

COMPLIANCE WORLDWIDE INC. TEST REPORT 245-13

In Accordance with the Requirements of
Industry Canada RSS 210, Issue 8, Annex II
Federal Communications Commission CFR Title 47 Part 15.231, Subpart C
Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

Nel - Tech Labs, Inc.
4 Ash Street Extension
Derry, NH 03038

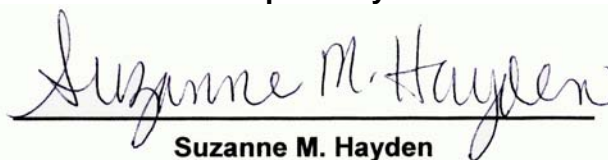
for the

Duo Wireless Adapter
(Two Button Switch)

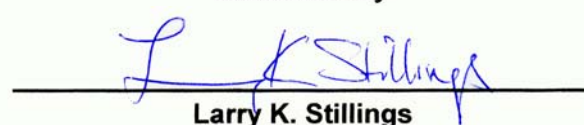
FCC ID: UOX-MSGADDONDWA
IC: 3358A- MSGADDONDWA

Report Issued on August 2, 2013

Prepared by


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1. Scope

This test report certifies that the Nel -Tech Labs Duo Wireless Adapter, as tested, meets the RSS 210 Annex II Rules and FCC Part 15.231, Subpart C requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required

2. Product Details

- 2.1. Manufacturer:** Nel -Tech Labs, Inc.
- 2.2. Model Number:** MSG-ADDONDWA
- 2.3. Serial Number:** N/A
- 2.4. Description:** 433.8 MHz Two line on-hold switch
- 2.5. Power Source:** 6 VDC, 100 MA (AC 120 Volt, 60 Hz Adapter)
- 2.6. EMC Modifications:** None

3. Product Configuration

3.1. Operational Characteristics & Software

Operating Instructions for Test

The Nel-Tech Labs Duo Wireless Adapter is operated by simply pressing one of the two buttons on the unit.

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Frq (Hz)	Description/Function
Nel - Tech Labs	Duo Wireless Adapter	N/A	120	60	Two button on-hold switch
GlobTech	N/A	N/A	120	60	6 VDC, 100 ma wall adapter

3.3. Support Equipment

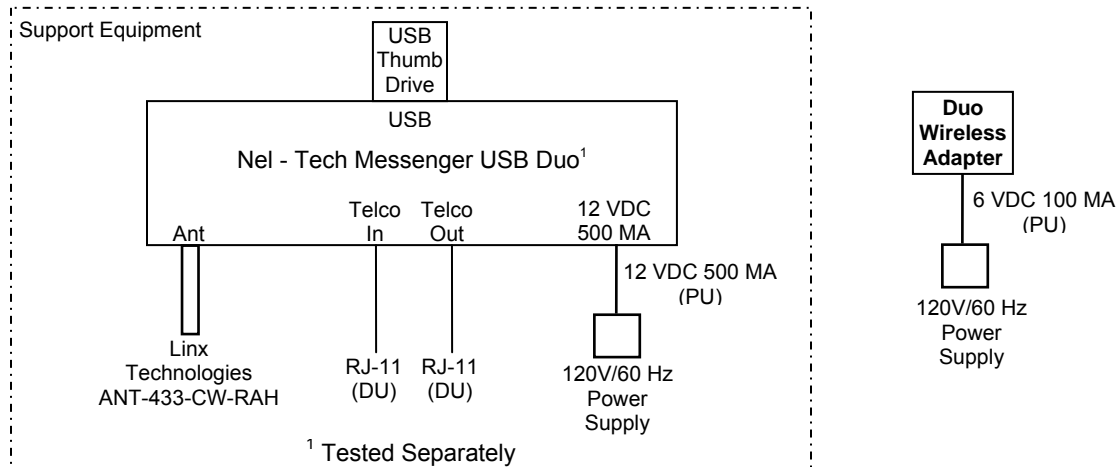
Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Frq (Hz)	Description/Function
Nel - Tech Labs	Messenger USB Duo	N/A	120	60	Message-on-hold digital repeater
SG Daxin	YP-015	N/A	120	60	12 VDC 500 MA 6W AC adapter
Linx Technologies	ANT-433-CW-RAH	N/A	N/A	N/A	433 MHz 1/4 wave whip antenna

3.4. Support Equipment Cables

Cable Type	Length	Shield	From	To
RJ-11 Cable	1 Meter	No	DUT Telco In	N/A
RJ-11 Cable	1 Meter	No	DUT Telco Out	N/A

3. Product Configuration (continued)

3.5. Block Diagram



4. Measurements Parameters

4.1 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	6/13/2014
Spectrum Analyzer	Agilent	E4407B	MY4510449	2/26/2015
Spectrum Analyzer	Rohde & Schwarz	FSV40	100899	6/6/2015
Microwave Preamp	Hewlett Packard	8449B	3008A01323	6/5/2015
Bilog Antenna	Com-Power	AC-220	25509	8/30/2013
Horn Antenna	Electro-Metrics	EM-6961	6337	10/19/2013
Band Pass Filter	Mini-Circuits	VHP-16	0341	2/27/2014
Loop Antenna	EMCO	6912	9309-1139	8/28/2014
LISN 50 Ω 50 μ H, 9 kHz to 30 MHz	EMCO	3825/2	9109-1860	6/5/2014

