FCC CFR47 PART 15 SUBPART C
ISED CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

433.92MHz TRANSMITTER FOR SMOKE DETECTOR

MODEL NUMBER: OET-TX433-SM

FCC ID: 2AHZG-EIA660W433
ISED ID: 21362-EIA660W433

REPORT NUMBER: R11261107-E1

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Revision History

Ver.	Issue Date	Revisions	Revised By
1	2017-01-11	Initial Issue	Brian Kiewra
2	2017-02-13	Updated duty-cycle section with plot showing 100ms window.	Mark Nolting

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: oneEvent Technologies
505 Sprindale St.
Mt. Horeb, WI 53572, USA

EUT DESCRIPTION: 433.92MHz Transmitter for Smoke Detector

MODEL: OET-TX433-SM

SERIAL NUMBER: 7E (standard unit); 6E (continuous transmit unit)

DATES TESTED: 09/08/2016; 09/23/2016; 10/13/2016; 10/17/2016; 11/01/2016; 11/10/2016; 12/05-12/06/2016; 12/12-12/16/2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	PASS
Innovation, Science and Economic Development Canada (ISED) RSS-210 Issue 8	PASS
ISED RSS-GEN Issue 4	PASS

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Approved & Released
For UL LLC By:

Jeffrey Moser
EMC Program Manager
UL – Consumer Technology Division

Prepared By:

Brian T. Kiewra
EMC Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-210 Issue 9.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Suite B, Perimeter Park Drive, Morrisville, NC 27560.

12 Laboratory Dr., RTP, NC 27709
☐ Chamber A
☐ Chamber C

2800 Suite B Perimeter Park Dr., Morrisville, NC 27560
☒ Chamber NORTH
☒ Chamber SOUTH

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at http://www.nist.gov/nvlap/

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
RF output power, conducted	±0.45 dB
Power Spectral Density, conducted	±1.50 dB
Unwanted Emissions, conducted	±2.94 dB
All emissions, Radiated	±5.36 dB
Conducted Emissions (0.150 – 30MHz)	±3.65 dB
Temperature	±0.07 °C
Humidity	±2.26 %
DC and Low Frequency Voltages	±1.27 %

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 433.92MHz Transmitter for a Smoke Detector.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a loop antenna, with a maximum gain of 0 dBi.

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1000022, rev. 4.9.

The EUT driver software installed during testing was radio433smoketx_100ms, rev. 48.

The test utility software used during testing was carrier_freq, rev. 1.

5.4. WORST-CASE CONFIGURATION AND MODE

Three orientations of the EUT were investigated for the worst-case emissions at its fundamental operating frequency. The worst-case orientation was with the unit lying flat on the test table.

5.5. MODIFICATIONS

Increased resistor R2 to 150 Ohm which reduces voltage to RF chip which reduces power out. Changed filter cap C5 to .001uF to remove over shoot at the beginning of the data bit.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

None required for test.

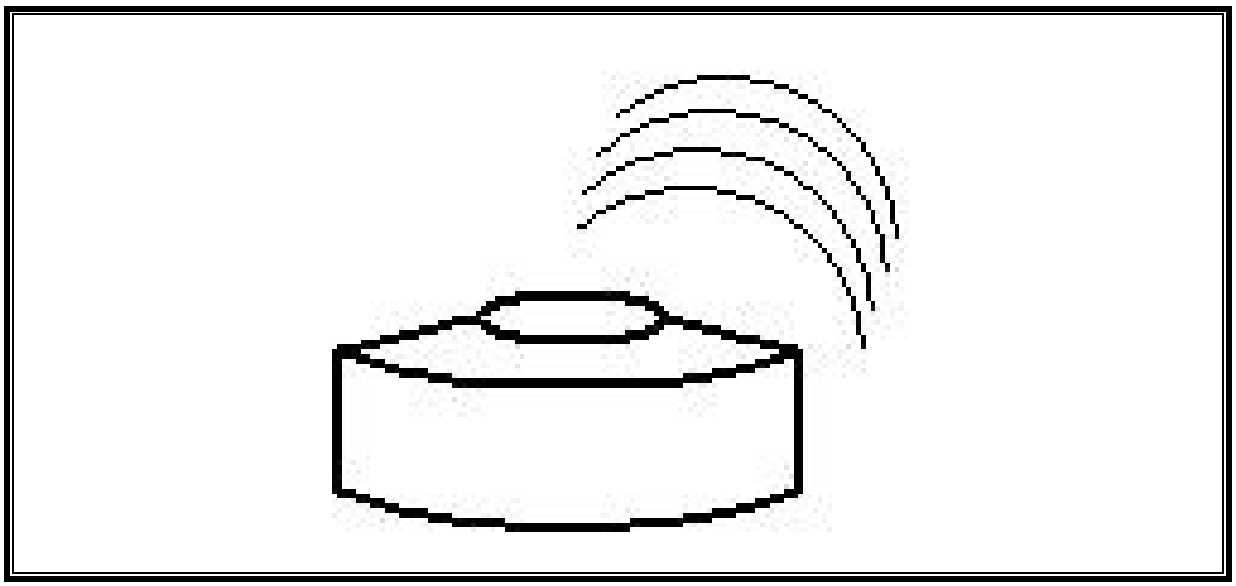
I/O CABLES (RADIATED SETUP)

None required for test.

