NORTHWEST EMC

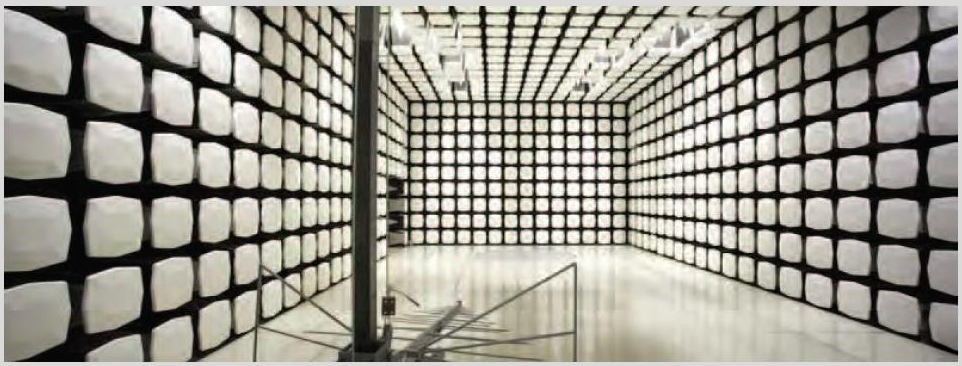
Remote Technologies, Inc.

XP-4 Advanced Control Processor

FCC 15.247:2016

2.4 GHz Zigbee Radio

Report # REMT0021.1



NVLAP TESTING

NVLAP Lab Code: 200676-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: December 15, 2016
Remote Technologies, Inc.
Model: XP-4 Advanced Control Processor

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2016	ANSI C63.10:2013
FCC 15.247:2016	KDB 558074

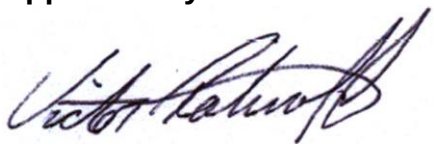
Results

Method Clause	Test Description	Applied	Results	Comments
6.2	AC - Powerline Conducted Emissions	Yes	Pass	
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	
11.9.1.1	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:



Victor Ratinoff, 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.

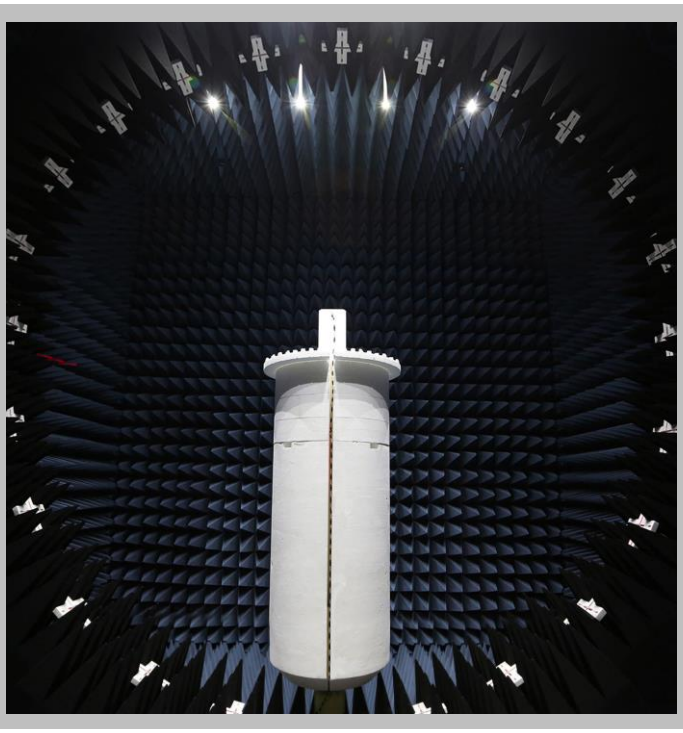
SCOPE

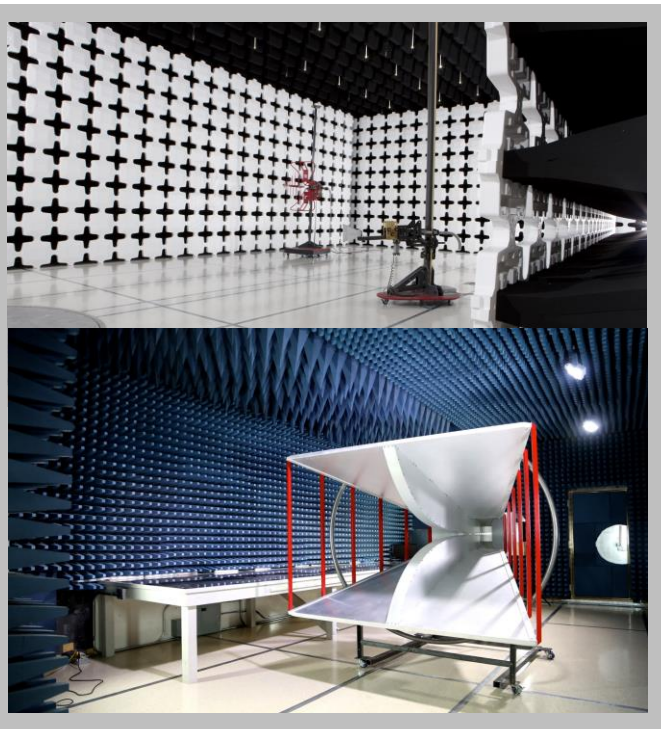
For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

FACILITIES

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





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.

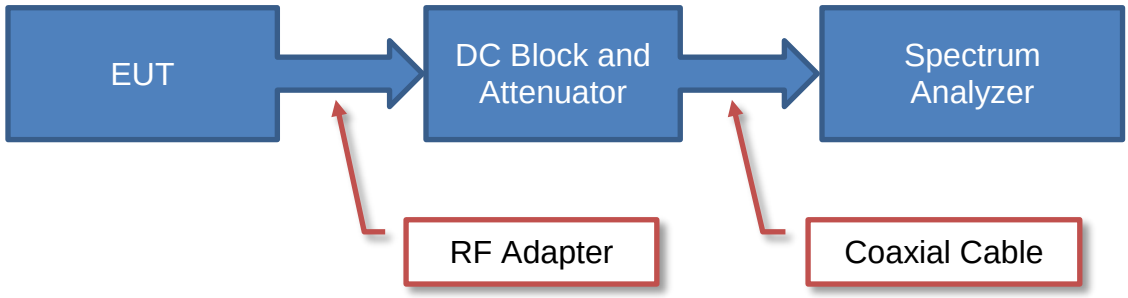
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

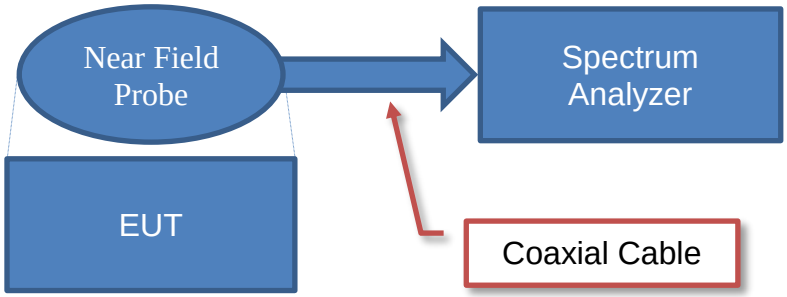
Test Setup Block Diagrams

NORTHWEST EMC
REV 2016.10.04

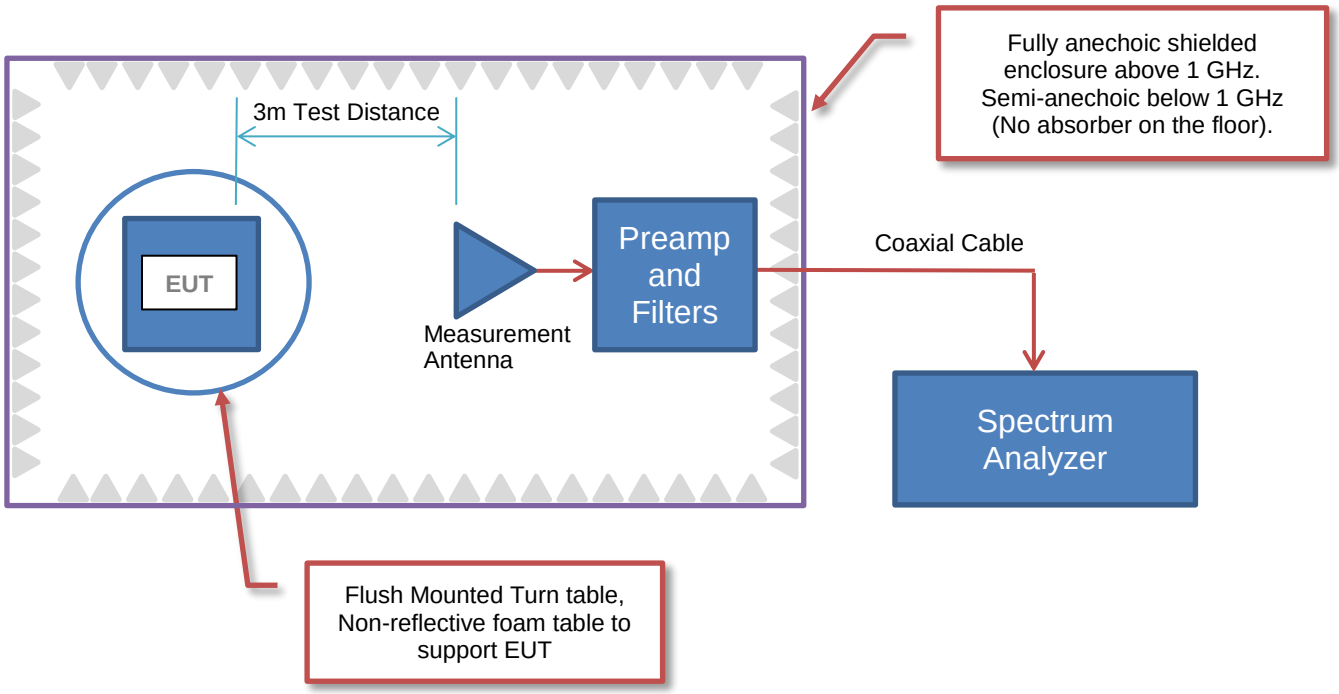
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

NORTHWEST EMC
2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Remote Technologies, Inc.
Address:	5775 12th Avenue East, Suite 180
City, State, Zip:	Shakopee, MN 55379
Test Requested By:	Mark Melville
Model:	XP-4 Advanced Control Processor
First Date of Test:	December 08, 2016
Last Date of Test:	December 15, 2016
Receipt Date of Samples:	September 06, 2016
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

The XP-4 Control Processor communicates between RTI handheld remote controllers or RTI in-wall controllers and other manufacturers' equipment, such as audio/video devices, security systems, HVAC and other electronic devices.

The XP-4 utilizes a 2.4 GHz Zigbee transceiver and external, ½ wavelength antenna.

Testing Objective:

To demonstrate compliance of the 2.4 GHz Zigbee radio to FCC 15.247 requirements.