4.2 Measurement & Equipment Setup

Test Date:	4/9/2013 to 5/8/2013
Test Engineers:	Cody S. Merry
Site Temperature ($^{\circ}$ C):	21.4
Relative Humidity (%RH):	44
Frequency Range:	30 MHz to 4.4 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz (30 MHz – 1 GHz) 1 MHz (>1 GHz)
EMI Receiver Avg Bandwidth:	300 kHz (30 MHz – 1 GHz) 3 MHz (>1 GHz)
Detector Functions:	Peak, Quasi-Peak and Average
Antenna Height:	1 to 4 meters

4. Measurements Parameters (continued)

4.3 Test Procedure

Test measurements were made in accordance FCC Part 15.231: Periodic operation within the bands 40.66 – 40.70 MHz and above 70 MHz.

The test methods used to generate the data in this test report are in accordance with ANSI C63.10: 2009, American National Standard for Methods for Unlicensed Wireless Devices

5. Measurement Summary

Test Requirement	FCC Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	6.1	Compliant	The DUT utilizes an external antenna with an RP-SMA connector.
Operational Requirements	15.231 (a)(1)	6.2.1	N/A	This clause does not apply to the unit under test.
	15.231 (a)(2)	6.2.2	Compliant	Transmission time is 1.055 seconds.
	15.231 (a)(3)	6.2.3	Compliant	
	15.231 (a)(4)	6.2.4	N/A	This clause does not apply to the unit under test.
	15.231 (a)(5)	6.2.5	N/A	This clause does not apply to the unit under test.
Radiated Field Strength of Fundamental	15.231 (b)	6.3	Compliant	
Radiated Field Strength of Harmonics	15.231 (b)(3)	6.4	Compliant	
Spurious Radiated Emissions	15.231 (b)(3), 15.209	6.5	Compliant	
Emission Bandwidth	15.231 (c)	6.6	Compliant	
Bandwidth of Momentary Signals	IC RSS-210 A1.1.3	6.7	Compliant	
Conducted Emissions	15.207	6.8	Compliant	
Determination of Average Factor (Duty Cycle)	15.35 (c)	---	Not Required	

6. Measurement Data

6.1. Antenna Requirement (Section 15.203)

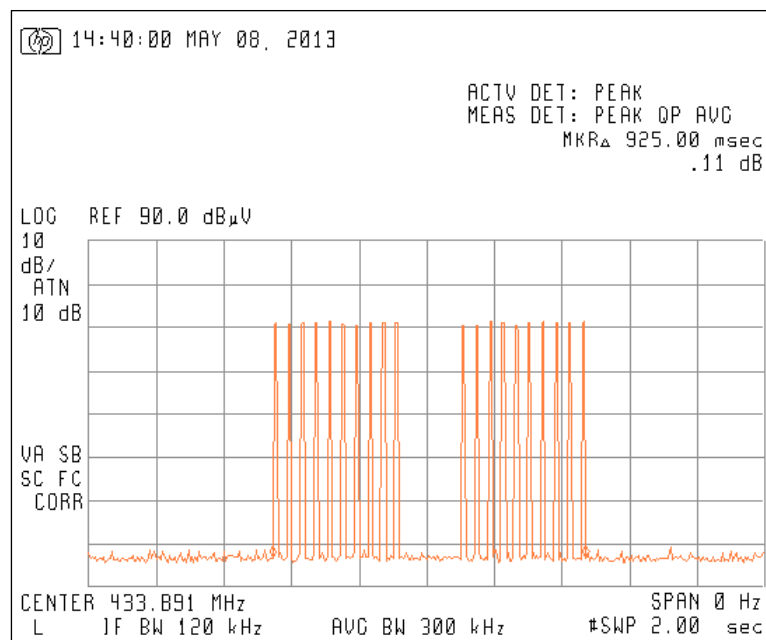
Requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

Status: The unit under test is configured with an internal, PC board mounted antenna.

6.2. Operational Requirements (Section 15.231(a))

6.2.1. Requirement: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released (Section 15.231(a)(1)).

Status: The transmitter switches deactivate after a 925 millisecond transmission.



6.2. Operational Requirements (Section 15.231(a)) (continued)

6.2.2. Requirement: A transmitter activated automatically shall cease transmission within 5 seconds after activation (Section 15.231(a)(2)).

Status: This clause does not apply to the device under test.

6.2.3. Requirement: Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour (Section 15.231(a)(3)).

Status: This clause does not apply to the unit under test.

6.2.4. Requirement: Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition. (Section 15.231(a)(4)).

Status: This clause does not apply to the unit under test.

