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Project Number: 12CA17295 Rev.1
File Number: MC15343
Date: April 19, 2012
Model: 885LM

Electromagnetic Compatibility Test Report

For

Chamberlain Group Inc.

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Test Report Details

Tests Performed By: **UL LLC**
 333 Pfingsten Rd.
 Northbrook, IL 60062

Tests Performed For: **Chamberlain Group Inc.**
 845 Larch Av
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Applicant Contact: **Hank Sieradzki**
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Test Report Date: **April 19, 2012**

Product Type: **Periodic Transmitter**

Product standards **FCC Part 15, Subpart C, 15.231 & RSS-210**

Model Number: **885LM**

EUT Category: **Wireless Device**

Testing Start Date: **April 9, 2012**

Date Testing Complete: **April 10, 2012**

Overall Results: **Compliant**

UL LLC 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. UL LLC shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL LLC issued reports. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
April 30, 2012	Rev. 1 - Added appendix with test setup photos	BM	MF

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The equipment under test is a multiple channel portable periodic transmitter operating at 310MHz, 315MHz and 390MHz.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Periodic Transmitter	Chamberlain Group Inc.	885LM	During testing this device was referenced to by part number starting with 1AXXXX
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 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	3	-	-	dc	-	Battery Operated

1.3 EUT Configurations

Mode #	Description
1	EUT with fresh batteries set to transmit.

1.4 EUT Operation Modes

Mode #	Description
1	EUT transmitting on 310MHz, 315MHz, and 390MHz.

1.5 Rational for EUT Configuration

Mode #	Description
1	The selected EUT configuration was chosen to maximize emissions

2.0 **Summary**

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL LLC 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
FCC Part 15, Subpart C, 15.231	Code of Federal Regulations, Part 15, Radio Frequency Devices	2010
RSS-210	License - exempt Radio Apparatus (All Frequency Bands): Category I Equipment	Issue 8

2.4 Results Summary

This product is considered Class B

Requirement – Test	Result (Compliant / Non-Compliant)*
Occupied Bandwidth	Compliant
Cease Operation	Compliant
Pulse Train and Duty Cycle	Compliant
Fundamental Frequency & Spurious Radiated Emissions	Compliant

Test Engineer:



Bartlomiej Mucha (Ext.41216)
Staff Engineer
International EMC Services
Conformity Assessment Services

Reviewer:



Michael Ferrer(Ext.41312)
Senior Project Engineer
International EMC Services
Conformity Assessment Services

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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.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

FCC	47 CFR Part 15 – Intentional Radiators
IC	RSS-210 and RSS-Gen License - exempt 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
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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 Test Conditions and Results – Occupied 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(c)	
Occupied Bandwidth Limits			
0.25% of Center Frequency (310MHz: 775kHz, 315MHz: 788kHz, 390MHz: 975kHz)			

Table 1 Occupied Bandwidth Configuration Settings

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

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth	Occupied Bandwidth Requirements	
	dBc	% PWR
10kHz	-20	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Result Summary

Center Frequency	20dB BW Measured (kHz)	99% BW Measured (kHz)
310MHz	56.4	123.2
315MHz	53.6	124.8
390MHz	54.4	125.6

Table 4 Occupied Bandwidth Test Equipment

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	Dec 28 2011	Dec 31 2012
Generic Di-Pole Antenna	-	-	-	-	-