TEST SETUP

The EUT was placed on a standard test table.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2016-06-27	2017-06-30
N-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2016-06-26	2017-06-30
SA0027	Spectrum Analyzer	Agilent	N9030A	2016-02-08	2017-02-08
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
139844	Temp/Humid/Pressure Meter	Fischer Scientific	14-650-118	2016-02-19	2017-02-19
MM0165	True RMS Multimeter	Agilent	U1232A	2016-10-08	2017-10-31

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2015-12-08	2016-12-31
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2016-06-07	2017-06-30
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2016-03-07	2017-03-31
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2016-10-04	2017-10-04
S-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2016-06-26	2017-06-30
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2016-08-28	2017-08-28
SA0025	Spectrum Analyzer	Agilent	N9030A	2016-03-17	2017-03-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
139844	Temp/Humid/Pressure Meter	Fischer Scientific	14-650-118	2016-02-19	2017-02-19
MM0165	True RMS Multimeter	Agilent	U1232A	2016-10-08	2017-10-31

Test Equipment Used - Wireless Antenna-Port Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SA0026	Spectrum Analyzer	Agilent	N9030A	2016-02-24	2017-02-28
139844	Temp/Humid/Pressure Meter	Fischer Scientific	14-650-118	2016-02-19	2017-02-19
MM0165	True RMS Multimeter	Agilent	U1232A	2016-10-08	2017-10-31

7. ANTENNA PORT TEST RESULTS

Note: Given that the EUT had an imbedded antenna without an accessible antenna port, the following tests were performed over the air via a receive antenna.

7.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)
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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

IC A1.1.3
For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

TEST PROCEDURE

99% BW: Per RSS-Gen, Section 6.6

The transmitter output is coupled to the spectrum analyzer via an antenna connected to the spectrum analyzer.

The RBW is set to 1% to 5% of the 99 % bandwidth. The VBW is set to approximately 3 times the RBW. The sweep time is coupled. The detection mode is set to peak and the trace mode to max hold as allowed by the RSS-Gen standard for devices that do not transmit continuously. The spectrum analyzer's internal 99% bandwidth function is utilized.

20dB BW: Per ANSI C63.10, Section 6.9.2

The transmitter output is coupled to the spectrum analyzer via an antenna connected to the spectrum analyzer.

The RBW is set to 1% to 5% of the 20dB bandwidth. The VBW is set to approximately 3 times the RBW. The sweep time is coupled. The detection mode is set to peak and the trace mode to max hold. The spectrum analyzer's internal 20dB bandwidth function is utilized.

RESULTS

No non-compliance noted:

20dB Bandwidth

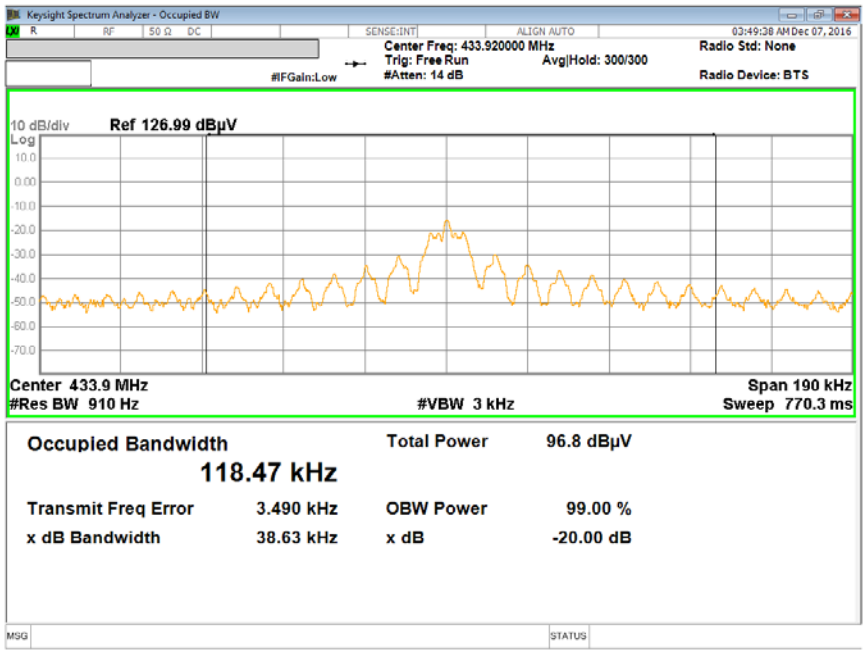
Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.92	38.63	1084.8	-1046.17