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration REMT0021- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Advanced Control Processor	Remote Technologies, Inc.	XP-4	REVD1
AC Adapter (ACP)	Remote Technologies, Inc.	KSAS0101200100D5	None
Antenna	Bobbintron Electrical Corp.	SA-006-01	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Monitor	Unknown	ADVANCE V1430	None
AC Adapter (Monitor)	TPi	TSA3-120200-1	T15W11 30-003376
IR Emitters	Remote Technologies, Inc.	vIRsa Mouse IR Emitter	None
IR Emitters	Remote Technologies, Inc.	vIRsa Mouse IR Emitter	None
IR Emitters	Remote Technologies, Inc.	vIRsa Mouse IR Emitter	None
IR Emitters	Remote Technologies, Inc.	vIRsa Mouse IR Emitter	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Lenovo Laptop	Lenovo	YDN0B5904001	YD00Q79
AC Adapter Laptop	Lenovo	ADS-25SGP-06 05020E	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cable (Monitor)	No	1.8m	No	Monitor	AC Adapter (Monitor)
AC Cable (Monitor)	No	1.3m	No	AC Adapter (Monitor)	AC Mains
HDMI Cable	Yes	1.0m	No	Advanced Control Processor	Monitor
HDMI Cable	Yes	1.5m	No	Advanced Control Processor	Unterminated
HDMI Cable	Yes	1.5m	No	Advanced Control Processor	Unterminated
Ethernet Cable	No	1.8m	No	Advanced Control Processor	Unterminated
Ethernet Cable	No	1.8m	No	Advanced Control Processor	Unterminated
Ethernet Cable	No	1.8m	No	Advanced Control Processor	Unterminated
DC Cable (ACP)	No	1.8m	Yes	Advanced Control Processor	AC Mains
IR Cable	No	3.0m	No	Advanced Control Processor	IR Emitters
IR Cable	No	3.0m	No	Advanced Control Processor	IR Emitters
IR Cable	No	3.0m	No	Advanced Control Processor	IR Emitters
IR Cable	No	3.0m	No	Advanced Control Processor	IR Emitters
Phoenix Connectors (6 pin)	No	1.8m	No	Advanced Control Processor	Unterminated
Phoenix Connectors (6 pin)	No	1.8m	No	Advanced Control Processor	Unterminated
Phoenix Connectors (4 pin)	No	1.8m	No	Advanced Control Processor	Unterminated
AC Cable	No	1.5m	Yes	Lenovo Laptop	AC Mains
Ethernet Cable	No	5.0m	No	Advanced Control Processor	Lenovo Laptop

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration REMT0021- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Advanced Control Processor	Remote Technologies, Inc.	XP-4	REVD1
AC Adapter (ACP)	Remote Technologies, Inc.	KSAS0101200100D5	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Lenovo Laptop	Lenovo	YDN0B5904001	YD00Q79
AC Adapter Laptop	Lenovo	ADS-25SGP-06 05020E	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cable (ACP)	No	1.8m	Yes	Advanced Control Processor	AC Mains
AC Cable	No	1.5m	Yes	Lenovo Laptop	AC Mains
Ethernet Cable	No	5.0m	No	Advanced Control Processor	Lenovo Laptop

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	12/8/2016	AC – Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	12/14/2016	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	12/14/2016	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	12/14/2016	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	12/14/2016	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	12/14/2016	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	12/15/2016	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

AC - POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2016.09.09

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARG	6/9/2016	6/9/2017
LISN	Solar Electronics	9252-50-24-BNC	LIA	3/3/2016	3/3/2017
LISN	Solar Electronics	9252-50-24-BNC	LIB	1/29/2016	1/29/2017
Cable - Conducted Cable Assembly	Northwest EMC	OCP, HFP, AWC	OCPA	4/4/2016	4/4/2017

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

REMT0021-2

MODES INVESTIGATED

Transmitting on Mid Channel 18, per client provided Test Configuration document

AC - POWERLINE CONDUCTED EMISSIONS

EUT:	XP-4 Advanced Control Processor	Work Order:	REMT0021
Serial Number:	REVD1	Date:	12/08/2016
Customer:	Remote Technologies, Inc.	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	46.3%
Customer Project:	None	Bar. Pressure:	1026 mb
Tested By:	Johnny Candelas	Job Site:	OC06
Power:	110VAC/60Hz	Configuration:	REMT0021-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	13	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

None

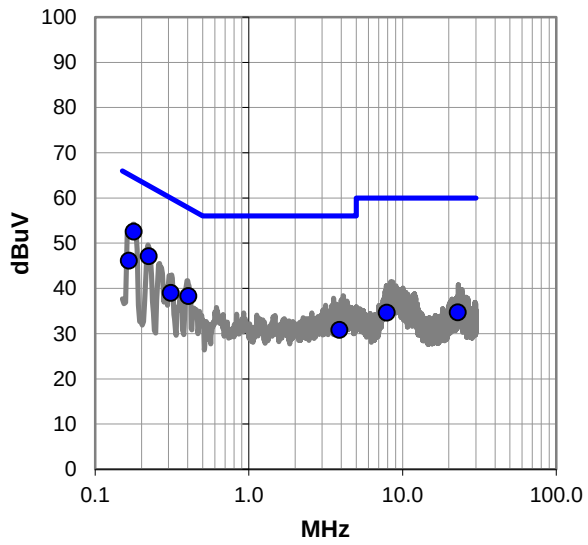
EUT OPERATING MODES

Transmitting on Mid Channel 18, per client provided Test Configuration document

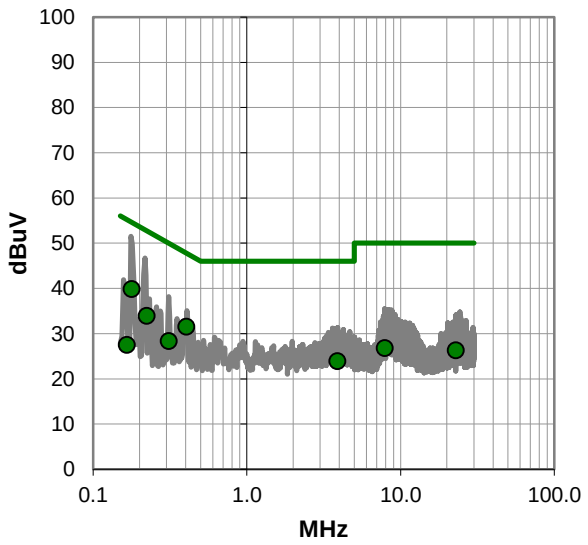
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC - POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2016.09.09

RESULTS - Run #13

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.178	32.3	20.2	52.5	64.6	-12.1
0.223	27.0	20.1	47.1	62.7	-15.6
0.166	25.9	20.2	46.1	65.1	-19.0
0.404	18.3	20.0	38.3	57.8	-19.5
0.311	18.9	20.1	39.0	59.9	-20.9
3.884	10.6	20.2	30.8	56.0	-25.2
22.884	13.3	21.4	34.7	60.0	-25.3
7.898	14.1	20.5	34.6	60.0	-25.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.178	19.6	20.2	39.8	54.6	-14.8
0.404	11.5	20.0	31.5	47.8	-16.3
0.223	13.8	20.1	33.9	52.7	-18.8
0.311	8.2	20.1	28.3	49.9	-21.6
3.884	3.7	20.2	23.9	46.0	-22.1
7.898	6.3	20.5	26.8	50.0	-23.2
22.884	4.9	21.4	26.3	50.0	-23.7
0.166	7.3	20.2	27.5	55.1	-27.6

CONCLUSION

Pass

Tested By

AC - POWERLINE CONDUCTED EMISSIONS

EUT:	XP-4 Advanced Control Processor	Work Order:	REMT0021
Serial Number:	REVD1	Date:	12/08/2016
Customer:	Remote Technologies, Inc.	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	46.3%
Customer Project:	None	Bar. Pressure:	1026 mb
Tested By:	Johnny Candelas	Job Site:	OC06
Power:	110VAC/60Hz	Configuration:	REMT0021-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	14	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

None

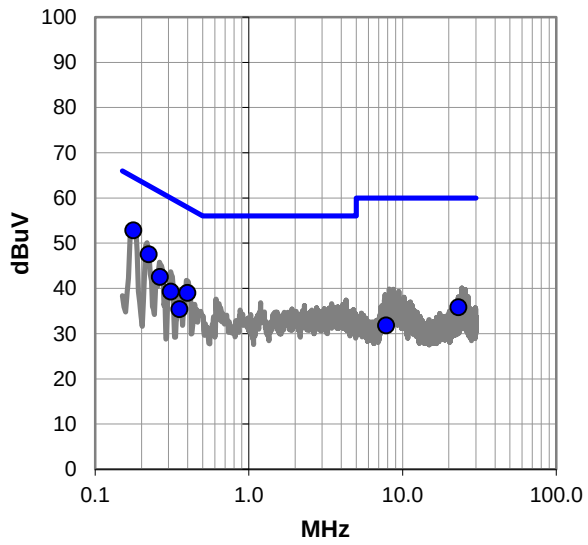
EUT OPERATING MODES

Transmitting on Mid Channel 18, per client provided Test Configuration document

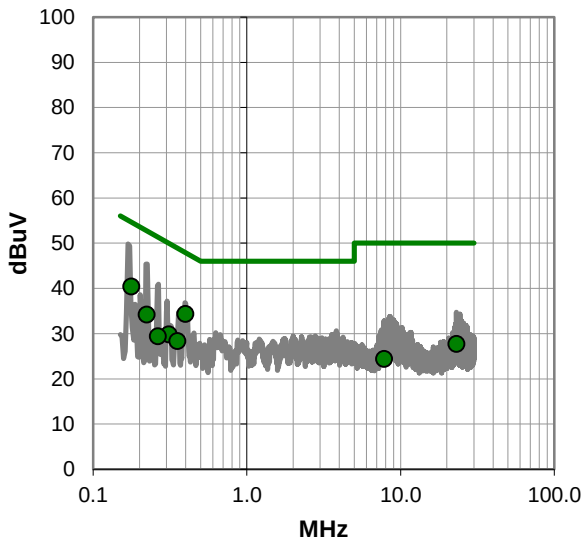
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC - POWERLINE CONDUCTED EMISSIONS

NORTHWEST EMC
WTD.2016.09.09

RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.178	32.6	20.2	52.8	64.6	-11.8
0.223	27.4	20.1	47.5	62.7	-15.2
0.265	22.4	20.1	42.5	61.3	-18.8
0.399	19.0	20.0	39.0	57.9	-18.9
0.311	19.2	20.1	39.3	59.9	-20.6
0.353	15.4	20.0	35.4	58.9	-23.5
23.128	14.4	21.4	35.8	60.0	-24.2
7.816	11.3	20.5	31.8	60.0	-28.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.399	14.3	20.0	34.3	47.9	-13.6
0.178	20.2	20.2	40.4	54.6	-14.2
0.223	14.1	20.1	34.2	52.7	-18.5
0.311	9.7	20.1	29.8	49.9	-20.1
0.353	8.3	20.0	28.3	48.9	-20.6
0.265	9.3	20.1	29.4	51.3	-21.9
23.128	6.3	21.4	27.7	50.0	-22.3
7.816	3.9	20.5	24.4	50.0	-25.6

