Underwriters Laboratories Inc.
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Job Number:	1001032475
Project Number:	08CA50745
File Number:	MC3181
Date:	October 21, 2008
Model:	T1000

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: Phone: E-mail:	**Hank Sieradzki** **(630) 993-6564** **Hank.Sieradzki@chamberlaingroup.com**
Test Report Date:	**April 15, 2008**
Product Type:	**Low Power Transceiver**
Product standards	**FCC Part 15, Subpart C, 15.249** **RSS-210, Section A2.9**
Model Number:	**T1000**
EUT Category:	**Transmitter / Digital Device**
Testing Start Date:	**April 2, 2008**
Date Testing Complete:	**April 9, 2008**
Overall Results:	**Compliant**

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None			

1 G E N E R A L - Product Description

1.1 Equipment Description

The equipment under test (EUT) was a low power transceiver operating in 900MHz band used to control electronic door locks.
This product is designed to operate under FCC Part 15.249 and therefore is excluded from routine SAR evaluation.

1.2 Antenna Information

The EUT meets FCC part 15.203 requirement. The antenna has a unique connector, making it difficult to be replaced with different antenna.

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Overlock Transceiver	Chamberlain Group Inc.	T1000	None
AE	Power Supply	OEM	AD-1230	none

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

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	DC	N	N	Power Supply
2	Relay Wire	I/O	Y	N	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

1.3.3 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120VAC	-	-	60-Hz	-	EUT uses DC from Power Supply

1.4 EUT Configurations

Mode #	Description
1	EUT configured on 80cm table connected in manner simulating normal use.

1.5 EUT Operation Modes

Mode #	Description
1	Receiver / Standby Mode
2	Transmit Mode (Low Power)

2 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

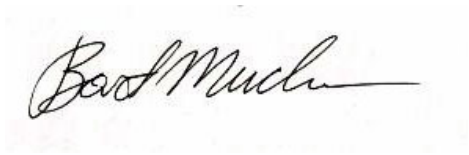
2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.249	Code of Federal Regulations, Part 15, Radio Frequency Devices	2008
RSS-Gen	General Requirements of Information for the Certification of Radiocommunication Equipment.	2007
RSS-210	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	2007

2.4 Results Summary

Requirement – Test	Result (Compliant / Non-Compliant)*
Conducted Emissions - Mains	Complaint
Radiated Emissions • Field Strength of Fundamental Frequency • Band Edge Compliance • Low Channel Spurious Emissions • Middle Channel Spurious Emissions • High Channel Spurious Emissions • Standby / Receive Radiated Emissions	Compliant
Bandwidth Measurements	Compliant

Test Engineer:



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Michael A. Ehas(Ext.42351)
Lead Engineering Associate
International EMC Services
Conformity Assessment Services

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

3 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 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

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

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

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

RSS-Gen	General Requirements of Information for the Certification of Radiocommunication Equipment.
RSS-210	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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

4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

Test Description	Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.

Basic Standard	47 CFR Part 15	
UL LPG	80-EM-S0026	
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains

Limits - Class B

Frequency (MHz)	Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Supplementary information: None

Table 1 Conducted Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1,2	1,2,3

Supplementary information: None

Table 2 Conducted Emissions Test Equipment

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Agilent	E7405A	EMC4242
Transient Limiter	Electro-Metrics	EM7600-2	EMC4224
LISN - L1	Solar	8602-50-TS-50-N	EMC4052
LISN - L2	Solar	8602-50-TS-50-N	EMC4064