99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.92	917.7	1084.8	-167.1

20dB BANDWIDTH

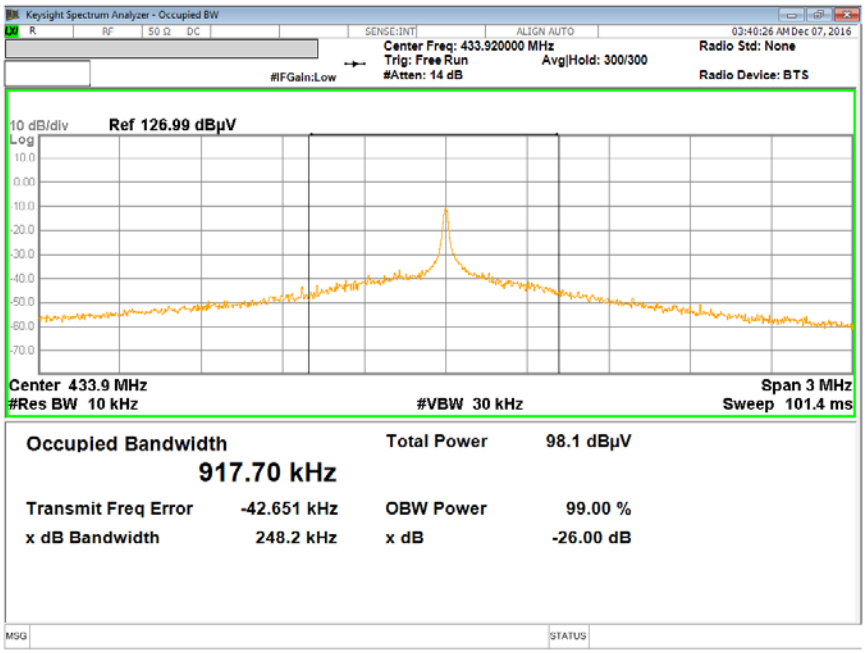
20dB BANDWIDTH



Test Operator: Mark Nolting Date: 2016-12-06

99% BANDWIDTH

99% BANDWIDTH



Test Operator: Mark Nolting Date: 2016-12-06

7.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)
The measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

TEST PROCEDURE

The transmitter output is coupled to the spectrum analyzer via an antenna connected to the spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

CALCULATION

Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is
(# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

For reporting purposes only. To be used for calculating average values of a pulsed signal.

The following modes were investigated to determine which mode produced the worst-case duty-cycle correction factor (DCCF):

(1) Short press of test button.
(2) Long press of test button. (Initiates audible alarm.)
(3) Open access cover.
(4) Close access cover.
(5) Install battery.
(6) Smoke-head self-test after battery installation.

Of the six modes presented above, modes (1) and (2) had the same DCCF that was worse than the other modes. Only mode (1) is presented in this section.

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	0.2740	12	0.1423	52	0.107	-19.42

WORST-CASE INTER-BURST-PACKET TIME

The following plot shows the worst-case inter-burst-packet time to be 105.7ms, It also shows a 100ms window showing no other emissions after the gated burst packet. Due to the variability in the time between burst-packets, this plot was captured by repeated triggering of the device to ensure capturing of the worst-case event.

WORST-CASE INTER-BURST-PACKET TIME

Test Operator: Mark Nolting Date: 2016-12-12

WORST-CASE PACKET CONTENT

WORST-CASE PACKET CONTENT

Test Operator: Mark Nolting Date: 2016-12-12

Number of Long Pulses: 12
Number of Short Pulses: 52

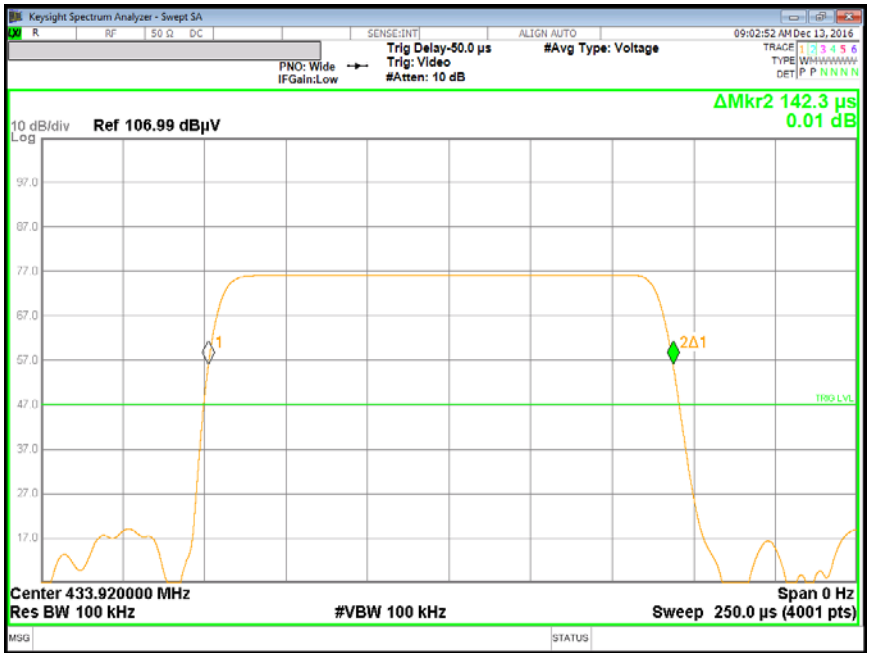
LONG PULSE WIDTH

LONG PULSE WIDTH

Test Operator: Mark Nolting Date: 2016-12-12

SHORT PULSE WIDTH

SHORT PULSE WIDTH



Test Operator: Mark Nolting Date: 2016-12-12

7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)
ISED RSS-210 A1.1.1 (b)

A transmitter activated automatically shall cease transmission within 5 seconds after activation.