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2016.09.30.1

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

Continuously Transmitting at Low Ch 11 - 2405MHz & High Ch 26 - 2480MHz
Continuously Transmitting at Low Ch 11 - 2405MHz, Mid Ch 18 - 2440MHz, & High Ch 26 - 2480MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

REMT0021 - 2

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
Filter - High Pass	Micro-Tronics	HPM50111	HHX	8/10/2016	12 mo
Attenuator	Fairview Microwave	SA18H-20	TKQ	NCR	0 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFC	10/17/2016	12 mo
Cable	Northwest EMC	8-18GHz RE Cables	OCO	8/10/2016	12 mo
Cable	Northwest EMC	18-26GHz RE Cables	OCK	1/6/2016	12 mo
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	8/4/2016	12 mo
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	8/9/2016	12 mo
Cable	ESM Cable Corp.	KMKM-72	OC1	1/6/2016	12 mo
Antenna - Biconilog	EMCO	3142	AXB	11/6/2015	24 mo
Amplifier - Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVQ	1/6/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	8/10/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	8/4/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	1/6/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOF	8/10/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	8/10/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-10	AIX	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHN	NCR	0 mo
Antenna - Double Ridge	EMCO	3115	AHB	3/21/2016	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFJ	2/9/2016	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

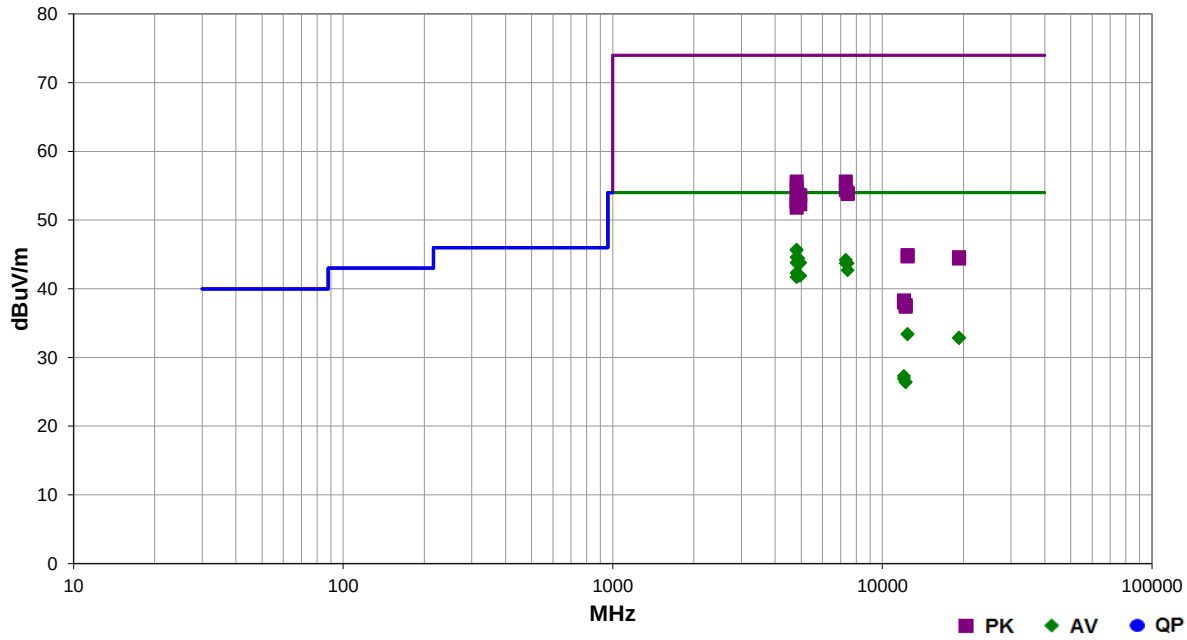
PSA-ESCI 2016.09.30.1

EmiR5 2016.08.26

Work Order:	REMT0021	**Date:**	12/15/16		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	OC10	**Humidity:**	49.6% RH		
Serial Number:	REVD1	**Barometric Pres.:**	1019 mbar	**Tested by:**	Johnny Candelas
EUT:	XP-4 Advanced Control Processor				
Configuration:	2				
Customer:	Remote Technologies, Inc.				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuously Transmitting at Low Ch 11 - 2405MHz, Mid Ch 18 - 2440MHz, & High Ch 26 - 2480MHz				
Deviations:	None				
Comments:	None				

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

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
4808.925	32.9	12.8	1.1	108.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT Horiz, Low Ch
4808.858	32.8	12.8	1.5	186.0	3.0	0.0	Vert	AV	0.0	45.6	54.0	-8.4	EUT on Side, Low Ch
4808.908	31.8	12.8	1.6	332.0	3.0	0.0	Vert	AV	0.0	44.6	54.0	-9.4	EUT Vert, Low Ch
4880.858	31.6	12.8	1.5	186.0	3.0	0.0	Vert	AV	0.0	44.4	54.0	-9.6	EUT on Side, Mid Ch
7318.342	26.2	18.0	1.5	143.0	3.0	0.0	Vert	AV	0.0	44.2	54.0	-9.8	EUT on Side, Mid Ch
4808.950	31.0	12.8	1.5	140.0	3.0	0.0	Horz	AV	0.0	43.8	54.0	-10.2	EUT on Side, Low Ch
4958.950	31.1	12.7	1.6	220.0	3.0	0.0	Horz	AV	0.0	43.8	54.0	-10.2	EUT Horiz, High Ch
7318.467	25.7	18.0	4.0	50.0	3.0	0.0	Horz	AV	0.0	43.7	54.0	-10.3	EUT Horiz, Mid Ch
7441.258	25.8	17.9	1.5	176.0	3.0	0.0	Vert	AV	0.0	43.7	54.0	-10.3	EUT on Side, High Ch
7438.708	24.8	17.9	2.3	241.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	EUT Horiz, High Ch
4810.875	29.5	12.8	1.5	66.0	3.0	0.0	Horz	AV	0.0	42.3	54.0	-11.7	EUT Vert, Low Ch
4879.000	29.1	12.8	1.5	137.0	3.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	EUT Horiz, Mid Ch
4958.983	29.2	12.7	1.5	207.0	3.0	0.0	Vert	AV	0.0	41.9	54.0	-12.1	EUT on Side, High Ch
4810.833	28.9	12.8	1.6	175.0	3.0	0.0	Vert	AV	0.0	41.7	54.0	-12.3	EUT Horiz, Low Ch
4809.150	42.8	12.8	1.1	108.0	3.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	EUT Horiz, Low Ch
7318.242	37.6	18.0	1.5	143.0	3.0	0.0	Vert	PK	0.0	55.6	74.0	-18.4	EUT on Side, Mid Ch
4809.008	42.0	12.8	1.5	186.0	3.0	0.0	Vert	PK	0.0	54.8	74.0	-19.2	EUT on Side, Low Ch
7318.325	36.4	18.0	4.0	50.0	3.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	EUT Horiz, 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
7441.292	36.1	17.9	1.5	176.0	3.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	EUT on Side, High Ch
7439.608	35.9	17.9	2.3	241.0	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	EUT Horiz, High Ch
4880.867	40.9	12.8	1.5	186.0	3.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	EUT on Side, Mid Ch
4808.950	40.8	12.8	1.6	332.0	3.0	0.0	Vert	PK	0.0	53.6	74.0	-20.4	EUT Vert, Low Ch
4958.917	40.9	12.7	1.6	220.0	3.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	EUT Horiz, High Ch
12400.230	25.1	8.3	1.2	94.0	3.0	0.0	Vert	AV	0.0	33.4	54.0	-20.6	EUT on Side, High Ch
12400.870	25.1	8.3	1.5	168.0	3.0	0.0	Horz	AV	0.0	33.4	54.0	-20.6	EUT Horiz, High Ch
19237.810	38.5	-5.6	1.5	201.0	3.0	0.0	Vert	AV	0.0	32.9	54.0	-21.1	EUT on Side, Low Ch
19238.420	38.4	-5.6	1.5	114.0	3.0	0.0	Horz	AV	0.0	32.8	54.0	-21.2	EUT Horiz, Low Ch
4808.792	39.9	12.8	1.5	140.0	3.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	EUT on Side, Low Ch
4810.933	39.7	12.8	1.5	66.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	EUT Vert, Low Ch
4878.992	39.6	12.8	1.5	137.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	EUT Horiz, Mid Ch
4958.967	39.6	12.7	1.5	207.0	3.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	EUT on Side, High Ch
4809.450	39.0	12.8	1.6	175.0	3.0	0.0	Vert	PK	0.0	51.8	74.0	-22.2	EUT Horiz, Low Ch
12022.520	31.3	-4.0	1.5	350.0	3.0	0.0	Horz	AV	0.0	27.3	54.0	-26.7	EUT Horiz, Low Ch
12023.240	30.9	-4.0	1.5	291.0	3.0	0.0	Vert	AV	0.0	26.9	54.0	-27.1	EUT on Side, Low Ch
12197.610	29.2	-2.8	1.5	162.0	3.0	0.0	Horz	AV	0.0	26.4	54.0	-27.6	EUT Horiz, Mid Ch
12197.780	29.2	-2.8	1.5	238.0	3.0	0.0	Vert	AV	0.0	26.4	54.0	-27.6	EUT on Side, Mid Ch
12402.200	36.6	8.3	1.5	168.0	3.0	0.0	Horz	PK	0.0	44.9	74.0	-29.1	EUT Horiz, High Ch
12401.550	36.4	8.3	1.2	94.0	3.0	0.0	Vert	PK	0.0	44.7	74.0	-29.3	EUT on Side, High Ch
19238.220	50.2	-5.6	1.5	114.0	3.0	0.0	Horz	PK	0.0	44.6	74.0	-29.4	EUT Horiz, Low Ch
19239.490	50.0	-5.6	1.5	201.0	3.0	0.0	Vert	PK	0.0	44.4	74.0	-29.6	EUT on Side, Low Ch
12023.840	42.3	-4.0	1.5	350.0	3.0	0.0	Horz	PK	0.0	38.3	74.0	-35.7	EUT Horiz, Low Ch
12024.520	42.0	-4.0	1.5	291.0	3.0	0.0	Vert	PK	0.0	38.0	74.0	-36.0	EUT on Side, Low Ch
12197.700	40.4	-2.8	1.5	162.0	3.0	0.0	Horz	PK	0.0	37.6	74.0	-36.4	EUT Horiz, Mid Ch
12200.130	40.2	-2.8	1.5	238.0	3.0	0.0	Vert	PK	0.0	37.4	74.0	-36.6	EUT on Side, Mid Ch