Figure 1 – 20dB Bandwidth Graph for 310MHz

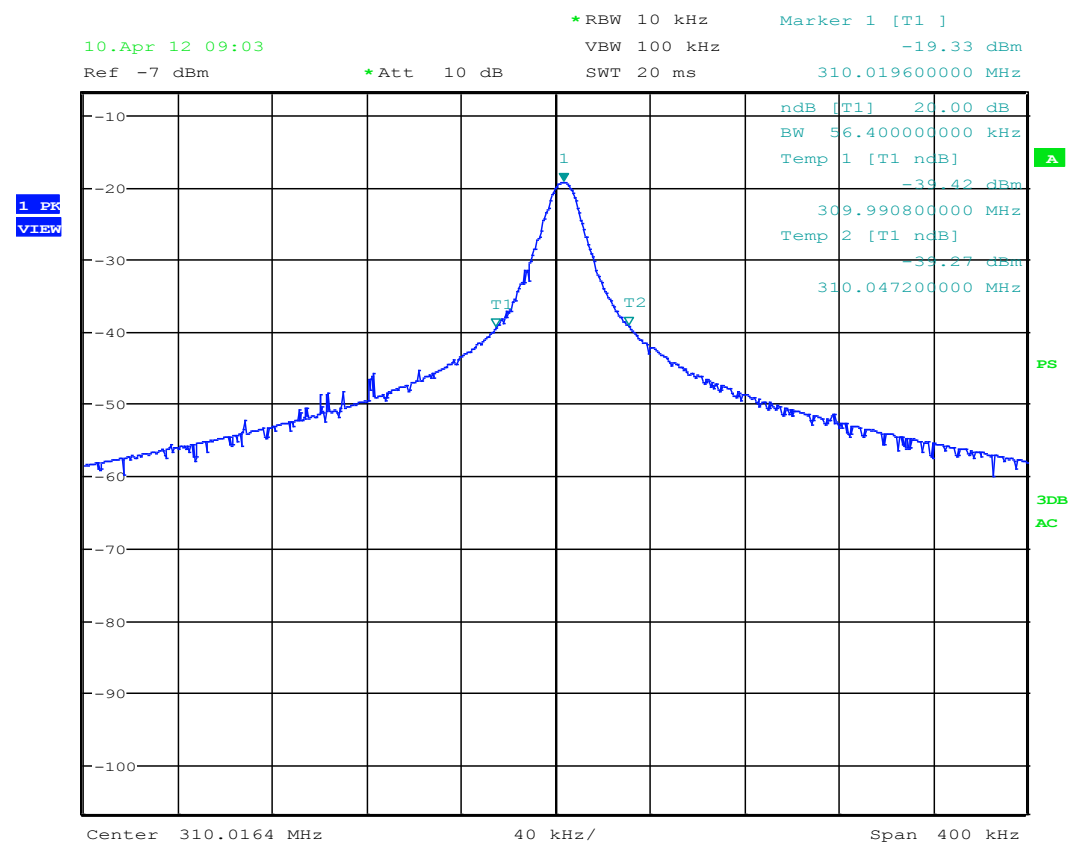


Figure 2 – 20dB Bandwidth Graph for 315MHz

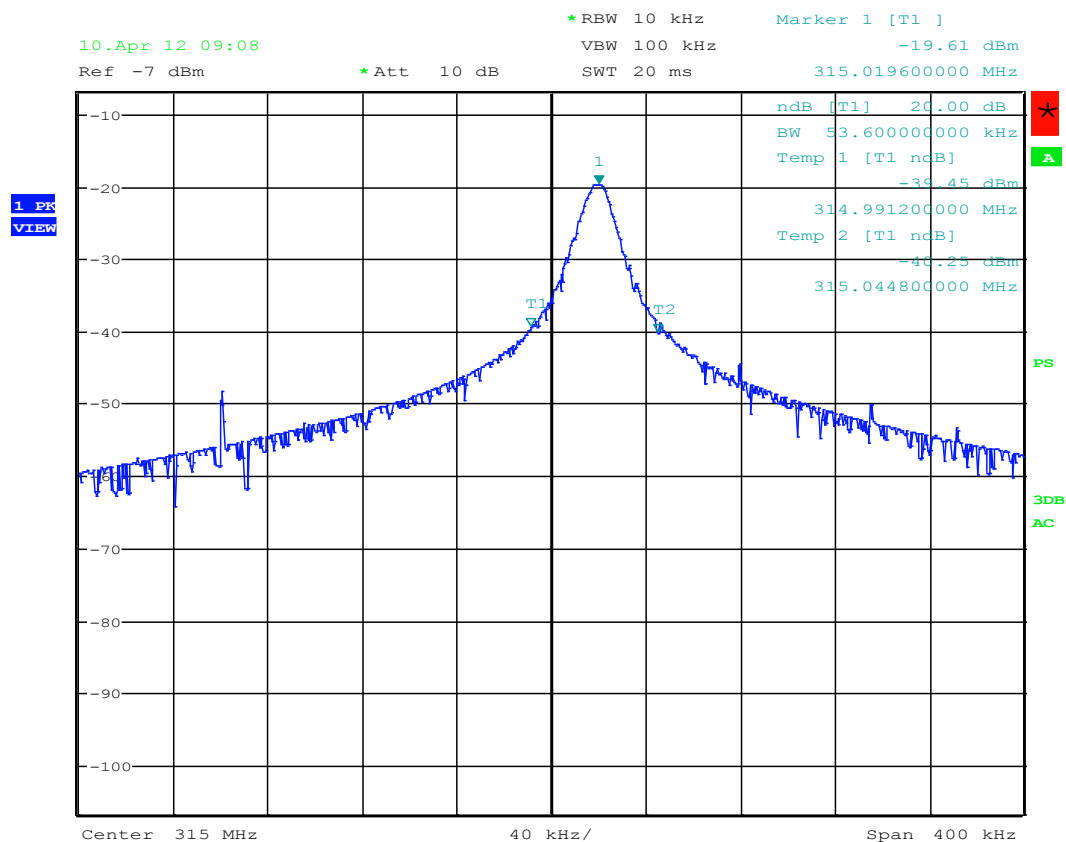


Figure 3 – 20dB Bandwidth Graph for 390MHz

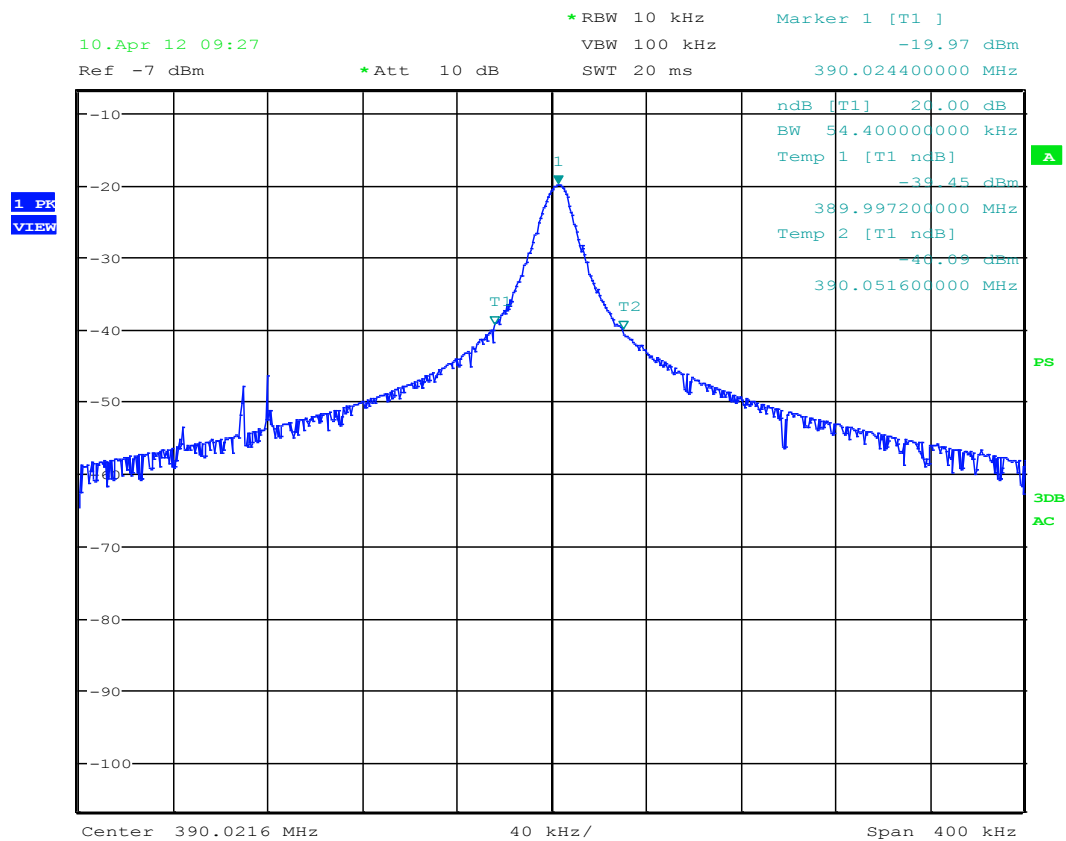


Figure 4 – 99% Bandwidth Graph for 310MHz

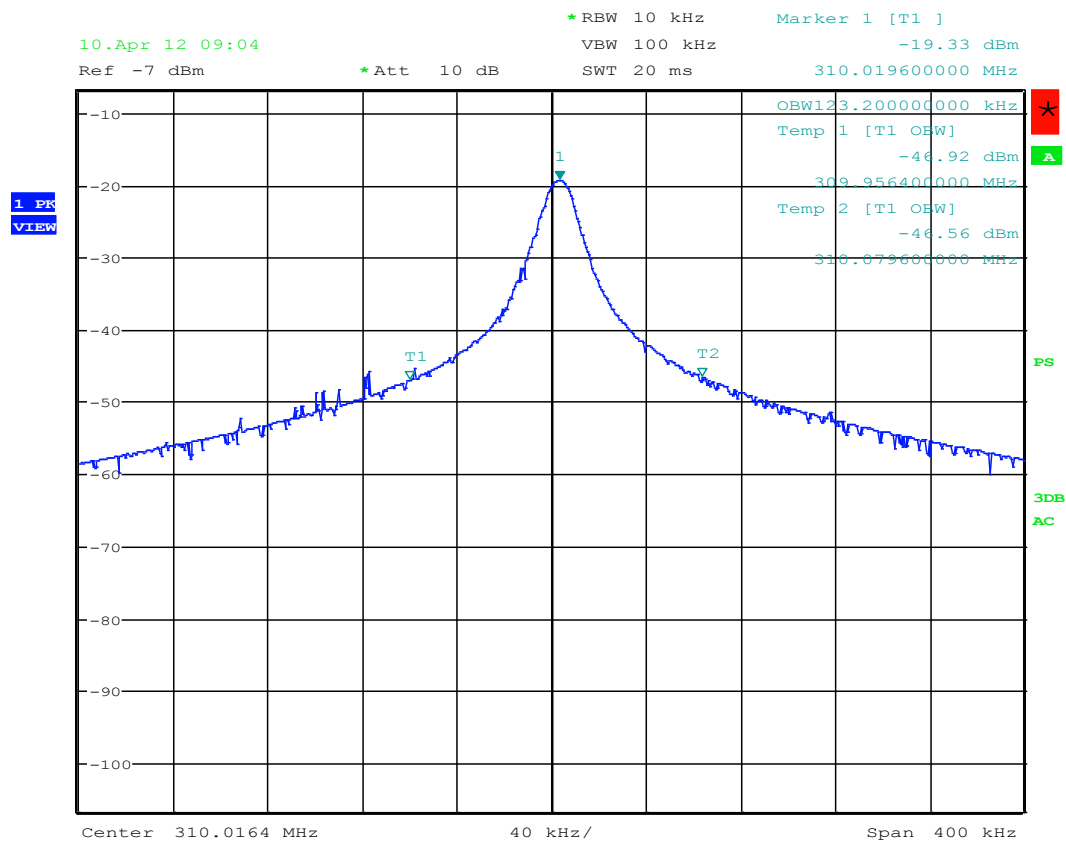


Figure 5 – 99% Bandwidth Graph for 315MHz

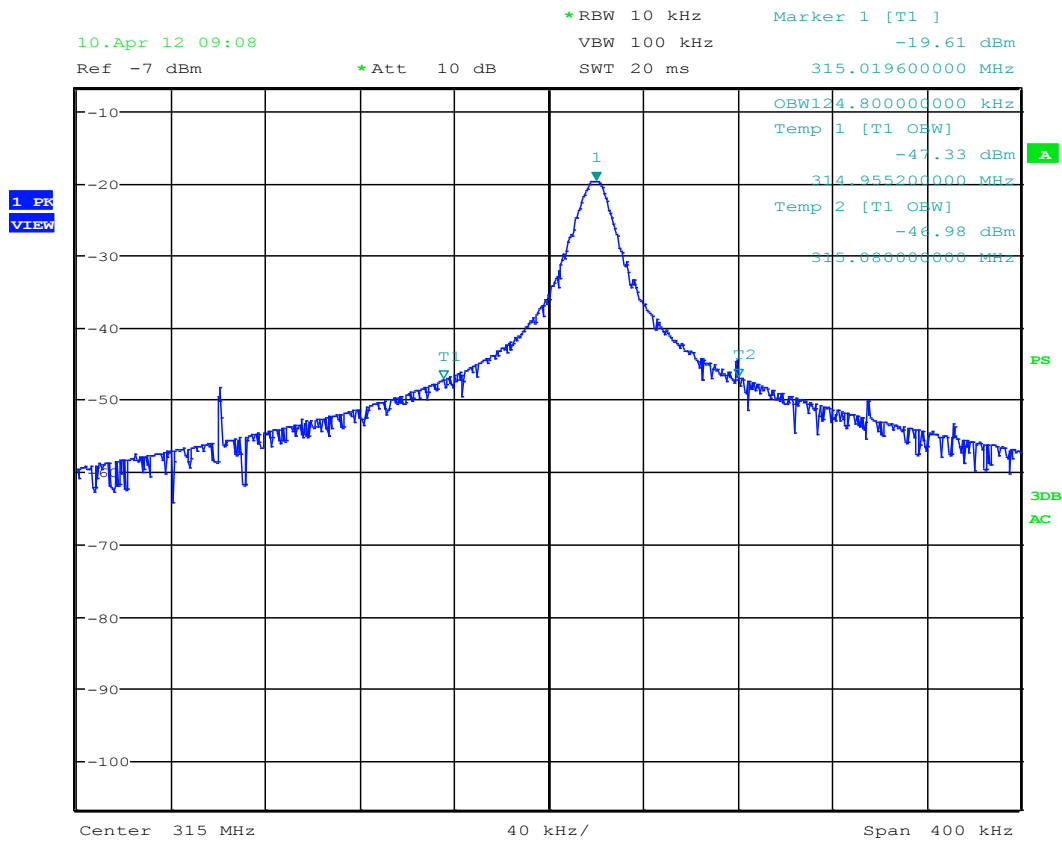
