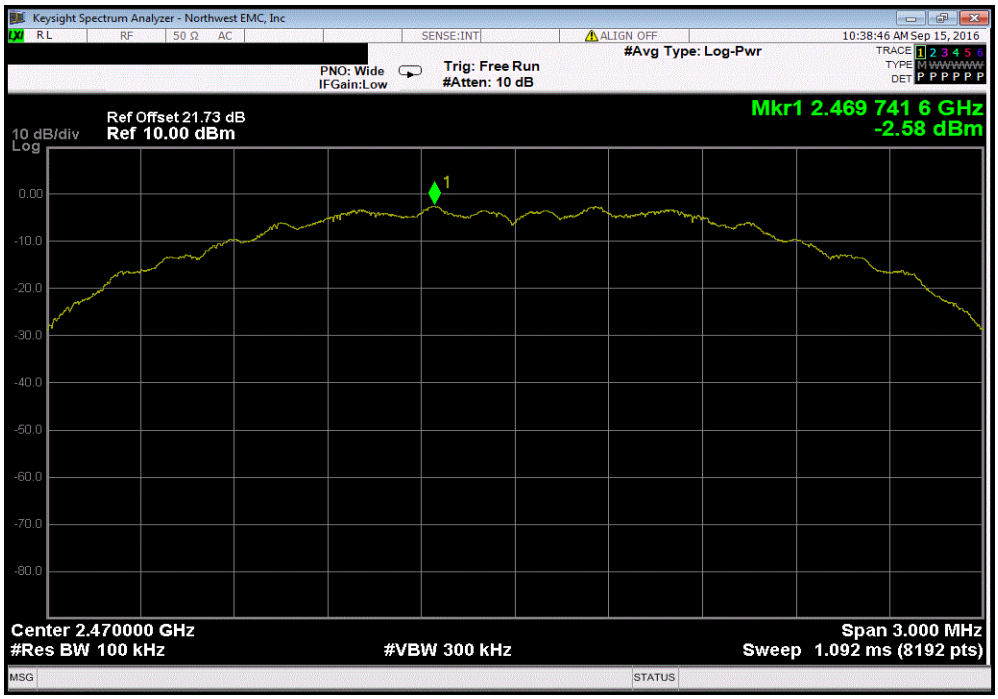
Mid Channel, 2440 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-43.35	-20	Pass



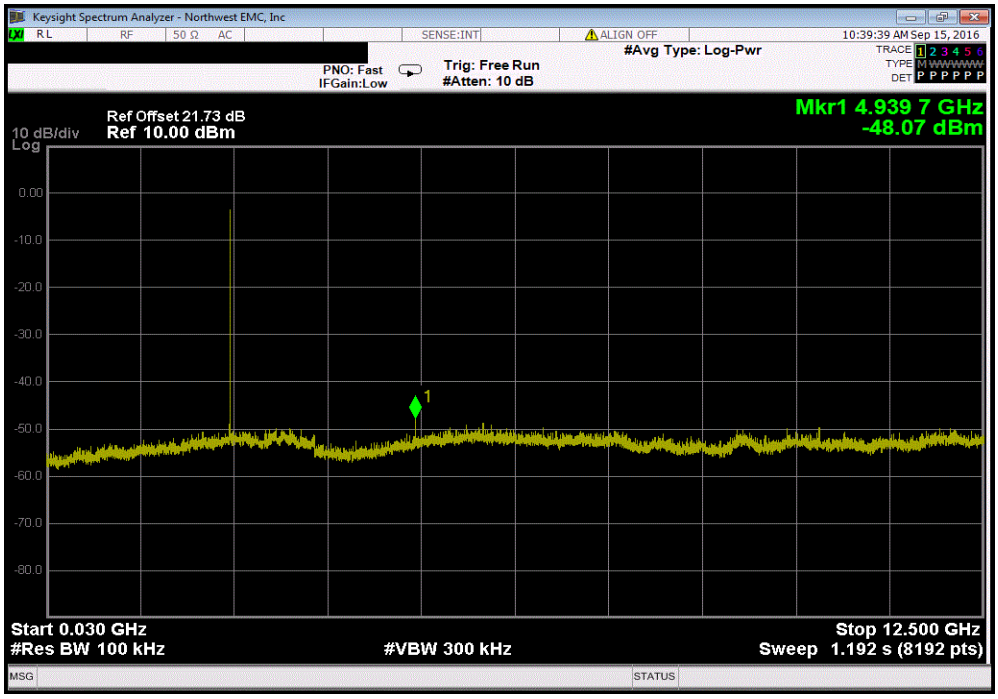
Mid Channel, 2440 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-35.85	-20	Pass



High Channel, 2470 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



High Channel, 2470 MHz					
Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz			-45.49	-20	Pass



High Channel, 2470 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-35.46	-20	Pass