SPURIOUS RADIATED EMISSIONS

NORTHWEST EMC

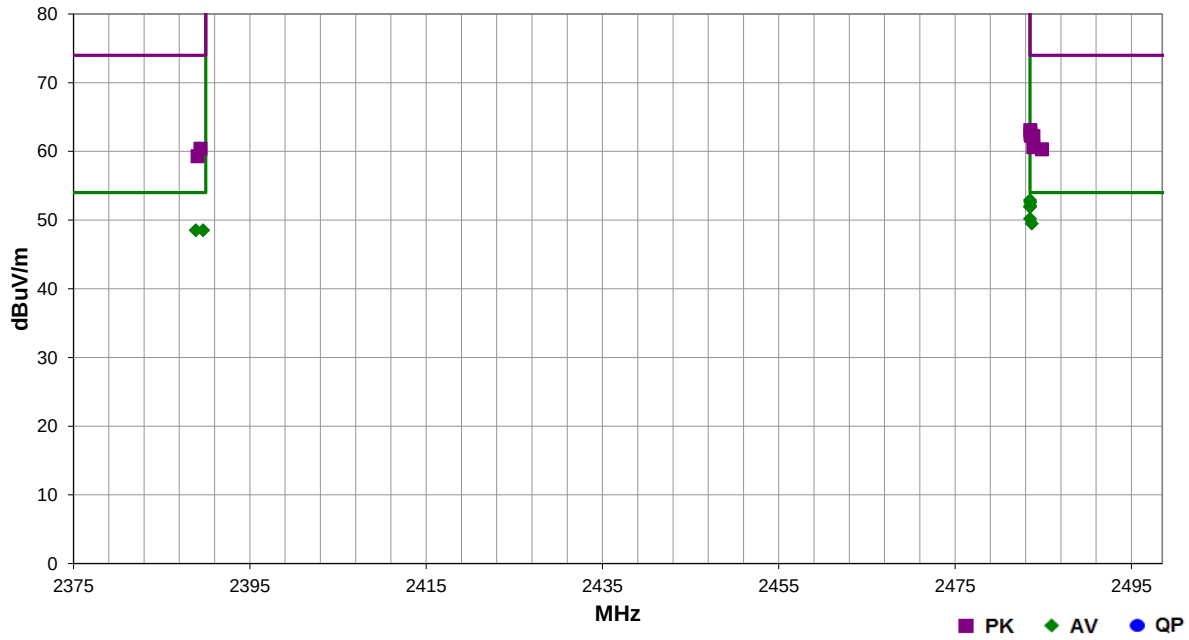
PSA-ESCI 2016.09.30.1

EmiR5 2016.08.26

Work Order:	REMT0021	**Date:**	12/15/16		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	OC10	**Humidity:**	49.6% RH		
Serial Number:	REVD1	**Barometric Pres.:**	1019 mbar	**Tested by:**	Johnny Candelas
EUT:	XP-4 Advanced Control Processor				
Configuration:	2				
Customer:	Remote Technologies, Inc.				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuously Transmitting at Low Ch 11 - 2405MHz & High Ch 26 - 2480MHz				
Deviations:	None				
Comments:	Band Edge				

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

Run #	19	**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
2483.507	30.6	2.3	1.5	177.0	3.0	20.0	Vert	AV	0.0	52.9	54.0	-1.1	EUT Horiz, High Ch
2483.533	30.3	2.3	1.5	158.0	3.0	20.0	Horz	AV	0.0	52.6	54.0	-1.4	EUT on Side, High Ch
2483.527	29.8	2.3	1.5	160.0	3.0	20.0	Horz	AV	0.0	52.1	54.0	-1.9	EUT Horiz, High Ch
2483.510	29.6	2.3	1.5	282.0	3.0	20.0	Horz	AV	0.0	51.9	54.0	-2.1	EUT Vert, High Ch
2483.507	27.9	2.3	1.5	147.0	3.0	20.0	Vert	AV	0.0	50.2	54.0	-3.8	EUT on Side, High Ch
2483.703	27.2	2.3	1.5	271.0	3.0	20.0	Vert	AV	0.0	49.5	54.0	-4.5	EUT Vert, High Ch
2388.873	26.5	2.0	1.5	136.0	3.0	20.0	Horz	AV	0.0	48.5	54.0	-5.5	EUT on Side, Low Ch
2389.697	26.5	2.0	1.5	353.0	3.0	20.0	Vert	AV	0.0	48.5	54.0	-5.5	EUT Horiz, Low Ch
2483.523	40.8	2.3	1.5	177.0	3.0	20.0	Vert	PK	0.0	63.1	74.0	-10.9	EUT Horiz, High Ch
2483.560	40.2	2.3	1.5	158.0	3.0	20.0	Horz	PK	0.0	62.5	74.0	-11.5	EUT on Side, High Ch
2483.623	40.0	2.3	1.5	282.0	3.0	20.0	Horz	PK	0.0	62.3	74.0	-11.7	EUT Vert, High Ch
2483.880	39.9	2.3	1.5	160.0	3.0	20.0	Horz	PK	0.0	62.2	74.0	-11.8	EUT Horiz, High Ch
2483.880	38.3	2.3	1.5	147.0	3.0	20.0	Vert	PK	0.0	60.6	74.0	-13.4	EUT on Side, High Ch
2389.390	38.4	2.0	1.5	136.0	3.0	20.0	Horz	PK	0.0	60.4	74.0	-13.6	EUT on Side, Low Ch
2484.863	38.0	2.3	1.5	271.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7	EUT Vert, High Ch
2389.083	37.3	2.0	1.5	353.0	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	EUT Horiz, Low Ch

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 2016.09.29

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	2/5/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18E-20	TKS	4/4/2016	4/4/2017
Block - DC	Aeroflex	INMET 8535	AMO	4/4/2016	4/4/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 2016.09.29
NweTx 2016.09.14.2

EUT:	**XP-4 Advanced Control Processor**			**Work Order:**	**REMT0021**
Serial Number:	**REVD1**			**Date:**	**12/14/16**
Customer:	**Remote Technologies, Inc.**			**Temperature:**	**20.7 °C**
Attendees:	**None**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1021 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

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

COMMENTS

Total reference level offset (20dB attenuator + DC Block + RF Cable + Rev SMA Adapter) = 22.6dB

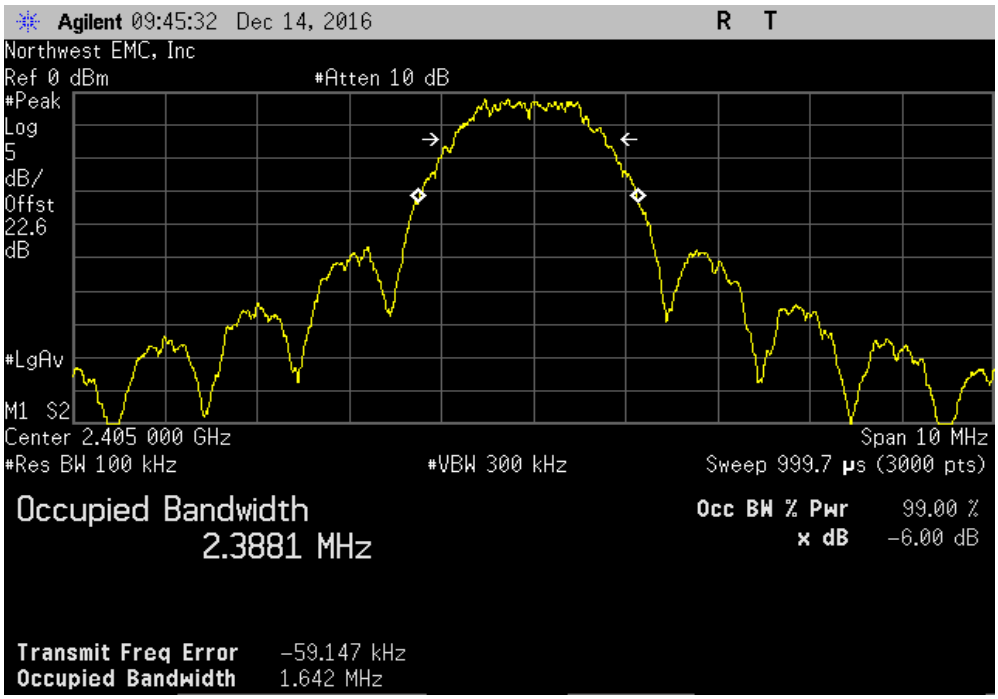
DEVIATIONS FROM TEST STANDARD

None

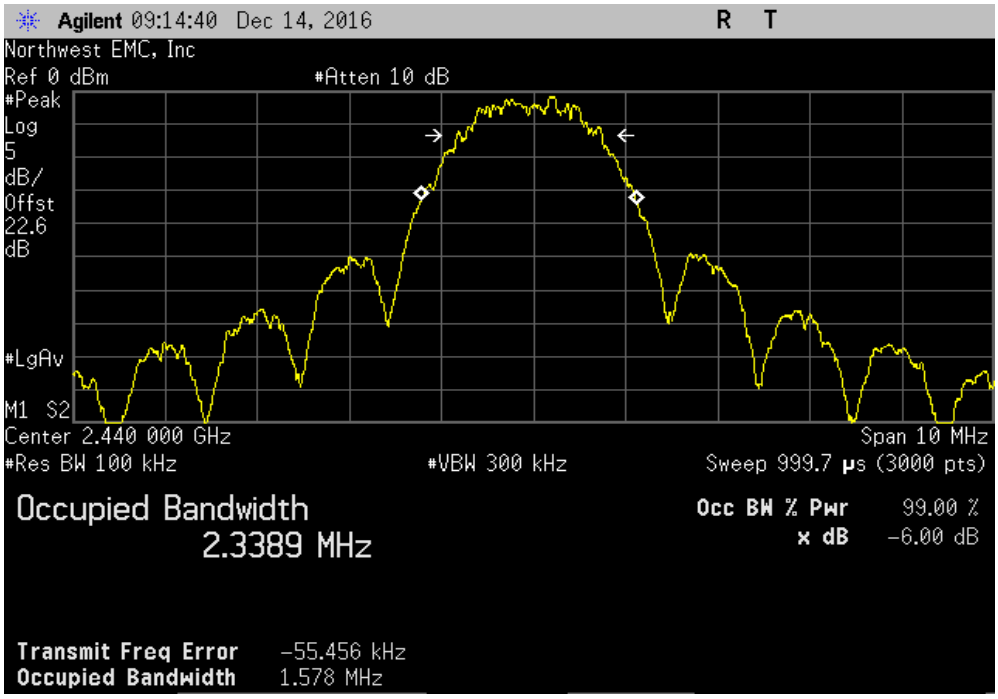
Configuration #	**3**	*Signature*

	Value	**Limit (>)**	**Result**
Zigbee			
Low Channel 11, 2405 MHz	1.642 MHz	500 kHz	Pass
Mid Channel 18, 2440 MHz	1.578 MHz	500 kHz	Pass
High Channel 26, 2480 MHz	1.549 MHz	500 kHz	Pass

Zigbee, Low Channel 11, 2405 MHz						
				Value	Limit (>)	Result
				1.642 MHz	500 kHz	Pass