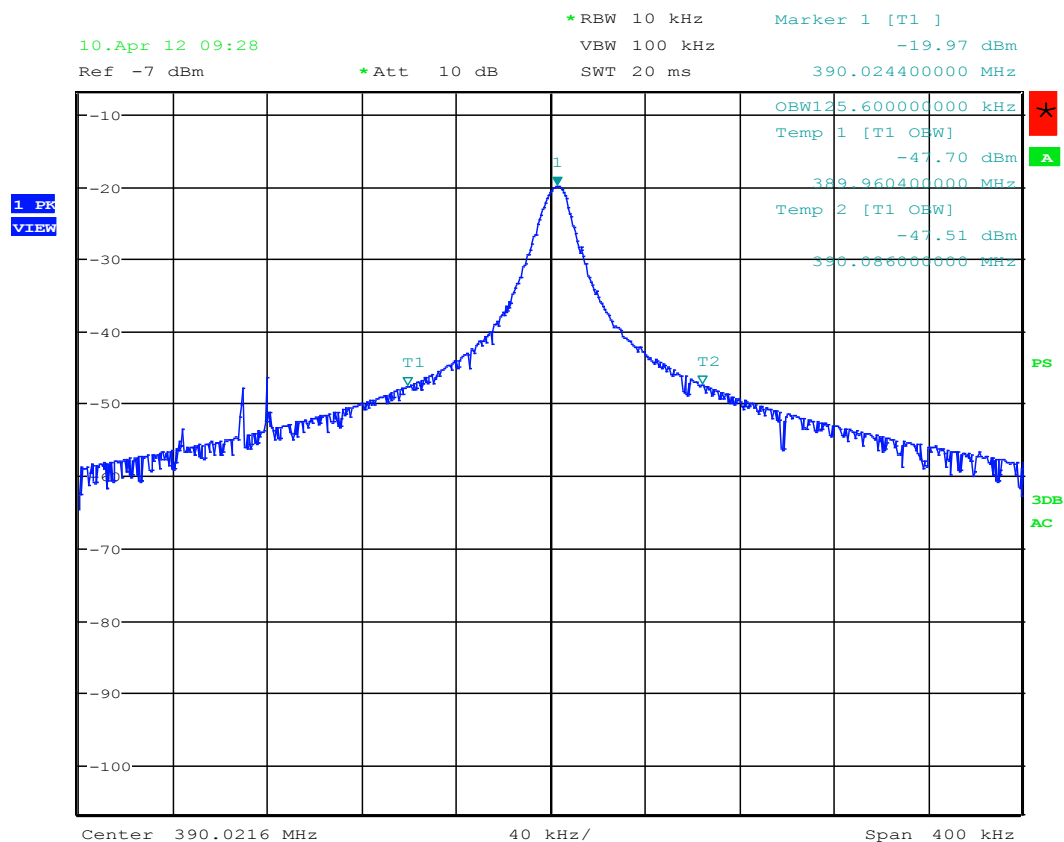


Figure 6 – 99% Bandwidth Graph for 390MHz



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	
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 5 Cease Operation Configuration Settings

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

Table 6 Cease Operation Test Equipment

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	Dec 28 2011	Dec 31 2012
Generic Di-Pole Antenna	-	-	-	-	-