6.2.5. Requirement: Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmission are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Status: This clause does not apply to the unit under test.

6. Measurement Data (continued)

6.3. Radiated Field Strength of Fundamental (15.231, Section (b))

Requirement: The 3 meter field strength of the fundamental emissions from intentional radiators operating within the 260-470 MHz frequency bands shall comply with the limits specified in FCC Part 15.231, Section (b). The limit is based on a linear interpolation of the following field strength:

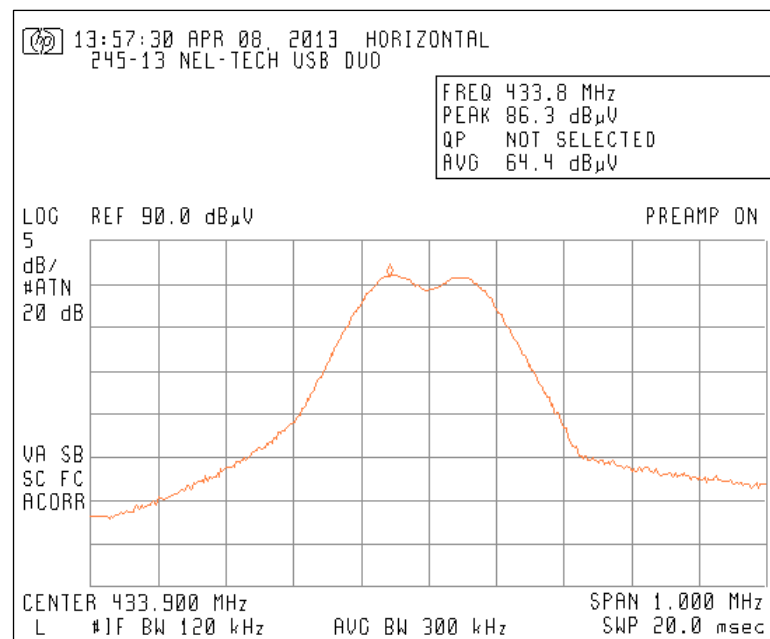
Fundamental Frequency (MHz)	Field Strength of Fundamental (μV/m)
260-470	1,500 to 5,000

Fundamental Limit at 433.8 MHz = 4,396.67 μV/m = 72.86 dBμV/m

Conclusion: The radiated field strength of the device under test complies with the requirements detailed in FCC Part 15.231, Section (b).

Freq (MHz)	Amplitude (dBμV/m)		Limit (dBμV/m)		Margin (dB)		Ant Pol.	Ant Ht.	Turntable Azimuth	Result
	Peak	Avg.	Peak	Avg.	Peak	Avg.	H/V	cm	Deg	
433.80	86.30	64.40	92.86	72.86	-6.6	-8.5	H/V	100	64	Compliant
	78.82	58.30	92.86	72.86	-14.0	-14.6	V	264	344	Compliant

6.3.1. Worst Case Radiated Field Strength of Fundamental



6. Measurement Data (continued)

6.4. Radiated Field Strength of Harmonics (15.231, Section (b))

Requirement: The 3 meter field strength of the harmonic emissions from intentional radiators operating within the 260-470 MHz frequency band shall comply with the limits specified in FCC Part 15.231, Section (b). The limit is based on a linear interpolation of the following field strength:

Fundamental Frequency (MHz)	Field Strength of Spurious Emissions ($\mu\text{V/m}$)
260-470	150 to 500

Spurious Emissions Limit = $439.67 \mu\text{V/m}$ = 52.86 dB $\mu\text{V/m}$

Test Notes: The peak field strength may not be greater than 20 dB above the average limit. FCC Part 15.231, Section (b)(3) permits the limits presented in the following tables to be higher than the limits presented in FCC Part 15.209..

Conclusion: The device under test complies with the requirements detailed in FCC 15.231, Section B.

6.4.1. Harmonics < 1 GHz

Freq.	Amplitude (dB $\mu\text{V/m}$)		Limit (dB $\mu\text{V/m}$)		Margin (dB)		Ant Polarity	Ant Height	Turntable Azimuth	Result
	Peak	QP	Peak	QP	Peak	QP	H/V	cm	Deg	
867.70	40.3	27.7	72.86	52.86	-32.56	-25.16	H	103	230	Compliant
865.94	38.2	20.9	72.86	52.86	-34.66	-31.96	V	138	274	Compliant

6.4.2. Harmonics > 1 GHz (Tabled data represents the worst case polarity)

Freq.	Amplitude ¹ (dB $\mu\text{V/m}$)		Limit (dB $\mu\text{V/m}$)		Margin (dB)		Ant Polarity	Ant Height	Turntable Azimuth	Result
	Peak	Average	Peak	Average	Peak	Average	H/V	cm	Deg	
1301.40	43.00	29.40	72.86	52.86	-29.86	-23.46	H	138	150	Compliant
1735.20	45.50	32.40	72.86	52.86	-27.36	-20.46	H	246	138	Compliant
2169.00	53.30	37.30	72.86	52.86	-19.56	-15.56	V	107	354	Compliant
2602.80	63.90	45.60	72.86	52.86	-8.96	-7.26	H	100	268	Compliant
3036.60	53.10	39.70	72.86	52.86	-19.76	-13.16	V	119	354	Compliant
3470.40	55.20	42.00	72.86	52.86	-17.66	-10.86	V	114	4	Compliant
3904.20	55.90	42.10	72.86	52.86	-16.96	-10.76	V	159	318	Compliant
4338.00	57.00	43.40	72.86	52.86	-15.86	-9.46	V	127	354	Compliant