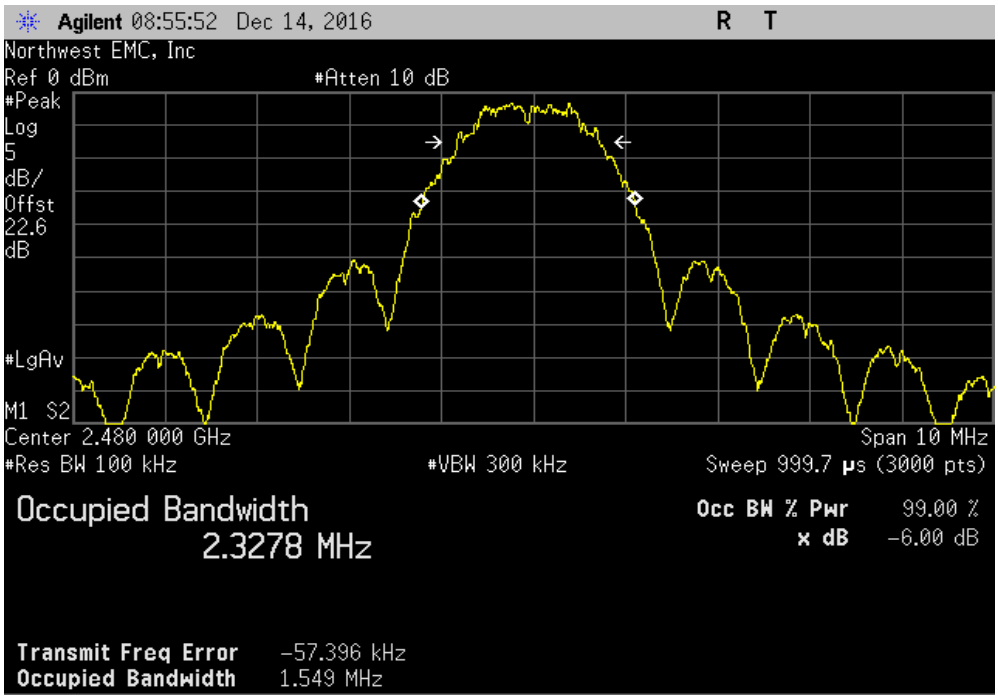
Zigbee, Mid Channel 18, 2440 MHz						
				Value	Limit (>)	Result
				1.578 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

XMit 2016.09.29
NweTx 2016.09.14.2

Zigbee, High Channel 26, 2480 MHz						
				Value	Limit (>)	Result
				1.549 MHz	500 kHz	Pass



OUTPUT POWER

XMit 2016.09.29

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	2/5/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18E-20	TKS	4/4/2016	4/4/2017
Block - DC	Aeroflex	INMET 8535	AMO	4/4/2016	4/4/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 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 2016.09.29
NweTx 2016.09.14.2

EUT:	**XP-4 Advanced Control Processor**			**Work Order:**	**REMT0021**
Serial Number:	**REVD1**			**Date:**	**12/14/16**
Customer:	**Remote Technologies, Inc.**			**Temperature:**	**20.7 °C**
Attendees:	**None**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1021 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

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

COMMENTS

Total reference level offset (20dB attenuator + DC Block + RF Cable + Rev SMA Adapter) = 22.6dB

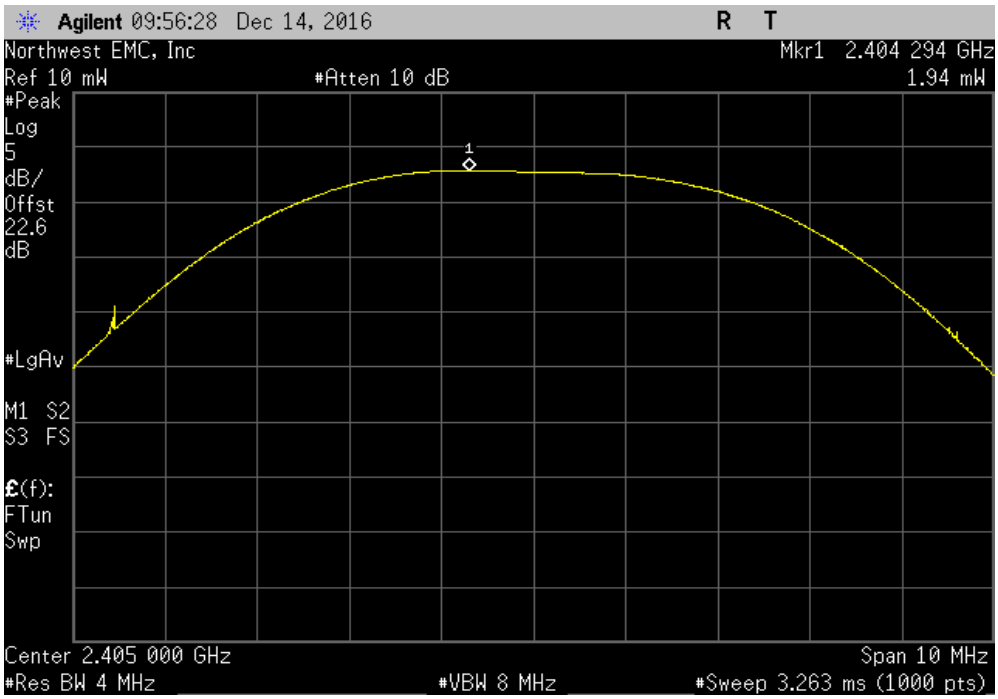
DEVIATIONS FROM TEST STANDARD

None

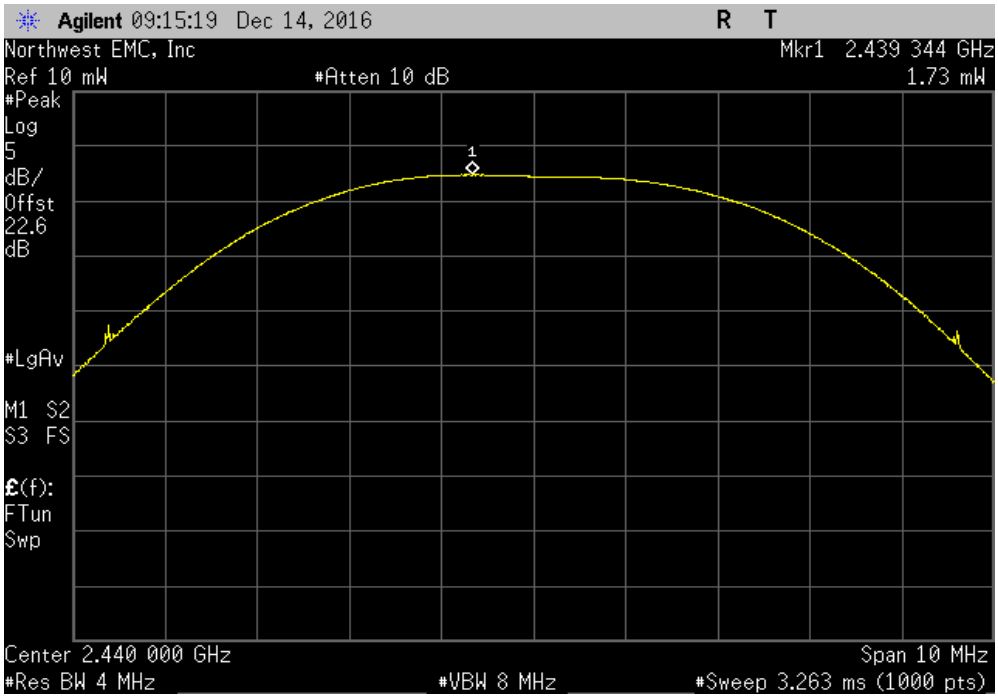
Configuration #	**3**	*Signature*

	Value	**Limit (<)**	**Result**
Zigbee			
Low Channel 11, 2405 MHz	1.936 mW	1 W	Pass
Mid Channel 18, 2440 MHz	1.727 mW	1 W	Pass
High Channel 26, 2480 MHz	1.555 mW	1 W	Pass

Zigbee, Low Channel 11, 2405 MHz						
				Value	Limit (<)	Result
				1.936 mW	1 W	Pass



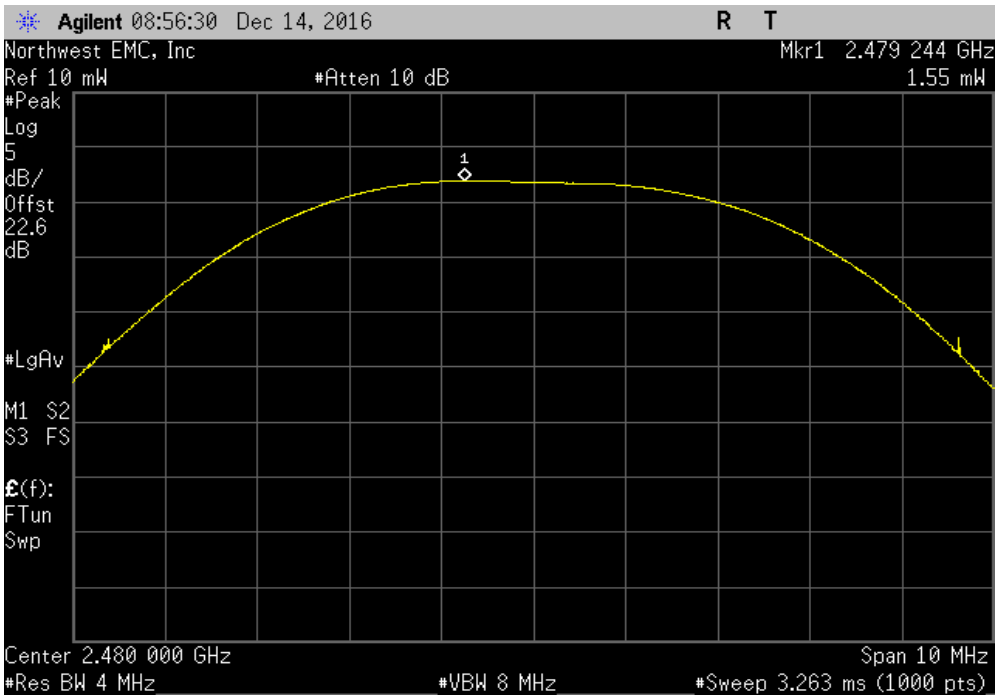
Zigbee, Mid Channel 18, 2440 MHz						
				Value	Limit (<)	Result
				1.727 mW	1 W	Pass



OUTPUT POWER

XMit 2016.09.29
NweTx 2016.09.14.2

Zigbee, High Channel 26, 2480 MHz						
				Value	Limit (<)	Result
				1.555 mW	1 W	Pass



POWER SPECTRAL DENSITY

XMit 2016.09.29

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	2/5/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18E-20	TKS	4/4/2016	4/4/2017
Block - DC	Aeroflex	INMET 8535	AMO	4/4/2016	4/4/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 2016.09.29
NweTx 2016.09.14.2

EUT:	**XP-4 Advanced Control Processor**			**Work Order:**	**REMT0021**
Serial Number:	**REVD1**			**Date:**	**12/14/16**
Customer:	**Remote Technologies, Inc.**			**Temperature:**	**20.7 °C**
Attendees:	**None**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1021 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