Figure 1 Test Setup for Conducted Emissions

Figure 2 Conducted Emissions Graph – Digital / RX

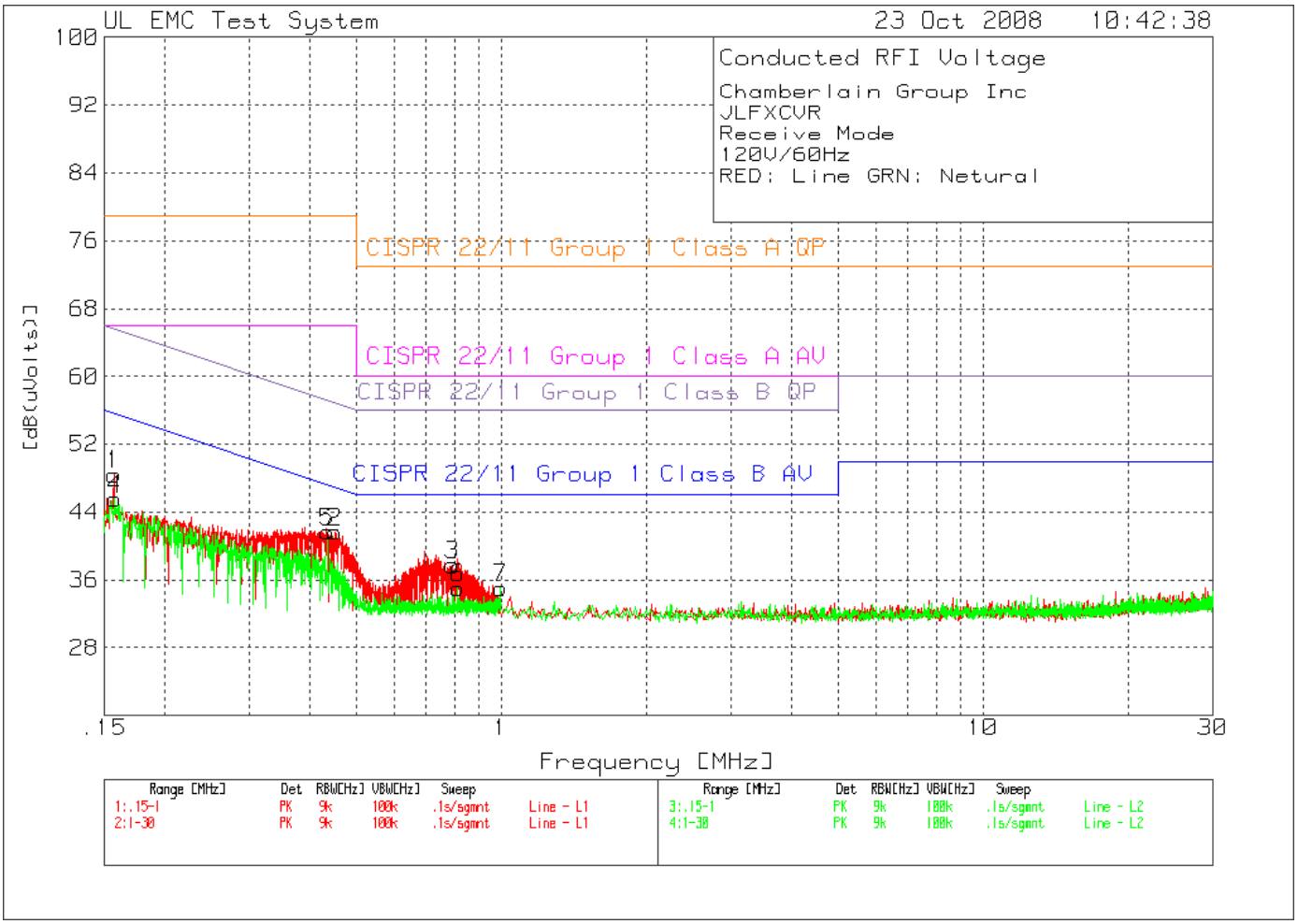


Table 3 Conducted Emissions Data Points

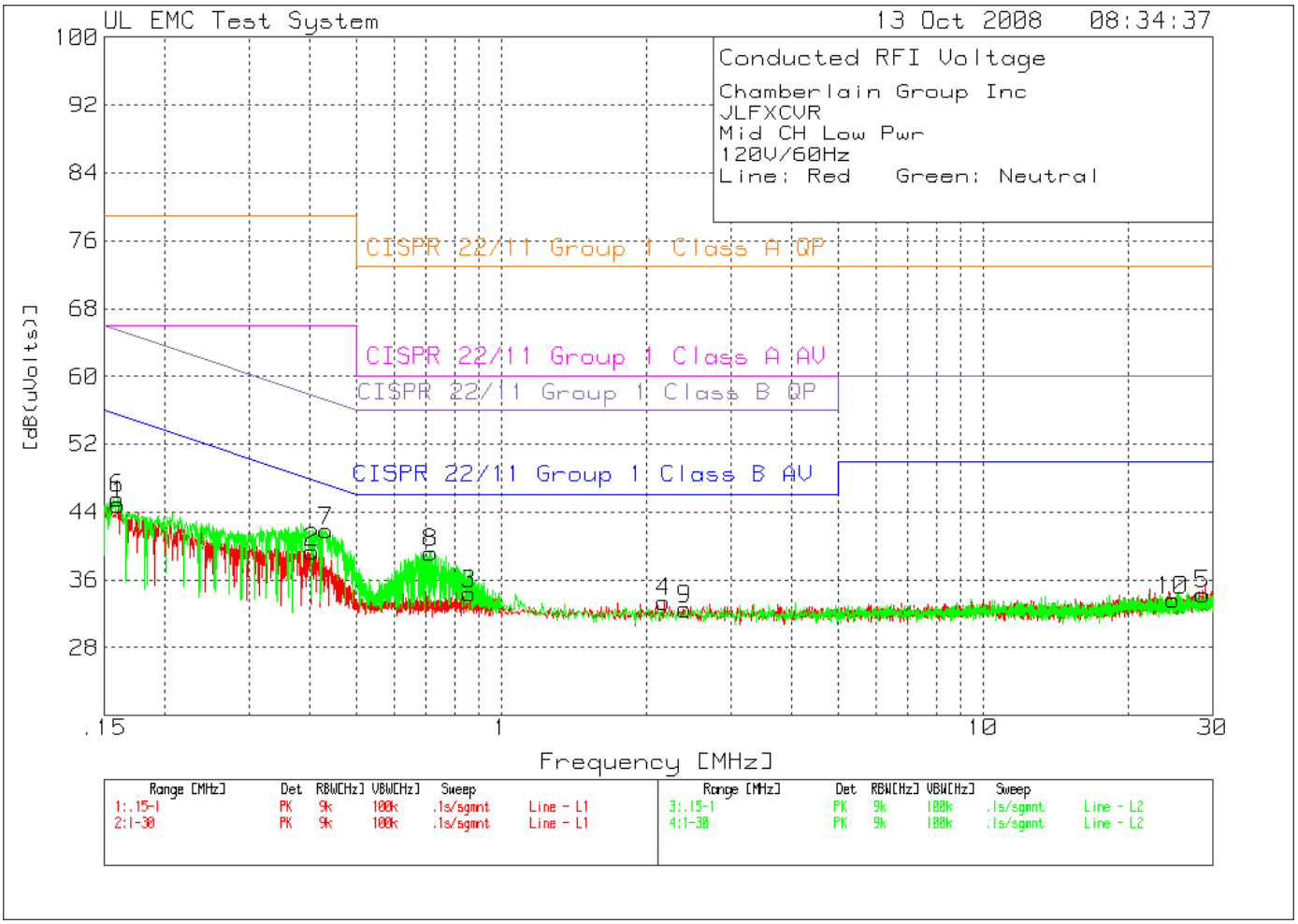
Chamberlain Group Inc
JLFXCVR
Receive Mode
120V/60Hz
RED: Line GRN: Netural