6. Measurement Data (continued)**6.5. Spurious Radiated Emissions, 12 MHz to 4.4 GHz (15.231, Section (b))**

Requirement: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

6.5.1. Spurious Radiated Emissions Test Setup

Requirement: (15.209) The Emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency Range (MHz)	Distance (Meters)	Limit (dB μ V/m) ¹
0.009 to 0.490	3	128.5 to 93.8
0.490 to 1.705	3	73.8 to 63.0
1.705 to 30	3	69.5
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
>960	3	54.0

¹Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise a quasi-peak detector is used.

Procedure: This test was performed in accordance with the procedure detailed in FCC OET publication number 558074, Section 5.4: Maximum Unwanted Emissions Levels and FCC 47CFRPart 15.209: Radiated Emission Limits; General Requirements.

Test measurements were made in accordance with ANSI C63.4-2009, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

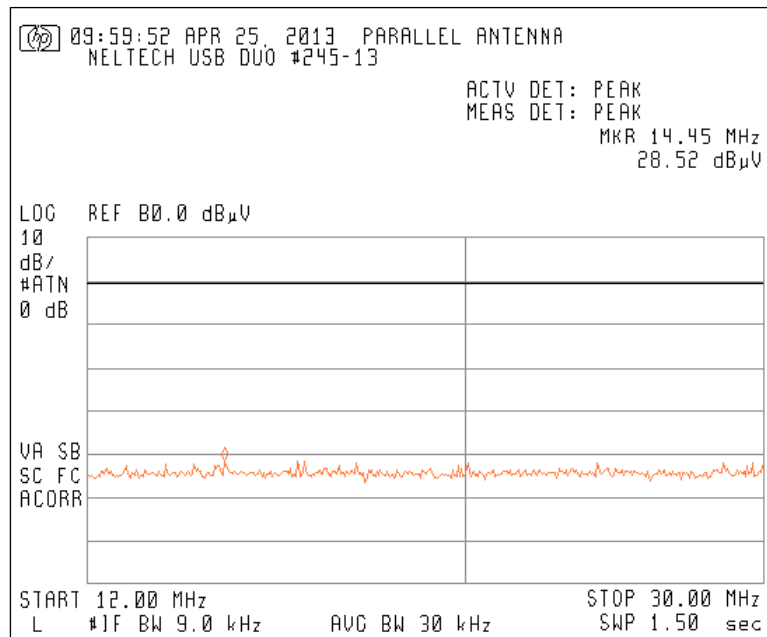
Conclusion: The Emissions from the DUT did not exceed the field strength levels specified in the above table.

6. Measurement Data (continued)

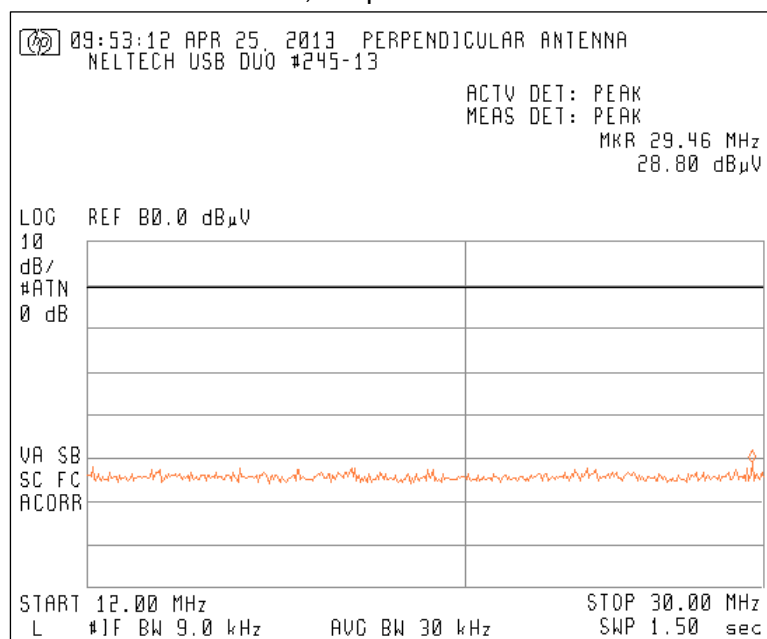
6.5. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231, Section (b)) (continued)