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

COMMENTS

Total reference level offset (20dB attenuator + DC Block + RF Cable + Rev SMA Adapter) = 22.6dB

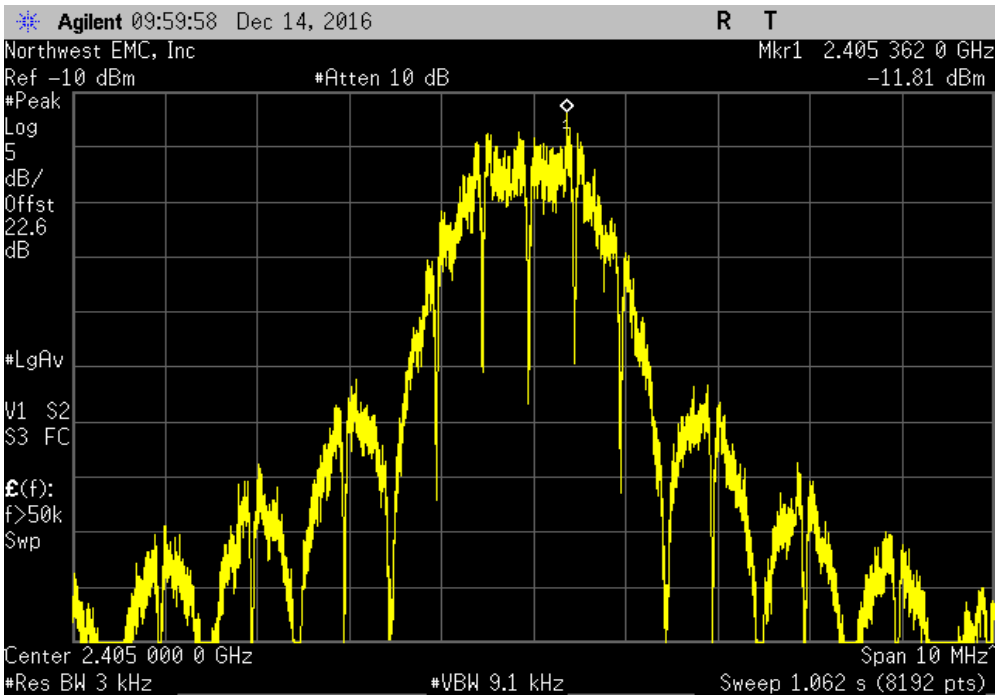
DEVIATIONS FROM TEST STANDARD

None

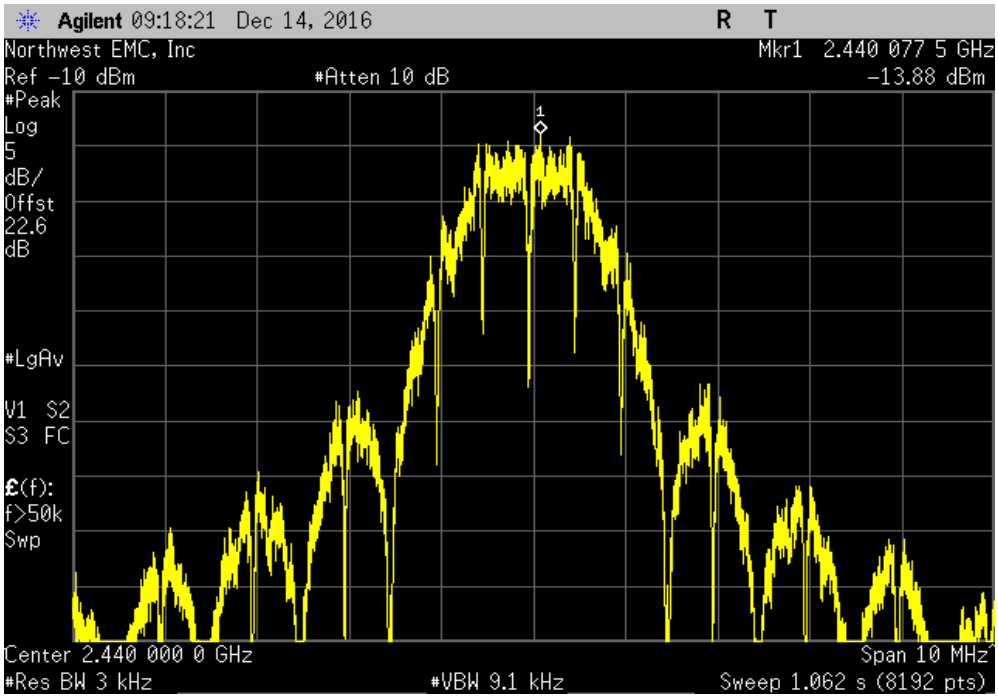
Configuration #	**3**	*Signature*

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
Zigbee			
Low Channel 11, 2405 MHz	-11.811	8	Pass
Mid Channel 18, 2440 MHz	-13.882	8	Pass
High Channel 26, 2480 MHz	-13.415	8	Pass

Zigbee, Low Channel 11, 2405 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-11.811	8	Pass



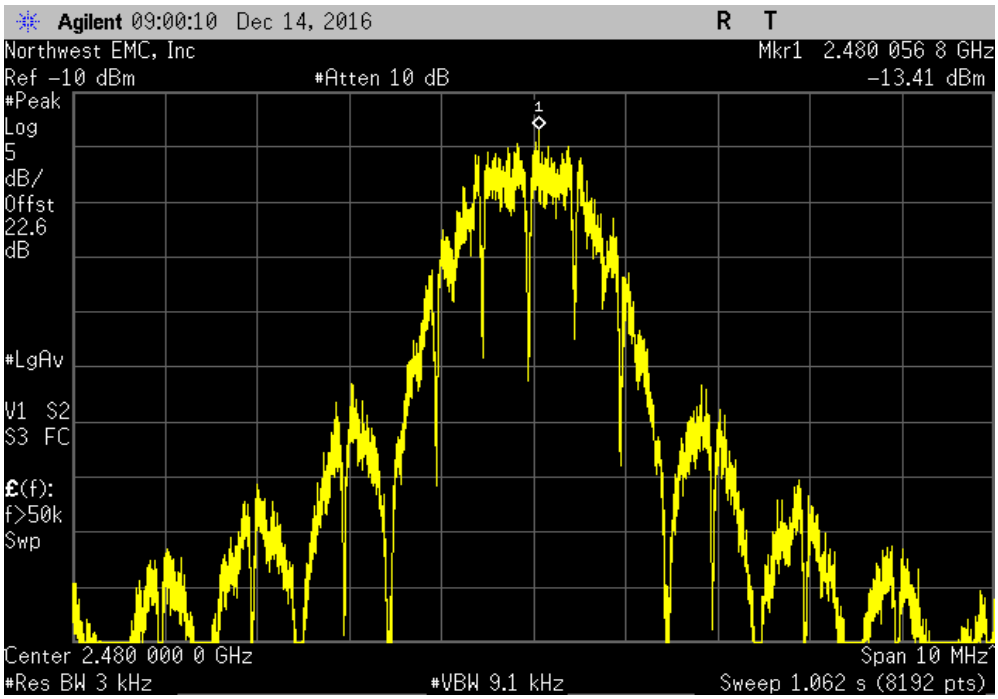
Zigbee, Mid Channel 18, 2440 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.882	8	Pass



POWER SPECTRAL DENSITY

XMit 2016.09.29
NweTx 2016.09.14.2

Zigbee, High Channel 26, 2480 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-13.415	8	Pass



BAND EDGE COMPLIANCE

XMit 2016.09.29

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	2/5/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18E-20	TKS	4/4/2016	4/4/2017
Block - DC	Aeroflex	INMET 8535	AMO	4/4/2016	4/4/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 2016.09.29
NweTx 2016.09.14.2

EUT:	**XP-4 Advanced Control Processor**			**Work Order:**	**REMT0021**
Serial Number:	**REVD1**			**Date:**	**12/14/16**
Customer:	**Remote Technologies, Inc.**			**Temperature:**	**20.7 °C**
Attendees:	**None**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1021 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

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

COMMENTS

Total reference level offset (20dB attenuator + DC Block + RF Cable + Rev SMA Adapter) = 22.6dB