TEST PROCEDURE

The transmitter output is coupled to a spectrum analyzer via an antenna connected to the input of the spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is set to roughly 10 seconds and the span is set to 0 Hz.

RESULTS

No non-compliance noted.

The following modes were investigated for compliance to the 5-second off time requirement:

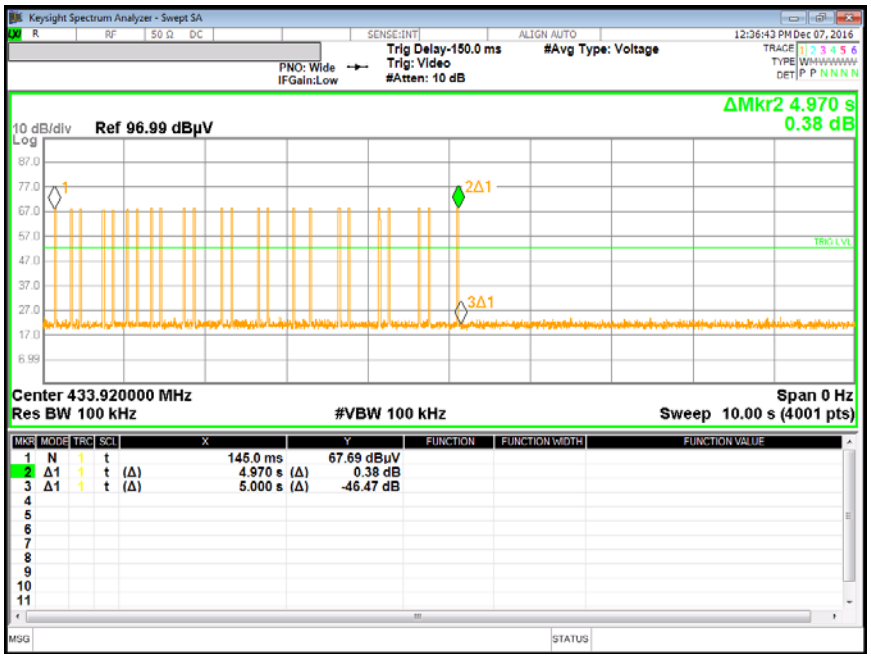
(1) Short press of test button.
(2) Long press of test button. (Initiates audible alarm.)
(3) Open access cover.
(4) Close access cover.
(5) Install battery.
(6) Smoke-head self-test after battery installation.

LESS THAN 5 SECONDS

Test Operator: Mark Nolting Date: 2016-12-06

Short press of test button: Worst-case observation.

LESS THAN 5 SECONDS



Test Operator: Mark Nolting Date: 2016-12-06

Long press of test button: Worst-case observation.

LESS THAN 5 SECONDS

Test Operator: Mark Nolting Date: 2016-12-13

Open access cover: Worst-case observation.

LESS THAN 5 SECONDS

Test Operator: Mark Nolting Date: 2016-12-13

Close access cover: Worst-case observation.

LESS THAN 5 SECONDS

Test Operator: Mark Nolting Date: 2016-12-16

Battery installation followed by smoke-head self-test: Worst-case observation.

(a) Insert battery: First four bursts.

(b) Smoke-head check: Last six bursts.

7.4. POLLING TIME

LIMITS

FCC §15.231 (a) (3)

ISED RSS-210 A1.1.1 (c)

For safety and security devices allowed periodic transmissions at regular predetermined intervals, the total transmission time shall not exceed two seconds per hour.

TEST PROCEDURE

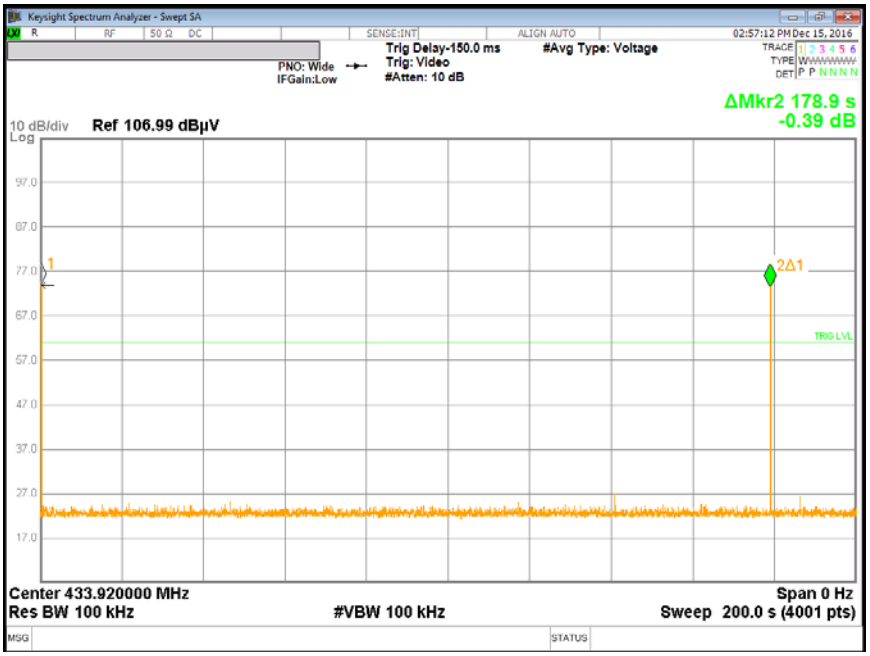
The transmitter output is coupled to a spectrum analyzer via an antenna connected to the input of the spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is set as needed to capture the event of interest and the span is set to 0 Hz.