6.5.1. Spurious Radiated Emissions, 12 MHz to 30 MHz Test Results

6.5.1.1. 12 MHz to 30 MHz, Parallel Antenna



6.5.1.2. 12 MHz to 30 MHz, Perpendicular Antenna



6. Measurement Data (continued)

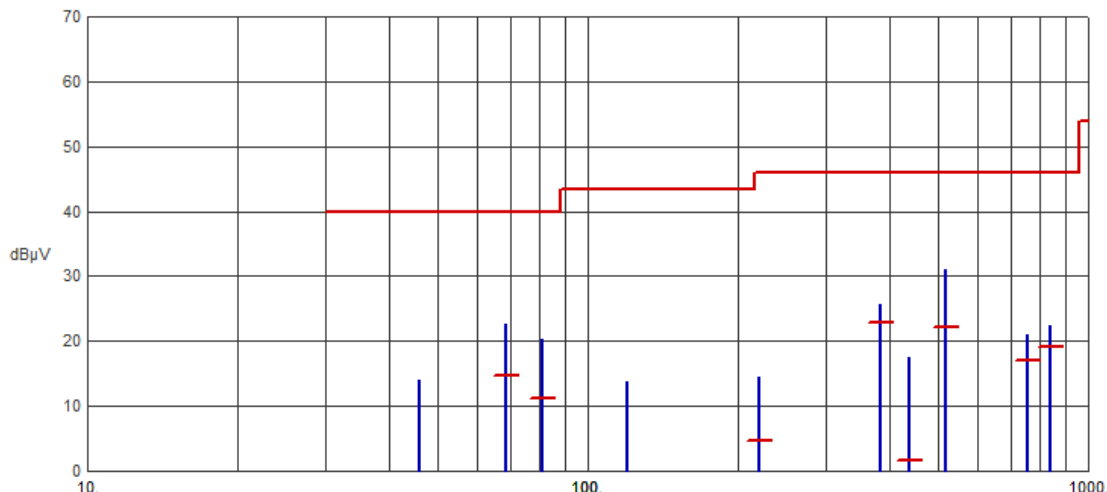
6.5. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231, Section (b)) (continued)

6.5.2. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Results

6.5.2.1. Horizontal Polarity

Test No.: 245-13, Radiated Emissions - Horizontal Polarity

FCC, Class B



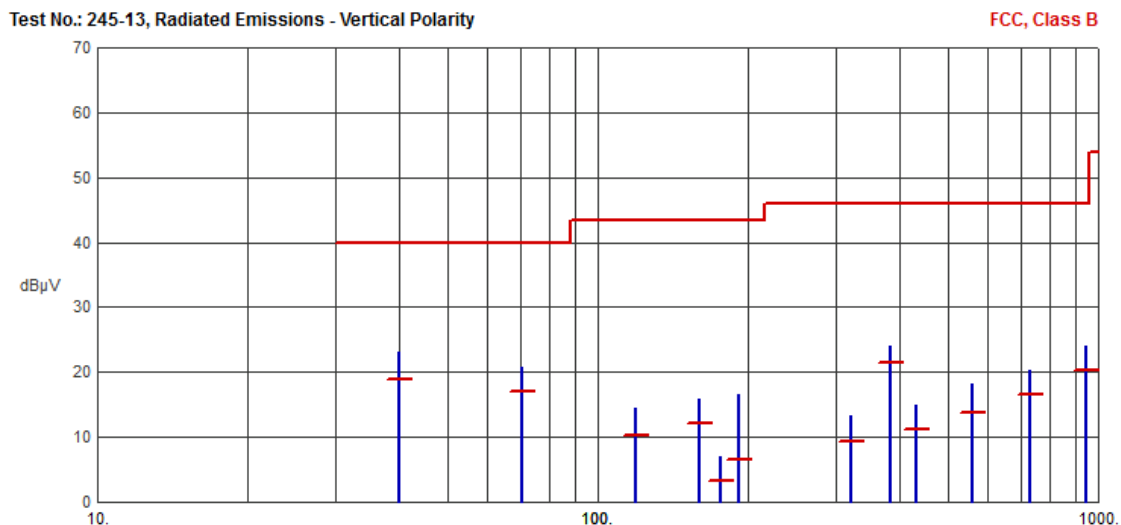
Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
46.0011	14.05	-1.75	40.00	-41.75	N/A	N/A	
68.6370	22.74	14.61	40.00	-25.39	N/A	N/A	
81.0324	20.23	11.17	40.00	-28.83	N/A	N/A	
119.4917	13.73	-5.70	43.50	-49.20	N/A	N/A	
219.5566	14.43	4.68	46.00	-41.32	N/A	N/A	
385.7121	25.78	22.82	46.00	-23.18	N/A	N/A	
437.7068	17.41	1.54	46.00	-44.46	N/A	N/A	
519.9883	30.95	22.28	46.00	-23.72	N/A	N/A	
757.4532	21.07	16.98	46.00	-29.02	N/A	N/A	
838.8783	22.32	19.03	46.00	-26.97	N/A	N/A	

6. Measurement Data (continued)

6.5. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231, Section (b))