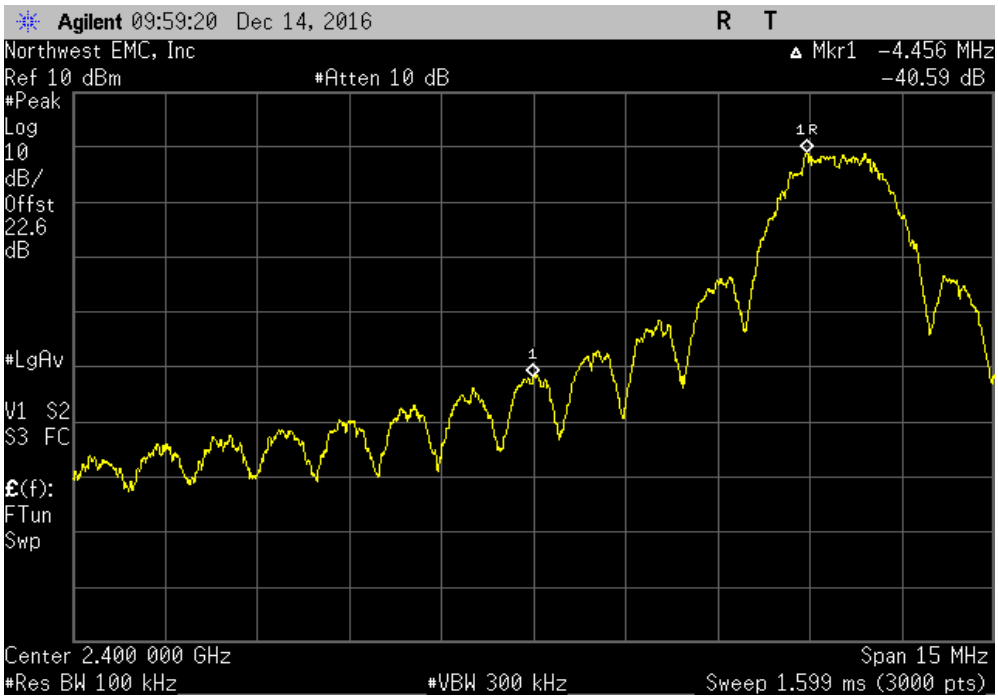
DEVIATIONS FROM TEST STANDARD

None

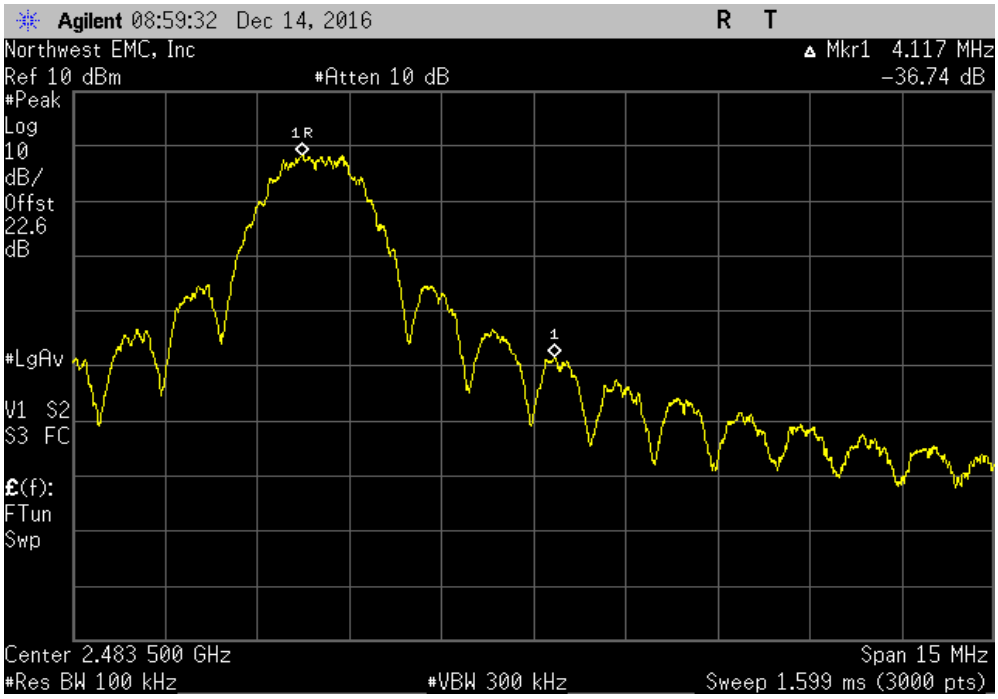
Configuration #	**3**	*Signature*

	Value (dBc)	**Limit ≤ (dBc)**	**Result**
Zigbee			
Low Channel 11, 2405 MHz	-40.59	-20	Pass
High Channel 26, 2480 MHz	-36.74	-20	Pass

Zigbee, Low Channel 11, 2405 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-40.59	-20	Pass



Zigbee, High Channel 26, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-36.74	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2016.09.29

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	2/5/2018
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18E-20	TKS	4/4/2016	4/4/2017
Block - DC	Aeroflex	INMET 8535	AMO	4/4/2016	4/4/2017
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	11/2/2016	11/2/2017

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 2016.09.29
NweTx 2016.09.14.2

EUT:	**XP-4 Advanced Control Processor**			**Work Order:**	**REMT0021**
Serial Number:	**REVD1**			**Date:**	**12/14/16**
Customer:	**Remote Technologies, Inc.**			**Temperature:**	**20.7 °C**
Attendees:	**None**			**Humidity:**	**48.3% RH**
Project:	**None**			**Barometric Pres.:**	**1021 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

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

COMMENTS

Total reference level offset (20dB attenuator + DC Block + RF Cable + Rev SMA Adapter) = 22.6dB

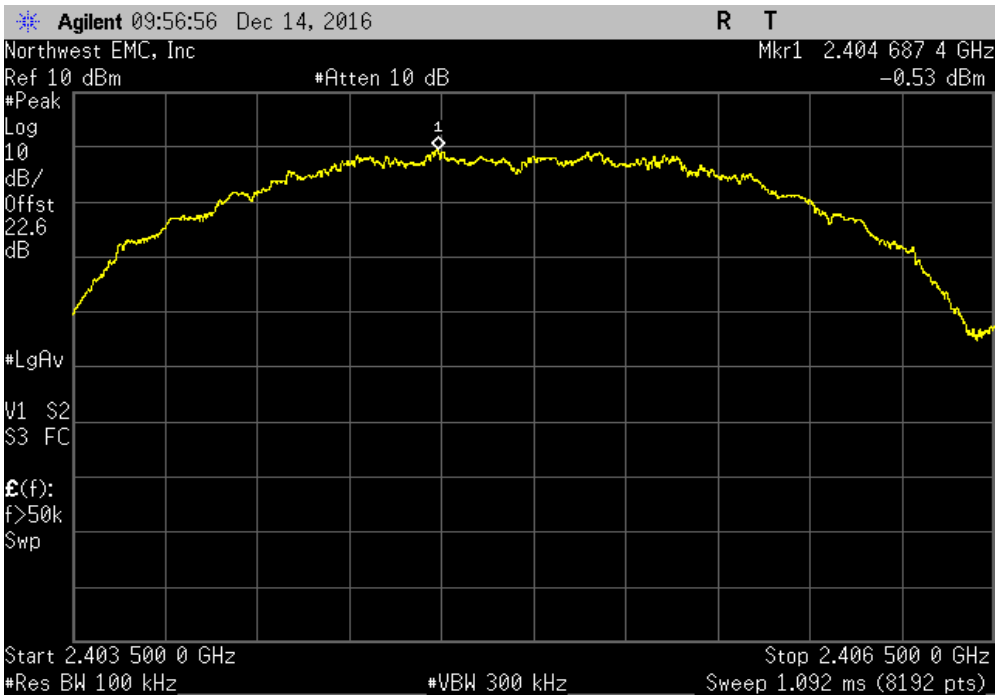
DEVIATIONS FROM TEST STANDARD

None

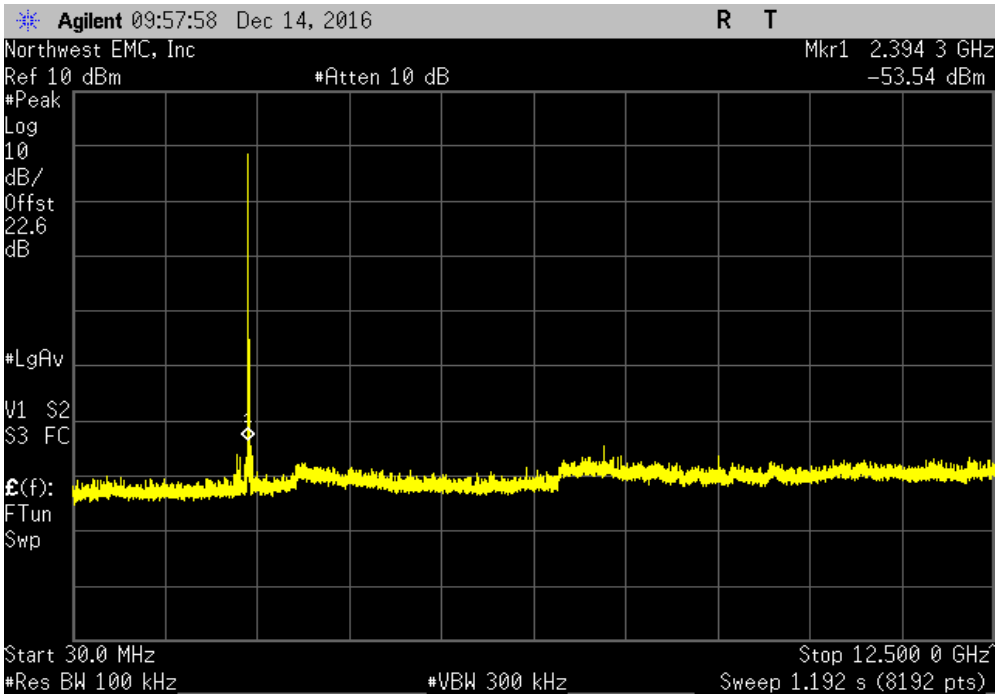
Configuration #	**3**	*Signature*

		Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
Zigbee					
	Low Channel 11, 2405 MHz	Fundamental	N/A	N/A	N/A
	Low Channel 11, 2405 MHz	30 MHz - 12.5 GHz	-53.01	-20	Pass
	Low Channel 11, 2405 MHz	12.5 GHz - 25 GHz	-51.68	-20	Pass
	Mid Channel 18, 2440 MHz	Fundamental	N/A	N/A	N/A
	Mid Channel 18, 2440 MHz	30 MHz - 12.5 GHz	-54.07	-20	Pass
	Mid Channel 18, 2440 MHz	12.5 GHz - 25 GHz	-51.5	-20	Pass
	High Channel 26, 2480 MHz	Fundamental	N/A	N/A	N/A
	High Channel 26, 2480 MHz	30 MHz - 12.5 GHz	-47.76	-20	Pass
	High Channel 26, 2480 MHz	12.5 GHz - 25 GHz	-50.96	-20	Pass

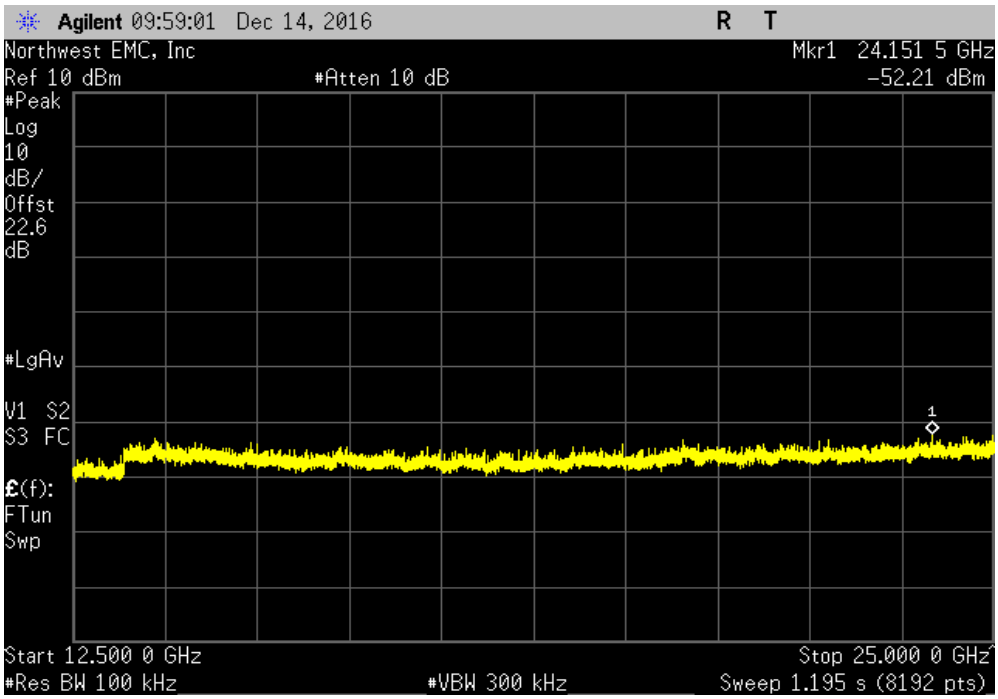
Zigbee, Low Channel 11, 2405 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