RESULTS

No non-compliance noted:

The device's polling period was as shown below.

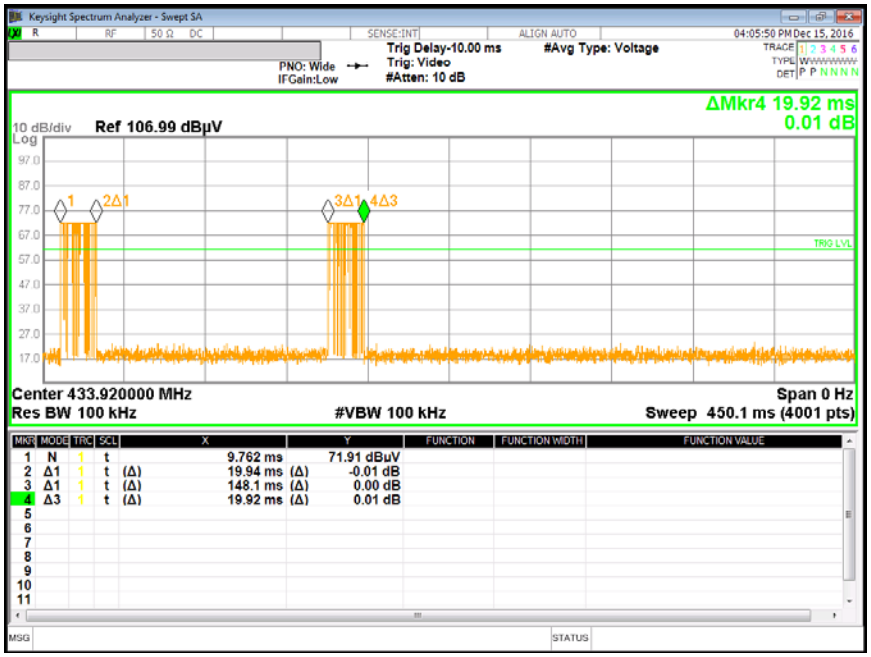
POLLING PERIOD



Test Operator: Mark Nolting Date: 2016-12-15

Two packets of information were transmitted every 178.9 seconds as shown below.

TWO PACKETS WITHIN A POLLING PERIOD



Test Operator: Mark Nolting Date: 2016-12-15

The contents of two two packets remained constant from one poll period to the next and are presented on the next page.

FIRST PACKET CONTENTS

Test Operator: Mark Nolting Date: 2016-12-16

SECOND PACKET CONTENTS

Test Operator: Mark Nolting Date: 2016-12-16

The total transmit time is calculated using the following parameters:

Time Interval (hr)	Polling Period (s)	# Bursts per Period	Burst Duration (ms)	Total Transmit Time per Hour (s)	Limit (s)	Margin (s)
1	178.9	2	19.9	0.84	2	-1.16

8. RADIATED EMISSION TEST RESULTS

8.1. TX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.231 (b)
IC A1.1.2
In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750	125 to 375
174 - 260	3,750	375
260 - 470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

1 Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 – 13.41	322 - 335.4		

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 88	100 **	3
88 216	150 **	3
216 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 meters above the ground plane for above 1 GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz. For average measurements, the resolution and video bandwidths are set as described in ANSI 63.10:2013 for the applicable average measurement.

The spectrum from 9 kHz to 4 GHz is investigated with the transmitter on.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