6.5.2. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Results (continued)

6.5.2.2. Vertical Polarity



Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
39.9945	23.20	18.97	40.00	-21.03	N/A	N/A	
70.6263	20.71	16.97	40.00	-23.03	N/A	N/A	
119.2547	14.38	10.22	43.50	-33.28	N/A	N/A	
159.9951	15.97	12.16	43.50	-31.34	N/A	N/A	
175.4882	7.07	3.24	43.50	-40.26	N/A	N/A	
191.9960	16.66	6.58	43.50	-36.92	N/A	N/A	
319.9811	13.22	9.45	46.00	-36.55	N/A	N/A	
385.7016	23.96	21.45	46.00	-24.55	N/A	N/A	
432.3615	14.96	11.10	46.00	-34.90	N/A	N/A	
559.8233	18.14	13.74	46.00	-32.26	N/A	N/A	
732.6249	20.32	16.54	46.00	-29.46	N/A	N/A	
946.2410	24.03	20.28	46.00	-25.72	N/A	N/A	

6.5.3. Spurious Radiated Emissions, >1 GHz Test Results

There were no measurable spurious emissions other than the harmonic emissions detailed in section 6.4.2.

6. Measurement Data (continued)

6.6. Emission Bandwidth

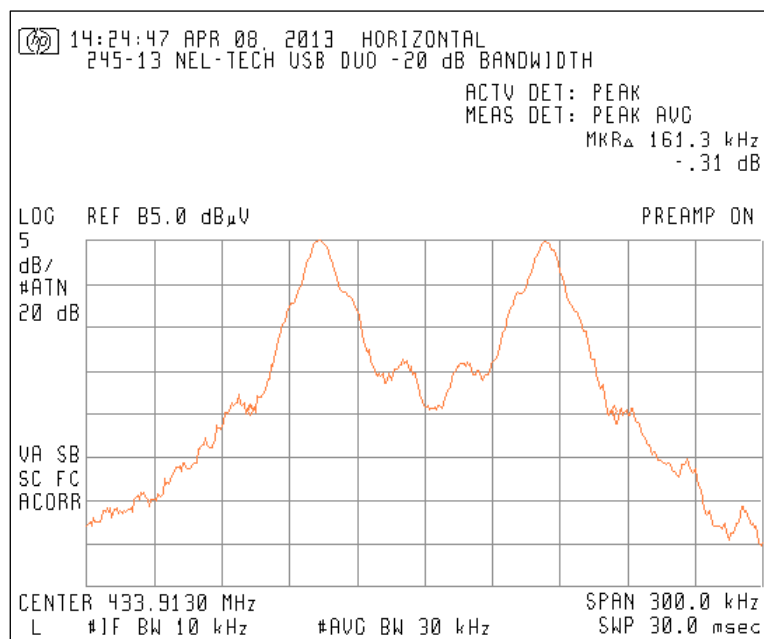
Requirement: The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Note: In order to measure the modulated signal properly, a resolution bandwidth that is small compared with the bandwidth required by the procuring or regulatory agency shall be used on the measuring instrument. However, the resolution bandwidth of the measuring instrument shall be set to a value within 1% to 5% of the signal bandwidth requirements..

Conclusion: The Emissions from the DUT meets the above requirement.

Site Temperature: 22.4°C Site Humidity: 31% RH

Fundamental Frequency	-20 dB Bandwidth	Limit	Result
(MHz)	(MHz)	(MHz)	
433.850	0.1613	1.0846	Compliant



6. Measurement Data (continued)

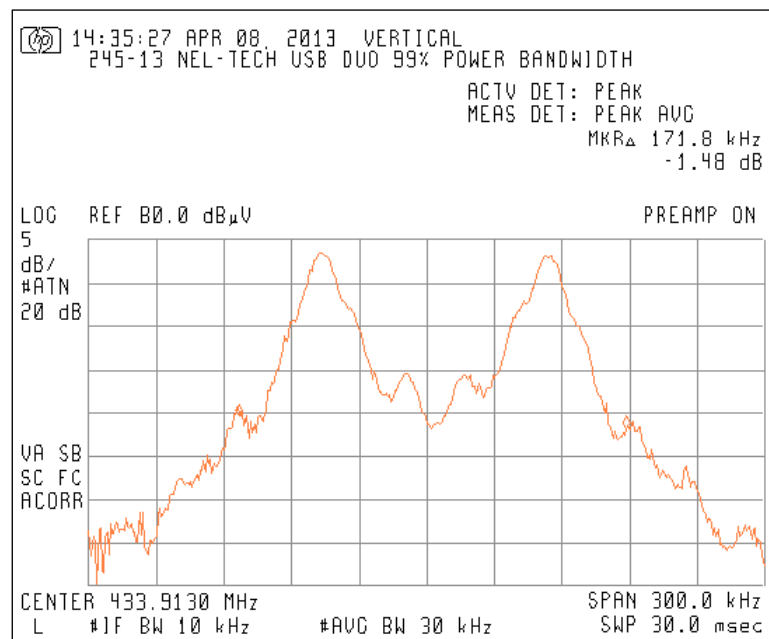
6.7. Bandwidth of Momentary Signals (IC RSS-210 A1.1.3)

Requirement: The 99% bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating between 70 MHz - 900 MHz.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

Conclusion: The Emissions from the DUT meets the above requirement.