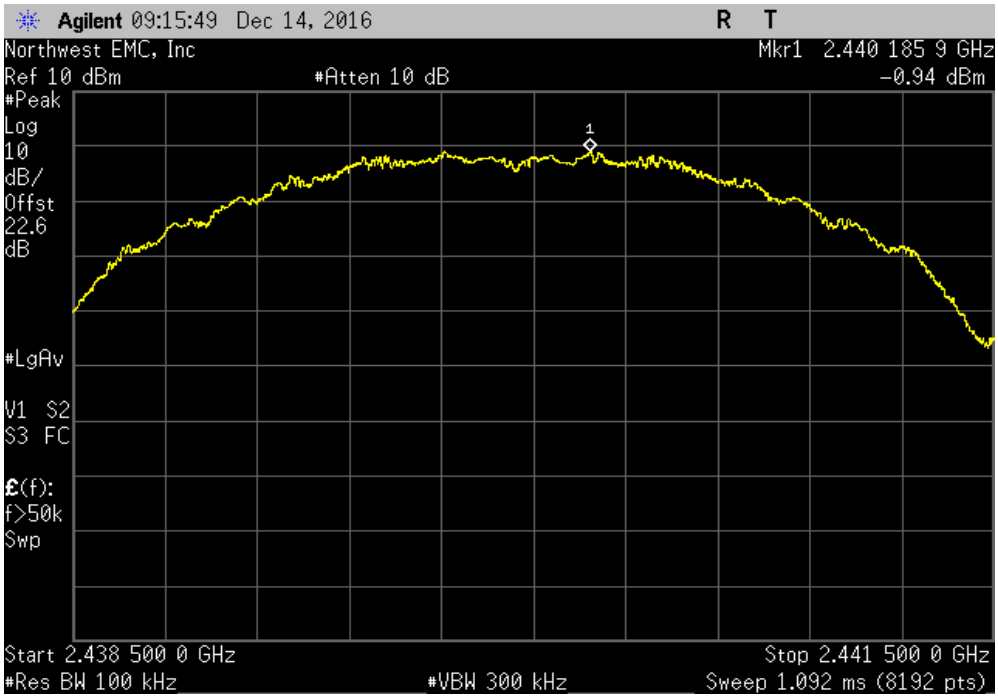
Zigbee, Low Channel 11, 2405 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	30 MHz - 12.5 GHz			-53.01	-20	Pass



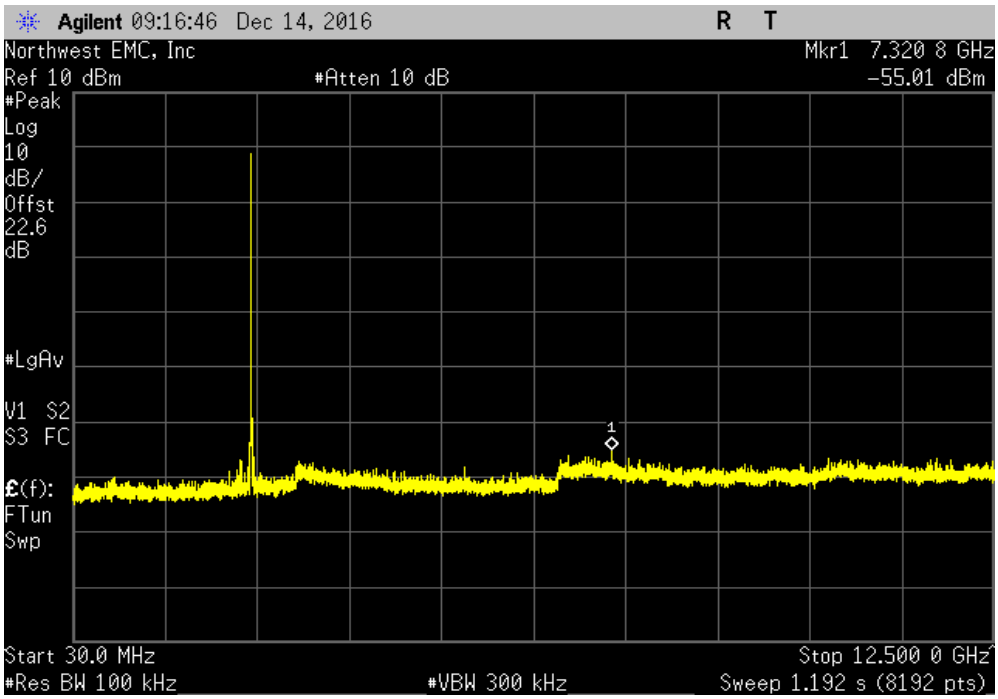
Zigbee, Low Channel 11, 2405 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.68	-20	Pass



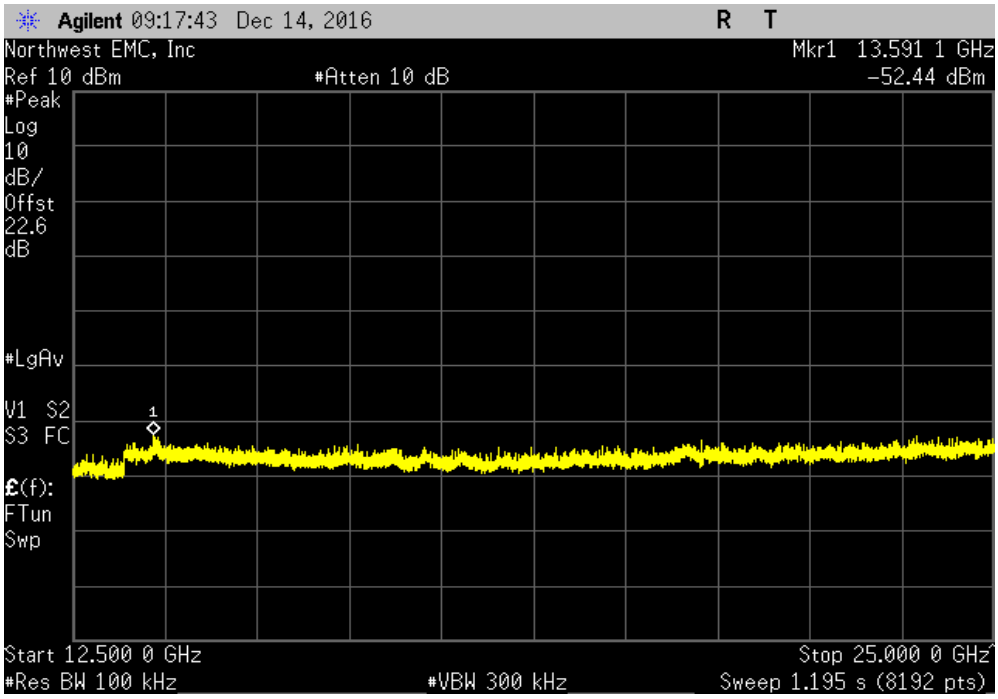
Zigbee, Mid Channel 18, 2440 MHz						
	Frequency Range			**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
	Fundamental			N/A	N/A	N/A



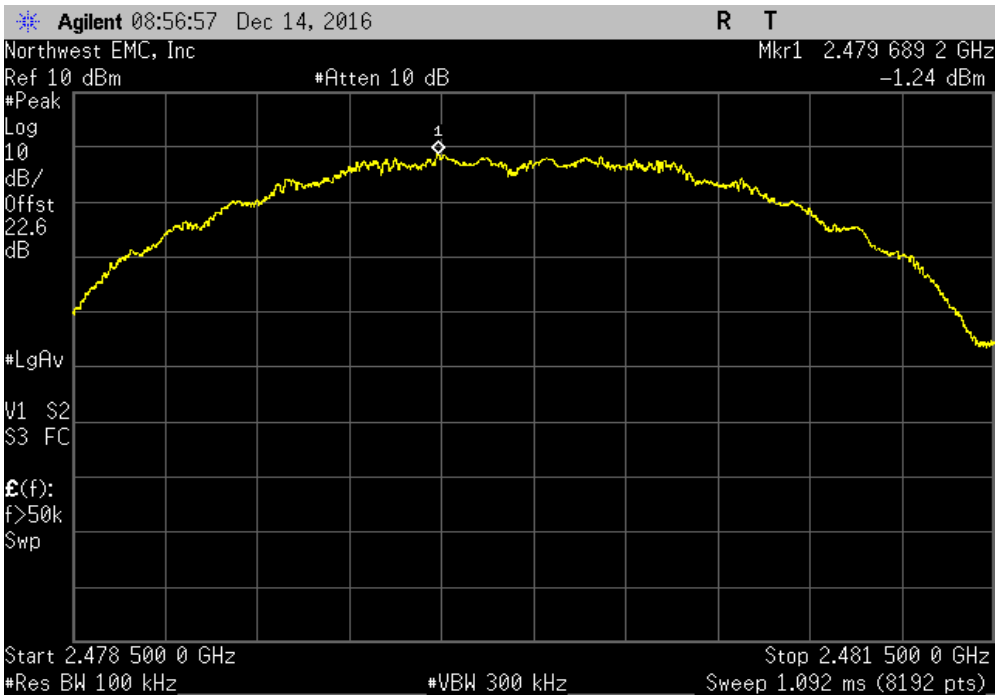
Zigbee, Mid Channel 18, 2440 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-54.07	-20	Pass



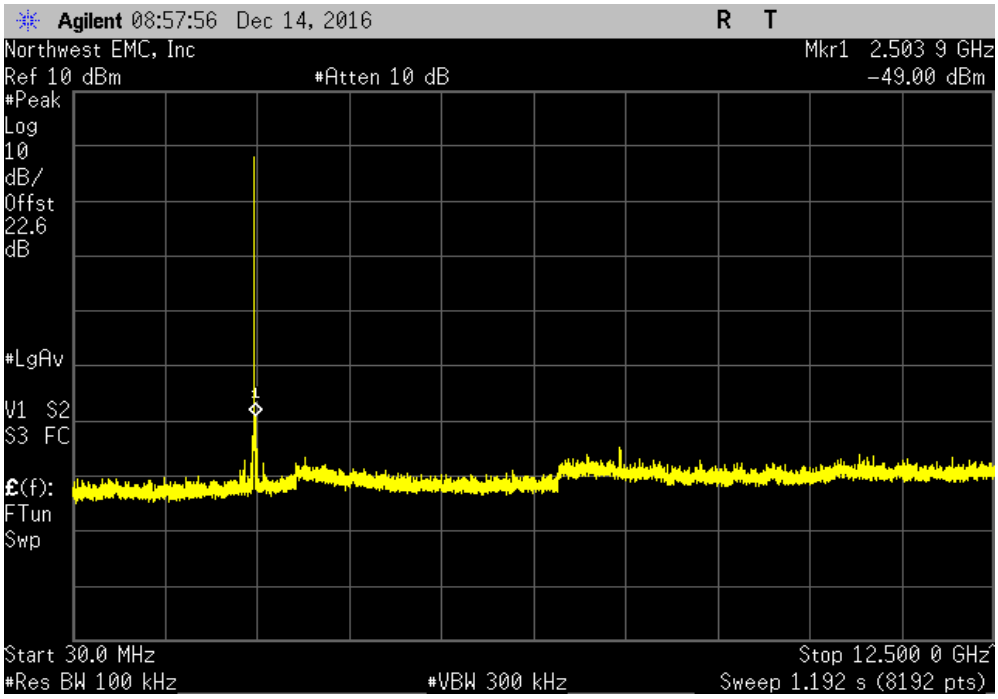
Zigbee, Mid Channel 18, 2440 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-51.5	-20	Pass



Zigbee, High Channel 26, 2480 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



Zigbee, High Channel 26, 2480 MHz					
Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz			-47.76	-20	Pass



Zigbee, High Channel 26, 2480 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-50.96	-20	Pass