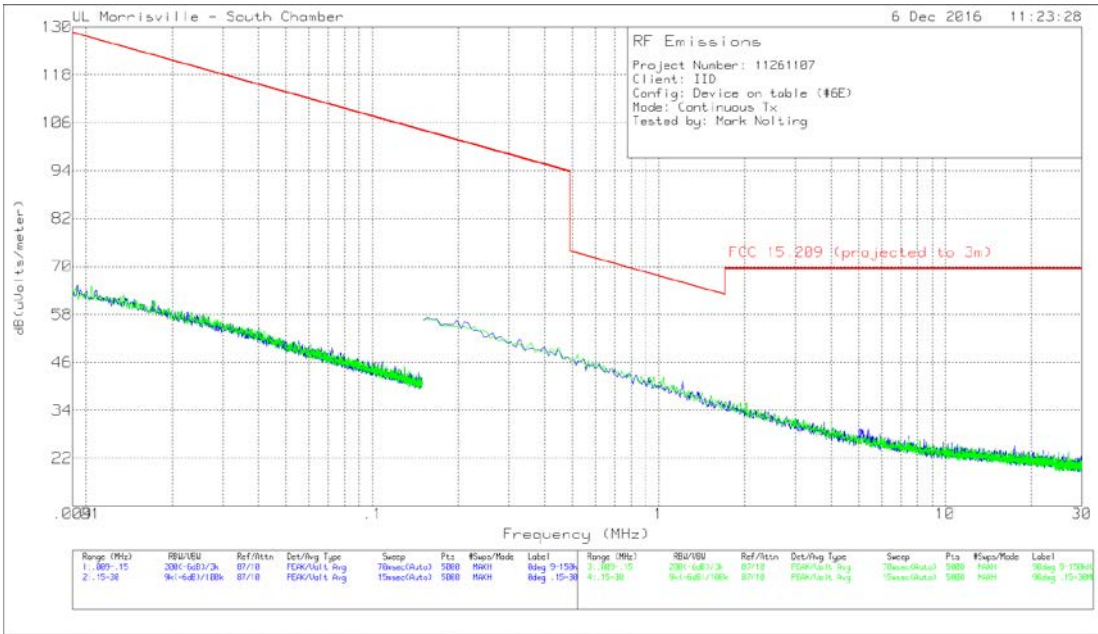
RESULTS

TX SPURIOUS EMISSIONS (0.009-30MHz)

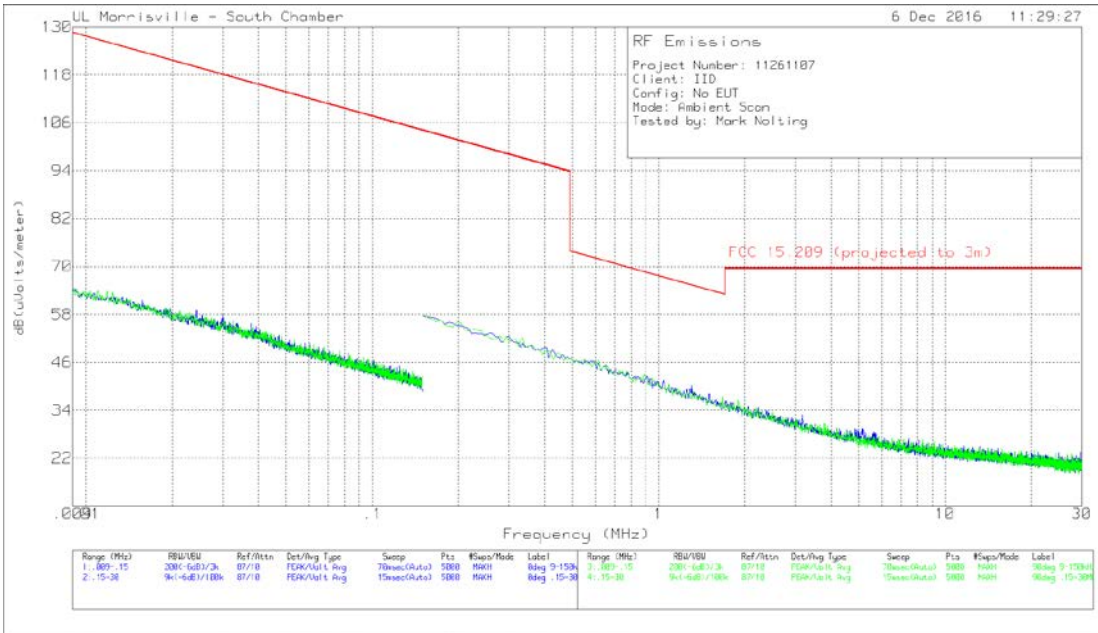
Note: All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (specification distance / test distance) per FCC 15.31 (f) (2).

Although these tests were performed at a test site other than an open area test site, adequate comparison measurements were confirmed against an open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