Fundamental Frequency	99% Bandwidth	Limit	Result
(MHz)	(MHz)	(MHz)	
433.850	0.1718	1.0846	Compliant



6. Measurement Data (continued)**6.8. Conducted Emissions (15.207)****6.8.1. Conducted Emissions Regulatory Limit: FCC P15.207**

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56 ¹	56 to 46 ¹
0.50 to 5.0	56	46
5.0 to 30	60	50

¹ The limit decreases linearly with the logarithm of the frequency.

6.8.2. Measurement & Equipment Setup

Test Date:	4/9/2013
Test Engineers:	Cody S. Merry
Site Temperature (°C):	21.4
Relative Humidity (%RH):	44
Frequency Range:	150 kHz to 30 MHz

6.8.3. Test Procedure

Test measurements were made in accordance with ANSI C63.10-2009, American National Standard for Testing Unlicensed Wireless Devices.

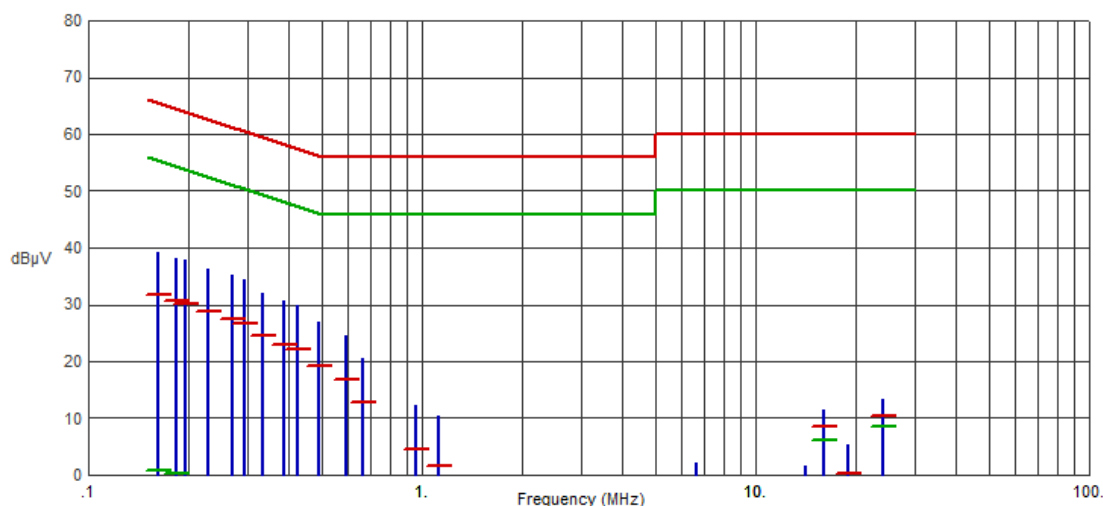
6. Measurement Data (continued)

6.8. Conducted Emissions (15.207) (cont.)

6.8.4. 120 Volts, 60 Hz Phase

Test No.: 245-13, 120 Volts, 60 Hz Phase

FCC, Class B



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1612	39.19	31.65	65.40	-33.75	0.89	55.40	-54.51	
.1833	38.21	30.62	64.33	-33.71	0.17	54.33	-54.16	
.1951	37.90	30.11	63.82	-33.71	-0.24	53.82	-54.06	
.2291	36.39	28.78	62.48	-33.70	-1.69	52.48	-54.17	
.2700	35.25	27.54	61.12	-33.58	-2.83	51.12	-53.95	
.2936	34.52	26.79	60.42	-33.63	-3.59	50.42	-54.01	
.3330	32.13	24.41	59.38	-34.97	-5.52	49.38	-54.90	
.3852	30.66	22.96	58.17	-35.21	-6.68	48.17	-54.85	
.4225	29.88	22.07	57.40	-35.33	-7.32	47.40	-54.72	
.4904	26.97	19.31	56.16	-36.85	-8.65	46.16	-54.81	
.5900	24.63	16.83	56.00	-39.17	-9.11	46.00	-55.11	
.6664	20.50	12.79	56.00	-43.21	-9.26	46.00	-55.26	
.9571	12.37	4.62	56.00	-51.38	-8.70	46.00	-54.70	
1.1211	10.29	1.73	56.00	-54.27	-8.70	46.00	-54.70	
6.6663	2.20	-2.74	60.00	-62.74	-8.79	50.00	-58.79	
14.1956	1.69	-2.45	60.00	-62.45	-8.91	50.00	-58.91	
16.0006	11.34	8.60	60.00	-51.40	6.13	50.00	-43.87	
18.9149	5.35	.31	60.00	-59.69	-6.01	50.00	-56.01	
23.9998	13.46	10.48	60.00	-49.52	8.53	50.00	-41.47	

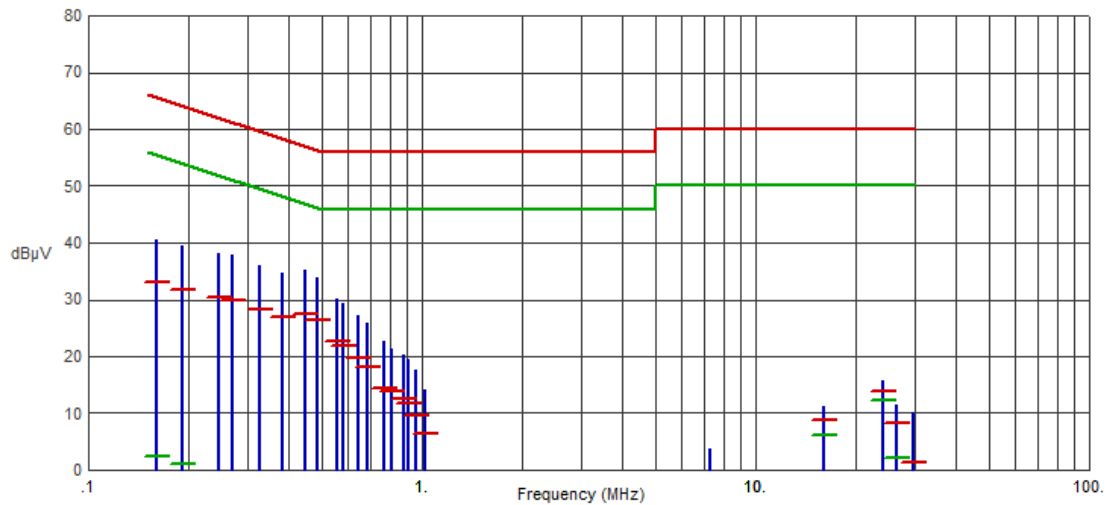
6. Measurement Data (continued)

6.8. Conducted Emissions (15.207)

6.8.5. 120 Volts, 60 Hz Neutral

Test No.: 245-13, 120 Volts, 60 Hz Neutral

FCC, Class B



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1607	40.60	33.00	65.43	-32.43	2.39	55.43	-53.04	
.1918	39.39	31.78	63.96	-32.18	0.94	53.96	-53.02	
.2459	38.04	30.31	61.89	-31.58	-0.06	51.89	-51.95	
.2710	37.94	29.89	61.09	-31.20	-0.48	51.09	-51.57	
.3252	36.05	28.26	59.57	-31.31	-2.16	49.57	-51.73	
.3802	34.79	26.96	58.28	-31.32	-3.25	48.28	-51.53	
.4450	35.10	27.44	56.97	-29.53	-2.92	46.97	-49.89	
.4865	33.88	26.34	56.23	-29.89	-3.87	46.23	-50.10	
.5558	30.13	22.66	56.00	-33.34	-6.94	46.00	-52.94	
.5801	29.39	21.86	56.00	-34.14	-7.42	46.00	-53.42	
.6417	27.33	19.84	56.00	-36.16	-8.33	46.00	-54.33	
.6856	25.90	18.03	56.00	-37.97	-9.01	46.00	-55.01	
.7711	22.60	14.50	56.00	-41.50	-9.36	46.00	-55.36	
.8111	21.42	13.80	56.00	-42.20	-9.65	46.00	-55.65	
.8792	20.27	12.59	56.00	-43.41	-9.31	46.00	-55.31	
.9099	19.54	11.61	56.00	-44.39	-9.67	46.00	-55.67	
.9577	17.62	9.52	56.00	-46.48	-9.16	46.00	-55.16	
1.0237	14.14	6.48	56.00	-49.52	-8.91	46.00	-54.91	
7.2729	3.68	-2.02	60.00	-62.02	-8.33	50.00	-58.33	
15.9992	11.18	8.83	60.00	-51.17	6.24	50.00	-43.76	
23.9992	15.65	13.86	60.00	-46.14	12.15	50.00	-37.85	
26.4874	11.38	8.27	60.00	-51.73	2.06	50.00	-47.94	
29.8377	10.03	1.39	60.00	-58.61	-5.74	50.00	-55.74	

Test Number: 245-13

Issue Date: 7/26/2013

8. Test Setup Photographs

8.1. Radiated Emissions Front View



8. Test Setup Photographs

8.2. Radiated Emissions Rear View < 30 MHz



8. Test Setup Photographs

8.3. Radiated Emissions Rear View 30 MHz – 1 GHz



8. Test Setup Photographs

8.4. Radiated Emissions Rear View > 1 GHz



8. Test Setup Photographs

8.5. Conducted Emissions – Front View



8. Test Setup Photographs

8.6. Conducted Emissions – Rear View



8. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023A-1**).

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meter W x 1.5 meter L x 2.0 meter H, floor standing or table top.