Figure 7 Cease Operation Graph for 310MHz

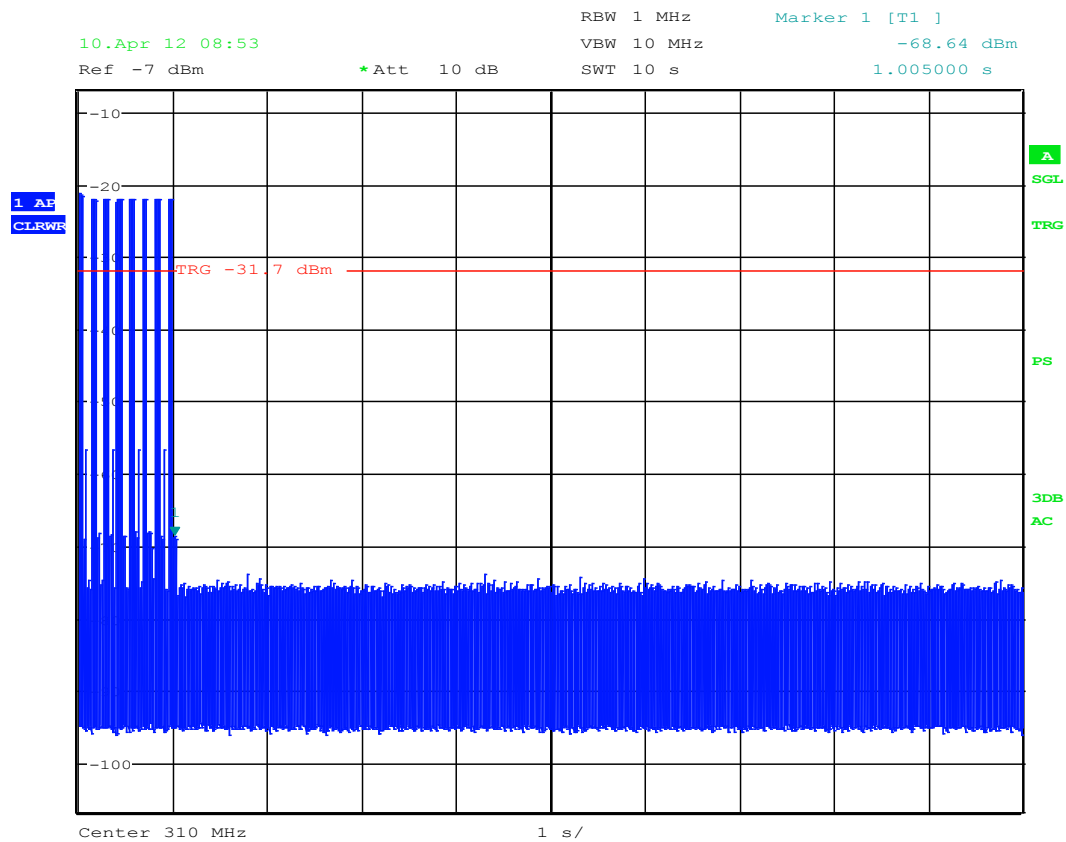


Figure 8 Cease Operation Graph for 315MHz

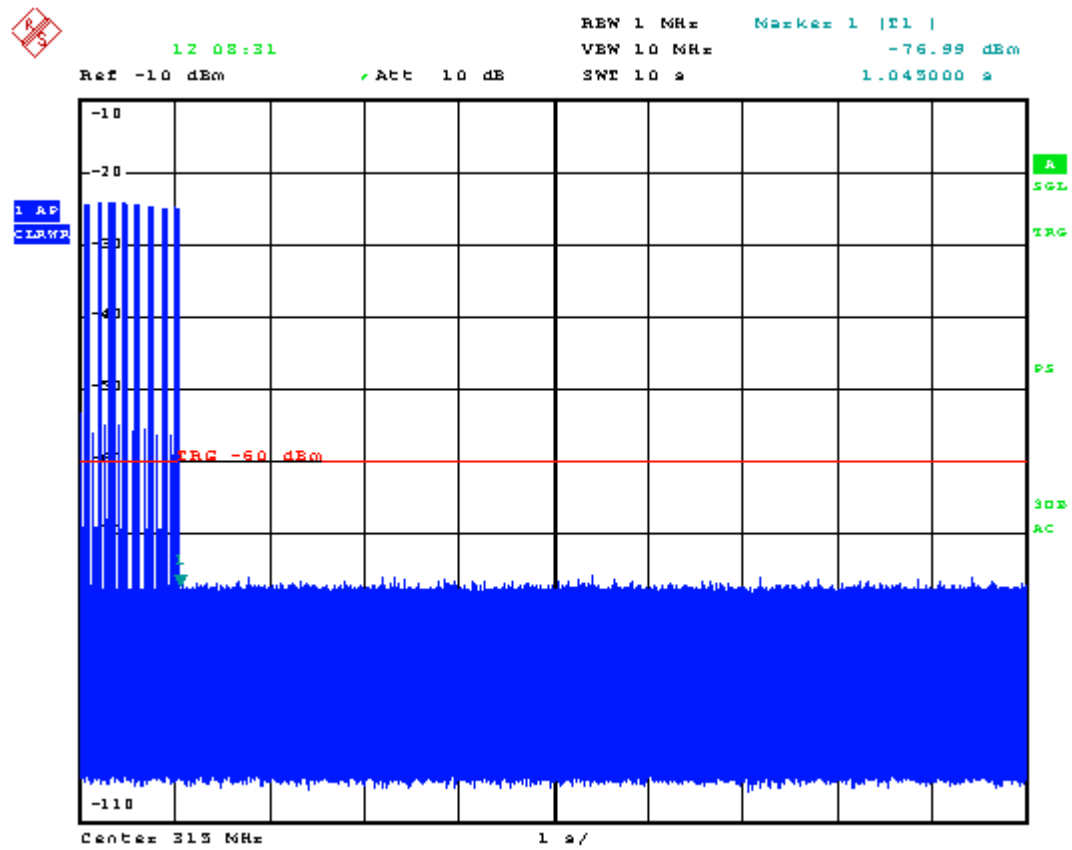
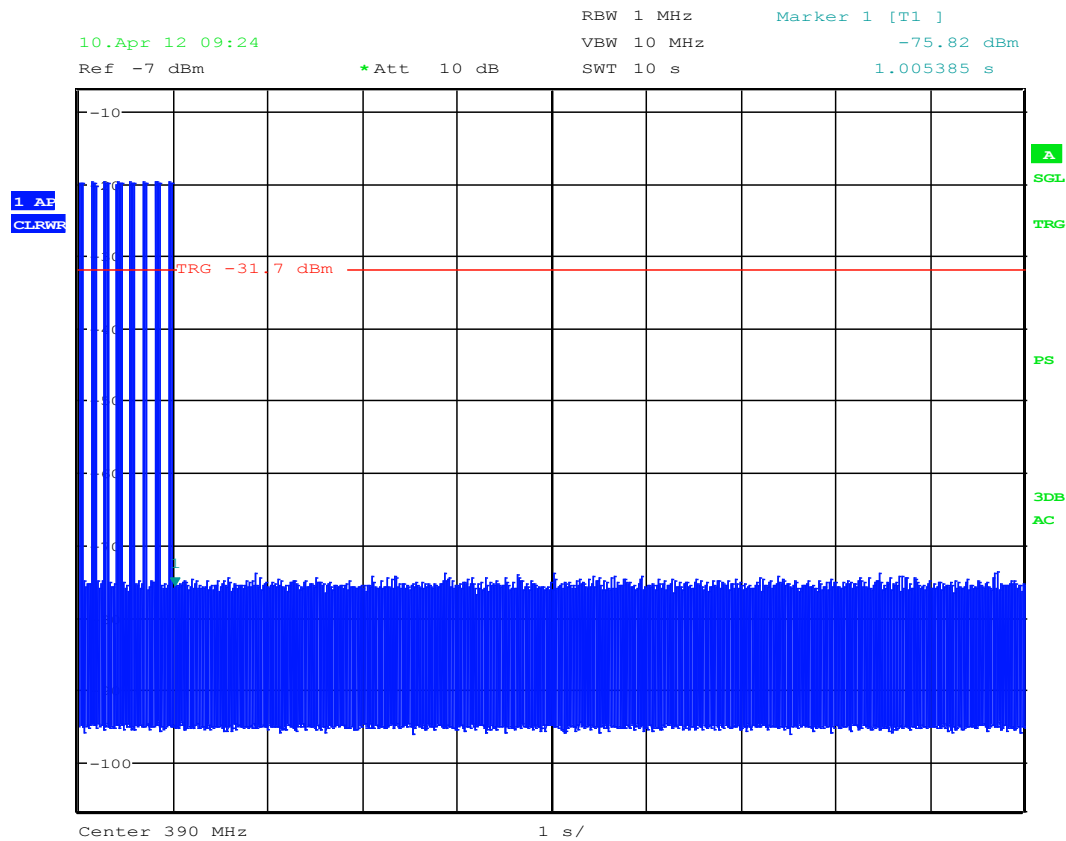


Figure 9 Cease Operation Graph for 390MHz



4.3 Test Conditions and Results – Pulse Train

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 7 Pulse Train Configuration Settings

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

Table 8 Pulse Train Calculation

TX Frequency	Total TX time	Total Transmission time or 100ms whichever is lesser	DC Correction Factor (dB)
			$20\log\left(\frac{PulseWidth}{Period}\right)$
310MHz	$(47 \times 0.288461) + (20 \times 0.52282)$	100ms	-12.39
315MHz	$(41 \times 0.28) + (23 \times 0.54)$	100ms	-12.43
390MHz	$(53 \times 0.288461) + (16 \times 0.528846)$	100ms	-12.49
Worst Case Duty Cycle: -12.4dB			

Table 9 Pulse Train Test Equipment

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	Dec 28 2011	Dec 31 2012
Generic Di-Pole Antenna	-	-	-	-	-

Figure 10 Pulse Train Graphs for 310MHz

310MHz Pulse Capture

10.Apr 12 08:55
Ref -7 dBm * Att 10 dB RBW 1 MHz VBW 10 MHz SWT 10 ms Marker 1 [T1] -79.90 dBm 3.493590 ms

Marker 2 [T1] -80.11 dBm 4.016410 ms
Marker 3 [T1] -80.63 dBm 4.481154 ms
Marker 4 [T1] -82.18 dBm 4.769615 ms