EUT PLOT



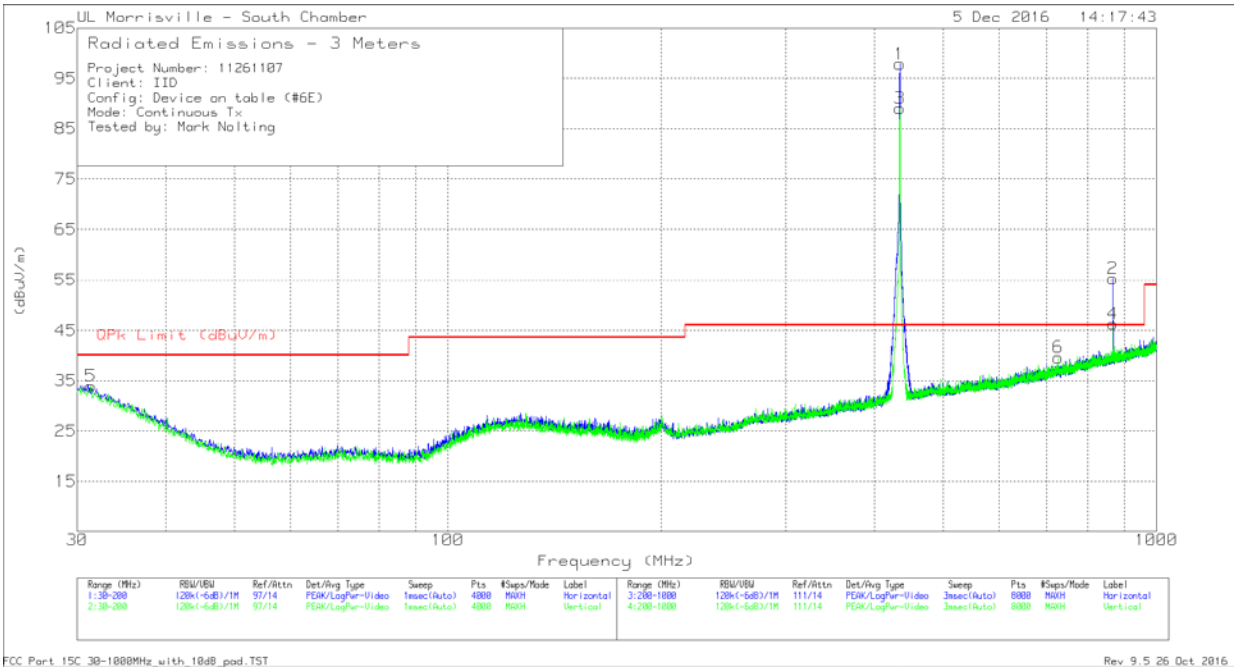
NOISE-FLOOR PLOT



The above plots demonstrate there were no EUT-related emissions of interest relative to the FCC 15.209 limit below 30MHz.

FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)

PLOT



TABULAR DATA

Marker	Freq. (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Pk Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Pol.
5	31.3604	25.33	Qp	24.9	-31.8	9.9	0.0	28.33	-	-	60.83	-32.50	151	101	V
1	433.9203	96.58	Pk	20.8	-29	9.9	0.0	98.28	100.83	-2.55	-	-	266	231	H
	433.9203	96.58	Pk	20.8	-29	9.9	-19.42	78.86	-	-	80.83	-1.97	266	231	H
2	867.8405	46.18	Pk	26.7	-27.4	9.9	0.0	55.38	80.83	-25.45	-	-	74	101	H
	867.8405	46.18	Pk	26.7	-27.4	9.9	-19.42	35.96	-	-	60.83	-24.87	74	101	H
3	433.9204	87.98	Pk	20.8	-29	9.9	0.0	89.68	100.83	-11.15	-	-	344	239	V
	433.9204	87.98	Pk	20.8	-29	9.9	-19.42	70.26	-	-	80.83	-10.57	344	239	V
6	725.8684	24.9	Qp	25.1	-28.2	9.9	0.0	31.7	-	-	60.83	-29.13	68	300	V
4	867.84	38.47	Pk	26.7	-27.4	9.9	0.0	47.67	80.83	-33.16	-	-	340	201	V
	867.84	38.47	Pk	26.7	-27.4	9.9	-19.42	28.25	-	-	60.83	-32.58	340	201	V

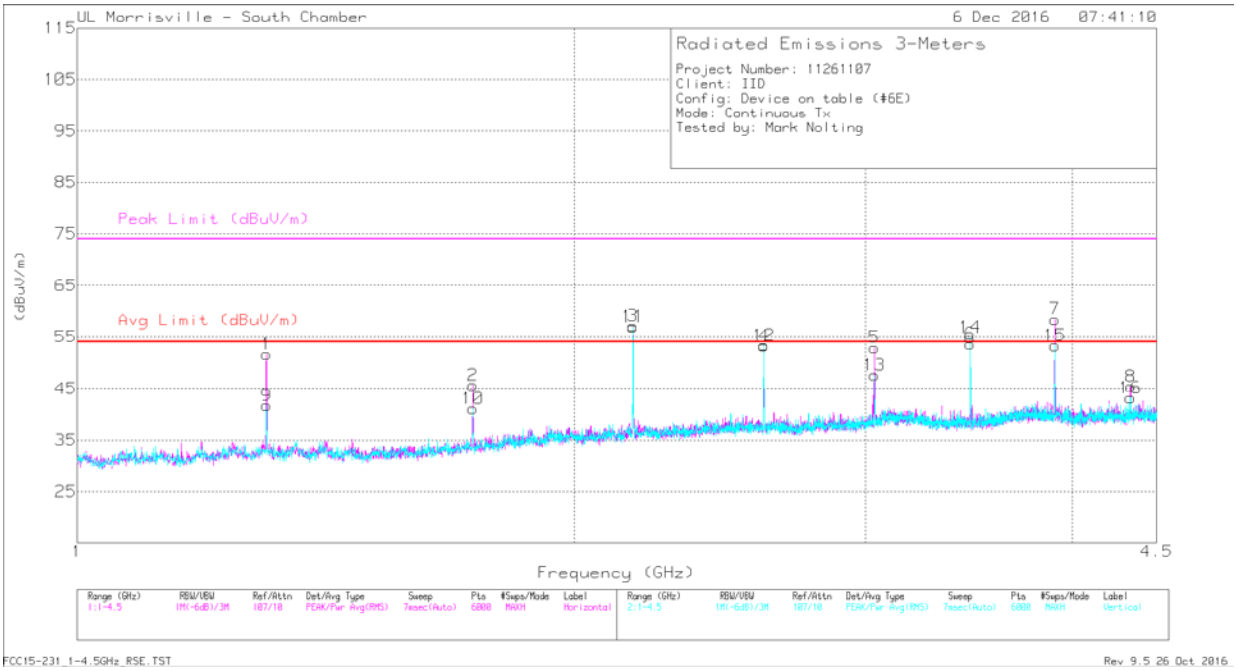
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz

PLOT



TABULAR DATA

Marker	Freq. (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Avg Limit (dBuV/m)	Avg Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.302	61.7	Pk	28.8	-35.2	0.0	55.3	74	-18.7	-	-	48	124	H
	* 1.302	61.7	Pk	28.8	-35.2	-19.42	35.88	-	-	54	-18.12	48	124	H
2	1.736	52.01	Pk	29.4	-34.9	0.0	46.51	80.83	-34.32	-	-	14	153	H
	1.736	52.01	Pk	29.4	-34.9	-19.42	27.09	-	-	60.83	-33.74	14	153	H
3	2.17	61.95	Pk	31.8	-34.5	0.0	59.25	80.83	-21.58	-	-	173	195	H
	2.17	61.95	Pk	31.8	-34.5	-19.42	39.83	-	-	60.83	-21	173	195	H
4	2.604	59.25	Pk	32.3	-34.3	0.0	57.25	80.83	-23.58	-	-	211	348	H
	2.604	59.25	Pk	32.3	-34.3	-19.42	37.83	-	-	60.83	-23	211	348	H
5	3.037	58.93	Pk	33	-33.9	0.0	58.03	80.83	-22.8	-	-	283	271	H
	3.037	58.93	Pk	33	-33.9	-19.42	38.61	-	-	60.83	-22.22	283	271	H
6	3.471	60.63	Pk	32.9	-33.6	0.0	59.93	80.83	-20.9	-	-	9	125	H
	3.471	60.63	Pk	32.9	-33.6	-19.42	40.51	-	-	60.83	-20.32	9	125	H
7	* 3.905	59.85	Pk	33.5	-33.1	0.0	60.25	74	-13.75	-	-	77	147	H
	* 3.905	59.85	Pk	33.5	-33.1	-19.42	40.83	-	-	54	-13.17	77	147	H
8	* 4.339	50.01	Pk	33.6	-32.6	0.0	51.01	74	-22.99	-	-	316	103	H
	* 4.339	50.01	Pk	33.6	-32.6	-19.42	31.59	-	-	54	-22.41	316	103	H
9	* 1.302	56.7	Pk	28.8	-35.2	0.0	50.3	74	-23.7	-	-	273	400	V
	* 1.302	56.7	Pk	28.8	-35.2	-19.42	30.88	-	-	54	-23.12	273	400	V
10	1.736	48.58	Pk	29.4	-34.9	0.0	43.08	80.83	-37.75	-	-	337	110	V
	1.736	48.58	Pk	29.4	-34.9	-19.42	23.66	-	-	60.83	-37.17	337	110	V
11	2.17	61.81	Pk	31.8	-34.5	0.0	59.11	80.83	-21.72	-	-	213	386	V
	2.17	61.81	Pk	31.8	-34.5	-19.42	39.69	-	-	60.83	-21.14	213	386	V
12	2.603	59.59	Pk	32.3	-34.3	0.0	57.59	80.83	-23.24	-	-	303	103	V
	2.603	59.59	Pk	32.3	-34.3	-19.42	38.17	-	-	60.83	-22.66	303	103	V
13	3.037	56.77	Pk	33	-33.9	0.0	55.87	80.83	-24.96	-	-	148	360	V
	3.037	56.77	Pk	33	-33.9	-19.42	36.45	-	-	60.83	-24.38	148	360	V
14	3.471	57.01	Pk	32.9	-33.6	0.0	56.31	80.83	-24.52	-	-	163	101	V
	3.471	57.01	Pk	32.9	-33.6	-19.42	36.89	-	-	60.83	-23.94	163	101	V
15	* 3.905	57.06	Pk	33.5	-33.1	0.0	57.46	74	-16.54	-	-	286	373	V
	* 3.905	57.06	Pk	33.5	-33.1	-19.42	38.04	-	-	54	-15.96	286	373	V
16	* 4.339	47.5	Pk	33.6	-32.6	0.0	48.5	74	-25.5	-	-	270	101	V
	* 4.339	47.5	Pk	33.6	-32.6	-19.42	29.08	-	-	54	-24.92	270	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector