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Project Number:	11CA61237 Rev.1
File Number:	MC15343
Date:	December 16, 2011
Model:	001D7472-1, -2

Electromagnetic Compatibility Test Report

For

Chamberlain Group Inc.

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **333 Pfingsten Rd.** **Northbrook, IL 60062**
Tests Performed For:	**Chamberlain Group Inc.** **845 Larch Av** **Elmhurst, IL 60126**
Applicant Contact:	**Hank Sieradzki**
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Test Report Date:	**December 16, 2011**
Product Type:	**Low Power Transmitter / Receiver**
Product standards	**FCC Part 15, Subpart C, 15.231**
Model Number:	**001D7472-1, -2**
EUT Category:	**Periodic Low Power Transmitter**
Testing Start Date:	**November 30, 2011**
Date Testing Complete:	**December 14, 2011**
Overall Results:	**Compliant**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

Report Directory

1.0 G E N E R A L - Product Description 5
1.1 Equipment Description 5
1.2 Device Configuration During Test 5
1.2.1 Equipment Used During Test: 5
1.2.2 Input/Output Ports: 5
1.2.3 EUT Internal Operating Frequencies: 6
1.2.4 Power Interface: 6
1.3 EUT Configurations 6
1.4 EUT Operation Modes 6
2.0 Summary 7
2.1 Deviations from standard test methods 7
2.2 Device Modifications Necessary for Compliance 7
2.3 Reference Standards 8
2.4 Results Summary 8
3.0 Calibration of Equipment Used for Measurement 9
3.1 Equipment Used for Testing 9
4.0 EMISSIONS TEST RESULTS 10
4.1 E00-code 310MHz, 315MHz, 390MHz Transmitter 11
4.1.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 11
4.1.2 Test Conditions and Results – Cease Operation 15
4.1.3 Test Conditions and Results – Pulse Train / Duty Cycle 17
4.1.4 Test Conditions and Results – 20dB / 99% Bandwidth 21
4.2 E01-code 310MHz, 315MHz, 390MHz Transmitter 24
4.2.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 24
4.2.2 Test Conditions and Results – Cease Operation 28
4.2.3 Test Conditions and Results – Pulse Train / Duty Cycle 30
4.2.4 Test Conditions and Results – 20dB / 99% Bandwidth 32
4.3 D-code 315MHz Transmitter 35
4.3.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 35
4.3.2 Test Conditions and Results – Cease Operation 38
4.3.3 Test Conditions and Results – Pulse Train / Duty Cycle 40
4.3.4 Test Conditions and Results – 20dB / 99% Bandwidth 42
4.4 D-code 390MHz Transmitter 44
4.4.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 44
4.4.2 Test Conditions and Results – Cease Operation 47
4.4.3 Test Conditions and Results – Pulse Train / Duty Cycle 49
4.4.4 Test Conditions and Results – 20dB / 99% Bandwidth 51
4.5 C-code 315MHz Transmitter 53
4.5.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 53
4.5.2 Test Conditions and Results – Cease Operation 56

4.5.3 Test Conditions and Results – Pulse Train / Duty Cycle 58
4.5.4 Test Conditions and Results – 20dB / 99% Bandwidth 60
4.6 C-code 390MHz Transmitter 62
4.6.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions 62
4.6.2 Test Conditions and Results – Cease Operation 65
4.6.3 Test Conditions and Results – Pulse Train / Duty Cycle 67
4.6.4 Test Conditions and Results – 20dB / 99% Bandwidth 69
4.7 Test Conditions and Results – Receiver and Radiated Emissions 71
5.0 TEST SETUP PHOTOS 74
6.0 IMMUNITY TEST RESULTS 76
Appendix A 77
Accreditations and Authorizations 77

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
20120127	Rev.1 - Corrected multiple typos and mislabeled items	Bart Mucha	Bob Delisi

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The equipment under test (EUT) is a learning transmitter used with Garage Door Operators.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Transmitter / Receiver	Chamberlain Group Inc. Sample 27229	001D7472-1, -2	Four button configuration programmed as follows: BT1: E00-code 310, 315, 390MHz TX BT2: E01-code 310, 315, 390MHz TX BT3: D-code 315MHz TX BT4: D-code 390MHz TX
EUT	Transmitter / Receiver	Chamberlain Group Inc. Sample 27206	001D7472-1, -2	Two button configuration programmed as follows: BT1: C-code 315MHz BT2: C-code 390MHz
EUT	Transmitter / Receiver	Chamberlain Group Inc. Sample 27207	001D7472-1, -2	Two button configuration programmed as follows: Program button used to activate learning mode. In learning mode the EUT remains in receive mode.

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.2.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
29.95	Local Oscillator

1.2.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	1.5	-	-	DC	-	Uses internal 1.5V AAA battery

1.3 EUT Configurations

Mode #	Description
1	EUT was placed on non-conductive support, aprx. 80cm above ground plane with fresh battery inserted. For all samples used for Radiated Emissions the worst case configuration was always X-Axis.
2	EUT was placed close to near field antenna

1.4 EUT Operation Modes

Mode #	Description
1	EUT was programmed to transmit continuously once the button is held in.
2	EUT was set into continuous receive mode.
3	EUT was used in normal intended use press and release.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
47 CFR Part 15.231, subpart C	Code of Federal Regulations, Part 15, Radio Frequency Devices	2010
47 CFR Part 15, subpart B	Code of Federal Regulations, Part 15, Radio Frequency Devices	2010
RSS-210	License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment	Issue 8, 2010
RSS-Gen	General Requirements and Information for the Certification of Radio Apparatus	Issue 3, 2011
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003

2.4 Results Summary

Requirement – Test	Result (Compliant / Non-Compliant)*
Radiated Emissions - Fundamental and Harmonics	Compliant
Cease Operation	Compliant
Pulse Train & Duty Cycle	Compliant
Bandwidth 20dB and 99% power	Compliant
Radiated Emissions - Receiver & Digital	Compliant
Line Conducted Emissions	Note 1
Note 1: EUT is portable, battery operation only without any provisions for external power supply.	

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Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

3.1 Equipment Used for Testing

Table 1 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	2010DEC30	2011DEC30
Bicon Antenna	Chase	VBA6106A	EMC4078	2010DEC02	2011DEC30
Log-P Antenna	Chase	UPA6109	EMC4313	2011JUN29	2012JUN29
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	2010DEC28	2011DEC30
Antenna Array	UL	BOMS	EMC4276	2010AUG30	2011DEC30

Table 2 Cease Operation Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	2010DEC28	2011DEC30
Generic Near-field Loop	-	-	-	N/A	N/A

Table 3 Pulse Train / Duty Cycle Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	2010DEC28	2011DEC30
Near-field Loop	-	-	-	N/A	N/A

Table 4 Occupied Bandwidth Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
Spectrum Analyzer	Rhode & Schwarz	ESCI	EMC4328	2010DEC29	2011DEC30
Near-field Loop	-	-	-	N/A	N/A

Table 5 Receiver and Digital Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	2010DEC30	2011DEC30
Bicon Antenna	Chase	VBA6106A	EMC4078	2010DEC02	2011DEC30
Log-P Antenna	Chase	UPA6109	EMC4313	2011JUN29	2012JUN29
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	2010DEC28	2011DEC30
Antenna Array	UL	BOMS	EMC4276	2010AUG30	2011DEC30

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- United States ----------

Code of Federal Regulations Title 47	Part 15, Subpart B, Radio Frequency Devices

---------- Canada ----------

RSS-210	License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS-Gen	General Requirements and Information for the Certification of Radio Apparatus

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

Sample Calculations
Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

4.1 E00-code 310MHz, 315MHz, 390MHz Transmitter

4.1.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

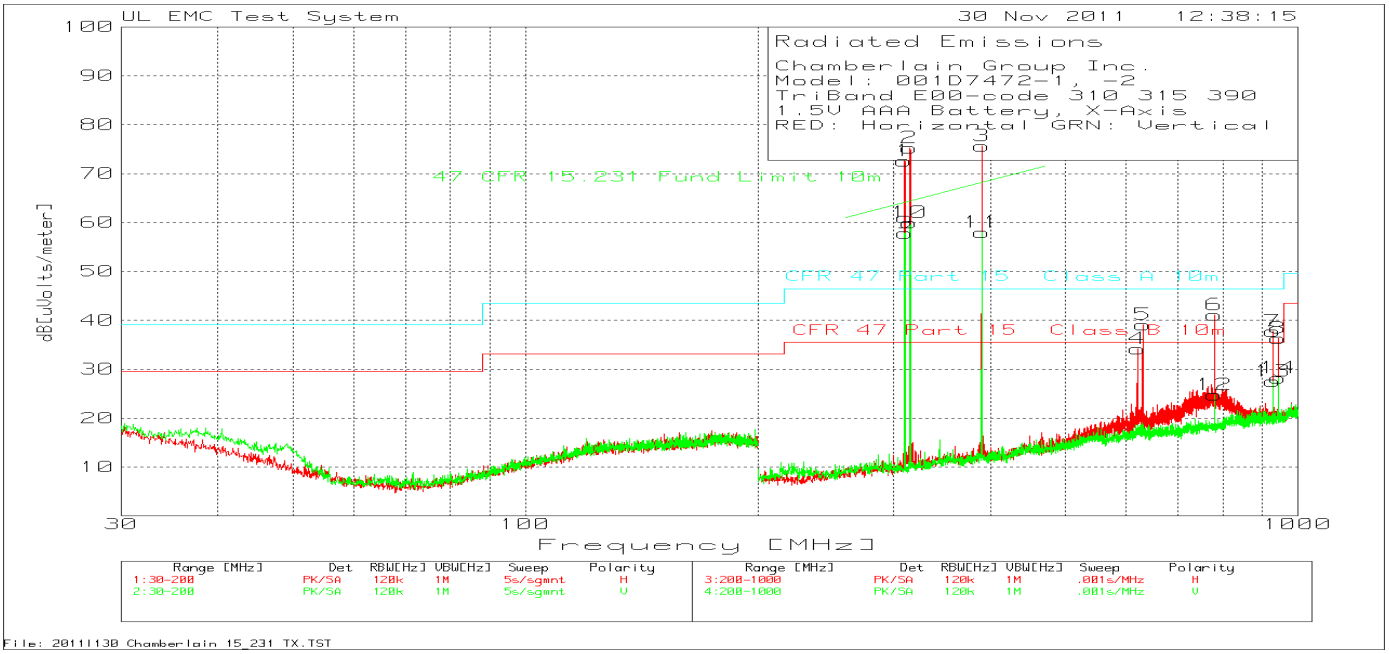
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 6 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information: None		

Figure 1 Radiated Emissions Graph



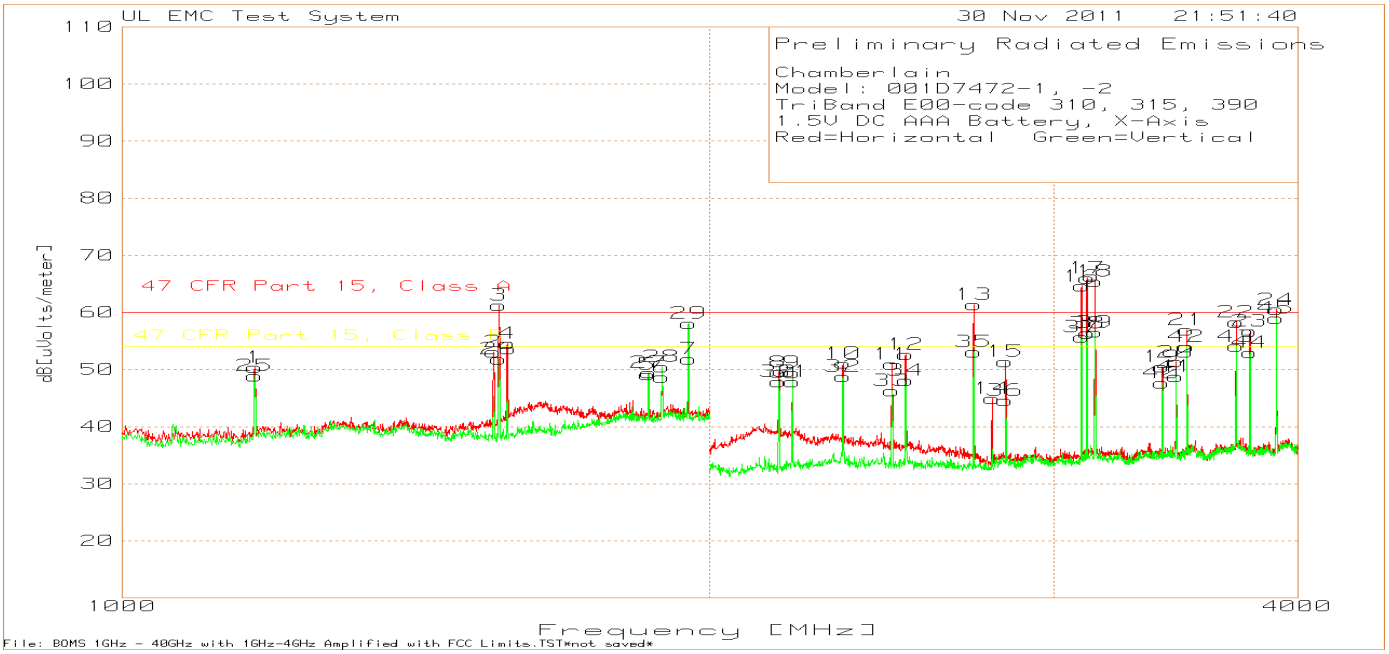


Table 7 Radiated Emissions Data Points

Chamberlain Group Inc.
Model: 001D7472-1, -2
TriBand E00-code 310 315 390
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical

	310MHz	315MHz	390MHz
Duty Cycle provided by manufacturer:	-16.19	-16.19	-16.19
Duty cycle measured:	-15.45	-15.7	-15.57

Test Frequency	Measurement distance m	Meter Reading	Detector	Antenna Factor	Path Loss/Gain	DC Factor dB	dBuV/m	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
310.0133	10	97.45	QP	12.9	-32.7	-15.45	62.2	64.1	-1.9			344	272	Horz
310.0133	10	97.91	PK	12.9	-32.7	-15.45	62.66	64.1	-1.44			344	272	Horz
310.0133	10	81.34	QP	12.9	-32.7	-15.45	46.09	64.1	-18.01			51	258	Vert
310.0133	10	81.78	PK	12.9	-32.7	-15.45	46.53	64.1	-17.57			51	258	Vert
315.012	10	98.98	QP	13.1	-32.7	-15.7	63.68	64.4	-0.72			0	273	Horz
315.012	10	99.43	PK	13.1	-32.7	-15.7	64.13	64.4	-0.27			0	273	Horz
315.012	10	85.08	QP	13.1	-32.7	-15.7	49.78	64.4	-14.62			256	331	Vert
315.012	10	85.57	PK	13.1	-32.7	-15.7	50.27	64.4	-14.13			256	331	Vert
390.0148	10	95.63	QP	15.1	-32.1	-15.57	63.06	68.2	-5.14			0	213	Horz
390.0148	10	96.02	PK	15.1	-32.1	-15.57	63.45	68.2	-4.75			0	213	Horz
390.0148	10	78.21	QP	15.1	-32.1	-15.57	45.64	68.2	-22.56			270	232	Vert
390.0148	10	78.65	PK	15.1	-32.1	-15.57	46.08	68.2	-22.12			270	232	Vert
620.0242	10	53.96	QP	20.3	-31.3	-15.45	27.51			35.6	-8.09	353	275	Horz
620.0242	10	55.47	PK	20.3	-31.3	-15.45	29.02			35.6	-6.58	353	275	Horz
620.0242	10	37.24	QP	20.3	-31.3	-15.45	10.79			35.6	-24.81	333	258	Vert
620.0242	10	41.97	PK	20.3	-31.3	-15.45	15.52			35.6	-20.08	333	258	Vert
630.025	10	57.33	QP	20.1	-31.1	-15.7	30.63			35.6	-4.97	351	274	Horz
630.025	10	58.44	PK	20.1	-31.1	-15.7	31.74			35.6	-3.86	351	274	Horz
630.025	10	34.33	QP	20.1	-31.1	-15.7	7.63			35.6	-27.97	234	324	Vert
630.025	10	40.44	PK	20.1	-31.1	-15.7	13.74			35.6	-21.86	234	324	Vert
780.03	10	51.82	QP	20.9	-31.5	-15.57	25.65			35.6	-9.95	153	150	Horz
780.03	10	53.67	PK	20.9	-31.5	-15.57	27.5			35.6	-8.1	153	150	Horz
780.03	10	41.47	QP	20.9	-31.5	-15.57	15.3			35.6	-20.3	24	171	Vert
780.03	10	45.13	PK	20.9	-31.5	-15.57	18.96			35.6	-16.64	24	171	Vert
930.0374	10	47.72	QP	22.7	-31.7	-15.45	23.27			35.6	-12.33	203	100	Horz
930.0374	10	50.14	PK	22.7	-31.7	-15.45	25.69			35.6	-9.91	203	100	Horz
930.0374	10	38.6	QP	22.7	-31.7	-15.45	14.15			35.6	-21.45	175	342	Vert
930.0374	10	41.4	PK	22.7	-31.7	-15.45	16.95			35.6	-18.65	175	342	Vert
945.042	10	46.39	QP	22.8	-31.5	-15.7	21.99			35.6	-13.61	187	275	Horz
945.042	10	48.93	PK	22.8	-31.5	-15.7	24.53			35.6	-11.07	187	275	Horz
945.042	10	38.35	QP	22.8	-31.5	-15.7	13.95			35.6	-21.65	241	154	Vert
945.042	10	40.72	PK	22.8	-31.5	-15.7	16.32			35.6	-19.28	241	154	Vert
1170.17	3	78.78	PK	27.7	-56.07	-15.57	34.84			54	-19.16		100	Horz
1550.551	3	80.49	PK	27.8	-55.15	-15.45	37.69			54	-16.31		100	Horz
1560.561	3	88.25	PK	27.9	-54.94	-15.57	45.64			54	-8.36		100	Horz
1575.576	3	81.31	PK	27.9	-54.62	-15.7	38.89			54	-15.11		100	Horz
1859.86	3	71.86	PK	31.1	-53.88	-15.45	33.63			54	-20.37		100	Horz
1890.891	3	70.57	PK	31.3	-53.21	-15.7	32.96			54	-21.04		100	Horz
1950.951	3	74.11	PK	31.2	-53.47	-15.57	36.27			54	-17.73		100	Horz
2169.446	3	79.98	PK	21.7	-52.15	-15.45	34.08			54	-19.92		100	Horz
2205.47	3	79.32	PK	21.8	-51.62	-15.7	33.8			54	-20.2		100	Horz

Chamberlain Group Inc.
Model: 001D7472-1, -2
TriBand E00-code 310 315 390
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical

	310MHz	315MHz	390MHz
Duty Cycle provided by manufacturer:	-16.19	-16.19	-16.19
Duty cycle measured:	-15.45	-15.7	-15.57

Test Frequency	Measurement distance m	Meter Reading	Detector	Antenna Factor	Path Loss/Gain	DC Factor dB	dBuV/m	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
2340.227	3	80.49	PK	21.7	-51.08	-15.57	35.54			54	-18.46		100	Horz
2480.32	3	80.11	PK	22	-51.2	-15.45	35.46			54	-18.54		100	Horz
2520.347	3	81.5	PK	22.1	-50.97	-15.7	36.93			54	-17.07		100	Horz
2730.079	3	89.47	PK	22.1	-50.46	-15.57	45.54			54	-8.46	4	101	Horz
2789.86	3	73.45	PK	22.2	-50.75	-15.45	29.45			54	-24.55		100	Horz
2835.223	3	79.03	PK	22.3	-49.95	-15.7	35.68			54	-18.32		100	Horz
3100.137	3	92.14	PK	22.6	-50.09	-15.45	49.2			54	-4.8	224	102	Horz
3120.18	3	93.28	PK	22.7	-49.79	-15.57	50.62			54	-3.38	225	100	Horz
3150.125	3	92.41	PK	22.9	-50.09	-15.7	49.52			54	-4.48	223	101	Horz
3410.274	3	77.19	PK	23.5	-50.22	-15.45	35.02			54	-18.98		100	Horz
3464.977	3	78.12	PK	23.5	-50.28	-15.7	35.64			54	-18.36		100	Horz
3510.34	3	82.85	PK	23.5	-49.38	-15.57	41.4			54	-12.6		100	Horz
3721.147	3	83.93	PK	23.6	-49.19	-15.45	42.89			54	-11.11		100	Horz
3781.187	3	83.82	PK	24	-51.14	-15.7	40.98			54	-13.02		100	Horz
3901.268	3	87.88	PK	23.8	-51.16	-15.57	44.95			54	-9.05		100	Horz
1170.17	3	77.28	PK	27.7	-56.07	-15.57	33.34			54	-20.66		100	Vert
1560.561	3	78.85	PK	27.9	-54.94	-15.57	36.24			54	-17.76		100	Vert
1860.861	3	72.2	PK	31.1	-53.87	-15.45	33.98			54	-20.02		100	Vert
1890.891	3	72.37	PK	31.3	-53.21	-15.7	34.76			54	-19.24		100	Vert
1950.951	3	80.39	PK	31.2	-53.47	-15.57	42.55			54	-11.45		100	Vert
2169.446	3	78.29	PK	21.7	-52.15	-15.45	32.39			54	-21.61		100	Vert
2205.47	3	77.71	PK	21.8	-51.62	-15.7	32.19			54	-21.81		100	Vert
2340.227	3	78.2	PK	21.7	-51.08	-15.57	33.25			54	-20.75		100	Vert
2480.32	3	75.47	PK	22	-51.2	-15.45	30.82			54	-23.18		100	Vert
2520.347	3	76.94	PK	22.1	-50.97	-15.7	32.37			54	-21.63		100	Vert
2729.82	3	81.5	PK	22.1	-50.46	-15.57	37.57			54	-16.43		100	Vert
2835.223	3	72.28	PK	22.3	-49.95	-15.7	28.93			54	-25.07		100	Vert
3100.734	3	83.13	PK	22.6	-50.07	-15.45	40.21			54	-13.79		100	Vert
3120.747	3	83.51	PK	22.7	-49.8	-15.57	40.84			54	-13.16		100	Vert
3150.1	3	83.74	PK	22.9	-50.09	-15.7	40.85			54	-13.15		100	Vert
3410.274	3	74.34	PK	23.5	-50.22	-15.45	32.17			54	-21.83		100	Vert
3464.977	3	75.62	PK	23.5	-50.28	-15.7	33.14			54	-20.86		100	Vert
3510.34	3	79.9	PK	23.5	-49.38	-15.57	38.45			54	-15.55		100	Vert
3721.147	3	79.65	PK	23.6	-49.19	-15.45	38.61			54	-15.39		100	Vert
3781.187	3	80.11	PK	24	-51.14	-15.7	37.27			54	-16.73		100	Vert
3901.268	3	86.31	PK	23.8	-51.16	-15.57	43.38			54	-10.62		100	Vert

4.1.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

Table 8 Cease Operation Configuration Settings

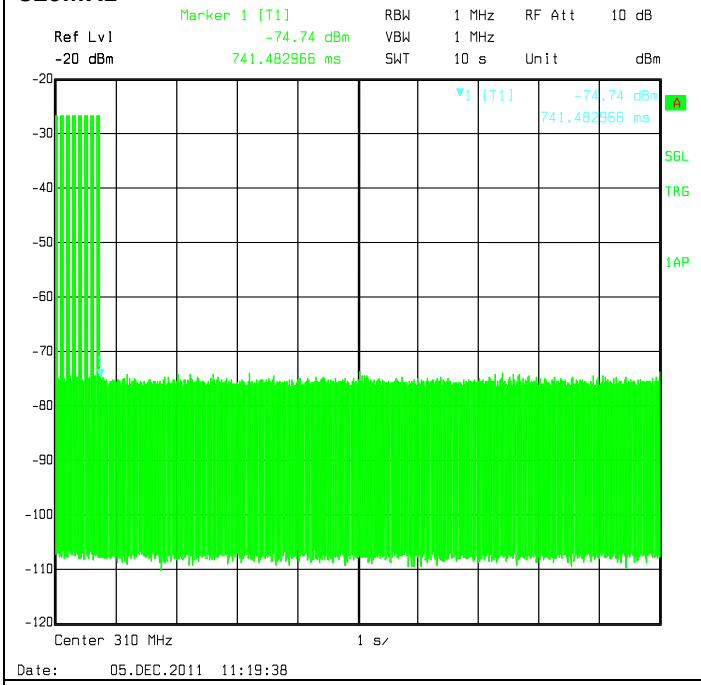
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 9 Cease Operation Test Results

Frequency	Requirement	Cease Operation Time
310MHz	5 seconds or less	741.5mS
315MHz	5 seconds or less	742.2mS
390MHz	5 seconds or less	741.5mS
Supplementary information: None		

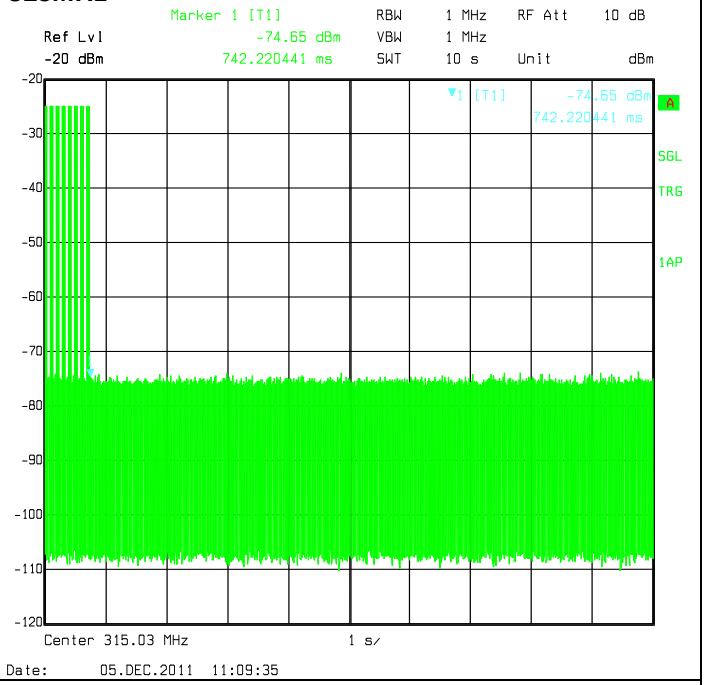
Figure 2 Cease Operation Graph for 310MHz

310MHz



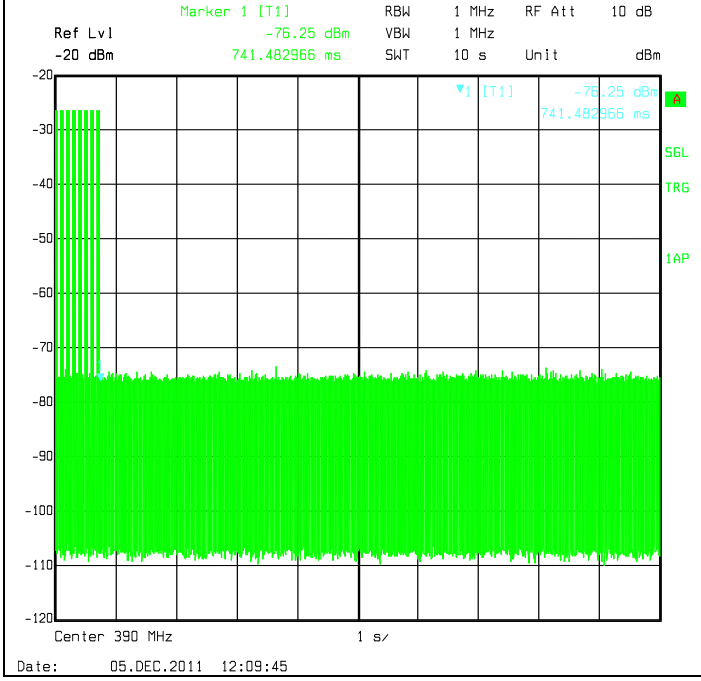
Date: 05.DEC.2011 11:19:38

315MHz



Date: 05.DEC.2011 11:09:35

390MHz



Date: 05.DEC.2011 12:09:45

4.1.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 10 Pulse Train Configuration Settings

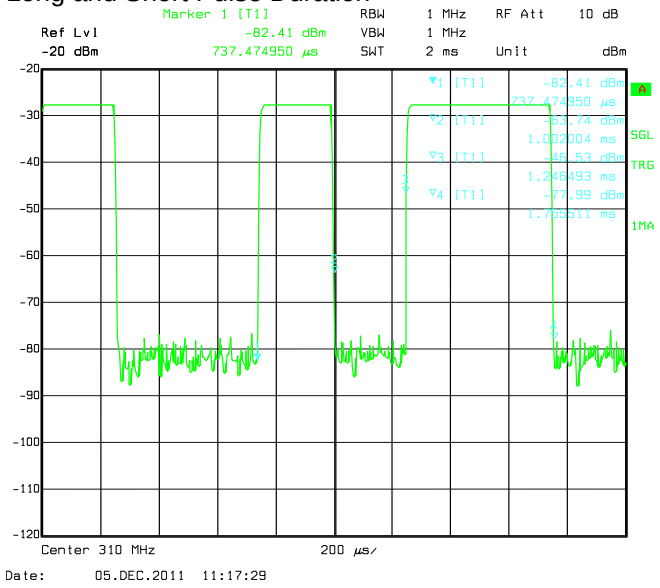
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 11 Pulse Train Calculation

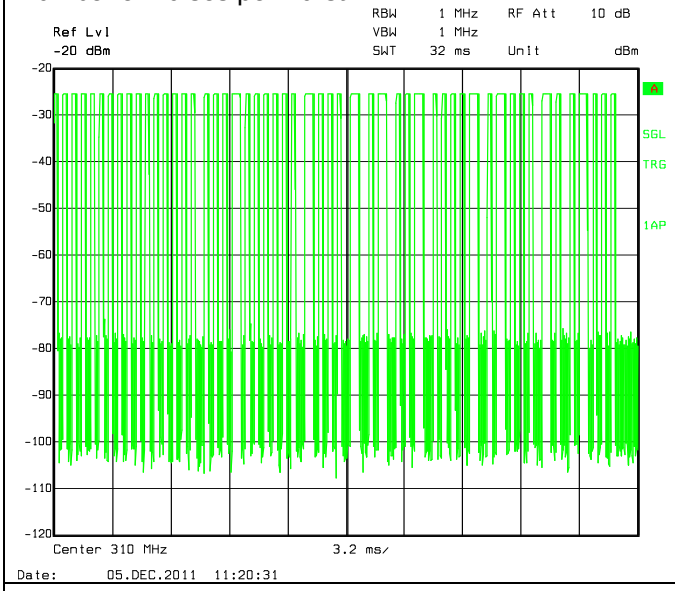
Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
310MHz	16.728mS	99.1263mS	-15.45
315MHz	16.199mS	98.7335mS	-15.70
390MHz	16.460mS	98.7976mS	-15.57

Figure 3 Pulse Train Graphs for 310MHz

Long and Short Pulse Duration



Number of Pulses per Burst



Period

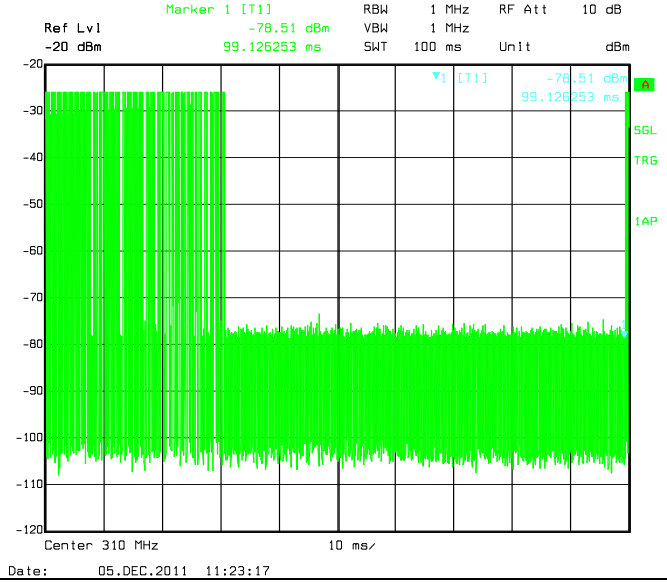
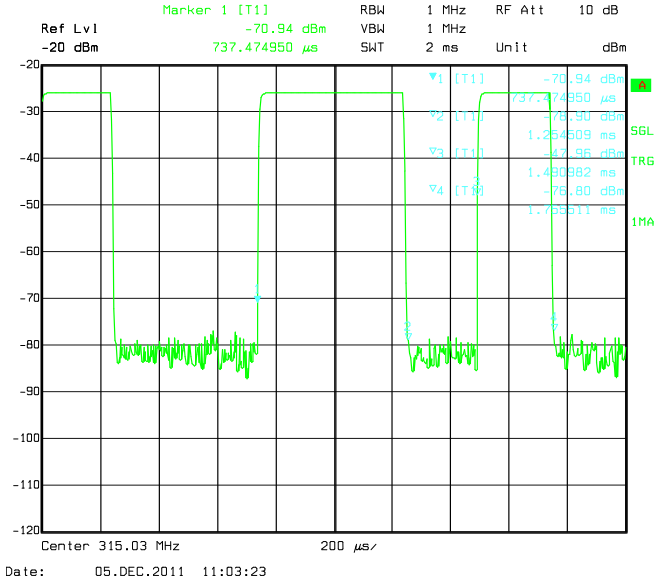
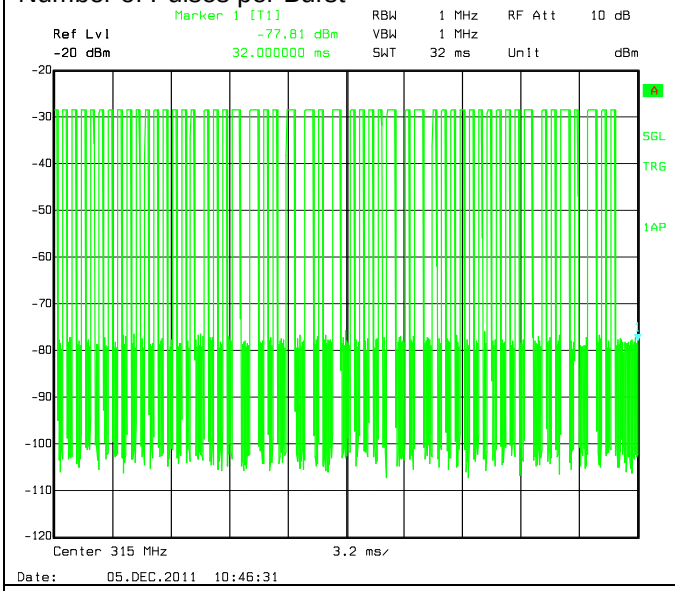


Figure 4 Pulse Train Graphs for 315MHz

Pulse Duration



Number of Pulses per Burst



Period

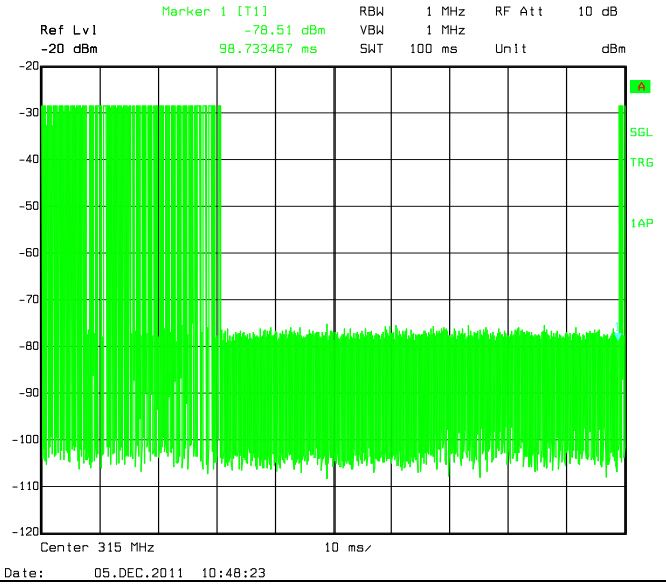
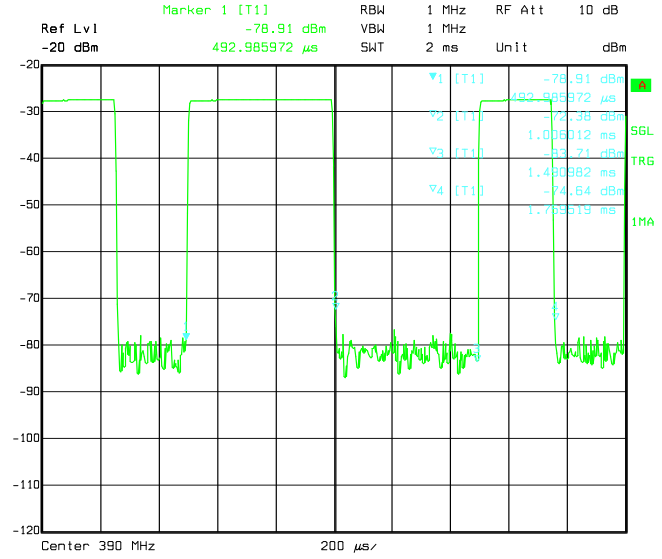
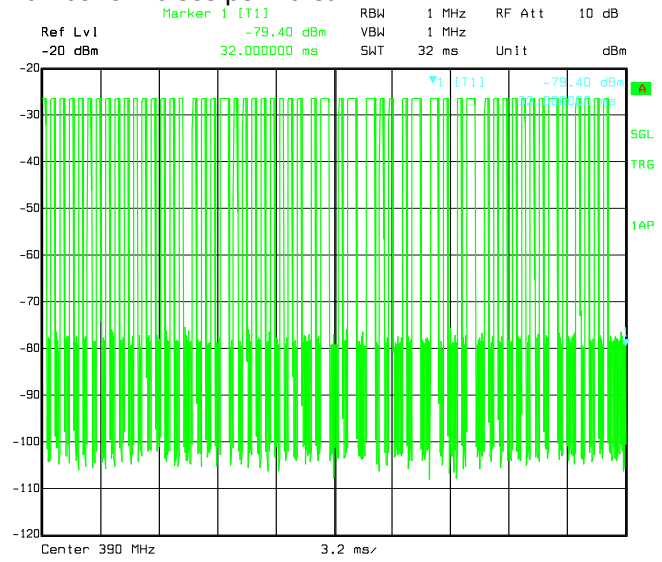


Figure 5 Pulse Train Graphs for 390MHz

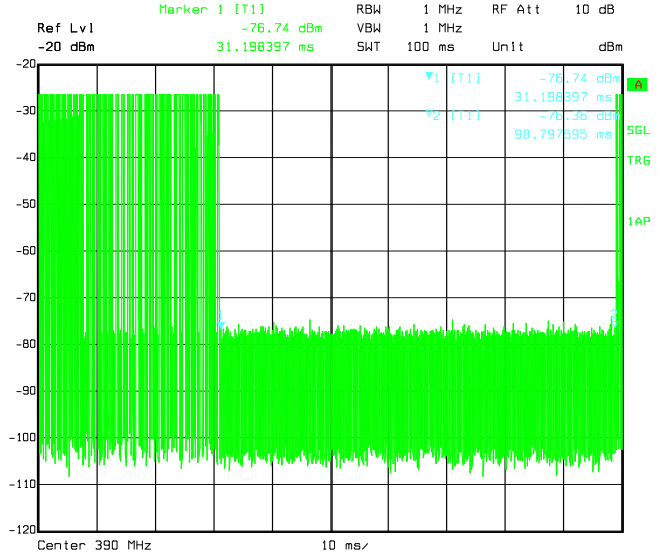
Pulse Duration



Number of Pulses per Burst



Period



4.1.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
310MHz – 0.7750MHz, 315MHz – 0.7875MHz, 390MHz – 0.9750MHz	

Table 12 Occupied Bandwidth Configuration Settings

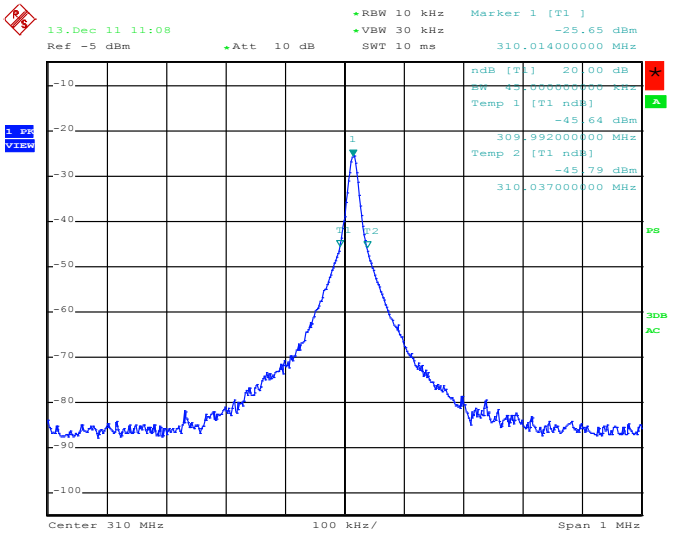
Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 13 Occupied Bandwidth Spectrum Analyzer Settings

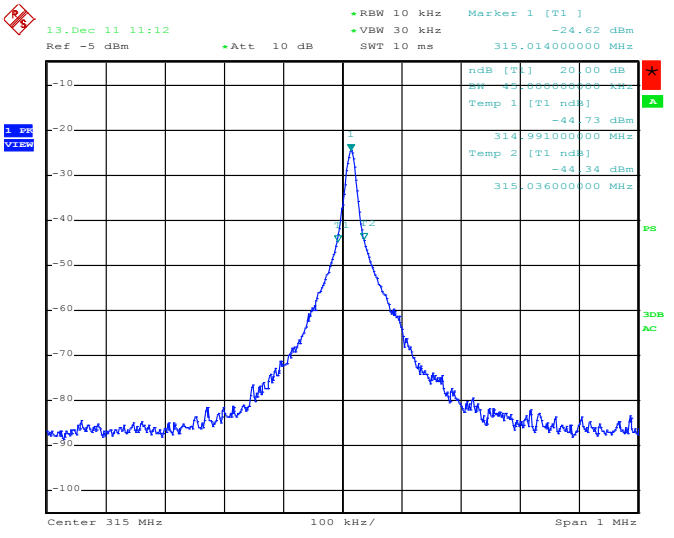
Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 310MHz	45kHz	55kHz
Results for 315MHz	45kHz	55kHz
Results for 390MHz	52kHz	76kHz
Supplementary information: None		

Figure 6 20dB Bandwidth Graphs

310MHz



315MHz



390MHz

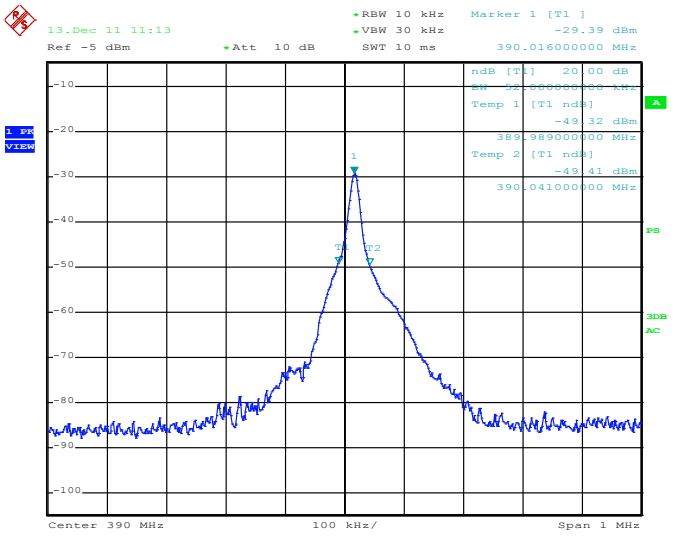
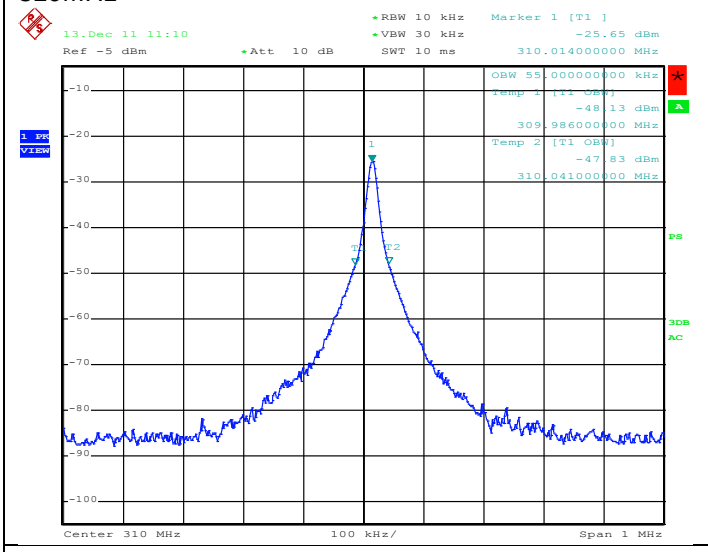
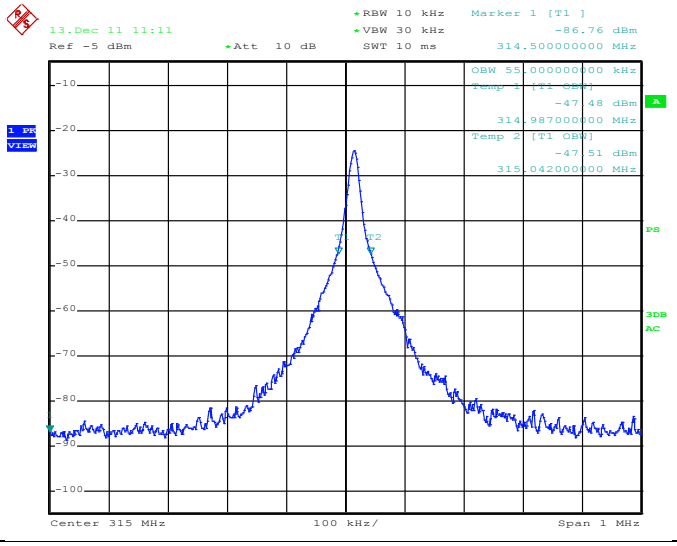


Figure 7 99% Power Bandwidth Graphs

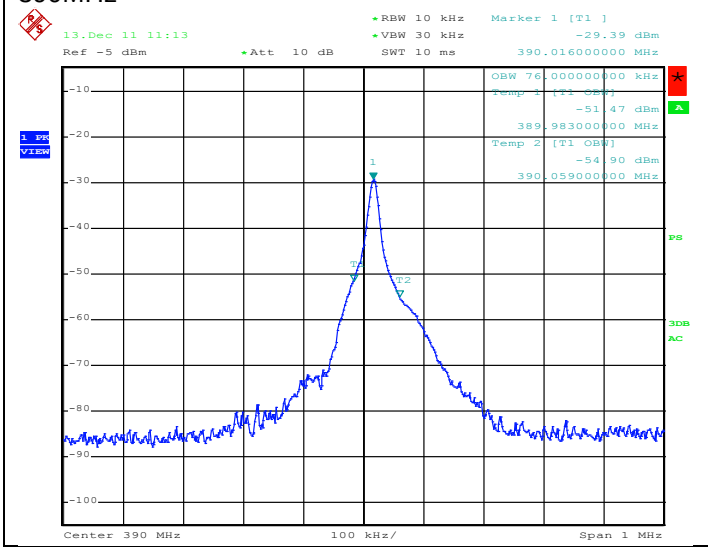
310MHz



315MHz



390MHz



4.2 E01-code 310MHz, 315MHz, 390MHz Transmitter

4.2.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

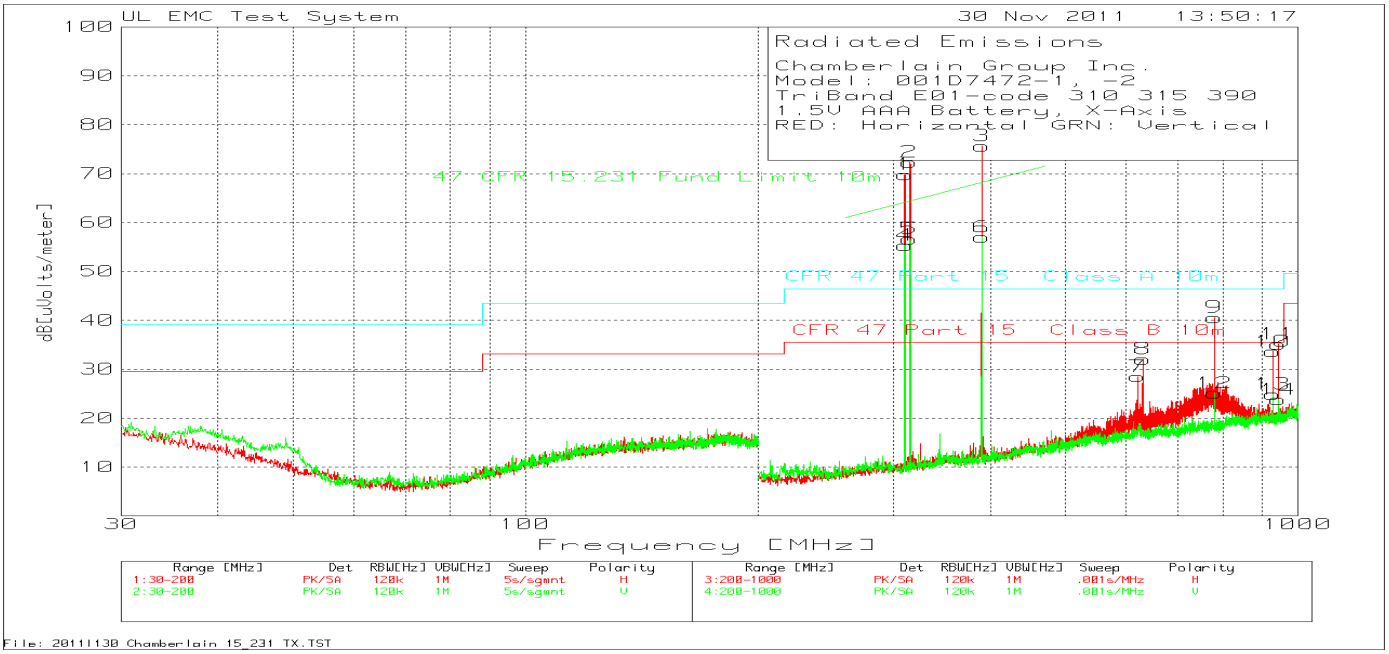
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 14 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information:		

Figure 8 Radiated Emissions Graph



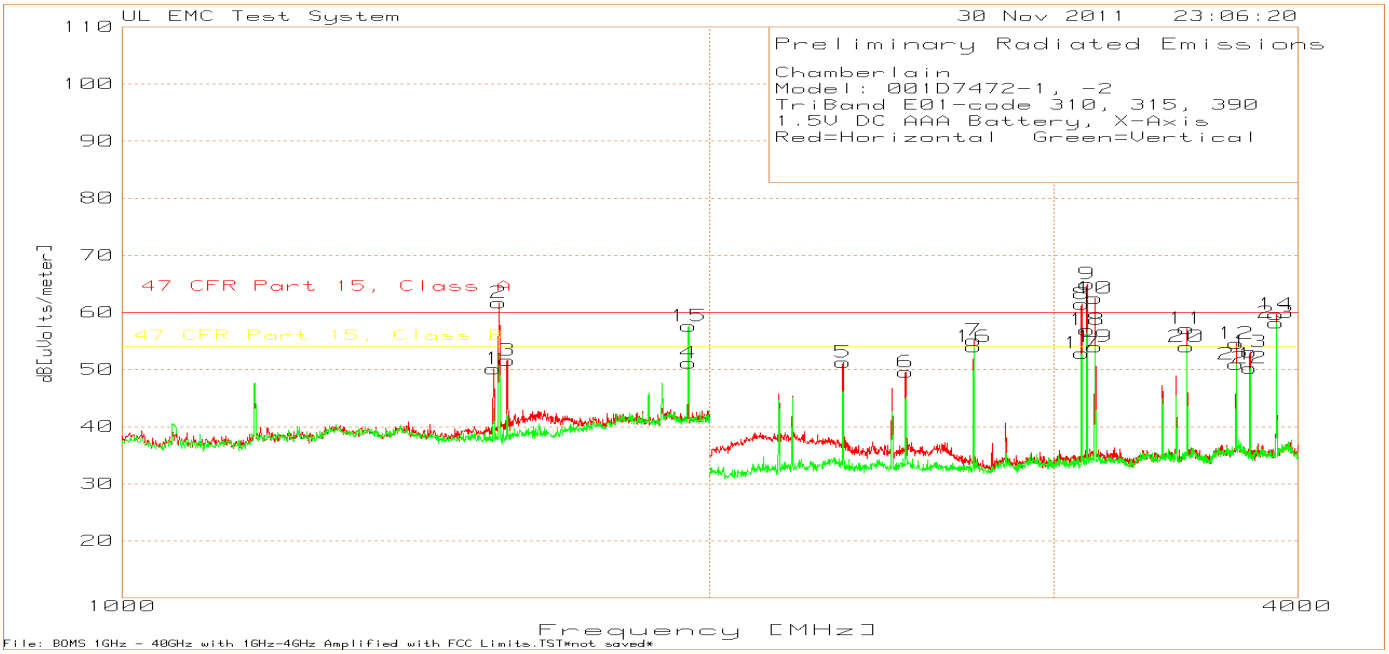


Table 15 Radiated Emissions Data Points

Chamberlain Group Inc.

Model: 001D7472-1, -2

TriBand E01-code 310 315 390

1.5V AAA Battery, X-Axis

RED: Horizontal GRN: Vertical	310MHz	315MHz	390MHz
Duty Cycle Provided by Manufacturer:	-13.35	-13.35	-13.35
Duty cycle measured:	-13.06	-12.87	-12.76

Test Frequency	Measurement Distance m	Meter Reading	Detector	Antenna Factor dB	Path Gain/Loss Factor dB	Duty Cycle Factor dB	dB[uVolts/meter]	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
310.0125	10	94.01	QP	12.9	-32.7	-13.06	61.15	64.1	-2.95			355	271	Horz
310.0125	10	94.6	PK	12.9	-32.7	-13.06	61.74	64.1	-2.36			355	271	Horz
310.0125	10	79.05	QP	12.9	-32.7	-13.06	46.19	64.1	-17.91			80	257	Vert
310.0125	10	79.65	PK	12.9	-32.7	-13.06	46.79	64.1	-17.31			80	257	Vert
315.014	10	95.82	QP	13.1	-32.7	-12.87	63.35	64.4	-1.05			337	269	Horz
315.014	10	96.41	PK	13.1	-32.7	-12.87	63.94	64.4	-0.46			337	269	Horz
315.013	10	82.14	QP	13.1	-32.7	-12.87	49.67	64.4	-14.73			264	325	Vert
315.013	10	82.75	PK	13.1	-32.7	-12.87	50.28	64.4	-14.12			264	325	Vert
390.015	10	95.33	QP	15.1	-32.1	-12.76	65.57	68.2	-2.63			0	215	Horz
390.015	10	95.85	PK	15.1	-32.1	-12.76	66.09	68.2	-2.11			0	215	Horz
390.0168	10	78.57	QP	15.1	-32.1	-12.76	48.81	68.2	-19.39			259	234	Vert
390.0168	10	79.11	PK	15.1	-32.1	-12.76	49.35	68.2	-18.85			259	234	Vert
620.0298	10	46.94	QP	20.3	-31.3	-13.06	22.88			35.6	-12.72	0	276	Horz
620.0298	10	48.24	PK	20.3	-31.3	-13.06	24.18			35.6	-11.42	0	276	Horz
620.0298	10	27.32	QP	20.3	-31.3	-13.06	3.26			35.6	-32.34	262	253	Vert
620.0298	10	32.58	PK	20.3	-31.3	-13.06	8.52			35.6	-27.08	262	253	Vert
630.0193	10	51.09	QP	20.1	-31.1	-12.87	27.22			35.6	-8.38	354	268	Horz
630.0193	10	52.19	PK	20.1	-31.1	-12.87	28.32			35.6	-7.28	354	268	Horz
630.0263	10	30.79	QP	20.1	-31.1	-12.87	6.92			35.6	-28.68	333	250	Vert
630.0263	10	35.38	PK	20.1	-31.1	-12.87	11.51			35.6	-24.09	333	250	Vert
780.0358	10	52.38	QP	20.9	-31.5	-12.76	29.02			35.6	-6.58	156	144	Horz
780.0358	10	53.47	PK	20.9	-31.5	-12.76	30.11			35.6	-5.49	156	144	Horz
780.026	10	40.37	QP	20.9	-31.5	-12.76	17.01			35.6	-18.59	10	176	Vert
780.026	10	42.44	PK	20.9	-31.5	-12.76	19.08			35.6	-16.52	10	176	Vert
930.0325	10	44.1	QP	22.7	-31.7	-13.06	22.04			35.6	-13.56	201	100	Horz
930.0325	10	45.81	PK	22.7	-31.7	-13.06	23.75			35.6	-11.85	201	100	Horz
930.0353	10	36.55	QP	22.7	-31.7	-13.06	14.49			35.6	-21.11	291	169	Vert
930.0353	10	39.36	PK	22.7	-31.7	-13.06	17.3			35.6	-18.3	291	169	Vert
945.043	10	43.7	QP	22.8	-31.5	-12.87	22.13			35.6	-13.47	195	100	Horz
945.043	10	45.44	PK	22.8	-31.5	-12.87	23.87			35.6	-11.73	195	100	Horz
945.0258	10	35.76	QP	22.8	-31.5	-12.87	14.19			35.6	-21.41	282	173	Vert
945.0258	10	38.77	PK	22.8	-31.5	-12.87	17.2			35.6	-18.4	282	173	Vert
1550.551	3	77.5	PK	27.8	-55.15	-13.06	37.09			54.00	-16.91		101	Horz
1560.045	3	88.79	PK	27.9	-54.95	-12.76	48.98			54	-5.02	240	100	Horz
1575.576	3	78.36	PK	27.9	-54.62	-12.87	38.77			54.00	-15.23		101	Horz
1950.951	3	73.48	PK	31.2	-53.47	-12.76	38.45			54.00	-15.55		101	Horz
2340.227	3	80.69	PK	21.7	-51.08	-12.76	38.55			54.00	-15.45		101	Horz
2520.347	3	78.42	PK	22.1	-50.97	-12.87	36.68			54.00	-17.32		101	Horz

Chamberlain Group Inc.

Model: 001D7472-1, -2

TriBand E01-code 310 315 390

1.5V AAA Battery, X-Axis

RED: Horizontal GRN: Vertical	310MHz	315MHz	390MHz
Duty Cycle Provided by Manufacturer:	-13.35	-13.35	-13.35
Duty cycle measured:	-13.06	-12.87	-12.76

Test Frequency	Measurement Distance m	Meter Reading	Detector	Antenna Factor dB	Path Gain/Loss Factor dB	Duty Cycle Factor dB	dB[uVolts/meter]	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
2729.82	3	83.45	PK	22.1	-50.46	-12.76	42.33			54.00	-11.67		101	Horz
3100.127	3	89.21	PK	22.6	-50.09	-13.06	48.66			54	-5.34	226	103	Horz
3120.149	3	93.1	PK	22.7	-49.79	-12.76	53.25			54	-0.75	229	103	Horz
3150.099	3	89.42	PK	22.9	-50.09	-12.87	49.36			54	-4.64	229	105	Horz
3510.34	3	83.09	PK	23.5	-49.38	-12.76	44.45			54.00	-9.55		101	Horz
3721.147	3	80.16	PK	23.6	-49.19	-13.06	41.51			54.00	-12.49		101	Horz
3781.187	3	80.23	PK	24	-51.14	-12.87	40.22			54.00	-13.78		101	Horz
3901.268	3	87.01	PK	23.8	-51.16	-12.76	46.89			54.00	-7.11		101	Horz
1950.951	3	79.85	PK	31.2	-53.47	-12.76	44.82			54.00	-9.18		101	Vert
2729.82	3	82.38	PK	22.1	-50.46	-12.76	41.26			54.00	-12.74		101	Vert
3100.734	3	80.36	PK	22.6	-50.07	-13.06	39.83			54.00	-14.17		101	Vert
3120.747	3	84.06	PK	22.7	-49.8	-12.76	44.20			54.00	-9.80		101	Vert
3150.1	3	81.21	PK	22.9	-50.09	-12.87	41.15			54.00	-12.85		101	Vert
3510.34	3	79.9	PK	23.5	-49.38	-12.76	41.26			54.00	-12.74		101	Vert
3721.147	3	76.5	PK	23.6	-49.19	-13.06	37.85			54.00	-16.15		101	Vert
3781.187	3	77.45	PK	24	-51.14	-12.87	37.44			54.00	-16.56		101	Vert
3901.268	3	85.57	PK	23.8	-51.16	-12.76	45.45			54.00	-8.55		101	Vert

4.2.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

Table 16 Cease Operation Configuration Settings

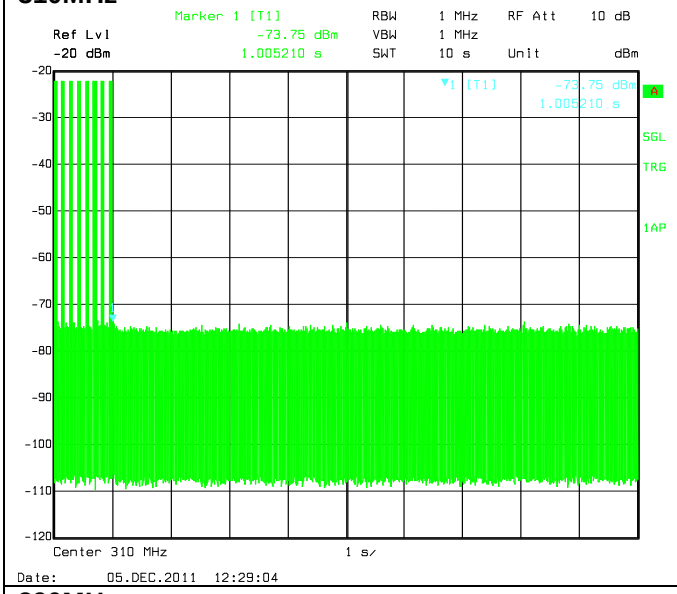
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 17 Cease Operation Test Results

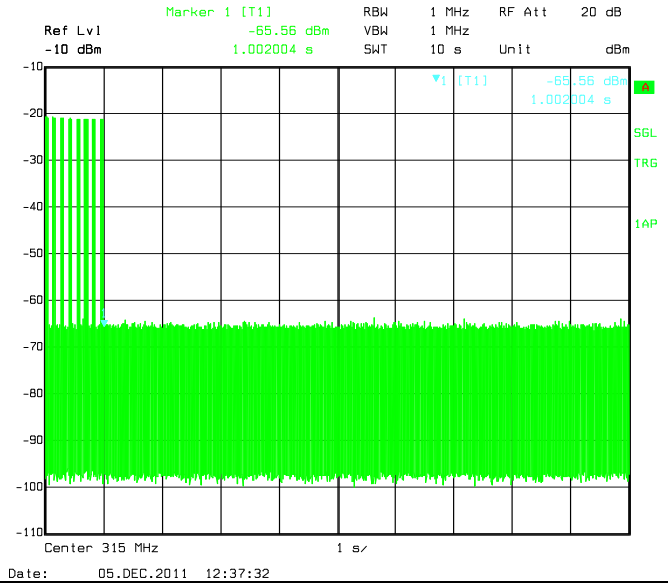
Frequency	Requirement	Cease Operation Time
310MHz	5 seconds or less	1.01 seconds
315MHz	5 seconds or less	1.00 seconds
390MHz	5 seconds or less	1.00 seconds
Supplementary information: None		

Figure 9 Cease Operation Graph

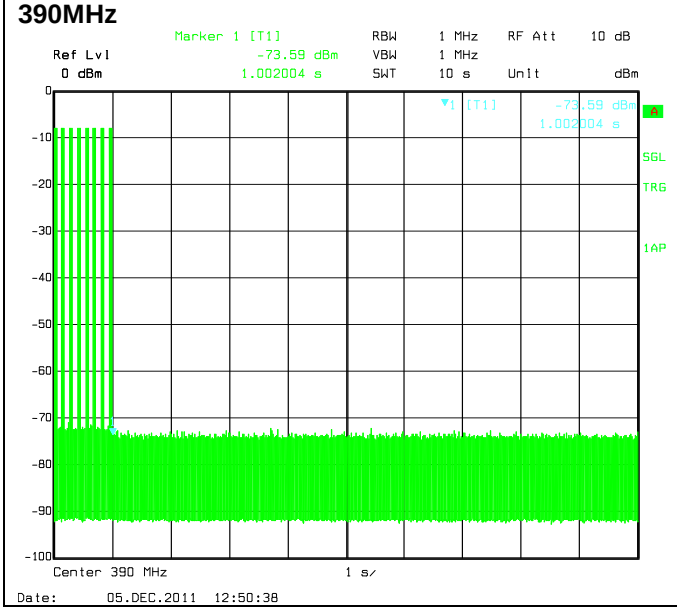
310MHz



315MHz



390MHz



4.2.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 18 Pulse Train Configuration Settings

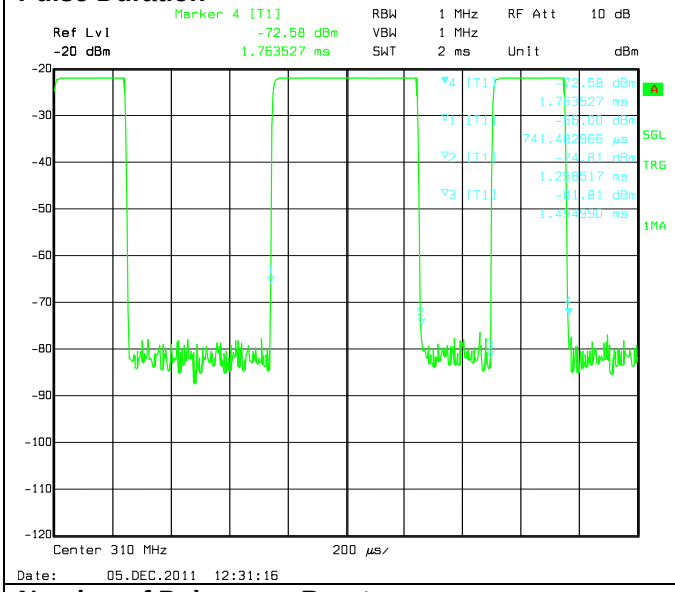
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 19 Pulse Train Calculation

Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
310MHz	22.231mS	100mS	-13.06
315MHz	22.731mS	100mS	-12.87
390MHz	23.015mS	100mS	-12.76

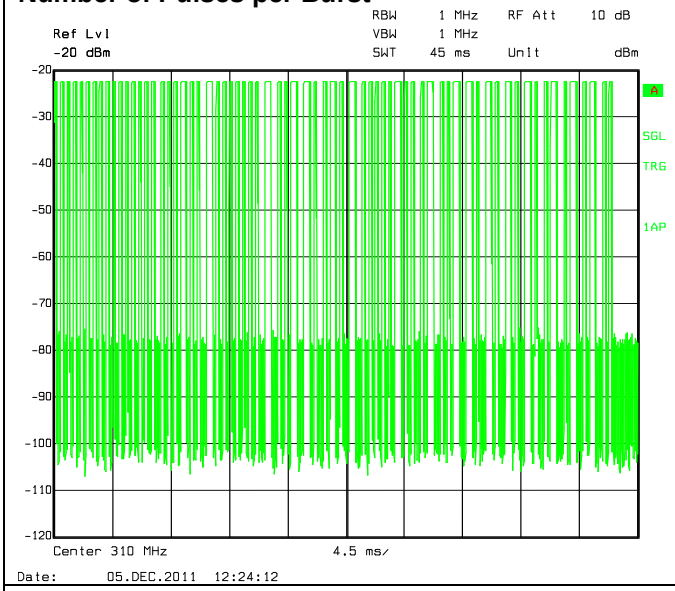
Figure 10 Pulse Train Graphs

Pulse Duration

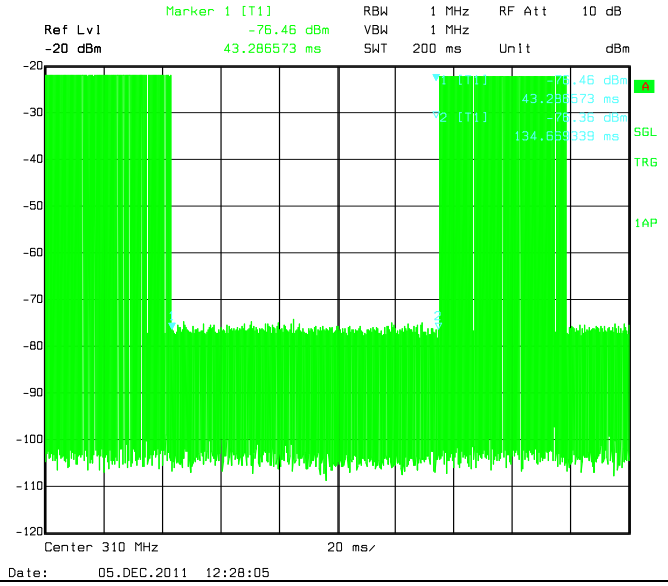


Pulse duration

Number of Pulses per Burst



Period



4.2.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
310MHz – 0.7750MHz, 315MHz – 0.7875MHz, 390MHz – 0.9750MHz	

Table 20 Occupied Bandwidth Configuration Settings

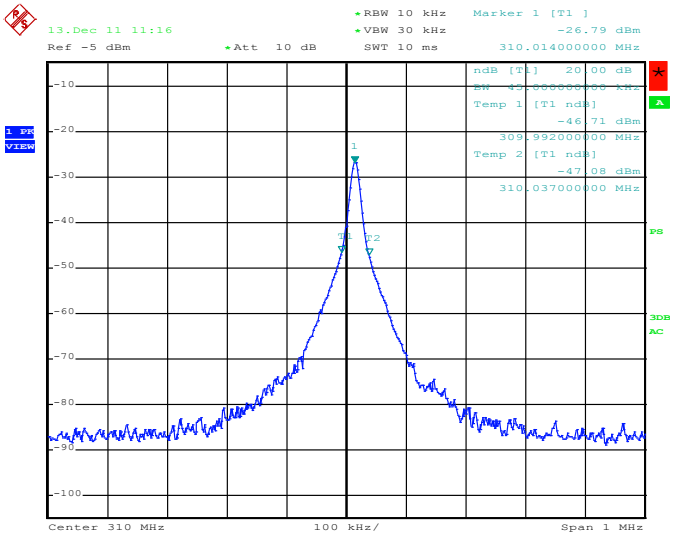
Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 21 Occupied Bandwidth Spectrum Analyzer Settings

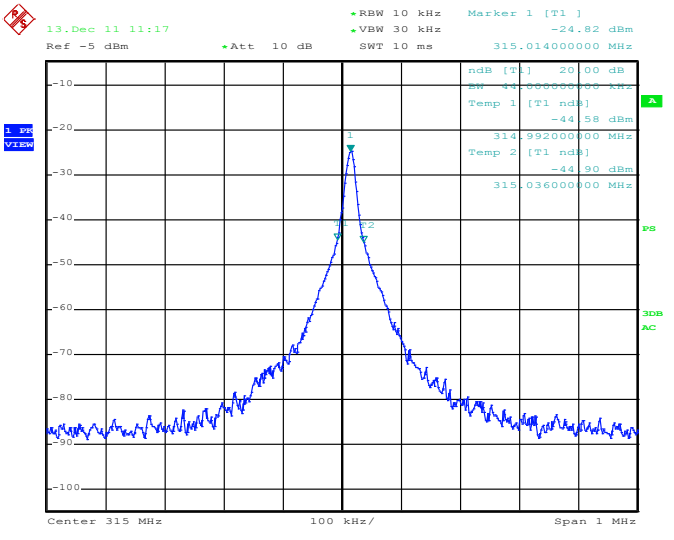
Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 310MHz	45	55
Results for 315MHz	44	55
Results for 390MHz	53	78
Supplementary information: None		

Figure 11 20dB Bandwidth Graph

310MHz



315MHz



390MHz

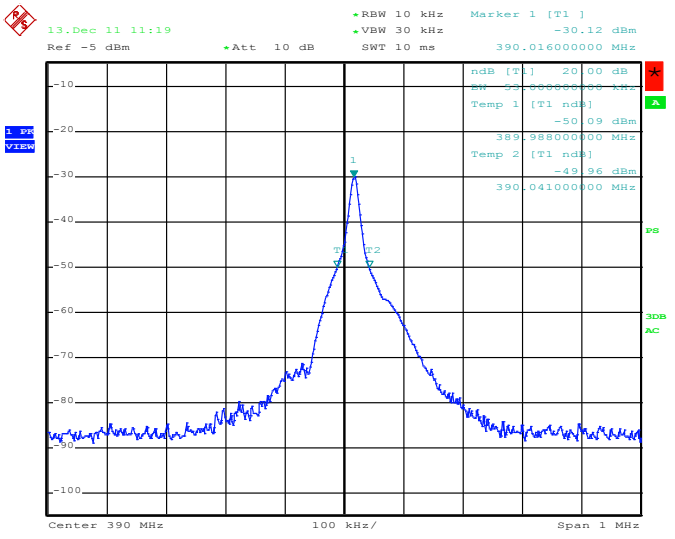
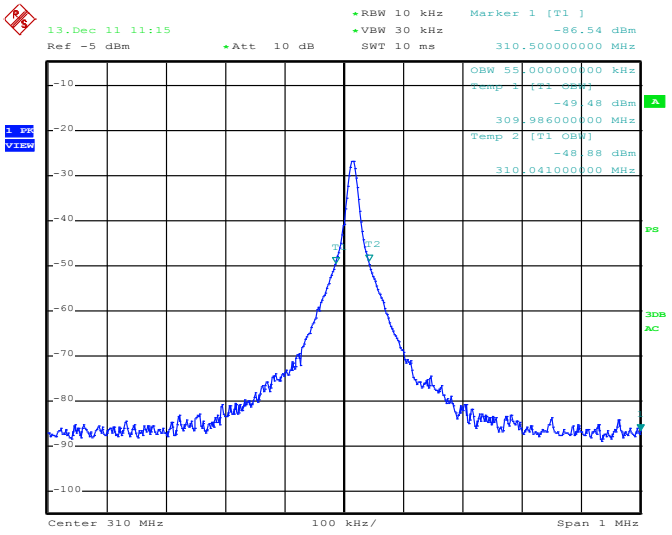
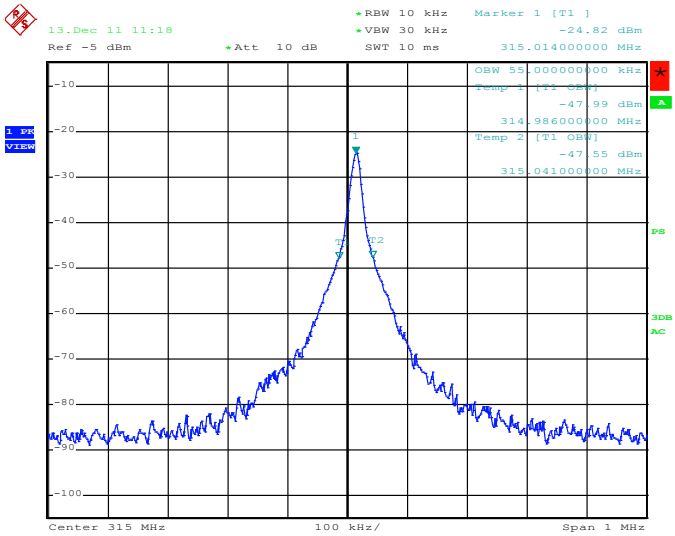


Figure 12 99% Power Bandwidth Graph

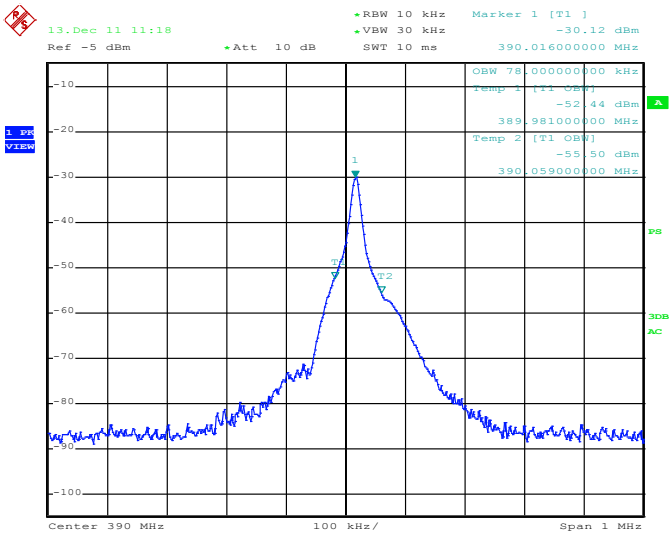
310MHz



315MHz



390MHz



4.3 D-code 315MHz Transmitter

4.3.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

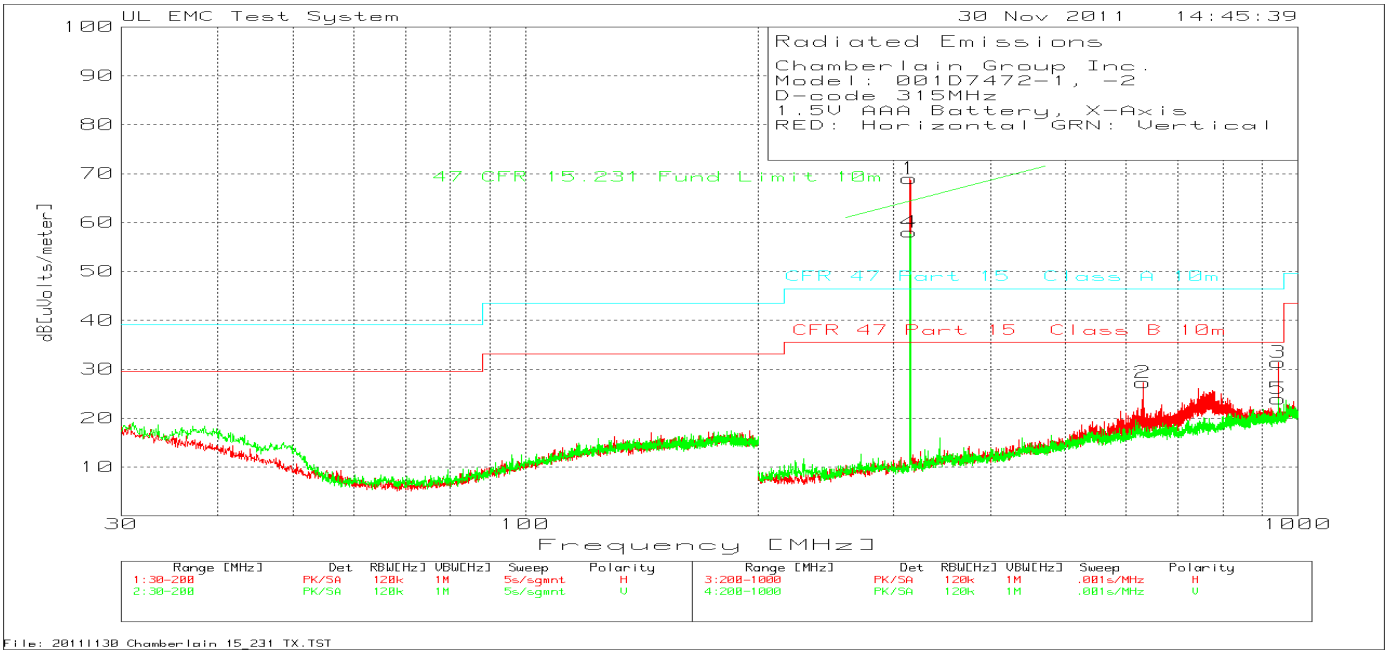
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 22 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information: None		

Figure 13 Radiated Emissions Graph



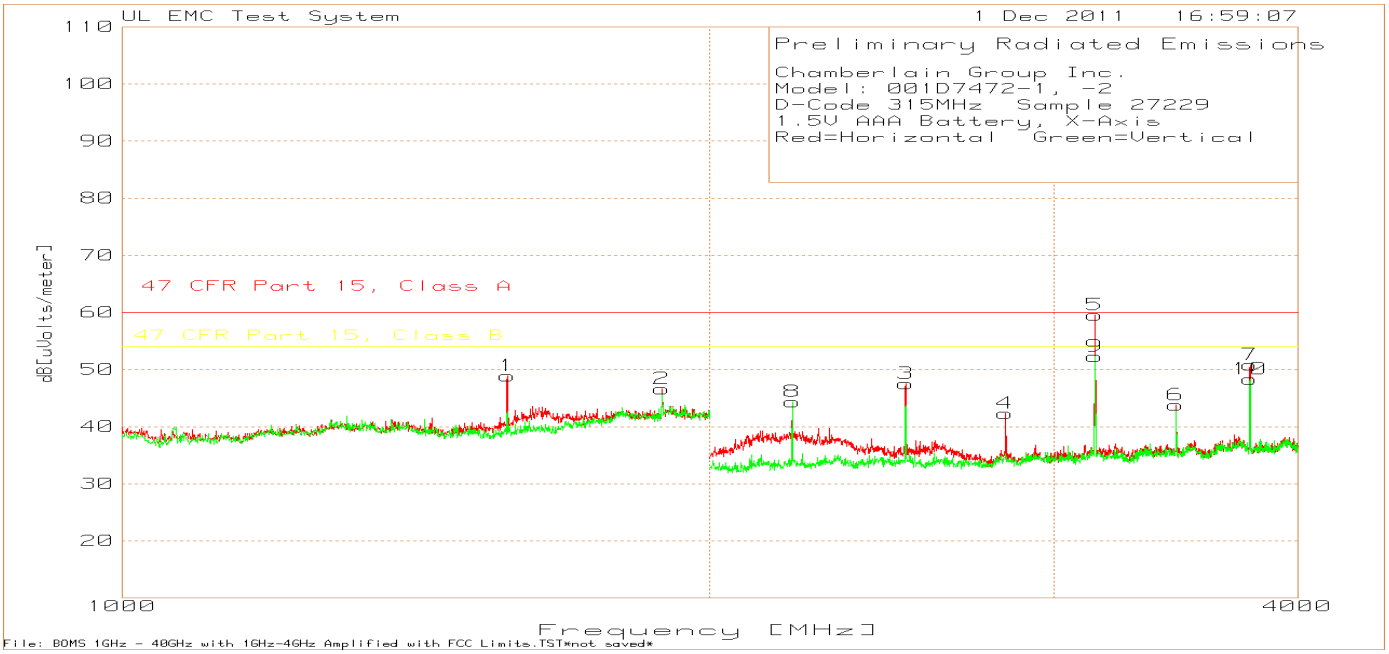


Table 23 Radiated Emissions Data Points

Chamberlain Group Inc.
Model: 001D7472-1, -2
D-code 315MHz
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical
Duty cycle provided by manufacturer: -10.17dB
Duty cycle measured: -12.56

Test Frequency	Measurement Distance (m)	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain dB	Duty Cycle Factor dB	dBuV/m	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
315.01255	10	92.7	QP	13.1	-32.7	-10.17	62.93	64.4	-1.47			341	272	Horz
315.0255	10	92.83	PK	13.1	-32.7	-10.17	63.06	64.4	-1.34			341	272	Horz
315.01275	10	78.56	QP	13.1	-32.7	-10.17	48.79	64.4	-15.61			254	323	Vert
315.01275	10	78.98	PK	13.1	-32.7	-10.17	49.21	64.4	-15.19			254	323	Vert
630.03255	10	43.98	QP	20.1	-31.1	-10.17	22.81			35.6	-12.79	9	270	Horz
630.03255	10	45.46	PK	20.1	-31.1	-10.17	24.29			35.6	-11.31	9	270	Horz
630.03255	10	28.65	QP	20.1	-31.1	-10.17	7.48			35.6	-28.12	325	257	Vert
630.03255	10	32.89	PK	20.1	-31.1	-10.17	11.72			35.6	-23.88	325	257	Vert
945.0456	10	39.69	QP	22.8	-31.5	-10.17	20.82			35.6	-14.78	195	272	Horz
945.0456	10	41.94	PK	22.8	-31.5	-10.17	23.07			35.6	-12.53	195	272	Horz
945.046525	10	32.94	QP	22.8	-31.5	-10.17	14.07			35.6	-21.53	229	155	Vert
945.046525	10	36.4	PK	22.8	-31.5	-10.17	17.53			35.6	-18.07	229	155	Vert
1575.576	3	75.61	PK	27.9	-54.62	-10.17	38.72			54	-15.28		100	Horz
1890.891	3	68.56	PK	31.3	-53.21	-10.17	36.48			54	-17.52		100	Horz
2520.347	3	76.37	PK	22.1	-50.97	-10.17	37.33			54	-16.67		100	Horz
2835.223	3	69.96	PK	22.3	-49.95	-10.17	32.14			54	-21.86		100	Horz
3150.1232	3	86.86	PK	22.9	-50.09	-10.17	49.5			54	-4.5	138	104	Horz
3464.977	3	70.61	PK	23.5	-50.28	-10.17	33.66			54	-20.34		100	Horz
3780.1232	3	77.98	PK	24	-51.13	-10.17	40.68			54	-13.32	184	101	Horz
2204.136	3	74.18	PK	21.8	-51.62	-10.17	34.19			54	-19.81		100	Vert
3150.0972	3	80.39	PK	22.9	-50.09	-10.17	43.03			54	-10.97	345	130	Vert
3781.187	3	75.51	PK	24	-51.14	-10.17	38.2			54	-15.8		100	Vert

4.3.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

Table 24 Cease Operation Configuration Settings

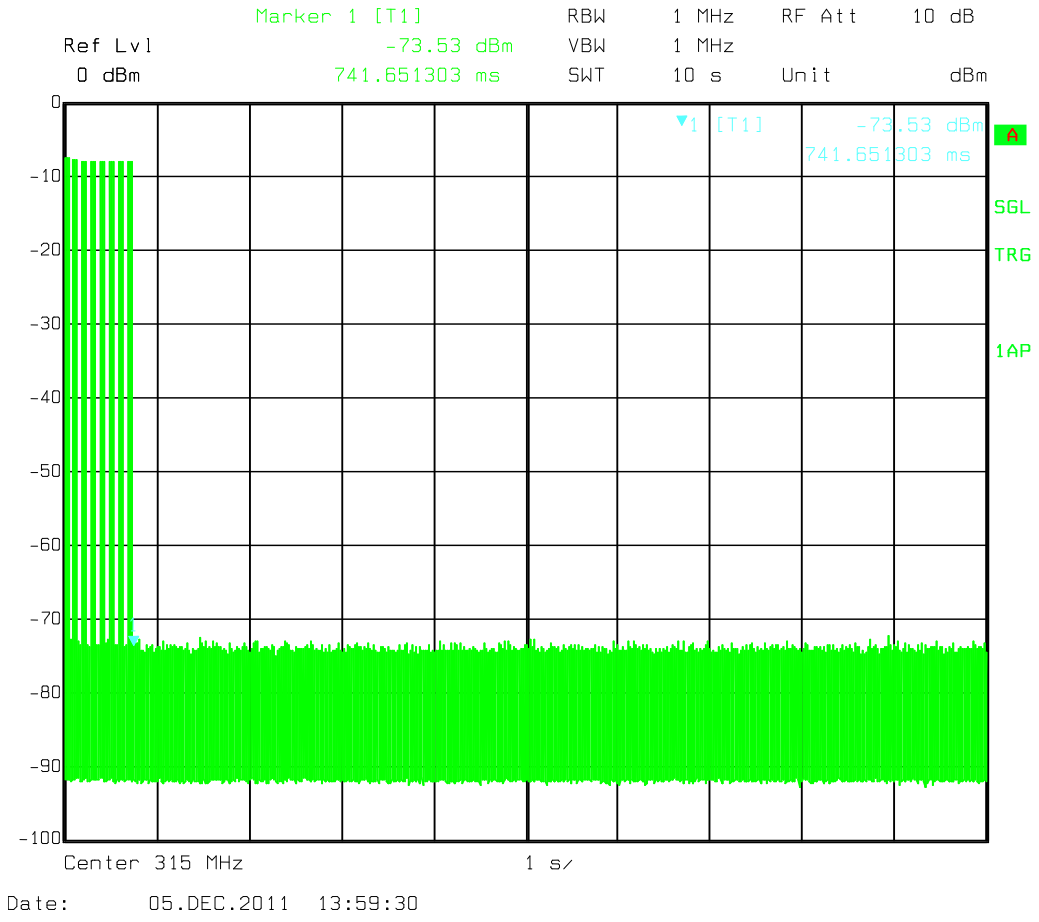
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 25 Cease Operation Test Results

Frequency	Requirement	Cease Operation Time
315MHz	5 seconds or less	741.65mS
Supplementary information: None		

Figure 14 Cease Operation Graph

315MHz



4.3.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 26 Pulse Train Configuration Settings

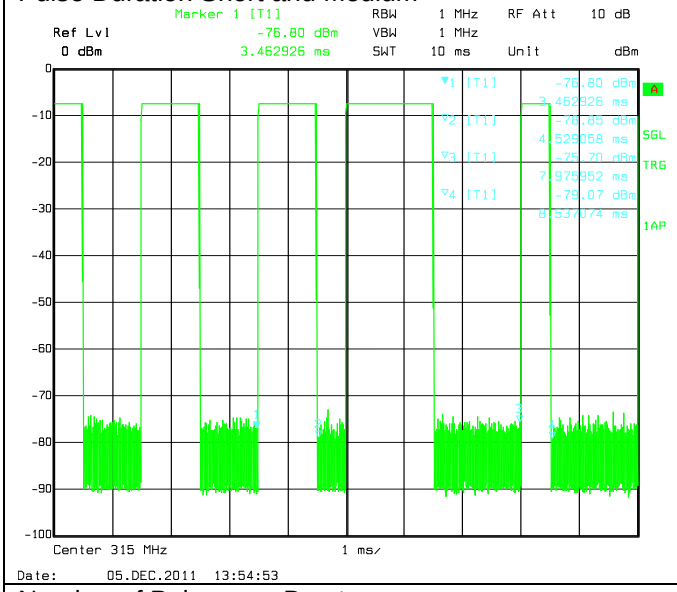
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 27 Pulse Train Calculation

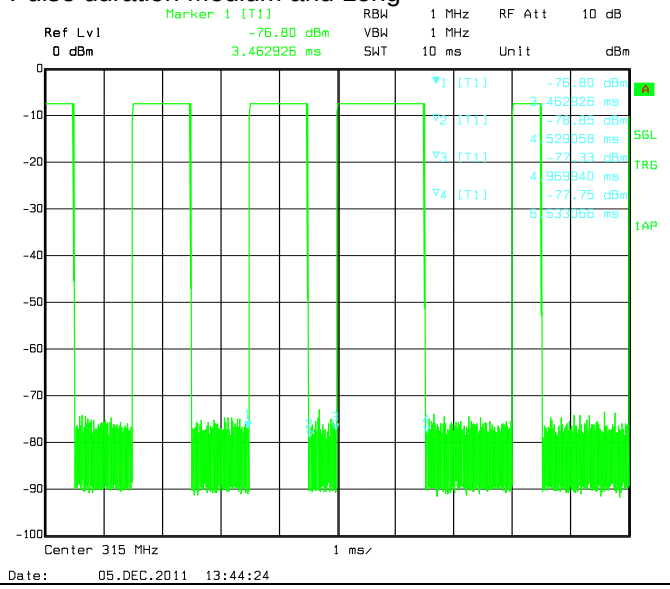
Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
315MHz	22.829mW	96.9138mS	-12.56

Figure 15 Pulse Train Graphs

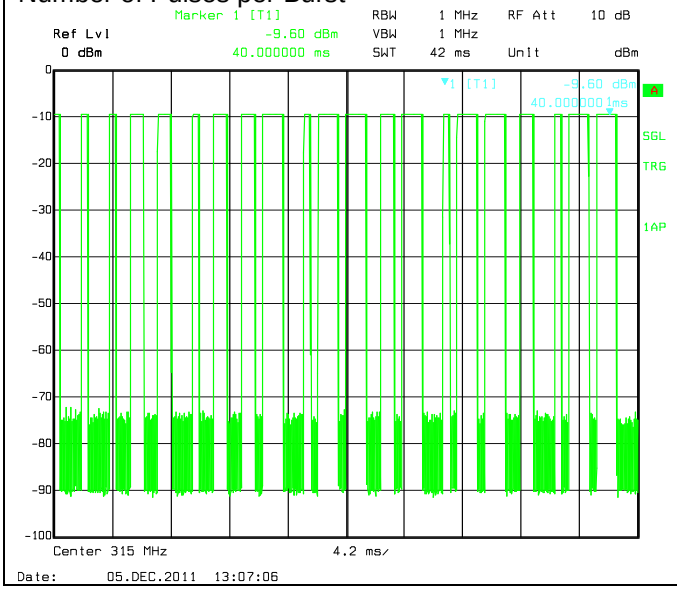
Pulse Duration Short and Medium



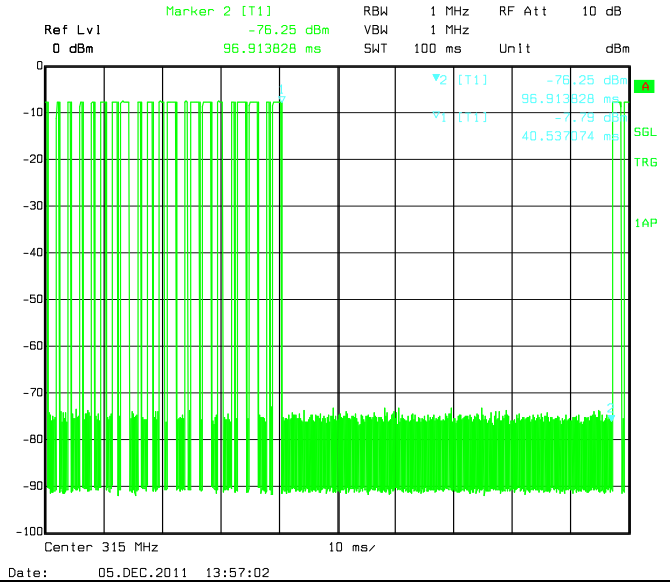
Pulse duration Medium and Long



Number of Pulses per Burst



Period



4.3.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
315MHz – 0.7875MHz	

Table 28 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 29 Occupied Bandwidth Spectrum Analyzer Settings

Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 315MHz	44kHz	54kHz
Supplementary information: None		

Figure 16 20dB Bandwidth Graph

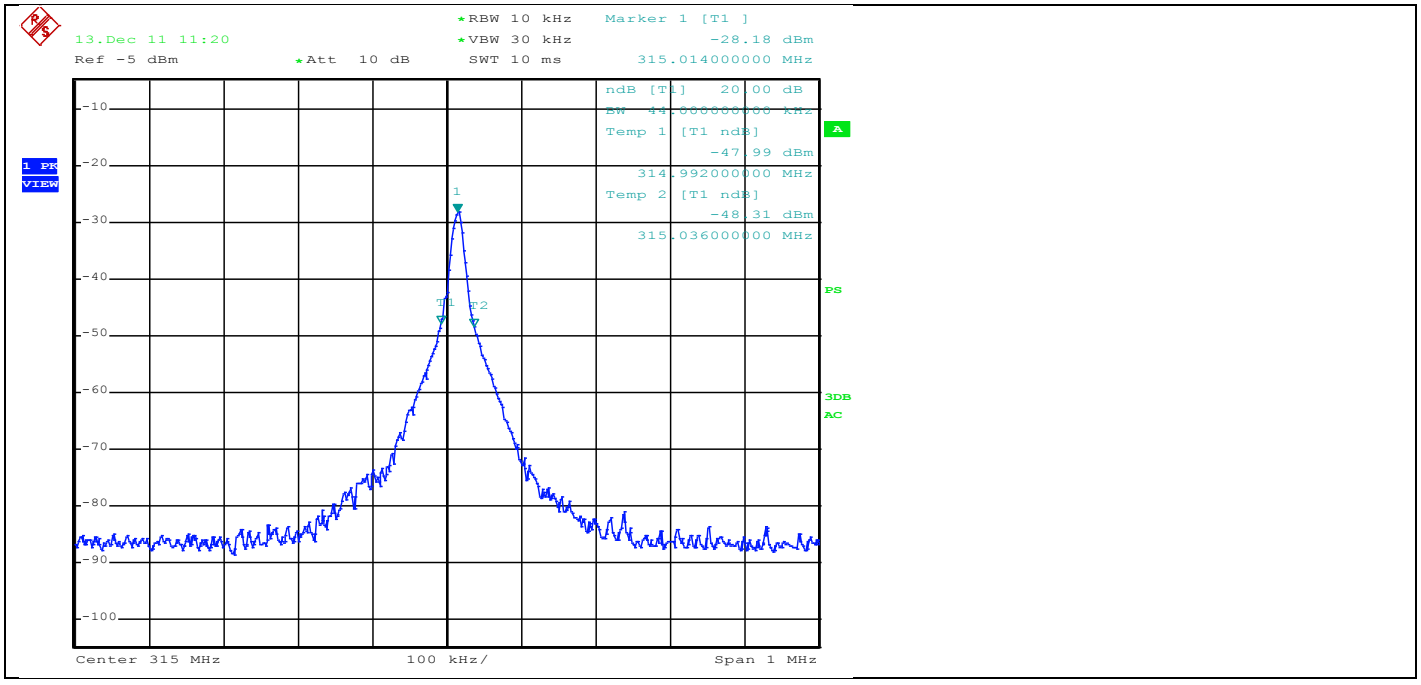
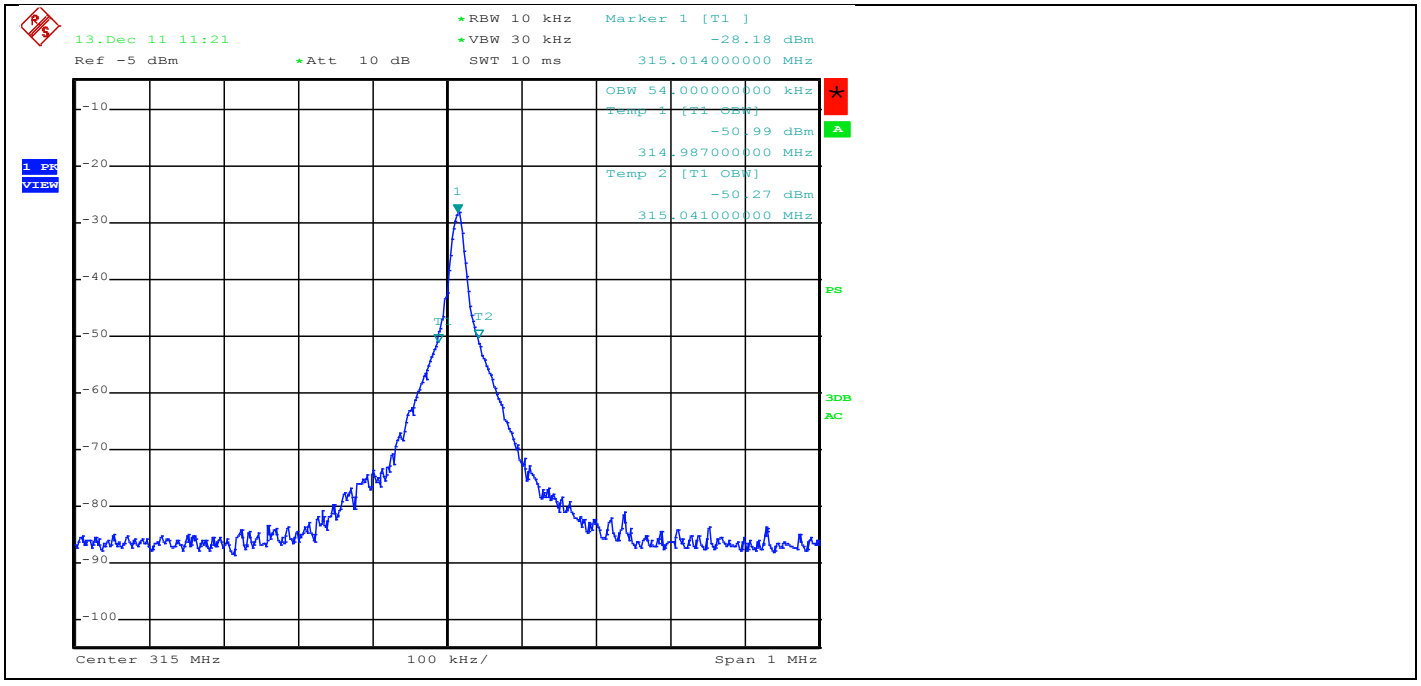


Figure 17 99% Power Bandwidth Graph



4.4 D-code 390MHz Transmitter

4.4.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

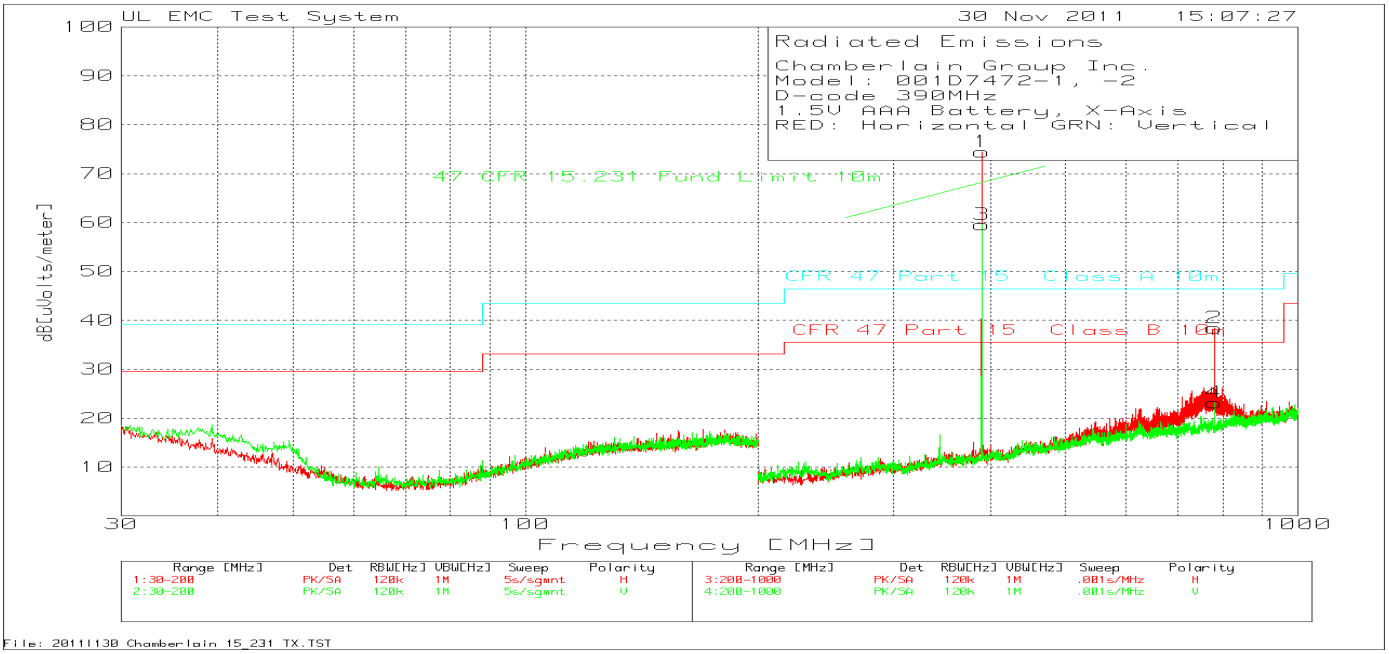
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 30 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information:		

Figure 18 Radiated Emissions Graphs



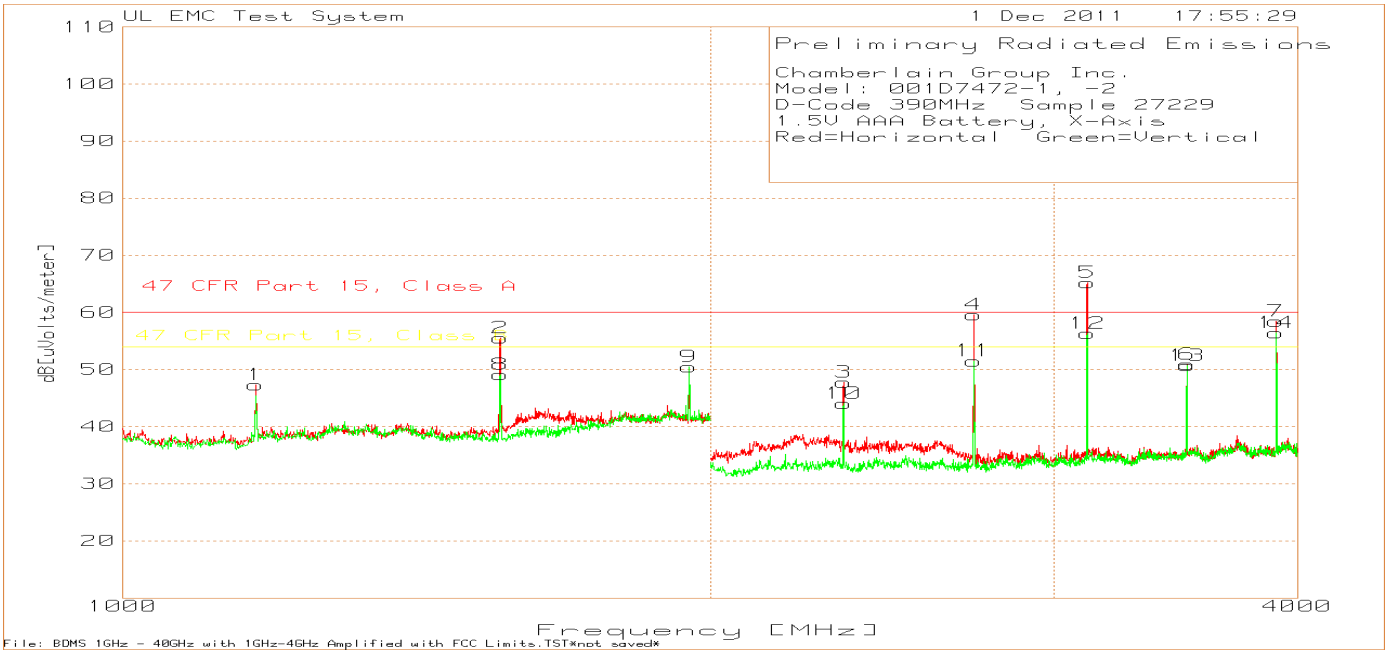


Table 31 Radiated Emissions Data Points

Chamberlain Group Inc.
Model: 001D7472-1, -2
D-code 390MHz
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical
Duty cycle provided by manufacturer: -10.17dB
Duty cycle measured: -13.87

Test Frequency	Measurement Distance (m)	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain db	Duty cycle Factor dB	dBuV/m	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
390.015375	10	94.18	QP	15.1	-32.1	-10.17	67.01	68.2	-1.19			180	201	Horz
390.015375	10	94.54	PK	15.1	-32.1	-10.17	67.37	68.2	-0.83			180	201	Horz
390.0067	10	76.56	QP	15.1	-32.1	-10.17	49.39	68.2	-18.81				100	Vert
390.0067	10	76.56	PK	15.1	-32.1	-10.17	49.39	68.2	-18.81				100	Vert
780.03375	10	50.07	QP	20.9	-31.5	-10.17	29.3			35.6	-6.3	358	262	Horz
780.03375	10	51.71	PK	20.9	-31.5	-10.17	30.94			35.6	-4.66	358	262	Horz
780.1466	10	33.76	QP	20.9	-31.5	-10.17	12.99			35.6	-22.61		100	Vert
780.1466	10	33.76	PK	20.9	-31.5	-10.17	12.99			35.6	-22.61		100	Vert
1170.17	3	75.74	PK	27.7	-56.07	-10.17	37.2			54	-16.8		100	Horz
1560.561	3	82.58	PK	27.9	-54.94	-10.17	45.37			54	-8.63		100	Horz
2340.227	3	77.16	PK	21.7	-51.08	-10.17	37.61			54	-16.39		100	Horz
2730.1232	3	88.06	PK	22.1	-50.46	-10.17	49.53			54	-4.47	131	100	Horz
3120.0902	3	92.76	PK	22.7	-49.79	-10.17	55.5			58.7	-3.16	137	106	Horz
3510.34	3	76.82	PK	23.5	-49.38	-10.17	40.77			54	-13.23		100	Horz
3900.1794	3	83.84	PK	23.8	-51.18	-10.17	46.29			54	-7.71	60	103	Horz
1560.561	3	76.19	PK	27.9	-54.94	-10.17	38.98			54	-15.02		100	Vert
1950.951	3	72.73	PK	31.2	-53.47	-10.17	40.29			54	-13.71		100	Vert
2340.227	3	73.46	PK	21.7	-51.08	-10.17	33.91			54	-20.09		100	Vert
2729.82	3	79.9	PK	22.1	-50.46	-10.17	41.37			54	-12.63		100	Vert
3120.1804	3	83.91	PK	22.7	-49.79	-10.17	46.65			54	-7.35	182	103	Vert
3510.34	3	76.58	PK	23.5	-49.38	-10.17	40.53			54	-13.47		100	Vert
3900.1794	3	83.9	PK	23.8	-51.18	-10.17	46.35			54	-7.65	141	103	Vert

4.4.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

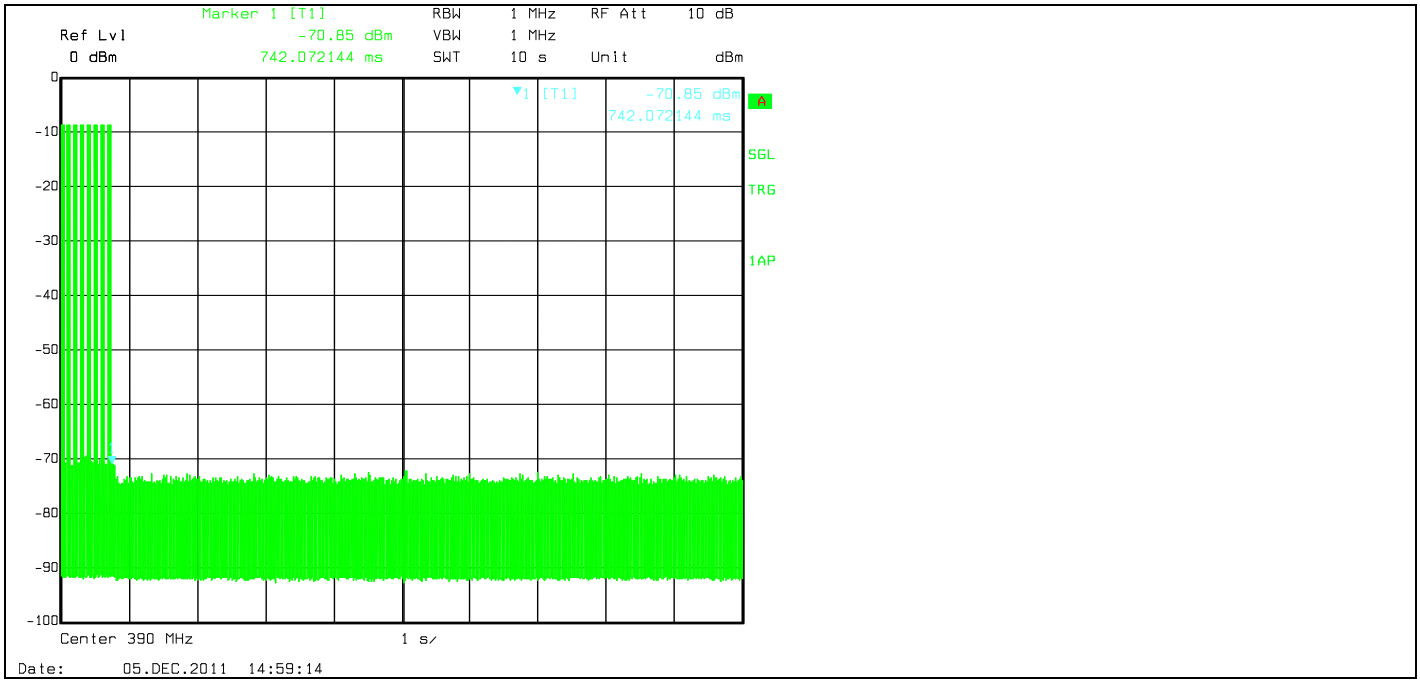
Table 32 Cease Operation Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 33 Cease Operation Test Results

Frequency	Requirement	Cease Operation Time
390MHz	5 seconds or less	742.07mS
Supplementary information: None		

Figure 19 Cease Operation Graph



4.4.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 34 Pulse Train Configuration Settings

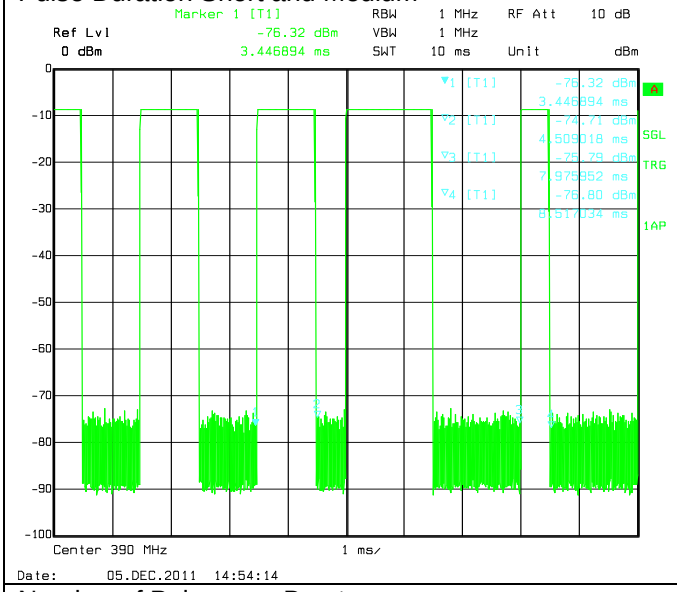
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 35 Pulse Train Calculation

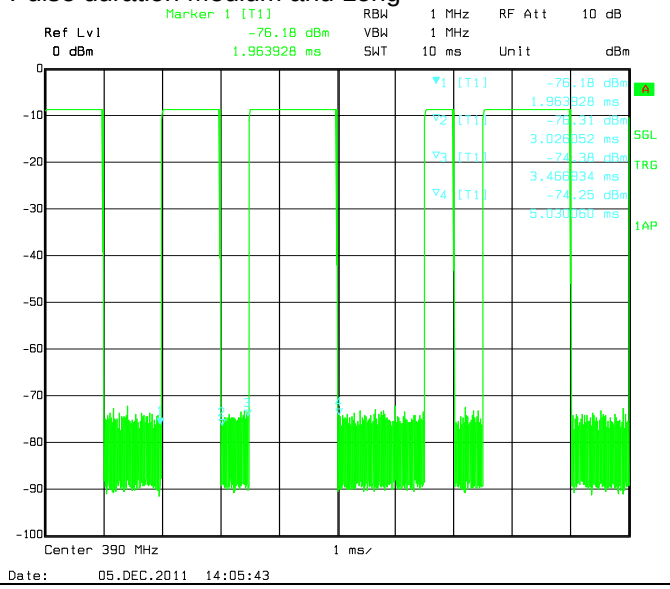
Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
390MHz	19.6391mS	96.9940mS	-13.87

Figure 20 Pulse Train Graphs

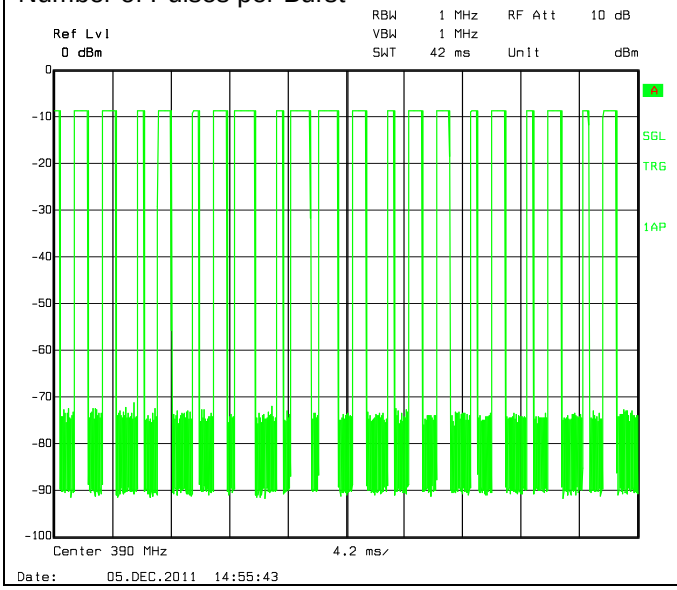
Pulse Duration Short and Medium



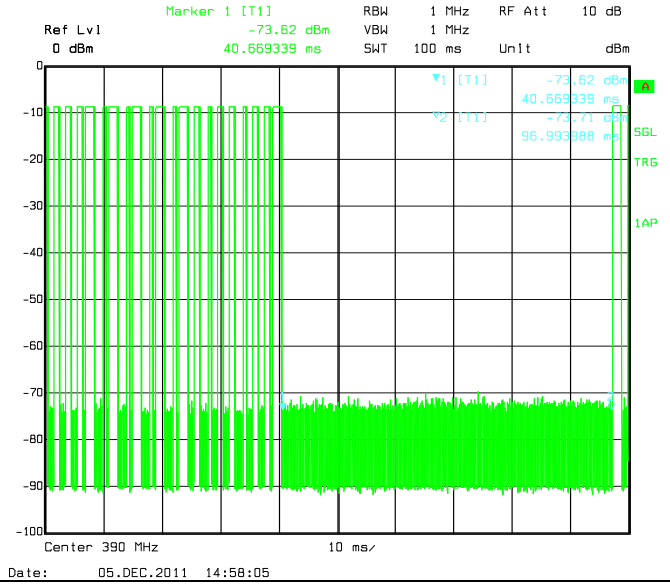
Pulse duration Medium and Long



Number of Pulses per Burst



Period



4.4.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
390MHz – 0.9750MHz	

Table 36 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 37 Occupied Bandwidth Spectrum Analyzer Settings

Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 390MHz	45kHz	63kHz
Supplementary information: None		

Figure 21 20dB Bandwidth Graph

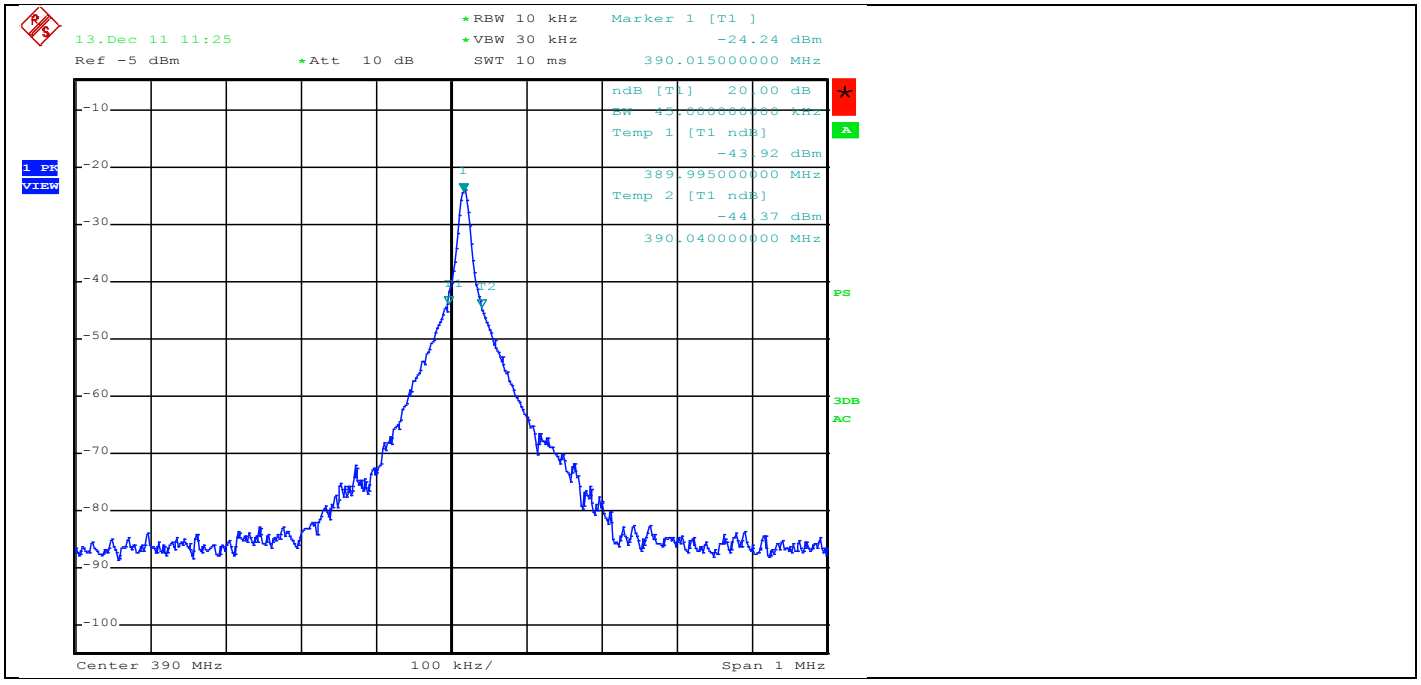
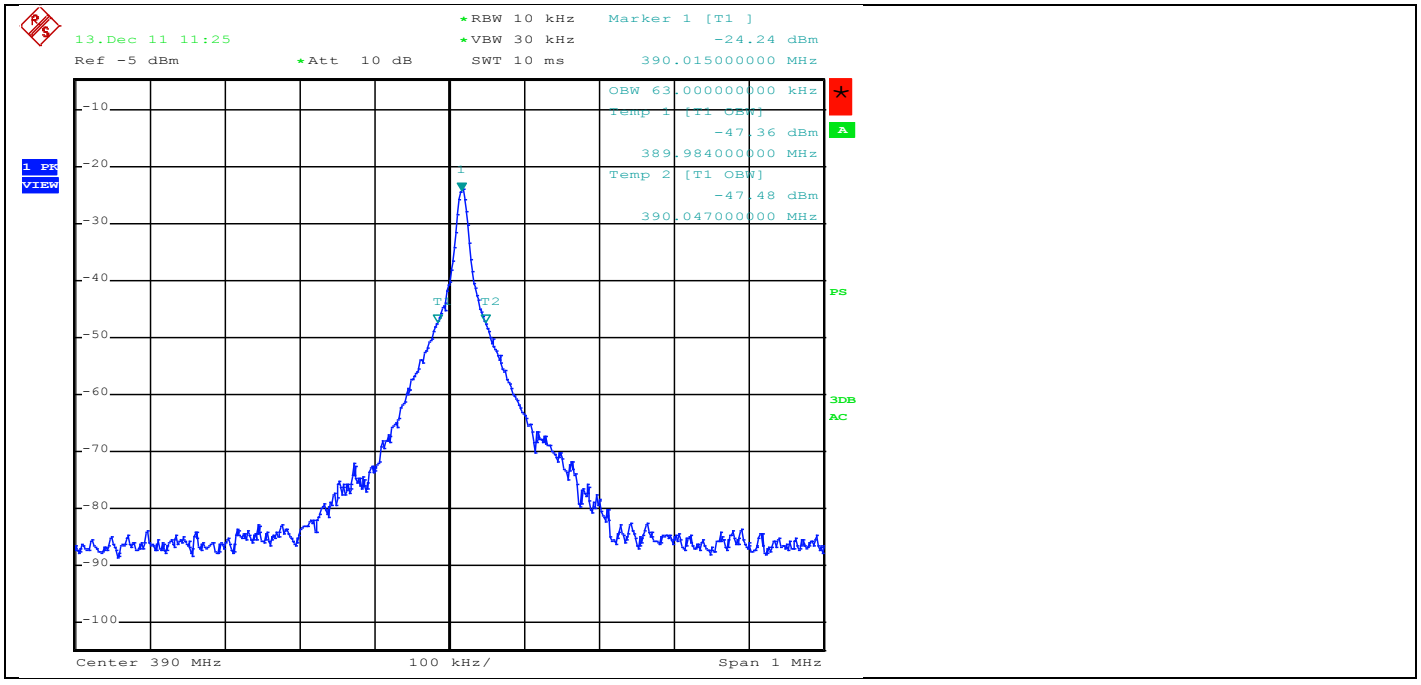


Figure 22 99% Power Bandwidth Graph



4.5 C-code 315MHz Transmitter

4.5.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

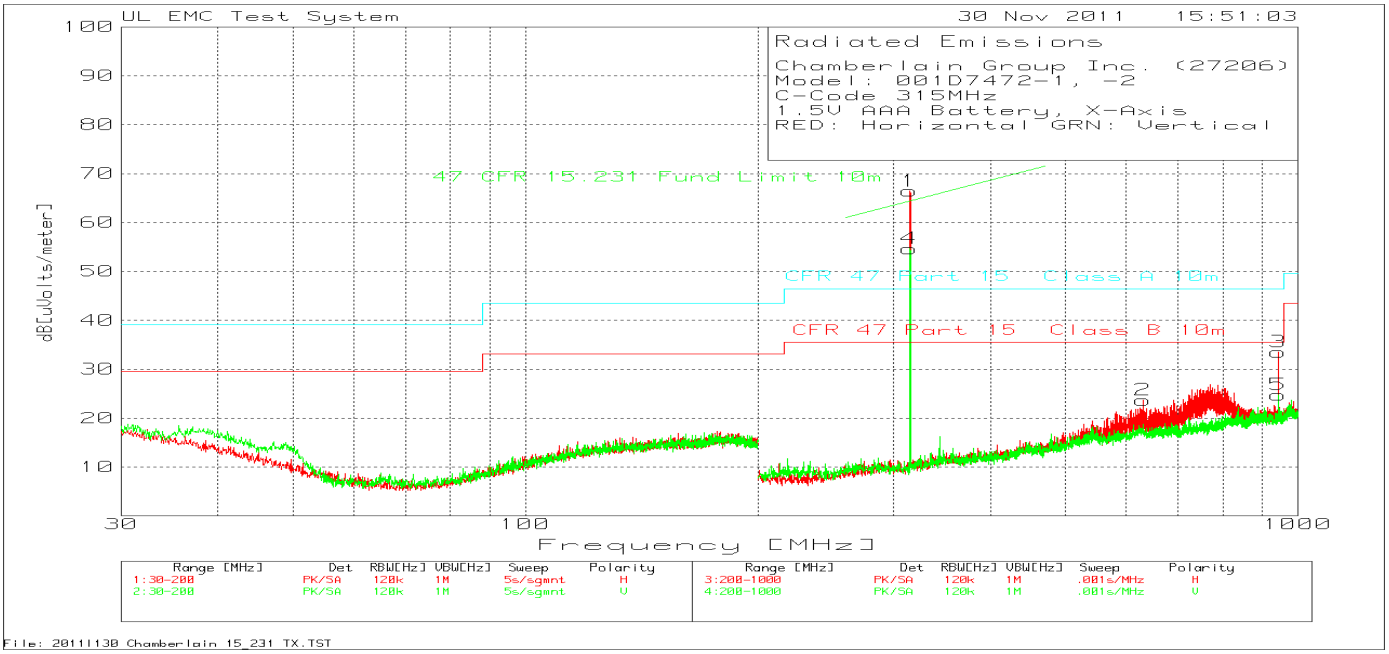
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 38 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information:		

Figure 23 Radiated Emissions Graph



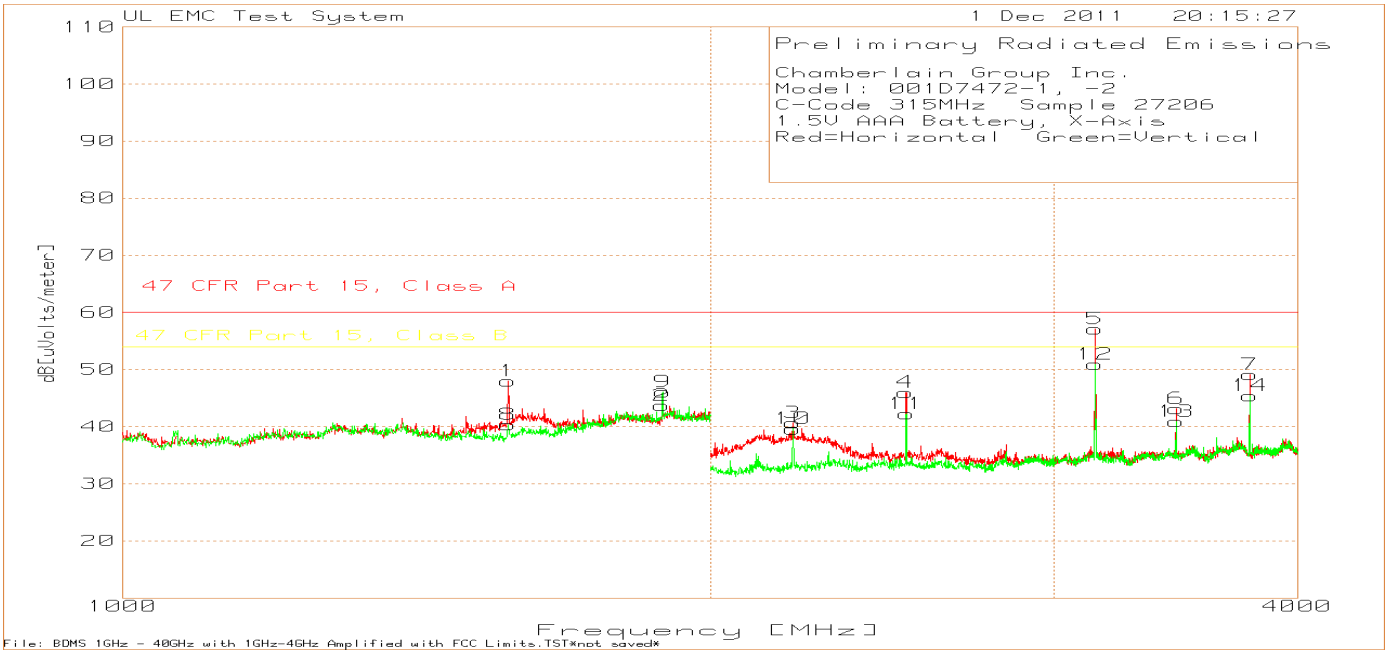


Table 39 Radiated Emissions Data Points

Chamberlain Group Inc. (27206)
Model: 001D7472-1, -2
C-Code 315MHz
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical
Duty Cycle provided by manufacturer: -9.13dB
Duty cycle Calculated: -11.42dB

Test Frequency	Measurement Distance M	Meter Reading	Detector	UPA6109 SN24423 6-29-12 10M H [dB]	East 200-1000MHz with Miteq [dB]	Duty cycle Factor dB	dB[uVolts/meter]	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
315.012875	10	90.15	QP	13.1	-32.7	-9.13	61.42	64.4	-2.98			342	276	Horz
315.012875	10	90.4	PK	13.1	-32.7	-9.13	61.67	64.4	-2.73			342	276	Horz
315.0095	10	74.57	QP	13.1	-32.7	-9.13	45.84	64.4	-18.56			79	154	Vert
315.0095	10	74.89	PK	13.1	-32.7	-9.13	46.16	64.4	-18.24			79	154	Vert
630.0285	10	39.66	QP	20.1	-31.1	-9.13	19.53			35.6	-16.07	342	265	Horz
630.0285	10	41.75	PK	20.1	-31.1	-9.13	21.62			35.6	-13.98	342	265	Horz
945.021375	10	40.47	QP	22.8	-31.5	-9.13	22.64			35.6	-12.96	197	100	Horz
945.021375	10	42.34	PK	22.8	-31.5	-9.13	24.51			35.6	-11.09	197	100	Horz
630.021449	10	28.73	QP	20.1	-31.1	-9.13	8.6			35.6	-27	351	231	Vert
630.021449	10	33.29	PK	20.1	-31.1	-9.13	13.16			35.6	-22.44	351	231	Vert
945.0335	10	33.64	QP	22.8	-31.5	-9.13	15.81			35.6	-19.79	294	181	Vert
945.0335	10	37.25	PK	22.8	-31.5	-9.13	19.42			35.6	-16.18	294	181	Vert
1575.0611	3	75.21	PK	27.9	-54.64	-9.13	39.34			54	-14.66	184	103	Horz
1889.89	3	65.69	PK	31.3	-53.26	-9.13	34.6			54	-19.4		103	Horz
2204.136	3	70.48	PK	21.8	-51.62	-9.13	31.53			54	-22.47		101	Horz
2519.013	3	74.92	PK	22.1	-50.99	-9.13	36.9			54	-17.1		101	Horz
3150.0832	3	84.75	PK	22.9	-50.09	-9.13	48.43			54	-5.57	142	103	Horz
3466.311	3	69.98	PK	23.5	-50.3	-9.13	34.05			54	-19.95		101	Horz
3780.1553	3	76.68	PK	24	-51.13	-9.13	40.42			54	-13.58	184	100	Horz
1575.576	3	67.09	PK	27.9	-54.62	-9.13	31.24			54	-22.76		101	Vert
1890.891	3	68.04	PK	31.3	-53.21	-9.13	37			54	-17		101	Vert
2204.136	3	69.44	PK	21.8	-51.62	-9.13	30.49			54	-23.51		101	Vert
2520.347	3	71.1	PK	22.1	-50.97	-9.13	33.1			54	-20.9		101	Vert
3150.1443	3	80.05	PK	22.9	-50.09	-9.13	43.73			54	-10.27	184	130	Vert
3464.977	3	67.67	PK	23.5	-50.28	-9.13	31.76			54	-22.24		101	Vert
3781.187	3	72.6	PK	24	-51.14	-9.13	36.33			54	-17.67		101	Vert

4.5.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

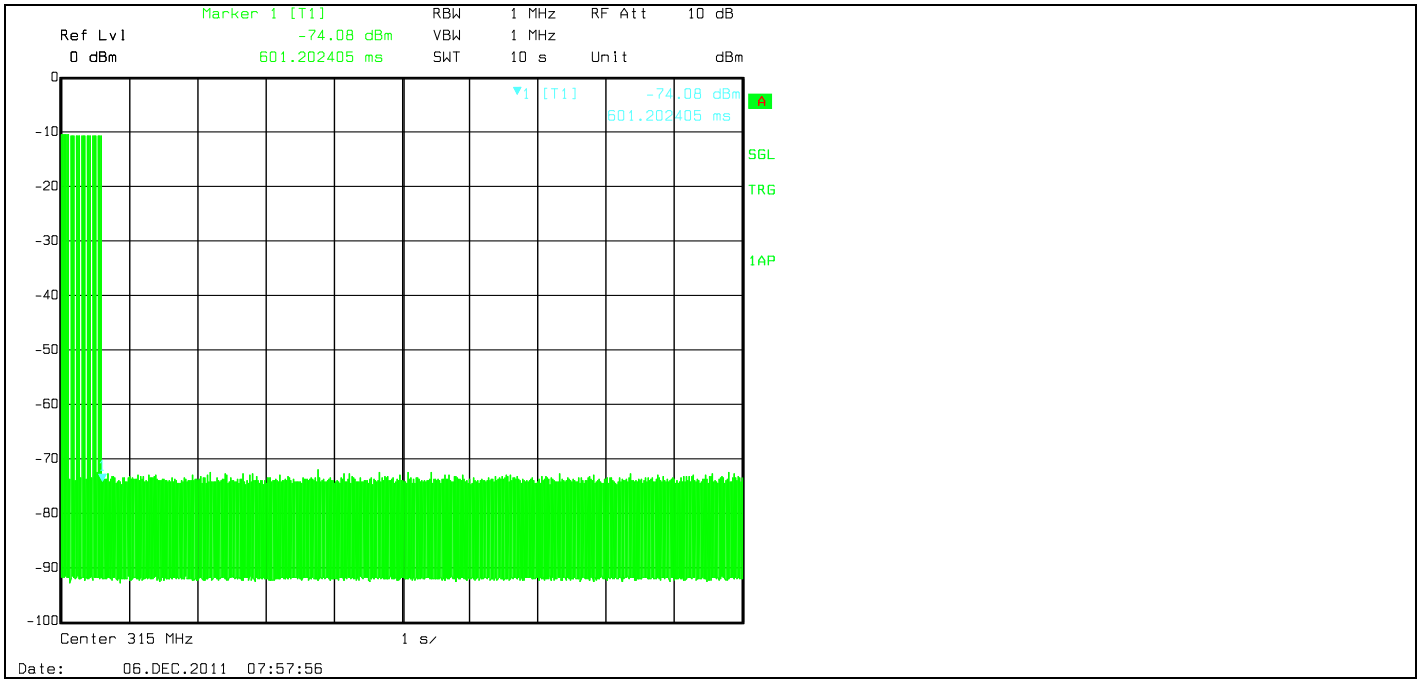
Table 40 Cease Operation Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 41 Cease Operation Test Results

Frequency	Requirement	Cease Operation Time
315MHz	5 seconds or less	601.2mS
Supplementary information: None		

Figure 24 Cease Operation Graph



4.5.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 42 Pulse Train Configuration Settings

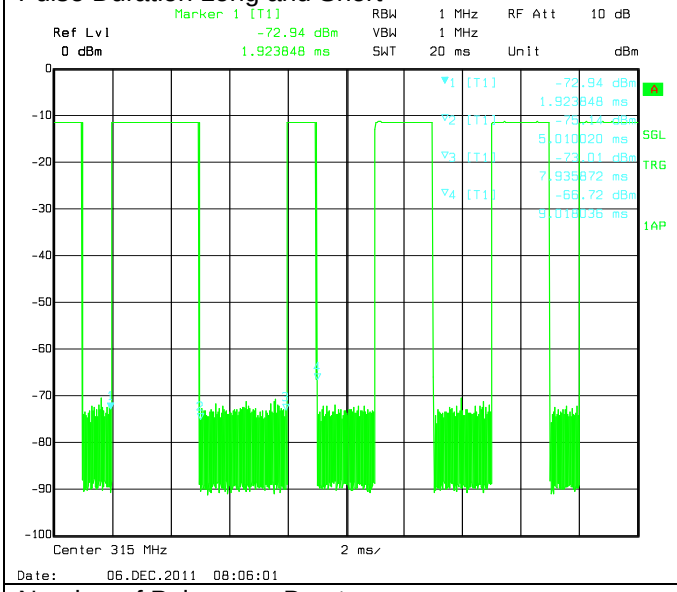
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 43 Pulse Train Calculation

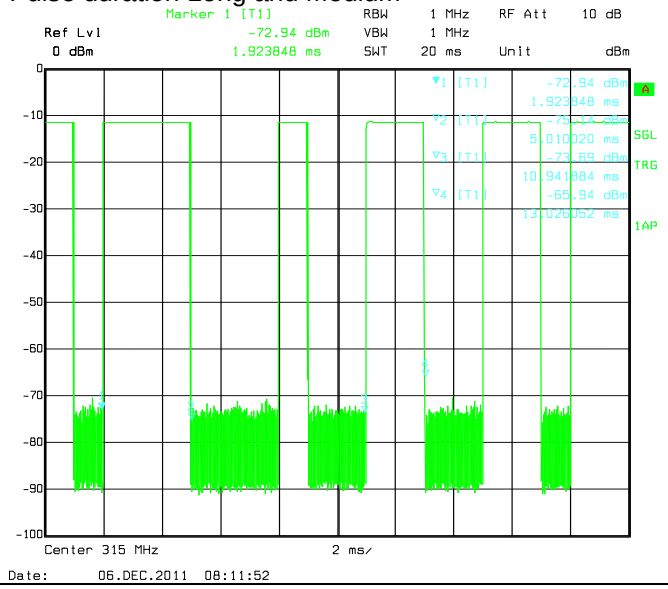
Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
315MHz	20.9282	77.9559	-11.42

Figure 25 Pulse Train Graphs

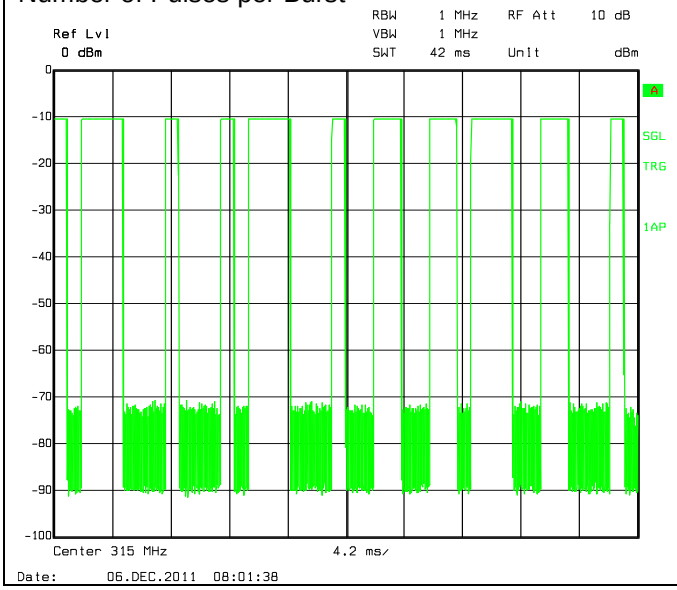
Pulse Duration Long and Short



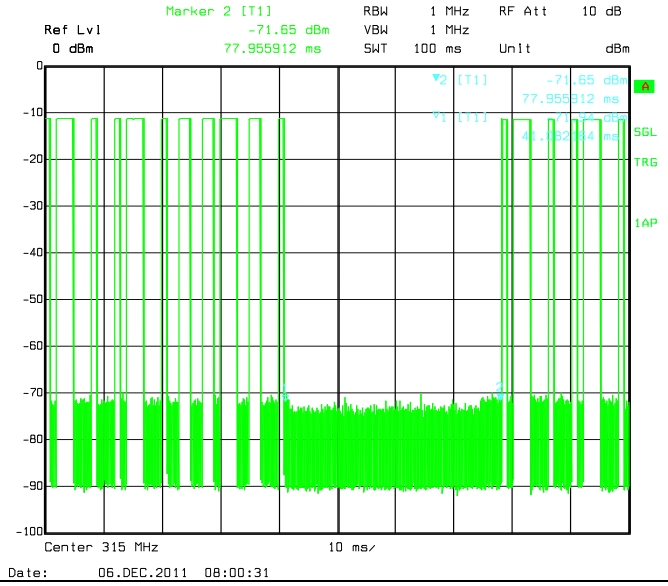
Pulse duration Long and Medium



Number of Pulses per Burst



Period



4.5.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
315MHz – 0.7875MHz	

Table 44 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 45 Occupied Bandwidth Spectrum Analyzer Settings

Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 315MHz	43kHz	50kHz
Supplementary information: None		

Figure 26 20dB Bandwidth Graph

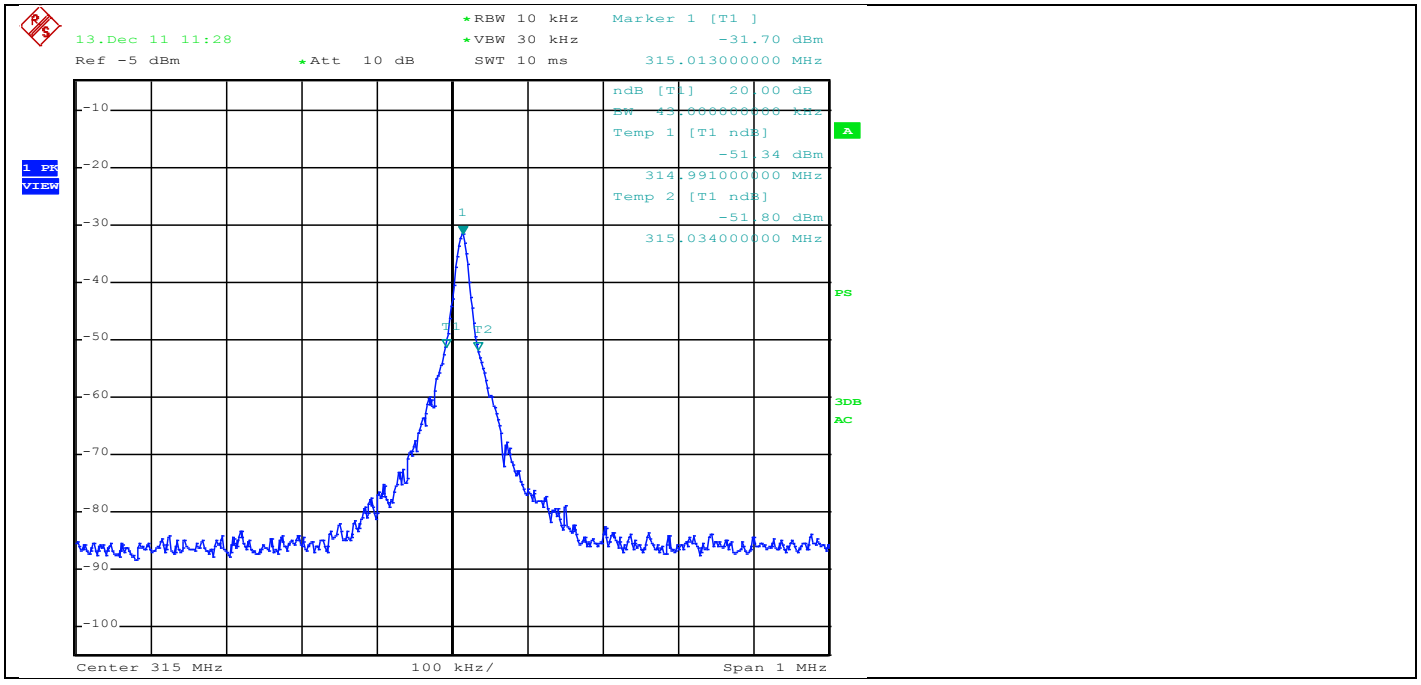
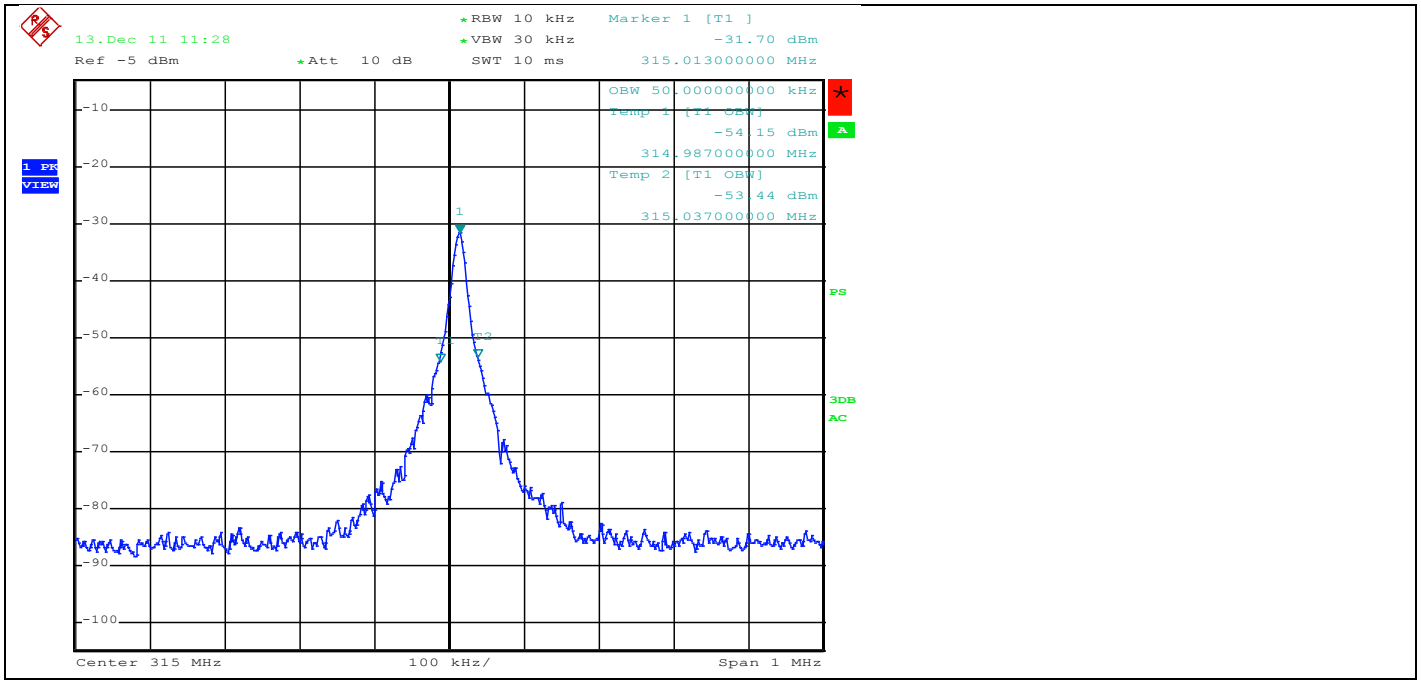


Figure 27 99% Power Bandwidth Graph



4.6 C-code 390MHz Transmitter

4.6.1 Test Conditions and Results – Fundamental and Harmonics Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15.231, RSS-210 A1.1	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(10m distance)
	1GHz – 4GHz	(3m distance)

Limits

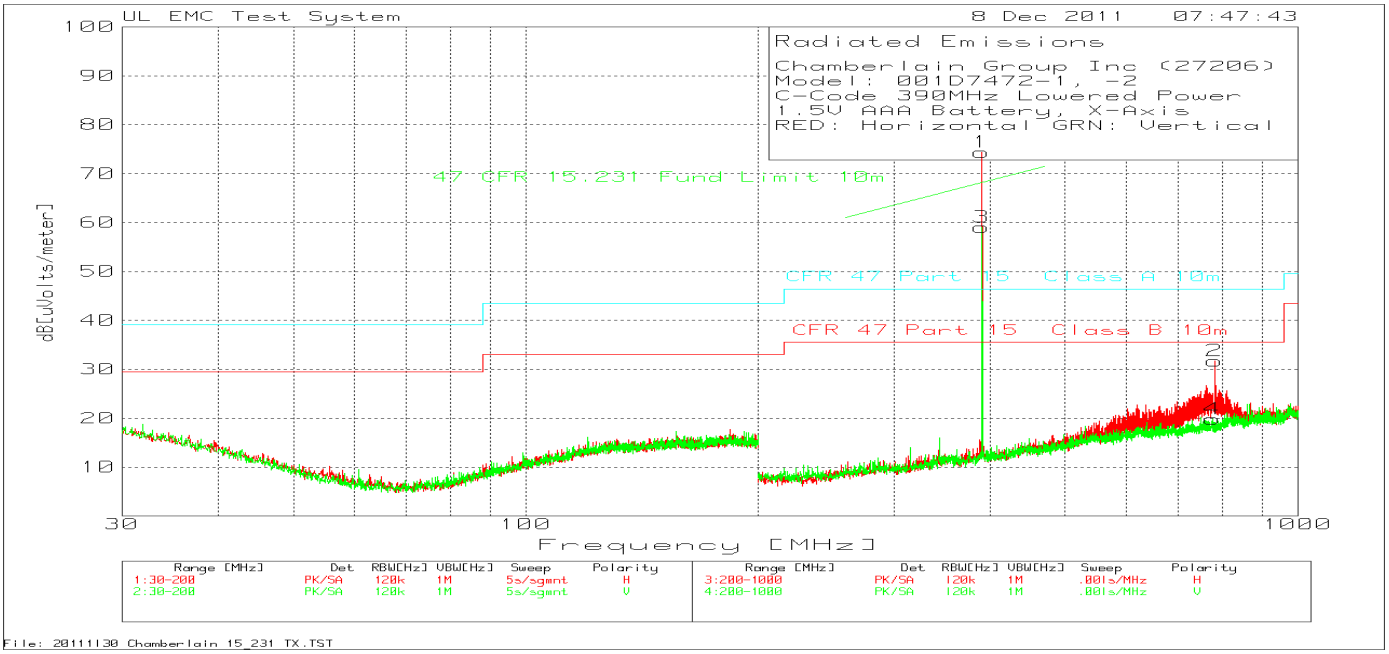
Frequency (MHz)	Limit (dBµV/m)	
	Fundamental Limit	Spurious
310MHz	64.1	-
315MHz	64.4	-
390MHz	68.2	-
30MHz – 88MHz	-	29.54
88MHz – 216MHz	-	33.06
216MHz – 960MHz	-	35.56
960MHz – 1,000MHz	-	43.52
1,000MHz – 4,000MHz	-	54

Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. All emissions below 1GHz were maximized. Above 1GHz only emissions within 6dB of the limit were maximized. Emissions that do not contain azimuth data, their level is based on pre-scan data.

Table 46 Radiated Emissions EUT Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	1
Supplementary information:		

Figure 28 Radiated Emissions Graph



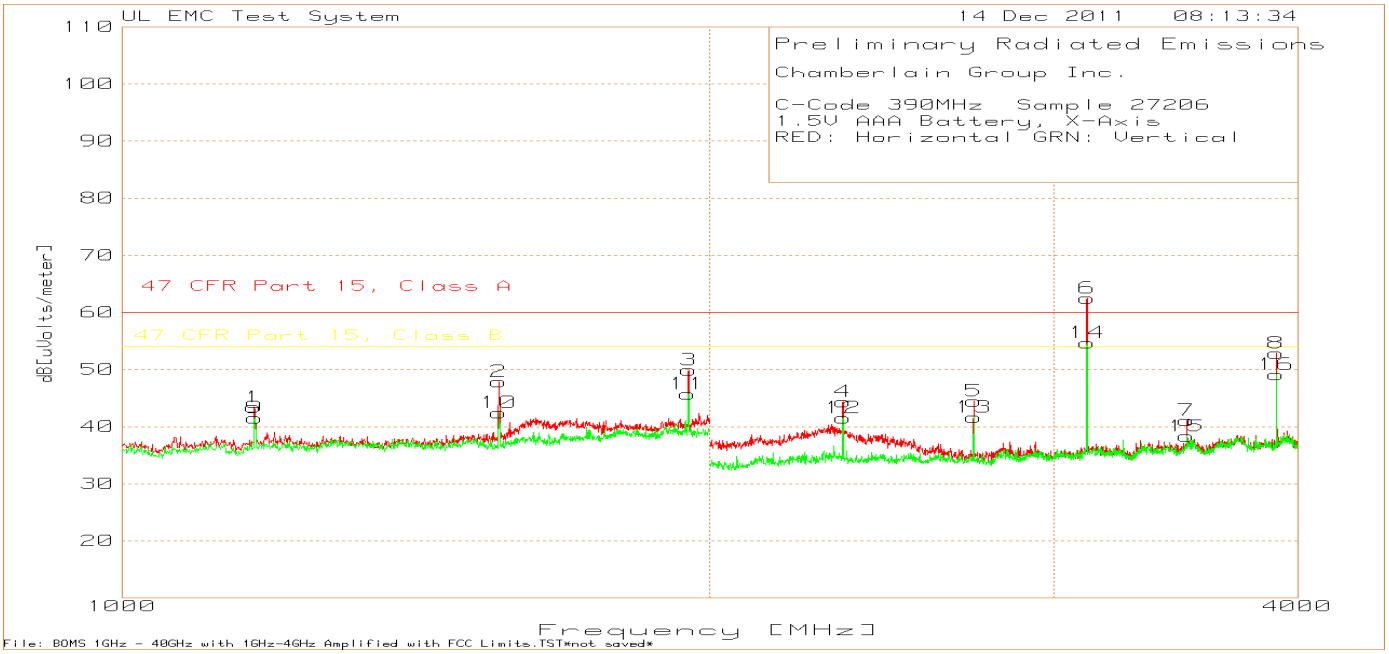


Table 47 Radiated Emissions Data Points

	Chamberlain Group Inc. (27206) Model: 001D7472-1, -2 C-Code 390MHz, Lowered Power 1.5V AAA Battery, X-Axis RED: Horizontal GRN: Vertical Duty Cycle Provided by Manufactuer: -9.13dB Duty cycle Measured: -9.51dB													
Test Frequency	Measurement distance m	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain dB	Duty Cycle Factor dB	dBuV/m	47 CFR 15.231 Fund Limit 10m	Margin	Limit at measurement distance	Margin	Azimuth [Degs]	Height [cm]	Polarity
390.0135	10	94.03	QP	15	-32.1	-9.13	67.9	68.2	-0.3			280	202	Horz
390.0135	10	94.27	PK	15	-32.1	-9.13	68.14	68.2	-0.06			280	202	Horz
390.0135	10	79.21	QP	15	-32.1	-9.13	53.08	68.2	-15.12			149	290	Vert
390.0135	10	79.48	PK	15	-32.1	-9.13	53.35	68.2	-14.85			149	290	Vert
780.0245	10	48.42	QP	21	-31.5	-9.13	28.69			35.6	-6.91	104	254	Horz
780.0245	10	49.92	PK	21	-31.5	-9.13	30.19			35.6	-5.41	104	254	Horz
780.0245	10	34.02	QP	21	-31.5	-9.13	14.29			35.6	-21.31	132	386	Vert
780.0245	10	38.71	PK	21	-31.5	-9.13	18.98			35.6	-16.62	132	386	Vert
1169.169	3	74.7	PK	25	-56.1	-9.13	34.28			54	-19.72		100	Horz
1560.561	3	77.58	PK	25	-54.9	-9.13	38.71			54	-15.29		150	Horz
1950.951	3	75.97	PK	27	-53.5	-9.13	40.77			54	-13.23		150	Horz
2340.227	3	73.8	PK	22	-51.1	-9.13	35.29			54	-18.71		100	Horz
2729.82	3	72.8	PK	22	-50.5	-9.13	35.31			54	-18.69		100	Horz
3120.166	3	89.2	PK	23	-49.8	-9.13	52.98			54	-1.02	221	100	Horz
3510.34	3	67.01	PK	24	-49.4	-9.13	32			54	-22		100	Horz
3901.268	3	80.26	PK	24	-51.2	-9.13	43.77			54	-10.23		100	Horz
1170.17	3	72.79	PK	25	-56.1	-9.13	32.39			54	-21.61		99	Vert
1560.561	3	72.14	PK	25	-54.9	-9.13	33.27			54	-20.73		99	Vert
1949.95	3	71.8	PK	27	-53.5	-9.13	36.62			54	-17.38		200	Vert
2340.227	3	70.9	PK	22	-51.1	-9.13	32.39			54	-21.61		100	Vert
2729.82	3	70.01	PK	22	-50.5	-9.13	32.52			54	-21.48		150	Vert
3120.747	3	81.81	PK	23	-49.8	-9.13	45.58			54	-8.42		150	Vert
3510.34	3	64.19	PK	24	-49.4	-9.13	29.18			54	-24.82		150	Vert
3901.268	3	76.53	PK	24	-51.2	-9.13	40.04			54	-13.96		100	Vert

4.6.2 Test Conditions and Results – Cease Operation

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1
Cease Operation Limits	
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.	

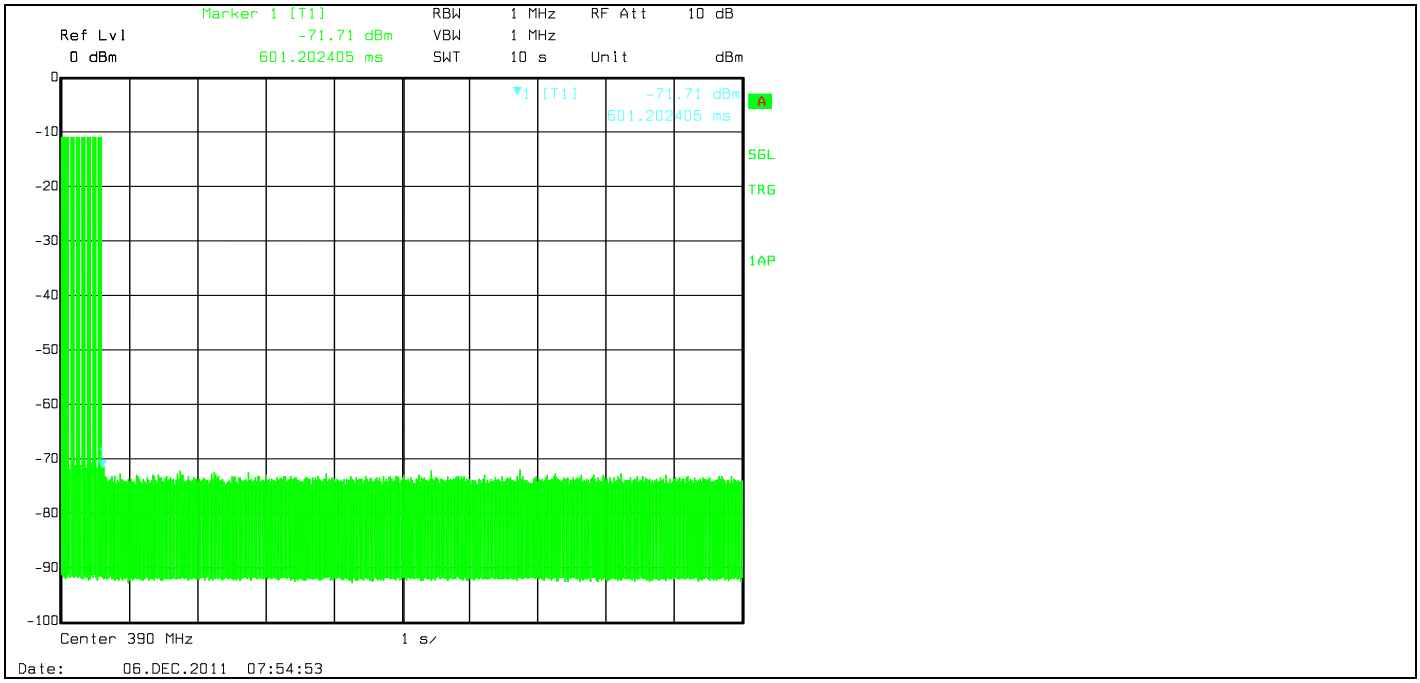
Table 48 Cease Operation Configuration Settings

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 49 Cease Operation Test Results

Frequency	Requirement	Cease Operation Time
390MHz	5 seconds or less	601.2mS
Supplementary information: None		

Figure 29 Cease Operation Graph



4.6.3 Test Conditions and Results – Pulse Train / Duty Cycle

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency.
Basic Standard	FCC Part 15 Subpart A, 15.35
Pulse Train Limits	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	

Table 50 Pulse Train Configuration Settings

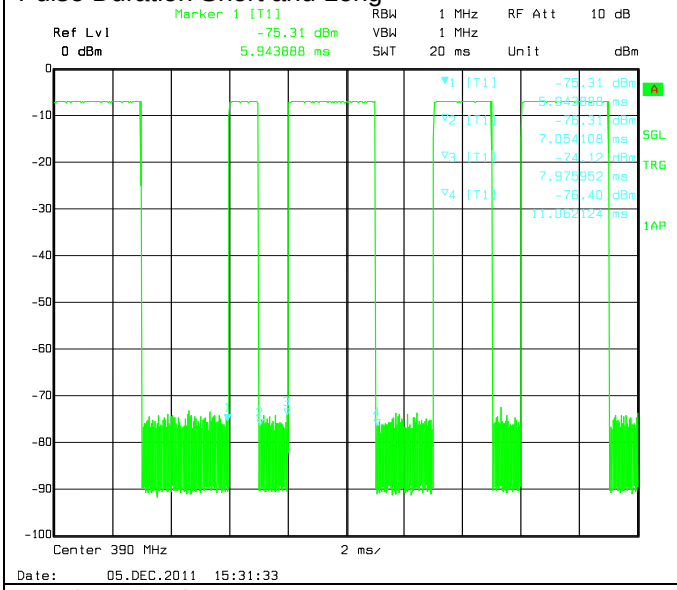
Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	2	3
Supplementary information: None		

Table 51 Pulse Train Calculation

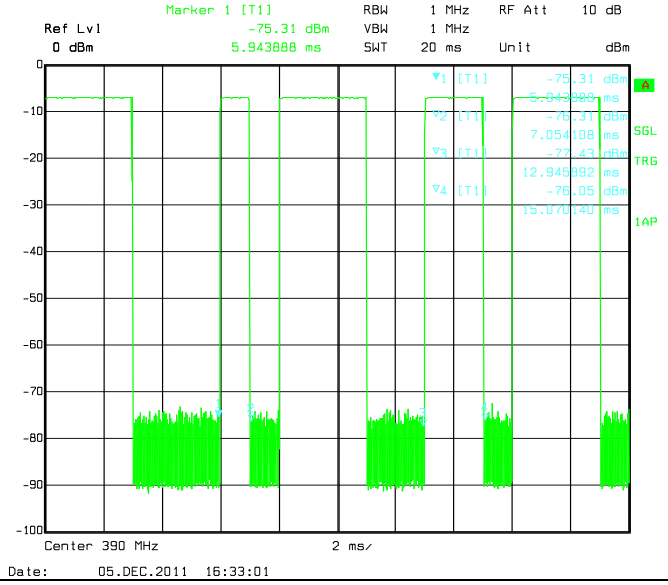
Frequency	Pulse Width (mS)	Period or 100ms whichever is lesser	Average Correction Factor (dB) $20\log\left(\frac{PulseWidth}{TotalTransmissionTime}\right)$
390MHz	26.0988	77.9559	-9.51

Figure 30 Pulse Train Graphs

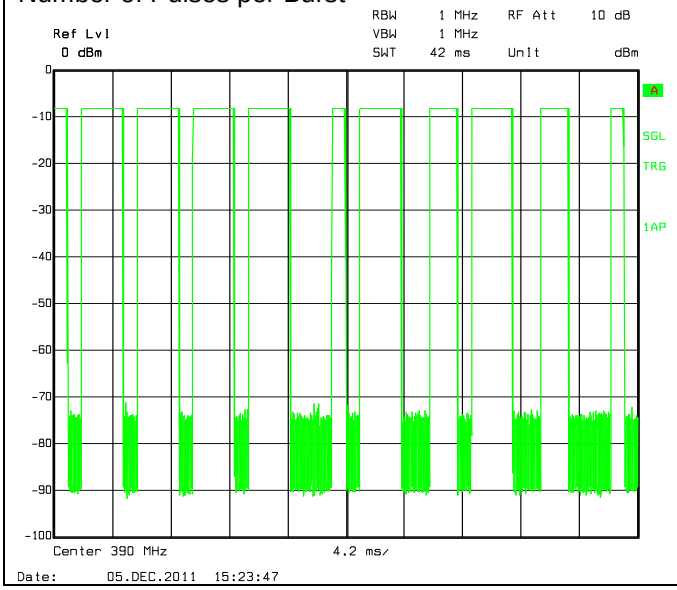
Pulse Duration Short and Long



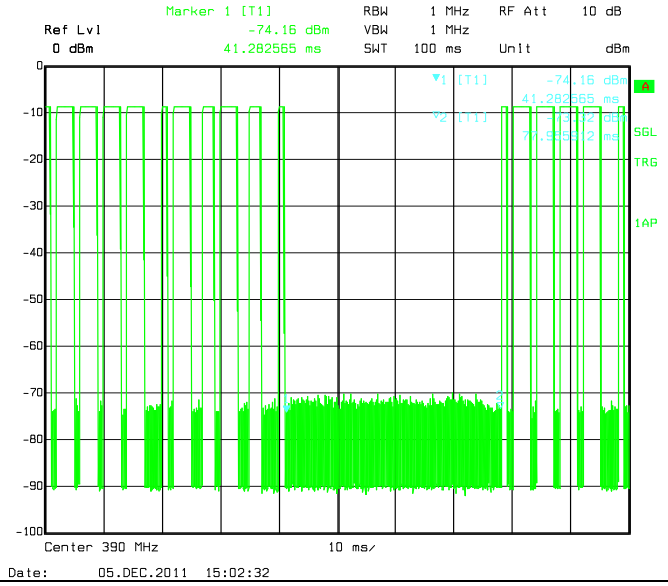
Pulse duration Short and Medium



Number of Pulses per Burst



Period



4.6.4 Test Conditions and Results – 20dB / 99% Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	47 CFR Part 15.231, RSS-210 A1.1.3
Occupied Bandwidth Limits	
No wider than 0.25% of the center frequency for devices operating between 70MHz and 900MHz.	
390MHz – 0.9750MHz	

Table 52 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode	EUT Operation Mode
1	2	1
Supplementary information: None		

Table 53 Occupied Bandwidth Spectrum Analyzer Settings

Occupied Bandwidth Requirements		
RBW / VBW Setting – 10kHz/30kHz	dBc	%
Requirement	**-20**	**99**
Results for 390MHz	44kHz	51kHz
Supplementary information: None		

Figure 31 20dB Bandwidth Graph

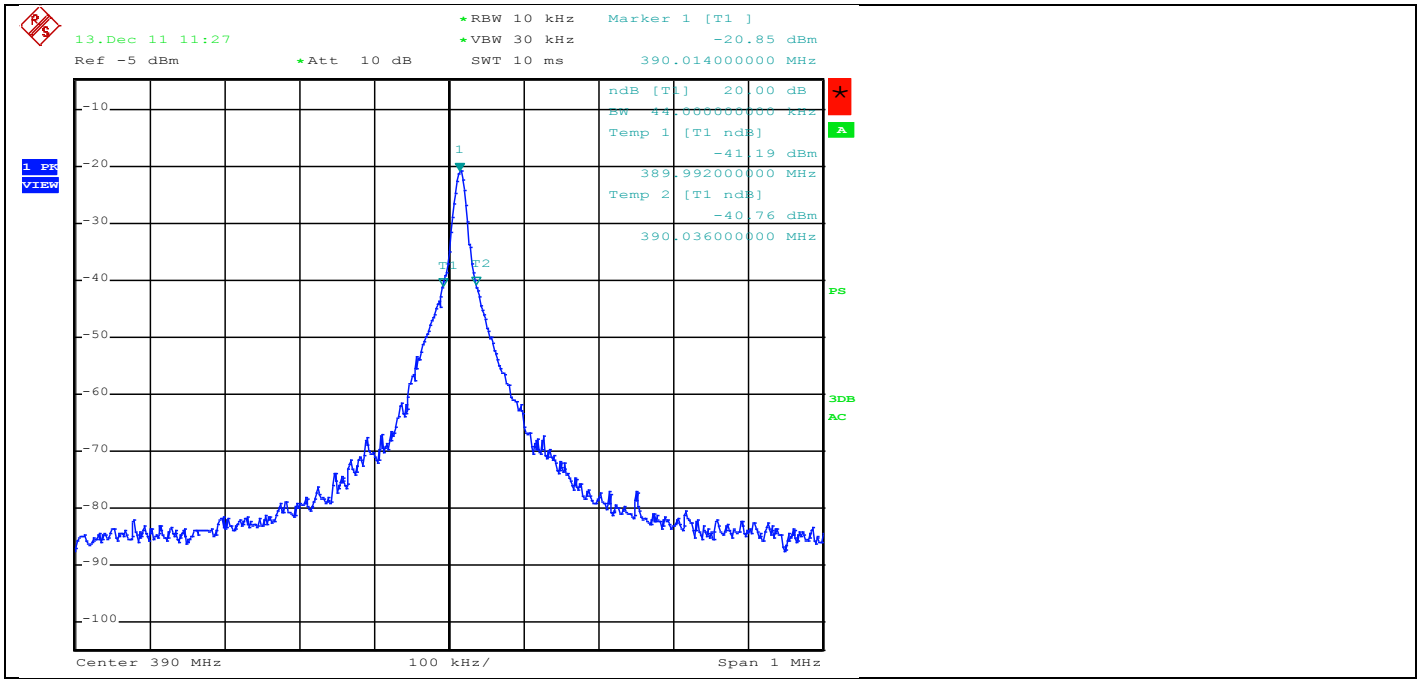
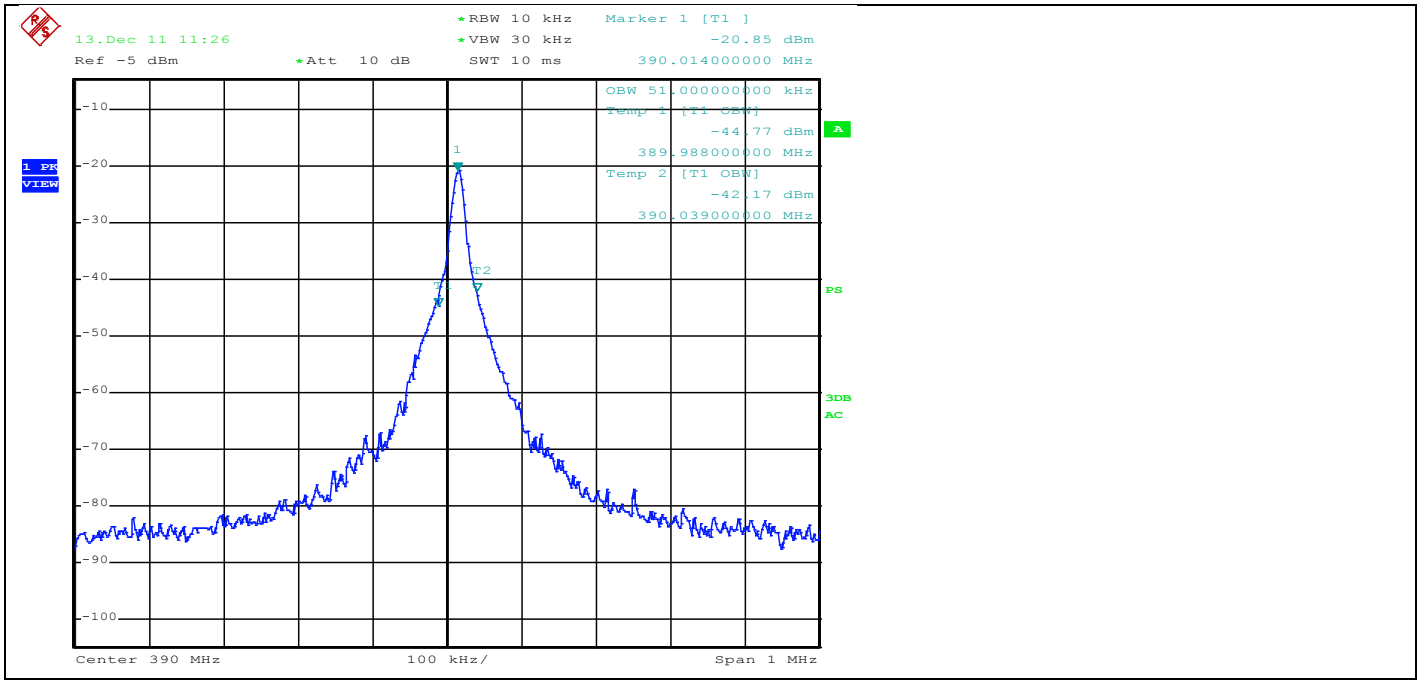


Figure 32 99% Power Bandwidth Graph



4.7 Test Conditions and Results – Receiver and Radiated Emissions

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	47 CFR Part 15, Subpart B	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	(10 meter measurement distance)

Limits - Class B

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30MHz – 88MHz	29.54	NA
88MHz – 216MHz	33.06	NA
216MHz – 960MHz	35.56	NA
960MHz – 1,000MHz	43.52	NA
Above 1,000MHz	NA	54 (at 3-meter)

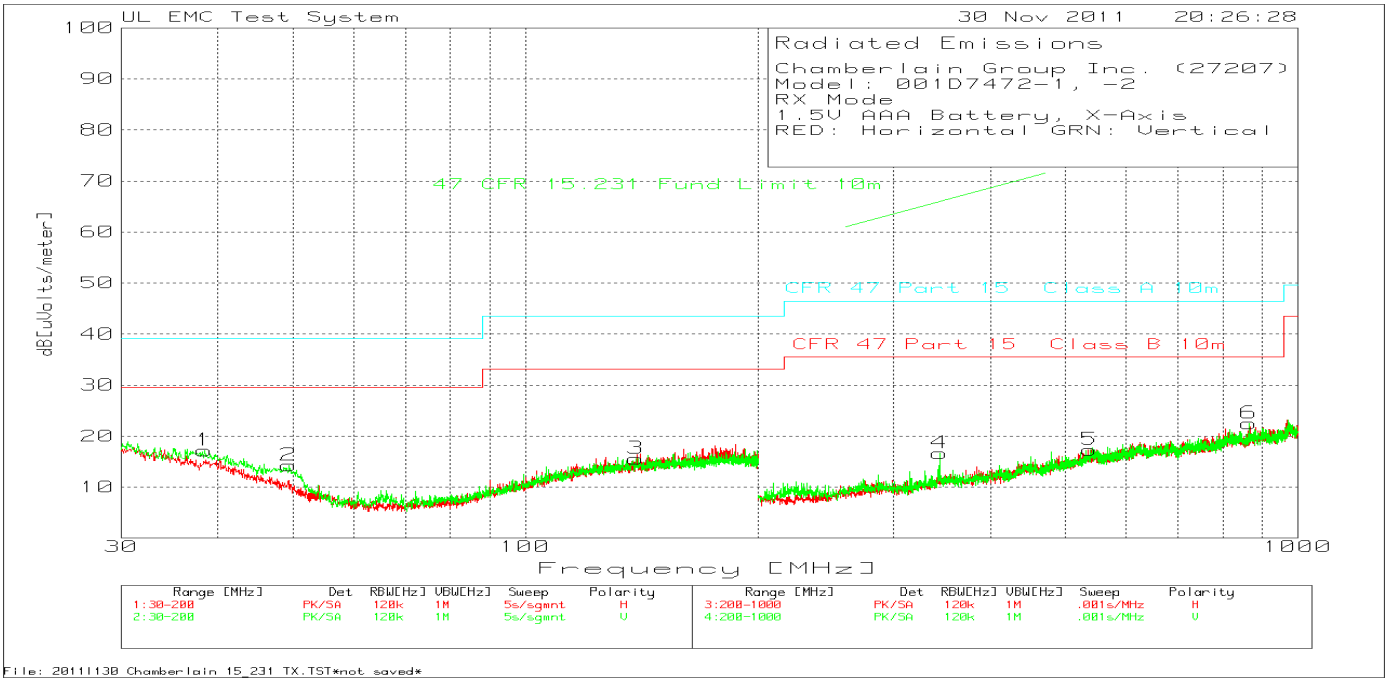
Supplementary information: None

Table 54 Receiver and Digital Radiated Emissions

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	2

Supplementary information: None

Figure 33 Radiated Emissions Graph



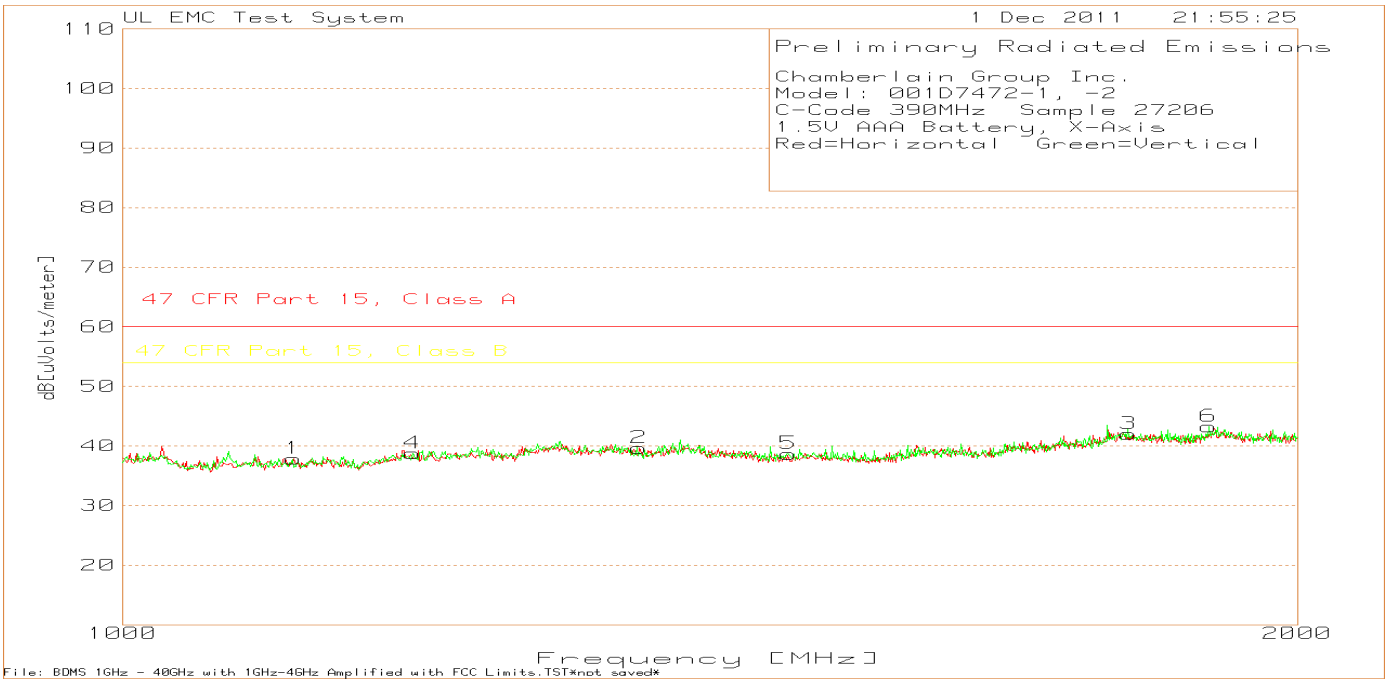


Table 55 Radiated Emissions Data Points

Chamberlain Group Inc. (27207)
Model: 001D7472-1, -2
RX Mode
1.5V AAA Battery, X-Axis
RED: Horizontal GRN: Vertical

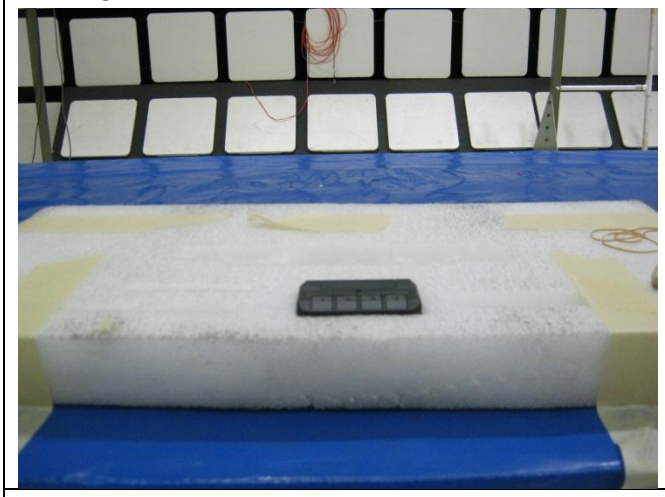
Test Frequency	Measurement Distance	Meter Reading	Detector	Antenna Factor dB	Gain / Loss Factor dB	dBuV/m	Limit at measurement distance	Margin	Height [cm]	Polarity
38.4108	10	32.83	PK	14.7	-30.3	17.23	29.6	-12.37	251	Vert
49.4553	10	34.33	PK	10.2	-30.3	14.23	29.6	-15.37	251	Vert
138.9155	10	31.22	PK	14.4	-30	15.62	33.1	-17.48	251	Vert
343.6376	10	34.7	PK	14.5	-32.5	16.7	35.6	-18.9	101	Vert
537.9081	10	29.98	PK	18.9	-31.6	17.28	35.6	-18.32	101	Vert
865.6895	10	31.93	PK	22.2	-31.6	22.53	35.6	-13.07	101	Vert
1106.106	3	66.79	PK	26.8	-55.71	37.88	54	-16.12	101	Horz
1356.356	3	66.41	PK	28.9	-55.65	39.66	54	-14.34	101	Horz
1810.811	3	64.66	PK	30.8	-53.44	42.02	54	-11.98	101	Horz
1186.186	3	66.49	PK	27.9	-55.66	38.73	54	-15.27	101	Vert
1481.481	3	65.54	PK	27.8	-54.63	38.71	54	-15.29	101	Vert
1897.898	3	65.03	PK	31.4	-53.11	43.32	54	-10.68	101	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector

5.0 TEST SETUP PHOTOS

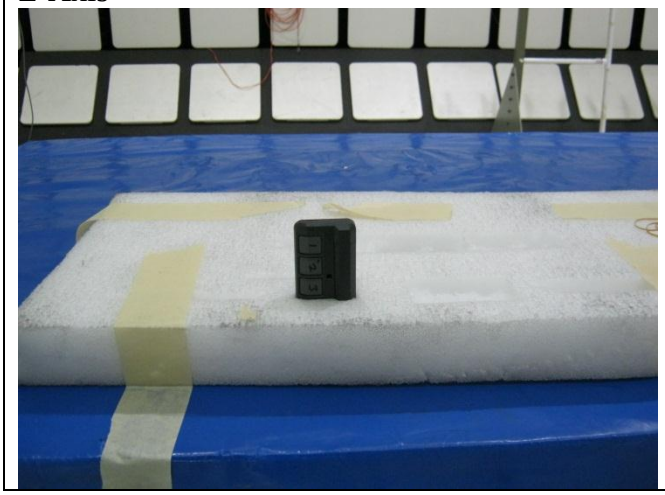
Figure 34 Test Setup for Radiated Emissions

X-Axis



Y-Axis

Z-Axis



Overall

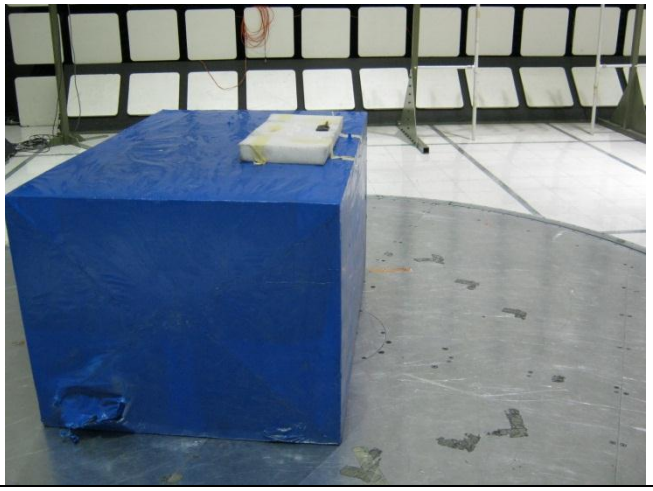


Figure 35 Test Setup for Cease Operation, Pulse Train, and Bandwidth

6.0 IMMUNITY TEST RESULTS

The immunity tests were not required nor requested.

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III (2-3). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6