1 AF
CLRWB

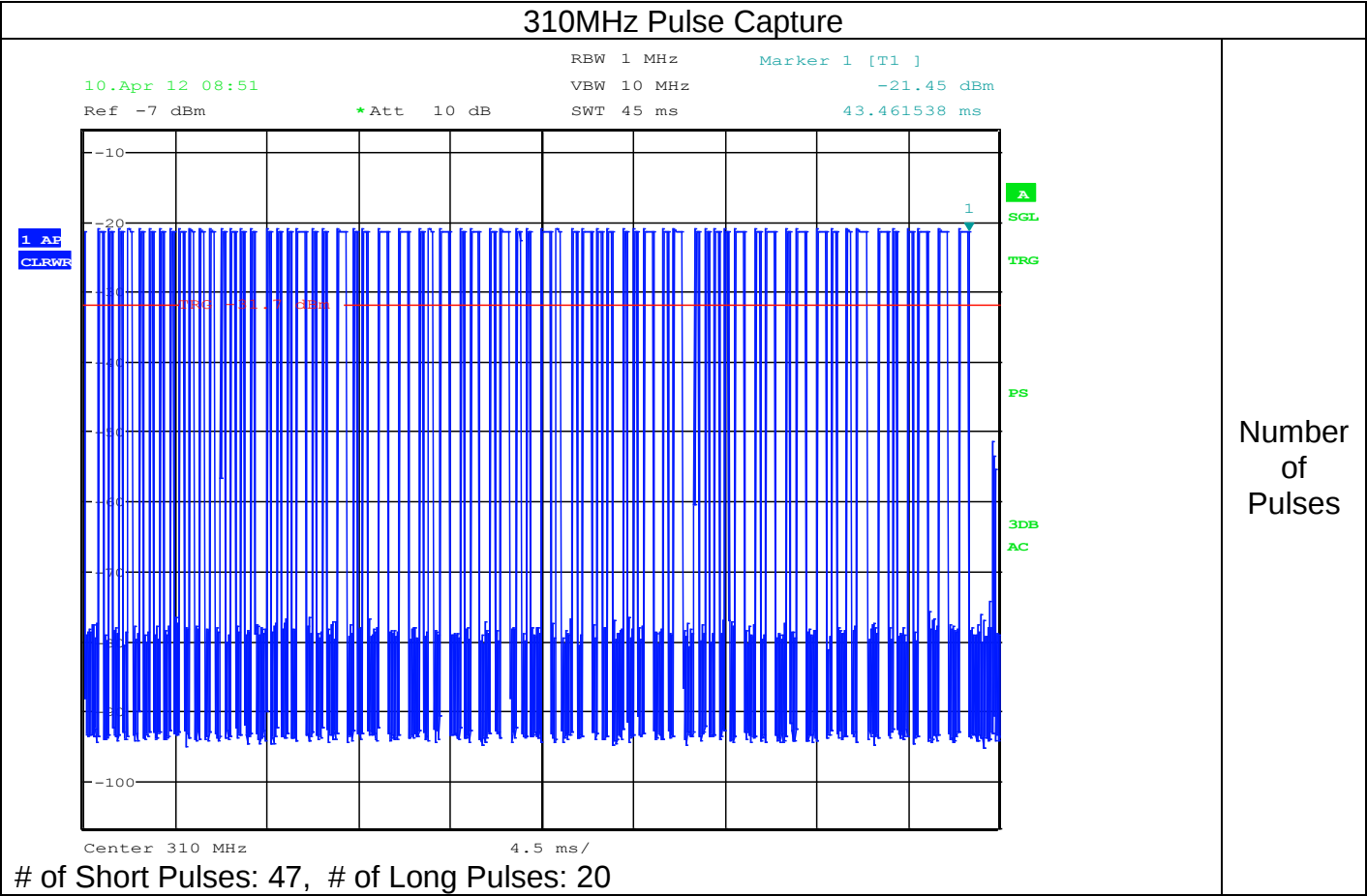
TRG -31.7 dBm

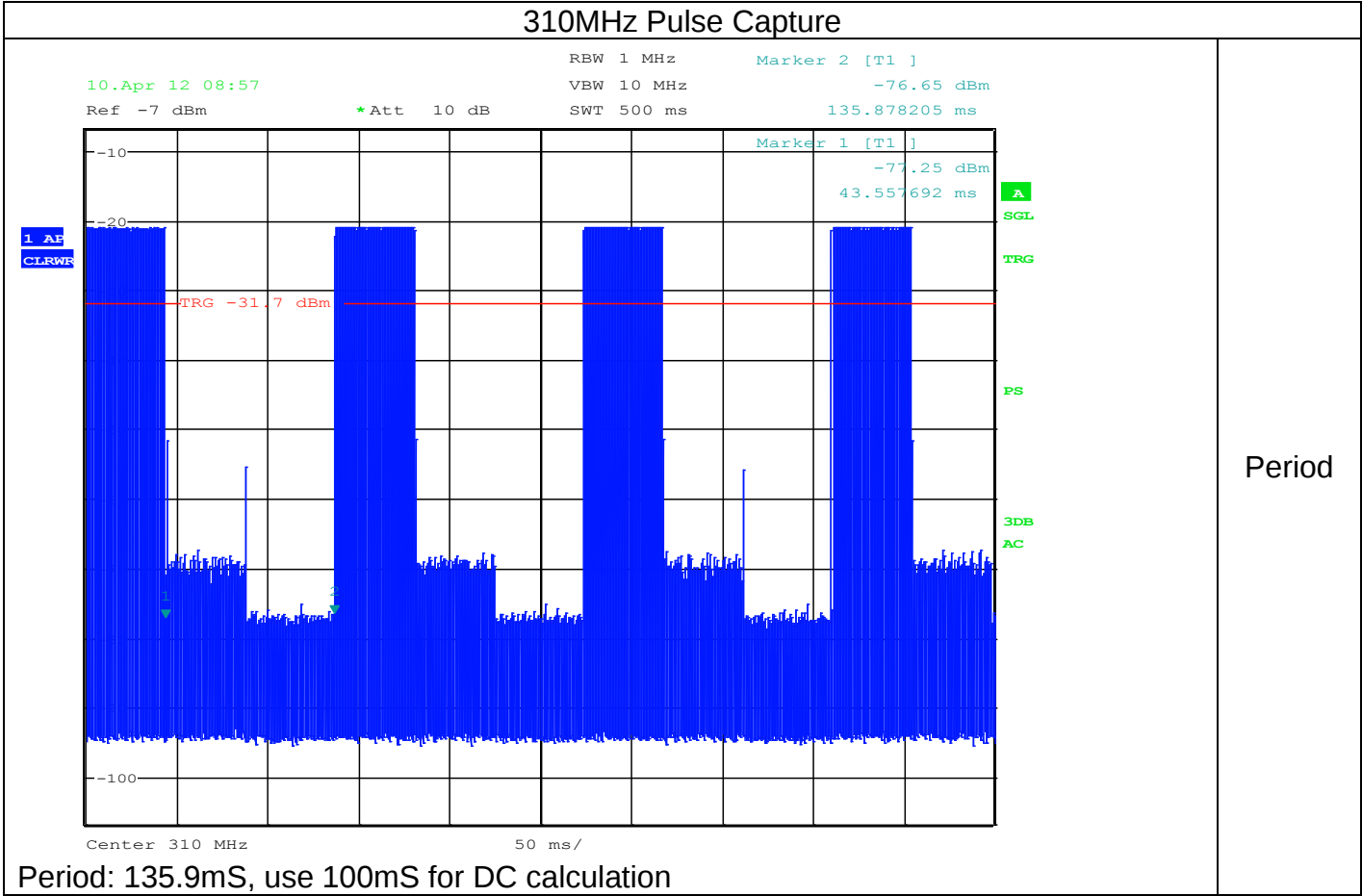
PS
3DB
AC

Center 310 MHz 1 ms/

Short Pulse: 0.288461mS, Long Pulse: 0.52282mS

Pulse Duration mS





315MHz Pulse Capture

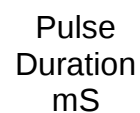
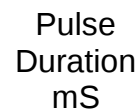
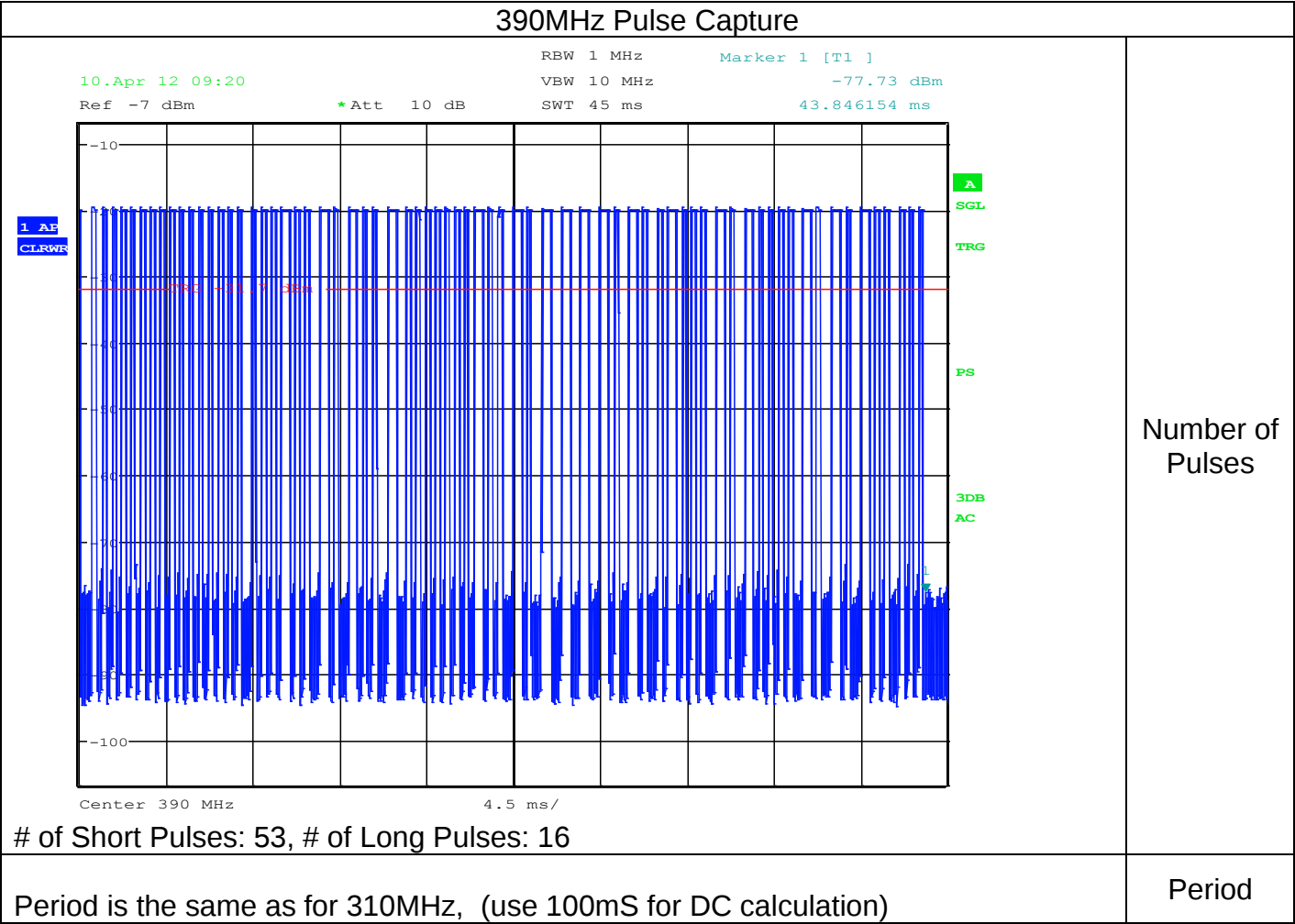


Figure 12 Pulse Train Graphs for 390MHz





4.4 Test Conditions and Results – RADIATED EMISSIONS Fundamental and Spurious

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 subpart C, and RSS-210	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	3 meter distance
	1GHz – 4GHz	3 meter distance
Restricted Band Limits		
Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Peak
30 - 88	40.00	NA
88 - 216	43.52	NA
216 - 960	46.02	NA
960 - 1000	54	NA
Above 1000 (FCC)	NA	*54 (at 3-meter)
Fundamental Frequency Limits and Non-restricted band Harmonic Limits		
Frequency (MHz)	Limit (dBµV/m) @ 3m distance	
	Average - Fundamental	Peak Harmonics
310	75.32	95.32
315	75.62	95.62
390	79.24	99.24
Supplementary information: *See section 4.3 for duty cycle information.		

Table 10 Radiated Emissions EUT Configuration Settings

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

Table 11 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	20111228	20121231
Bicon Antenna	Chase	VBA6106A	EMC4078	20120117	20130131
Log-P Antenna	Chase	UPA6109	EMC4313	20110929	20120629
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	20111227	20121231
Antenna Array	UL	BOMS	EMC4276	20111227	20121231

Figure 13 Radiated Emissions Graph (Below 1GHz) for 310MHz, 315MHz, and 390MHz

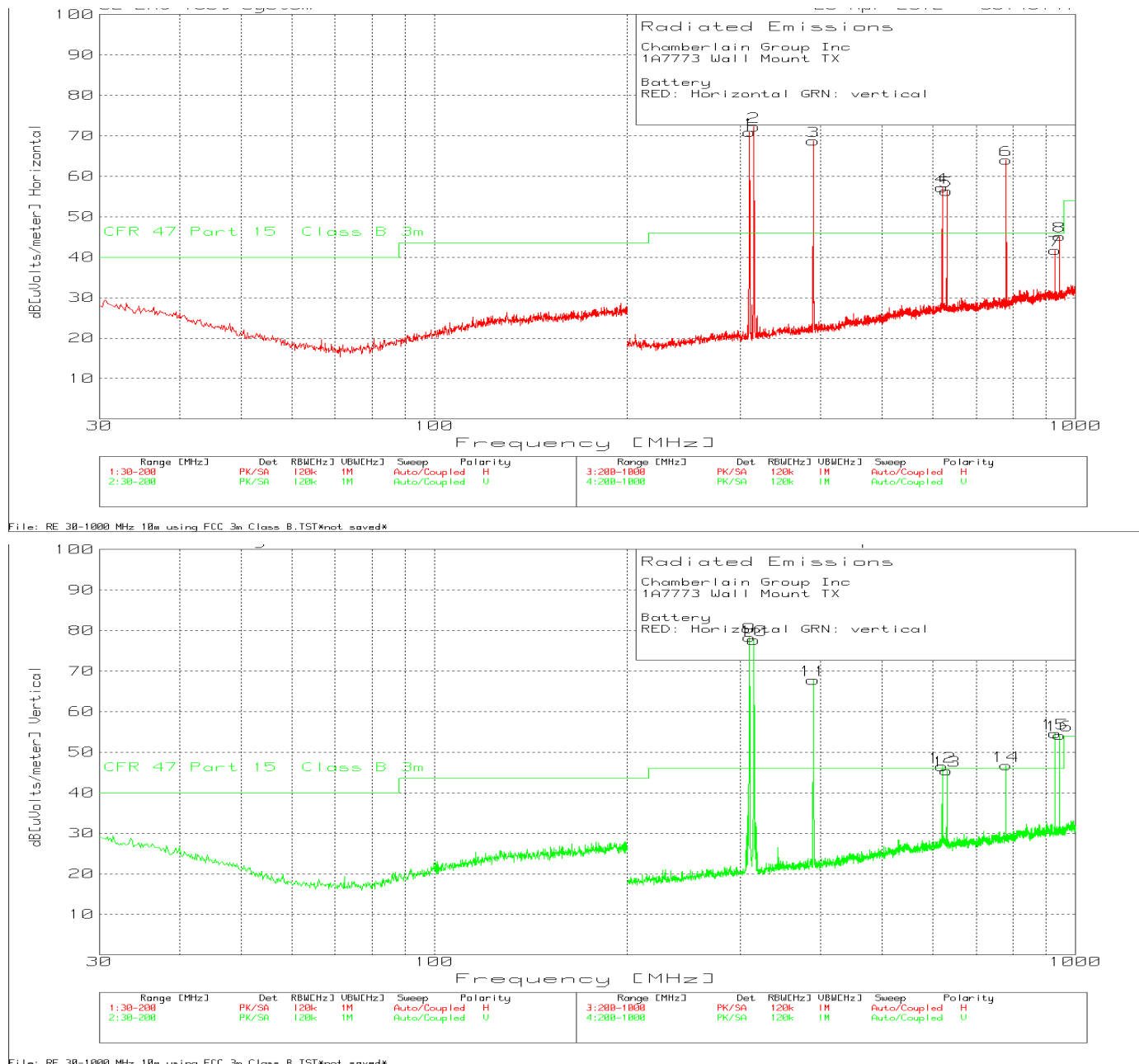


Figure 14 Radiated Emissions Graph (Above 1GHz) for 310MHz, 315MHz, and 390MHz

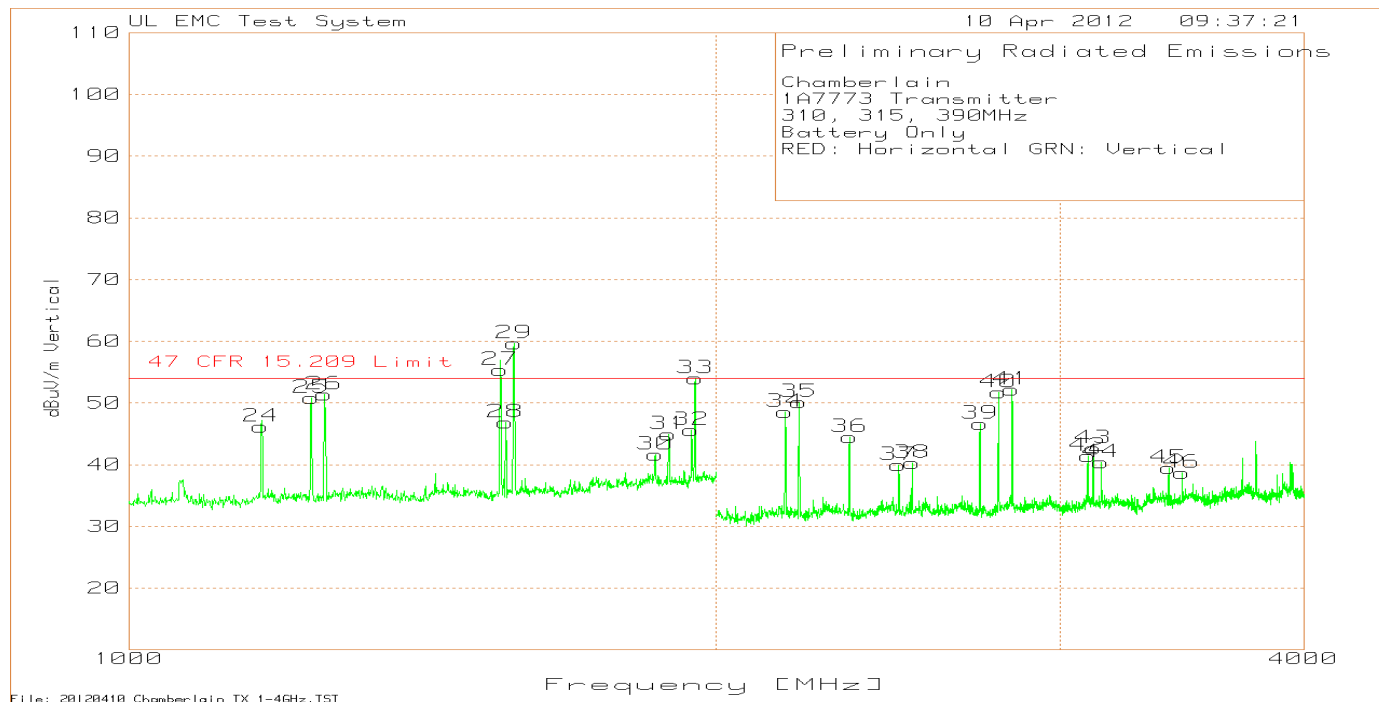
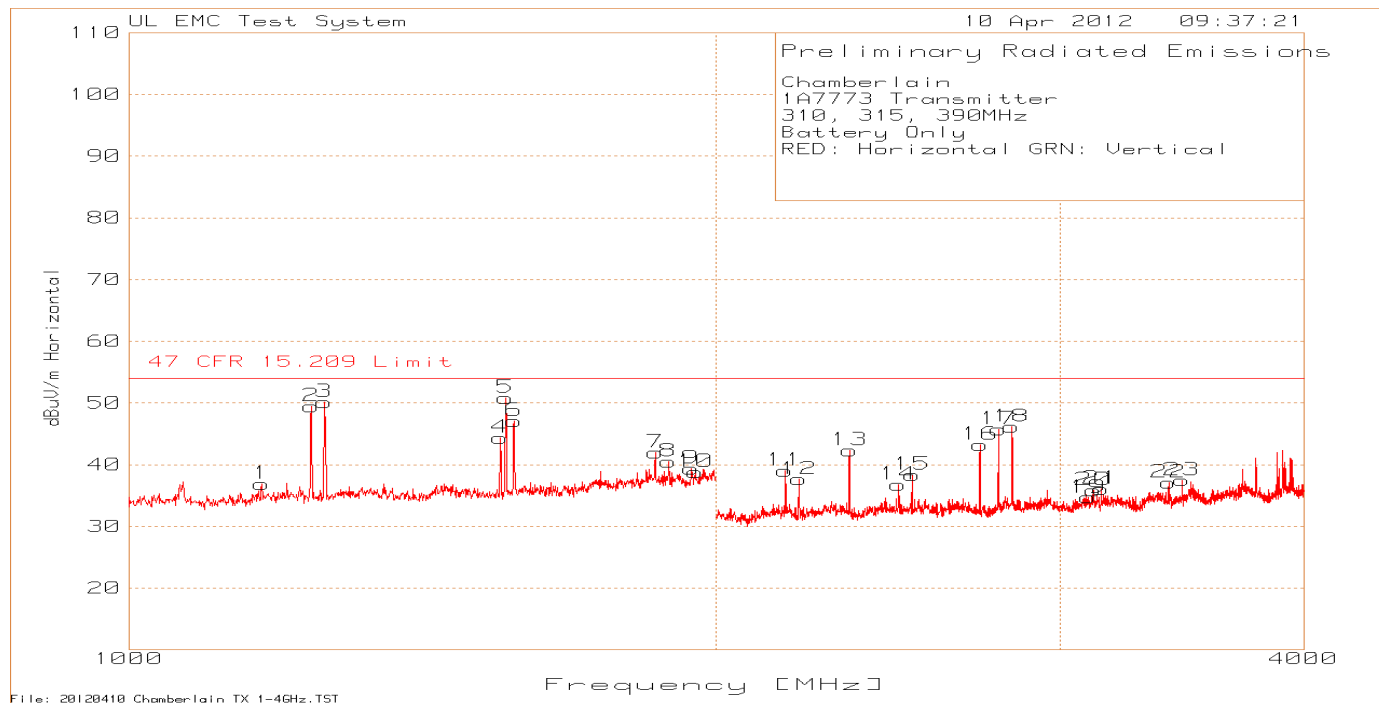


Table 12 Radiated Emissions Data Points

Measurements below 1GHz															
Test Frequency	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain dB	Attenuator dB	dBuV/m	Duty Cycle Correction	Level with Duty Cycle dBuV/m	PK Limit 3m Distance dBuV/m	PK Margin dB	AV Limit 3m Distance dBuV/m	AV Margin dB	Azimuth [Degs]	Height [cm]	Polarity
310.02	55.42	PK	13.7	2.1	8.8	80.02	-12.24	67.78	95.32	-15.3	75.32	-7.54	2	220	Horz
310.0216	60.47	PK	13.7	2.1	8.8	85.07	-12.24	72.83	95.32	-10.25	75.32	-2.49	103	182	Vert
315.015	55	PK	14	2.1	8.8	79.9	-12.24	67.66	95.62	-15.72	75.62	-7.96	1	222	Horz
315.0184	60.01	PK	14	2.1	8.8	84.91	-12.24	72.67	95.62	-10.71	75.62	-2.95	96	165	Vert
390.0243	46.86	PK	16	2.3	8.8	73.96	-12.24	61.72	99.24	-25.28	79.24	-17.52	10	399	Horz
390.0216	54.57	PK	16	2.3	8.8	81.67	-12.24	69.43	99.24	-17.57	79.24	-9.81	94	137	Vert
620.0418	27.51	PK	20.2	3	8.9	59.61	-12.24	47.37	75.32	-15.71	55.32	-7.95	12	127	Horz
620.0413	22.61	PK	20.2	3	8.9	54.71	-12.24	42.47	75.32	-20.61	55.32	-12.85	259	103	Vert
630.0332	25.98	PK	20.4	3	8.9	58.28	-12.24	46.04	75.62	-17.34	55.62	-9.58	192	121	Horz
630.0368	20.95	PK	20.4	3	8.9	53.25	-12.24	41.01	75.62	-22.37	55.62	-14.61	272	100	Vert
780.0493	30.86	PK	21.9	3.4	8.8	64.96	-12.24	52.72	79.24	-14.28	59.24	-6.52	3	100	Horz
780.045	21.81	PK	21.9	3.4	8.8	55.91	-12.24	43.67	79.24	-23.33	59.24	-15.57	62	198	Vert
930.0592	12.31	PK	23.4	3.8	8.8	48.31	-12.24	36.07	75.32	-27.01	55.32	-19.25	205	155	Horz
930.0602	19.88	PK	23.4	3.8	8.8	55.88	-12.24	43.64	75.32	-19.44	55.32	-11.68	250	112	Vert
945.062	5.47	PK	23.5	3.8	8.8	41.57	-12.24	29.33	75.62	-34.05	55.62	-26.29	195	153	Horz
945.0611	20.19	PK	23.5	3.8	8.8	56.29	-12.24	44.05	75.62	-19.33	55.62	-11.57	252	110	Vert

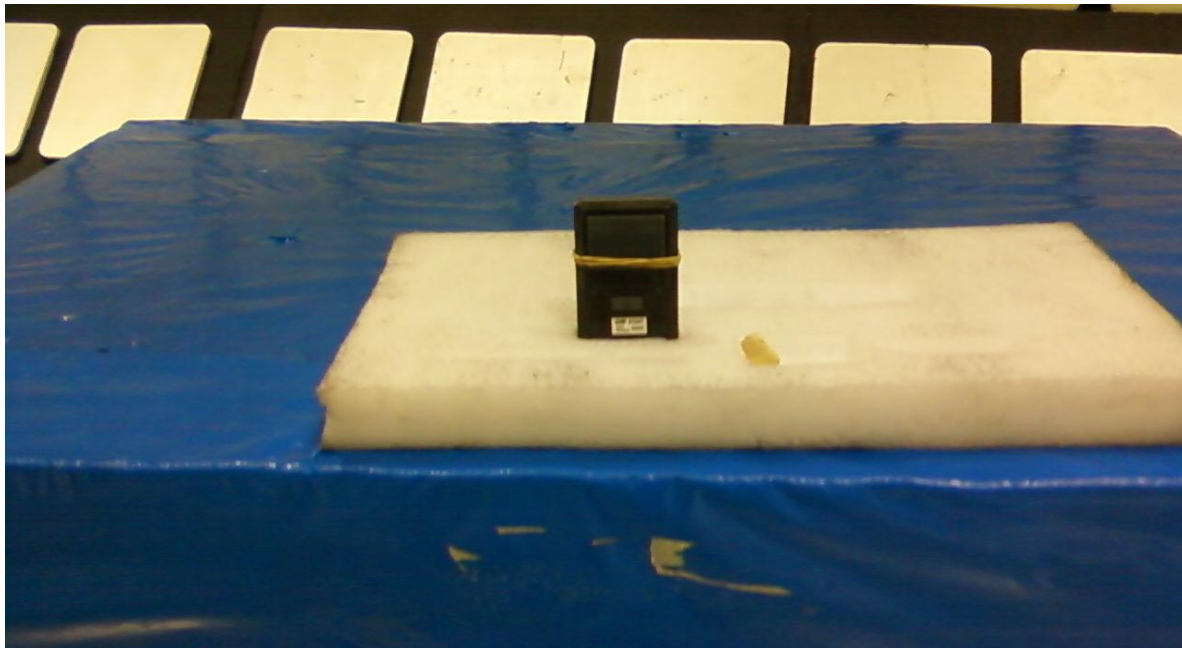
Measurements above 1GHz maximized (highest emissions only, based on pre-scan data)														
Test Frequency	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain dB	dBuV/m	Duty Cycle Factor dB	Level with Duty Cycle dBuV/m	PK Limit 3m Distance dBuV/m	Margin dB	47 CFR 15.209 Limit 3m distance dBuV/m	Margin dB	Azimuth [Degs]	Height [cm]	Polarity
1574.994	93.81	PK	25.3	-55.29	63.82	-12.24	51.58	74	-10.18	54	-2.42	161	100	Vert
1549.924	92.71	PK	25.2	-56.02	61.89	-12.24	49.65	74	-12.11	54	-4.35	170	100	Vert
1949.858	84.24	PK	27.4	-54.39	57.25	-12.24	45.01	74	-16.75	54	-8.99	126	102	Vert
1260.071	86.23	PK	25.1	-56.92	54.41	-12.24	42.17	74	-19.59	54	-11.83	160	211	Vert
1560.129	82.1	PK	25.2	-55.66	51.64	-12.24	39.4	74	-22.36	54	-14.6	76	100	Horz
1260.123	92.22	PK	25.1	-56.92	60.4	-12.24	48.16	74	-13.6	54	-5.84	74	120	Horz
1240.091	91.85	PK	25.1	-56.96	59.99	-12.24	47.75	74	-14.01	54	-6.25	70	122	Horz
1240.095	85.27	PK	25.1	-56.96	53.41	-12.24	41.17	74	-20.59	54	-12.83	170	207	Vert
2835.235	82.13	PK	22.3	-51.13	53.3	-12.24	41.06	74	-20.7	54	-12.94	99	104	Vert
2790.134	81.88	PK	22.2	-51.64	52.44	-12.24	40.2	74	-21.56	54	-13.8	110	104	Vert
2205.446	80.39	PK	21.8	-53.22	48.97	-12.24	36.73	74	-25.03	54	-17.27	350	100	Vert
2170.023	79.32	PK	21.7	-52.56	48.46	-12.24	36.22	74	-25.54	54	-17.78	0	100	Vert

Peak Marker Data above 1GHz													
Test Frequency	Meter Reading	Detector	Antenna Factor dB	Path Loss/Gain dB	Level dBuV/m	Duty Cycle Factor dB	Level with Duty Cycle dBuV/m	PK Limit 3m Distance dBuV/m	PK Margin dB	47 CFR 15.209 Limit dBuV/m	AV Margin dB	Height [cm]	Polarity
1170.17	69.32	PK	24.8	-57.23	36.89	-12.24	24.65	74	-37.11	54	-29.35	100	Horz
1240.24	81.34	PK	25.1	-56.96	49.48	-12.24	37.24	74	-24.52	54	-16.76	100	Horz
1260.26	81.93	PK	25.1	-56.91	50.12	-12.24	37.88	74	-23.88	54	-16.12	100	Horz
1550.551	75.21	PK	25.2	-56.02	44.39	-12.24	32.15	74	-29.61	54	-21.85	100	Horz
1560.561	81.26	PK	25.2	-55.64	50.82	-12.24	38.58	74	-23.18	54	-15.42	100	Horz
1575.576	77.06	PK	25.3	-55.28	47.08	-12.24	34.84	74	-26.92	54	-19.16	100	Horz
1860.861	69.18	PK	27.2	-54.44	41.94	-12.24	29.7	74	-32.06	54	-24.3	100	Horz
1890.891	67.41	PK	27.4	-54.33	40.48	-12.24	28.24	74	-33.52	54	-25.76	100	Horz
1942.943	66.41	PK	27.4	-54.47	39.34	-12.24	27.1	74	-34.66	54	-26.9	100	Horz
1950.951	65.76	PK	27.4	-54.39	38.77	-12.24	26.53	74	-35.23	54	-27.47	100	Horz
2170.085	69.88	PK	21.7	-52.56	39.02	-12.24	26.78	74	-34.98	54	-27.22	100	Horz
2205.103	69.05	PK	21.8	-53.22	37.63	-12.24	25.39	74	-36.37	54	-28.61	100	Horz
2340.17	73.48	PK	21.7	-52.86	42.32	-12.24	30.08	74	-31.68	54	-23.92	100	Horz
2480.24	67.04	PK	22	-52.25	36.79	-12.24	24.55	74	-37.21	54	-29.45	100	Horz
2520.26	68.56	PK	22.1	-52.34	38.32	-12.24	26.08	74	-35.68	54	-27.92	100	Horz
2730.365	73.37	PK	22.1	-52.28	43.19	-12.24	30.95	74	-30.81	54	-23.05	100	Horz
2790.395	75.22	PK	22.2	-51.64	45.78	-12.24	33.54	74	-28.22	54	-20.46	100	Horz
2835.418	74.96	PK	22.3	-51.13	46.13	-12.24	33.89	74	-27.87	54	-20.11	100	Horz
3100.55	62.92	PK	22.6	-50.84	34.68	-12.24	22.44	74	-39.32	54	-31.56	100	Horz
3120.56	64.37	PK	22.7	-51.24	35.83	-12.24	23.59	74	-38.17	54	-30.41	100	Horz
3150.575	65.08	PK	22.9	-51.9	36.08	-12.24	23.84	74	-37.92	54	-30.16	100	Horz
3410.705	65.08	PK	23.5	-51.48	37.1	-12.24	24.86	74	-36.9	54	-29.14	100	Horz
3465.733	65.53	PK	23.5	-51.52	37.51	-12.24	25.27	74	-36.49	54	-28.73	100	Horz
1169.169	78.64	PK	24.8	-57.22	46.22	-12.24	33.98	74	-27.78	54	-20.02	100	Vert
1240.24	82.68	PK	25.1	-56.96	50.82	-12.24	38.58	74	-23.18	54	-15.42	100	Vert
1260.26	83.23	PK	25.1	-56.91	51.42	-12.24	39.18	74	-22.58	54	-14.82	100	Vert
1549.55	86.19	PK	25.2	-56.02	55.37	-12.24	43.13	74	-18.63	54	-10.87	100	Vert
1560.561	77.27	PK	25.2	-55.64	46.83	-12.24	34.59	74	-27.17	54	-19.41	100	Vert
1575.576	89.61	PK	25.3	-55.28	59.63	-12.24	47.39	74	-14.37	54	-6.61	100	Vert
1860.861	68.87	PK	27.2	-54.44	41.63	-12.24	29.39	74	-32.37	54	-24.61	100	Vert
1890.891	71.9	PK	27.4	-54.33	44.97	-12.24	32.73	74	-29.03	54	-21.27	100	Vert
1942.943	72.71	PK	27.4	-54.47	45.64	-12.24	33.4	74	-28.36	54	-20.6	100	Vert
1950.951	81.03	PK	27.4	-54.39	54.04	-12.24	41.8	74	-19.96	54	-12.2	100	Vert
2170.085	79.4	PK	21.7	-52.56	48.54	-12.24	36.3	74	-25.46	54	-17.7	100	Vert
2205.103	81.6	PK	21.8	-53.22	50.18	-12.24	37.94	74	-23.82	54	-16.06	100	Vert
2340.17	75.6	PK	21.7	-52.86	44.44	-12.24	32.2	74	-29.56	54	-21.8	100	Vert
2480.24	70.15	PK	22	-52.25	39.9	-12.24	27.66	74	-34.1	54	-26.34	100	Vert
2520.26	70.53	PK	22.1	-52.34	40.29	-12.24	28.05	74	-33.71	54	-25.95	100	Vert
2730.365	76.85	PK	22.1	-52.28	46.67	-12.24	34.43	74	-27.33	54	-19.57	100	Vert
2790.395	81.22	PK	22.2	-51.64	51.78	-12.24	39.54	74	-22.22	54	-14.46	100	Vert
2835.418	81.07	PK	22.3	-51.13	52.24	-12.24	40	74	-21.76	54	-14	100	Vert
3100.55	69.7	PK	22.6	-50.84	41.46	-12.24	29.22	74	-32.54	54	-24.78	100	Vert
3120.56	71.24	PK	22.7	-51.24	42.7	-12.24	30.46	74	-31.3	54	-23.54	100	Vert
3150.575	69.43	PK	22.9	-51.9	40.43	-12.24	28.19	74	-33.57	54	-25.81	100	Vert
3410.705	67.52	PK	23.5	-51.48	39.54	-12.24	27.3	74	-34.46	54	-26.7	100	Vert
3465.733	66.75	PK	23.5	-51.52	38.73	-12.24	26.49	74	-35.27	54	-27.51	100	Vert

Appendix A

Test Setup Photos

Radiated Emissions



Near Field Measurements



Appendix B

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/standards/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