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
Line - L1 .15 - 1MHz											
1	.15742	33.04 pk	13.8	1.6	48.44	79	66	65.6	55.6	-	-
				Margin [dB]		-30.56	-17.56	-17.16	-7.16	-	-
2	.45278	30.77 pk	10.5	.4	41.67	79	66	56.8	46.8	-	-
				Margin [dB]		-37.33	-24.33	-15.13	-5.13	-	-
3	.7932	26.98 pk	10.6	.2	37.78	73	60	56	46	-	-
				Margin [dB]		-35.22	-22.22	-18.22	-8.22	-	-
Line - L2 .15 - 1MHz											
4	.15795	30.16 pk	13.6	1.8	45.56	79	66	65.6	55.6	-	-
				Margin [dB]		-33.44	-20.44	-20.04	-10.04	-	-
5	.43634	30.76 pk	10.5	.4	41.66	79	66	57.1	47.1	-	-
				Margin [dB]		-37.34	-24.34	-15.44	-5.44	-	-
6	.81388	24.27 pk	10.6	.2	35.07	73	60	56	46	-	-
				Margin [dB]		-37.93	-24.93	-20.93	-10.93	-	-
7	.99894	24.27 pk	10.6	.2	35.07	73	60	56	46	-	-
				Margin [dB]		-37.93	-24.93	-20.93	-10.93	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Figure 3 Conducted Emissions Graph – TX, Mid Channel



*There were no differences in emissions when EUT was set to Low and High Channels.

Table 4 Conducted Emissions Data Points

Chamberlain Group Inc
JLFXCVR
Mid CH Low Pwr
120V/60Hz
Line: Red Green: Neutral

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
Line - L1 .15 - 1MHz											
1	.16061	30.1 pk	13.2	1.6	44.9	79	66	65.4	55.4	-	-
				Margin [dB]		-34.1	-21.1	-20.5	-10.5	-	-
2	.40505	28.33 pk	10.6	.4	39.33	79	66	57.7	47.7	-	-
				Margin [dB]		-39.67	-26.67	-18.37	-8.37	-	-
3	.85895	23.6 pk	10.6	.2	34.4	73	60	56	46	-	-
				Margin [dB]		-38.6	-25.6	-21.6	-11.6	-	-
Line - L1 1 - 30MHz											
4	2.17555	22.79 pk	10.5	.1	33.39	73	60	56	46	-	-
				Margin [dB]		-39.61	-26.61	-22.61	-12.61	-	-
5	28.61646	22.49 pk	11.4	.4	34.29	73	60	60	50	-	-
				Margin [dB]		-38.71	-25.71	-25.71	-15.71	-	-
Line - L2 .15 - 1MHz											
6	.16008	30.59 pk	13.3	1.7	45.59	79	66	65.5	55.5	-	-
				Margin [dB]		-33.41	-20.41	-19.91	-9.91	-	-
7	.43369	30.92 pk	10.5	.4	41.82	79	66	57.2	47.2	-	-
				Margin [dB]		-37.18	-24.18	-15.38	-5.38	-	-
8	.71419	28.53 pk	10.5	.2	39.23	73	60	56	46	-	-
				Margin [dB]		-33.77	-20.77	-16.77	-6.77	-	-
Line - L2 1 - 30MHz											
9	2.41066	22.07 pk	10.4	.1	32.57	73	60	56	46	-	-
				Margin [dB]		-40.43	-27.43	-23.43	-13.43	-	-
10	24.79139	22.26 pk	11.2	.2	33.66	73	60	60	50	-	-
				Margin [dB]		-39.34	-26.34	-26.34	-16.34	-	-

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

4.2 Test Conditions and Results – 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 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	FCC Part 15, Subpart C, 15.209 & 15.249 RSS-Gen Section 7.2.3.2, RSS-210 Section 2.7 and A2.9		
UL LPG	80-EM-S0029		
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	10m measurement distance	
	1GHz – 10GHz	3m measurement distance	

Limits – 902MHz – 928MHz – Fundamental Frequency

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
902 - 928	83.52	NA

Limits – All Other Emissions including Harmonics

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

Supplementary information: None

Table 5 Radiated Emissions EUT Configuration Settings

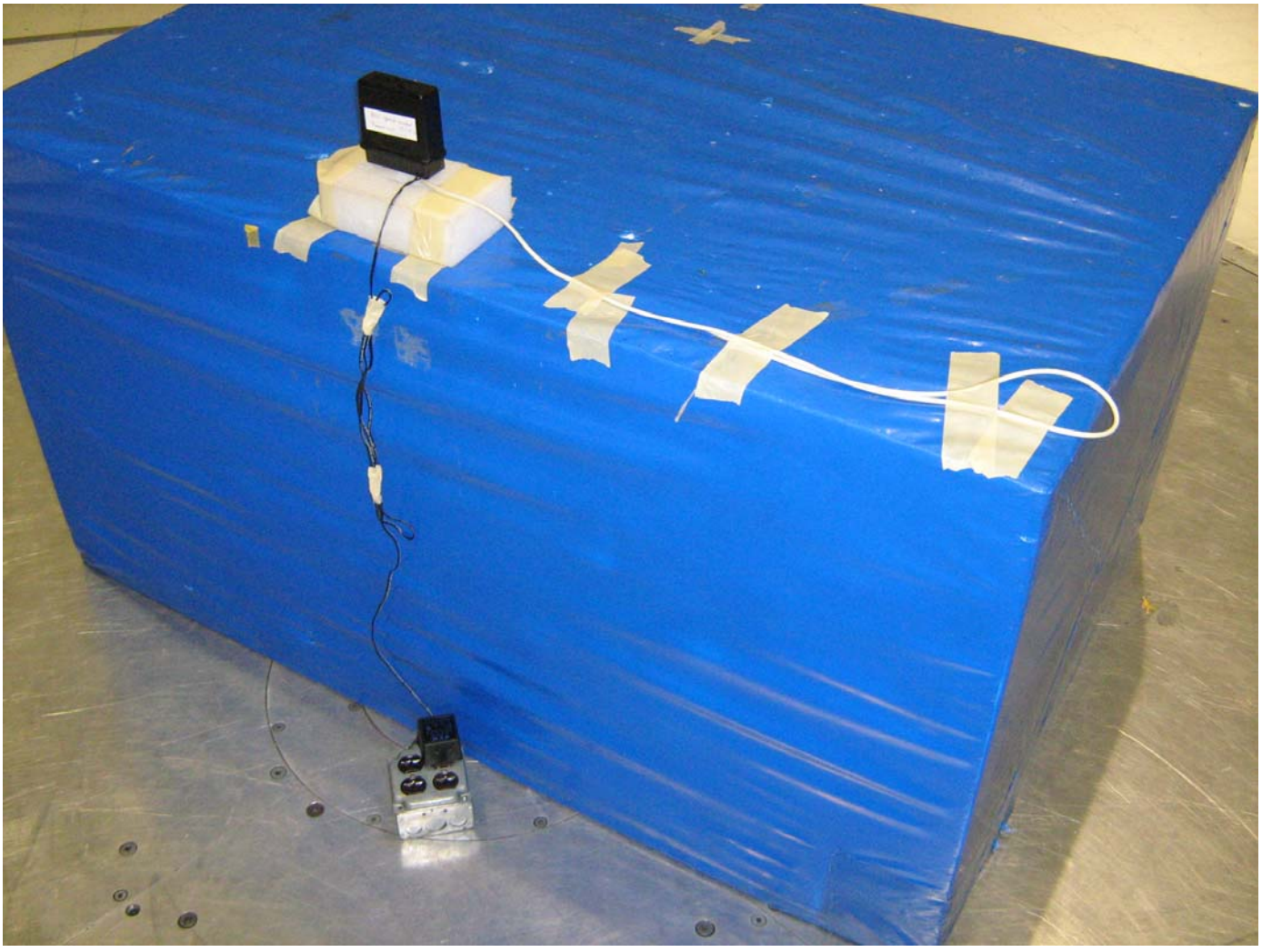
Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1 and 2

Supplementary information: None

Table 6 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	HP	8566B	EMC4085
Quasi-Peak Detector	HP	85650A	EMC4016
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6108	EMC4076
Spectrum Analyzer	Rhode & Schwartz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Figure 4 Test setup for Radiated Emissions



4.2.1 Radiated Emissions – Filed Strength of the Fundamental Frequency

Table 7 Fundamental Frequency Data Points

Low Channel Fundamental Level

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
903.153	73.8 qp	-31.8	22.2	64.2	-	-	-	83.5	-	-
Azimuth: 197	Height:103 Horz			Margin [dB]:	-	-	-	-19.3	-	-
903.1535	73.88 qp	-31.8	22.2	64.28	-	-	-	83.5	-	-
Azimuth: 296	Height:146 Vert			Margin [dB]:	-	-	-	-19.22	-	-

Middle Channel Fundamental Level

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
915.5912	75 qp	-31.7	22.2	65.5	-	-	-	83.5	-	-
Azimuth: 201	Height:107 Horz			Margin [dB]:	-	-	-	-18	-	-
915.5907	78.56 qp	-31.7	22.2	69.06	-	-	-	83.5	-	-
Azimuth: 292	Height:156 Vert			Margin [dB]:	-	-	-	-14.44	-	-

High Channel Fundamental Level

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
926.6281	68.52 qp	-31.7	22.9	59.72	-	-	-	83.5	-	-
Azimuth: 4	Height:265 Horz			Margin [dB]:	-	-	-	-23.78	-	-
926.654	78.37 qp	-31.7	22.9	69.57	-	-	-	83.5	-	-
Azimuth: 304	Height:162 Vert			Margin [dB]:	-	-	-	-13.93	-	-

4.2.2 Radiated Emissions – Band Edge Compliance

Table 8 Band Edge Emissions Data Points

Low Channel Band Edge

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
902	35 qp	-31.8	22.3	25.5	-	-	-	35.6	-	-
Azimuth: 197	Height:103 Horz			Margin [dB]:	-	-	-	-10.1	-	-
902	37.08 qp	-31.8	22.3	27.58	-	-	-	35.6	-	-
Azimuth: 296	Height:146 Vert			Margin [dB]:	-	-	-	-8.02	-	-

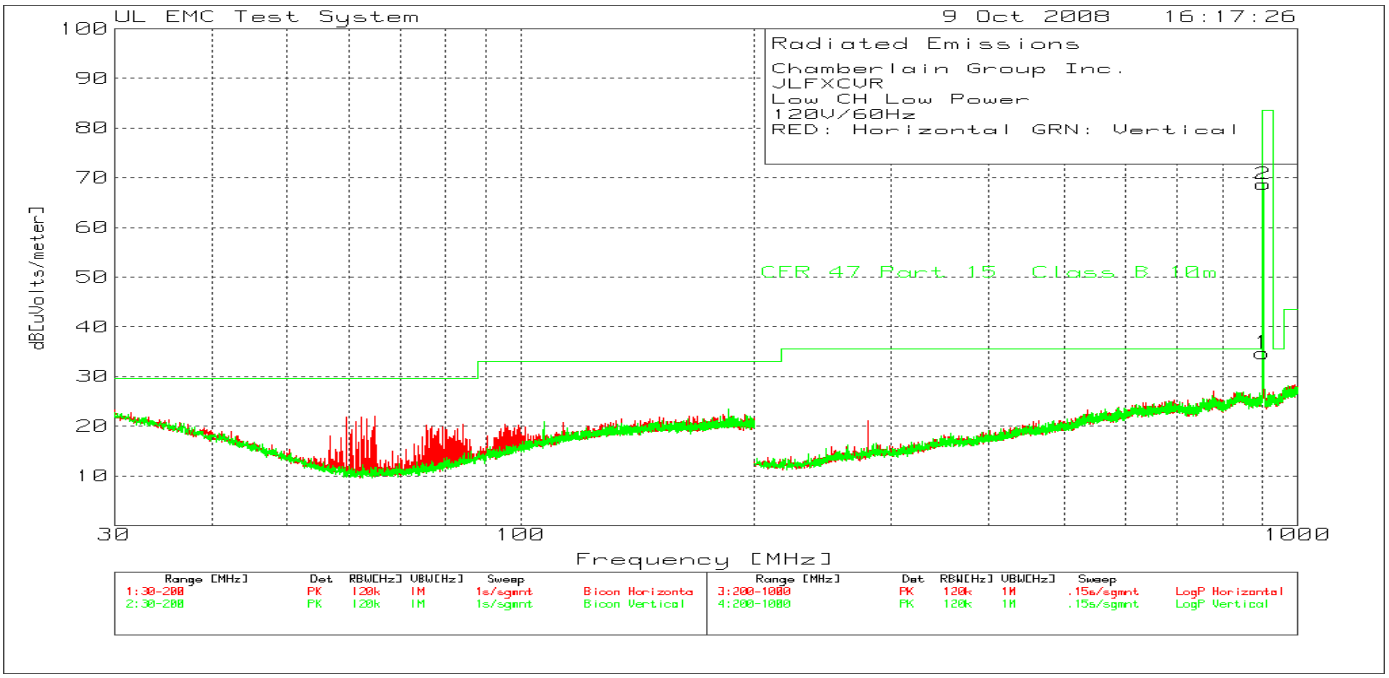
Low Channel Band Edge

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
928	33 qp	-31.5	23	24.5	-	-	-	35.6	-	-
Azimuth: 199	Height:104 Horz			Margin [dB]:	-	-	-	-11.1	-	-
928	39 qp	-31.5	23	30.5	-	-	-	35.6	-	-
Azimuth: 304	Height:162 Vert			Margin [dB]:	-	-	-	-5.1	-	-

4.2.3 Radiated Emissions – Low Channel Spurious Emissions

Figure 5 Radiated Spurious Emissions Graphs

30MHz – 1GHz



1GHz – 10GHz

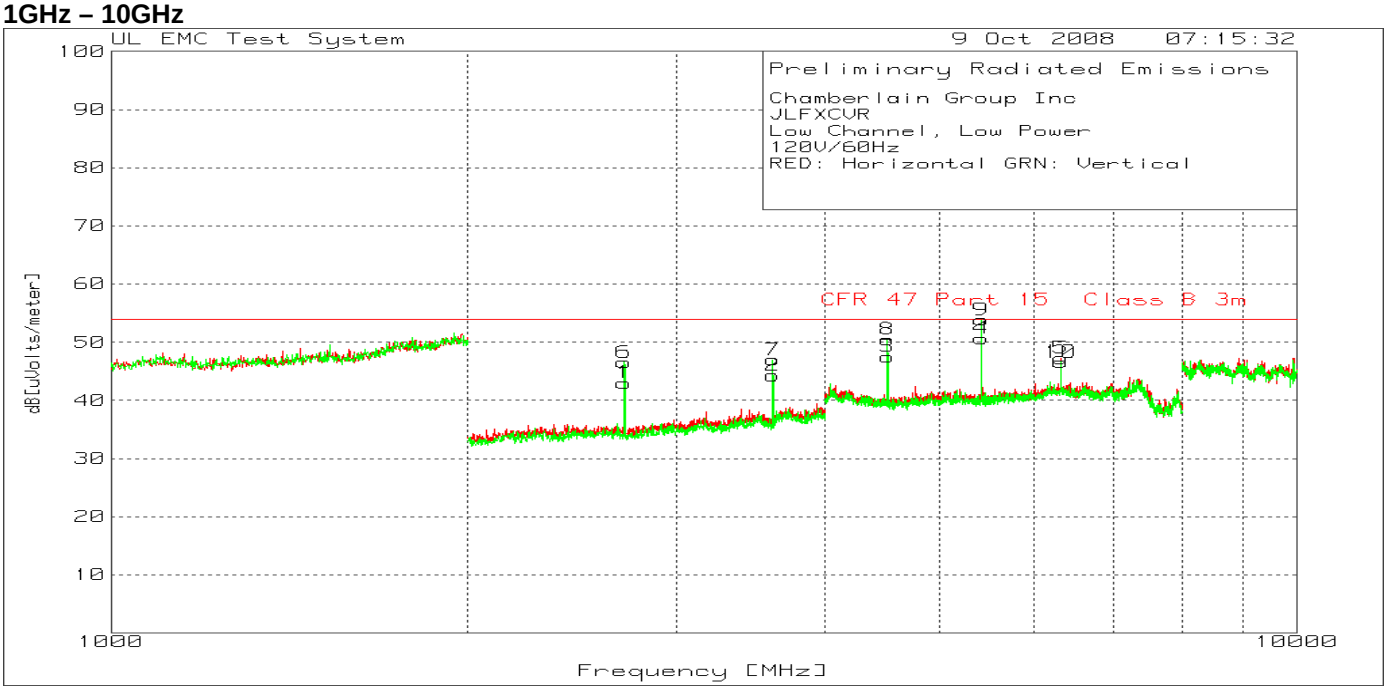


Table 9 Radiated Spurious Emissions Data Points

30MHz – 1GHz

Chamberlain Group Inc.
JLFXCVR
Low CH Low Power
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	901.8736	44.2 pk	-31.8	22.3	34.7	-	-	-	35.6	-	-
	Azimuth:196	Height:99 Horz		Margin [dB]		-	-	-	-.9	-	-
2	902.8728	78.3 pk	-31.8	22.2	68.7	-	-	-	83.5	-	-
	Azimuth:202	Height:201 Vert		Margin [dB]		-	-	-	-14.8	-	-

LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Only Fundamental Frequency Detected – No Measurements were required. For the level of fundamental frequency please refer to section 4.2.1.

1GHz – 10GHz

Chamberlain Group Inc
JLFXCVR
Low Channel, Low Power
120V/60Hz
RED: Horizontal GRN: Vertical

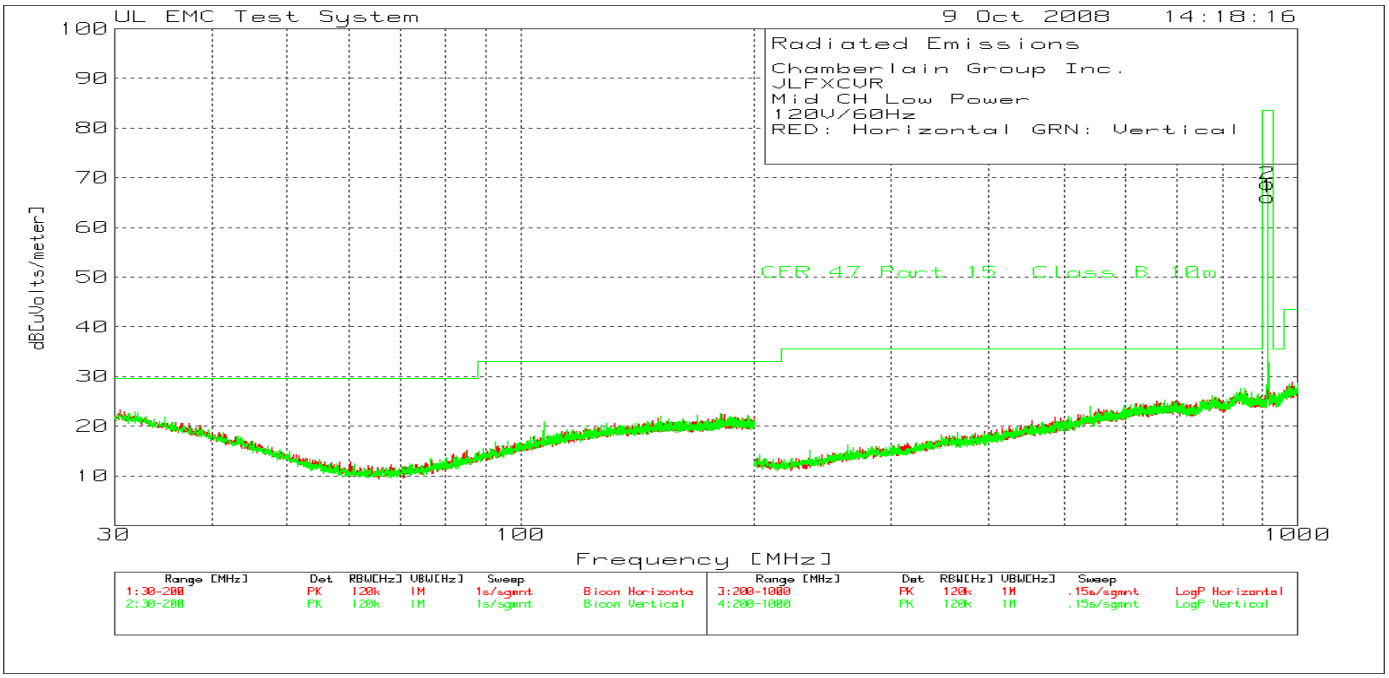
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
2709.687	72.54 pk	-51.24	22.1	43.4	54	-	-	-	-	-
Azimuth: 128	Height:100 Horz		Margin [dB]:	-10.6						
2709.715	69.84 av	-51.24	22.1	40.7	54	-	-	-	-	-
Azimuth: 128	Height:100 Horz		Margin [dB]:	-13.3						
2709.6529	75.54 pk	-51.24	22.1	46.4	54	-	-	-	-	-
Azimuth: 144	Height:169 Vert		Margin [dB]:	-7.6						
2709.709	74.07 av	-51.24	22.1	44.93	54	-	-	-	-	-
Azimuth: 144	Height:169 Vert		Margin [dB]:	-9.07						
3612.8765	69.43 pk	-50.92	23.2	41.71	54	-	-	-	-	-
Azimuth: 209	Height:109 Horz		Margin [dB]:	-12.29						
3612.9206	65.57 av	-50.92	23.2	37.85	54	-	-	-	-	-
Azimuth: 209	Height:109 Horz		Margin [dB]:	-16.15						
3612.8685	70.4 pk	-50.92	23.2	42.68	54	-	-	-	-	-
Azimuth: 140	Height:156 Vert		Margin [dB]:	-11.32						
3612.9246	67.15 av	-50.92	23.2	39.43	54	-	-	-	-	-
Azimuth: 140	Height:156 Vert		Margin [dB]:	-14.57						
4516.1483	71.61 pk	-52.48	27.8	46.93	54	-	-	-	-	-
Azimuth: 222	Height:117 Horz		Margin [dB]:	-7.07						
4516.1443	68.96 av	-52.48	27.8	44.28	54	-	-	-	-	-
Azimuth: 222	Height:117 Horz		Margin [dB]:	-9.72						
4515.9619	74.57 pk	-52.48	27.8	49.89	54	-	-	-	-	-
Azimuth: 26	Height:115 Vert		Margin [dB]:	-4.11						
4516.1383	71.95 av	-52.48	27.8	47.27	54	-	-	-	-	-
Azimuth: 26	Height:115 Vert		Margin [dB]:	-6.73						
5419.3164	71.45 pk	-50.15	27.9	49.2	54	-	-	-	-	-
Azimuth: 171	Height:100 Horz		Margin [dB]:	-4.8						
5419.3565	68.08 av	-50.15	27.9	45.83	54	-	-	-	-	-
Azimuth: 171	Height:100 Horz		Margin [dB]:	-8.17						
5419.2222	76.61 pk	-50.15	27.9	54.36	54	-	-	-	-	-
Azimuth: 338	Height:144 Vert		Margin [dB]:	.36						
5419.3425	75.21 av	-50.15	27.9	52.96	54	-	-	-	-	-
Azimuth: 338	Height:144 Vert		Margin [dB]:	-1.04						
6322.6208	65.47 pk	-47.96	29.2	46.71	54	-	-	-	-	-
Azimuth: 153	Height:108 Horz		Margin [dB]:	-7.29						
6322.5527	59.26 av	-47.96	29.2	40.5	54	-	-	-	-	-
Azimuth: 153	Height:108 Horz		Margin [dB]:	-13.5						
6322.5687	67.11 pk	-47.96	29.2	48.35	54	-	-	-	-	-
Azimuth: 156	Height:111 Vert		Margin [dB]:	-5.65						
6322.5607	62.57 av	-47.96	29.2	43.81	54	-	-	-	-	-
Azimuth: 156	Height:111 Vert		Margin [dB]:	-10.19						

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

4.2.4 Radiated Emissions – Middle Channel Spurious Emissions

Figure 6 Radiated Spurious Emissions Graphs
30MHz – 1GHz



1GHz – 10GHz

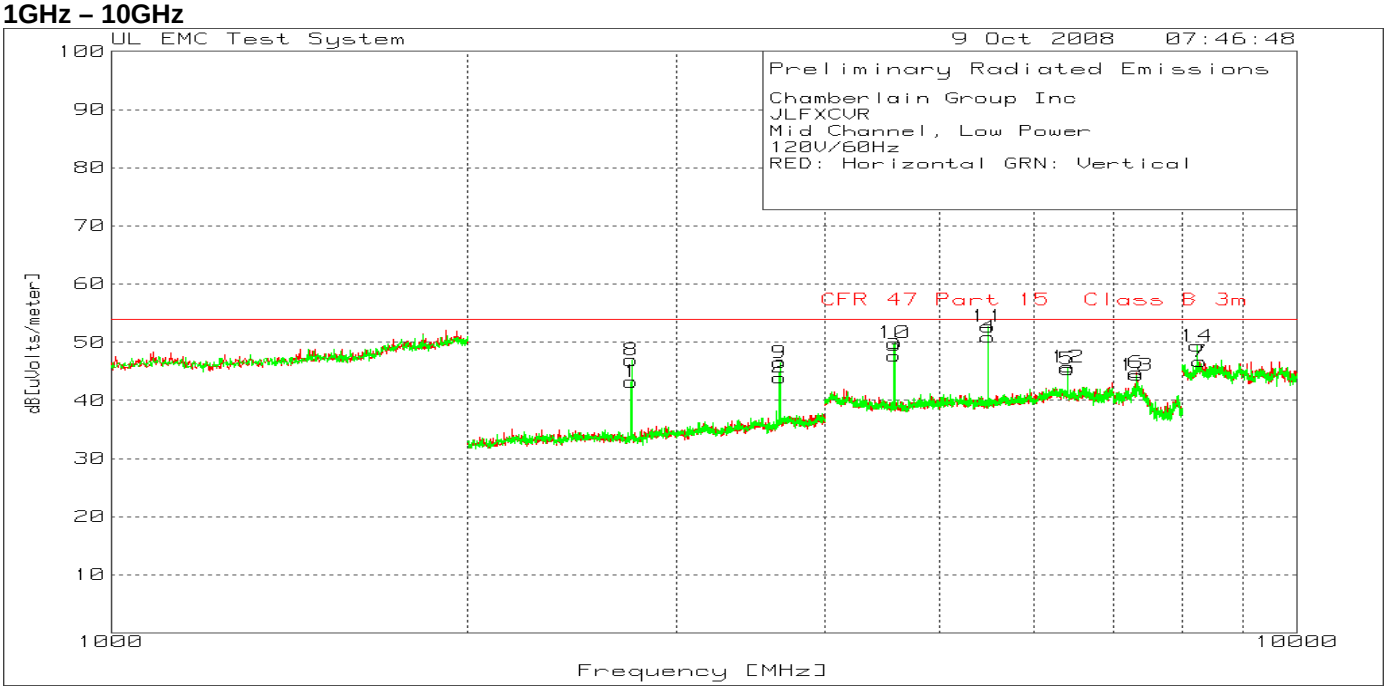


Table 10 Radiated Spurious Emissions Data Points

30MHz – 1GHz

Chamberlain Group Inc.
JLFXCVR
Mid CH Low Power
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	915.4634	75.6 pk	-31.7	22.2	66.1	-	-	-	83.5	-	-
	Azimuth:319	Height:100 Horz		Margin [dB]		-	-	-	-17.4	-	-
2	915.4634	78.3 pk	-31.7	22.2	68.8	-	-	-	83.5	-	-
	Azimuth:183	Height:203 Vert		Margin [dB]		-	-	-	-14.7	-	-

LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Only Fundamental Frequency Detected – No Measurements were required. For the level of fundamental frequency please refer to section 4.2.1.

1GHz – 10GHz

Chamberlain Group Inc
Mid Channel, Low Power, JLFXCVR
120V/60Hz
RED: Horizontal GRN: Vertical

Frequency [MHz]	Test	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
2746.9935	73.92 pk	-51.18	22.1	44.84	54	-	-	-	-	-	-
Azimuth: 131	Height:120 Horz			Margin [dB]:	-9.16	-	-	-	-	-	-
2747.0496	71.81 av	-51.18	22.1	42.73	54	-	-	-	-	-	-
Azimuth: 131	Height:120 Horz			Margin [dB]:	-11.27	-	-	-	-	-	-
2747.0696	76.26 pk	-51.18	22.1	47.18	54	-	-	-	-	-	-
Azimuth: 136	Height:167 Vert			Margin [dB]:	-6.82	-	-	-	-	-	-
2747.0416	74.14 av	-51.18	22.1	45.06	54	-	-	-	-	-	-
Azimuth: 136	Height:167 Vert			Margin [dB]:	-8.94	-	-	-	-	-	-
3662.6039	68.8 pk	-49.55	23.4	42.65	54	-	-	-	-	-	-
Azimuth: 210	Height:100 Horz			Margin [dB]:	-11.35	-	-	-	-	-	-
3662.6981	65.61 av	-49.55	23.4	39.46	54	-	-	-	-	-	-
Azimuth: 210	Height:100 Horz			Margin [dB]:	-14.54	-	-	-	-	-	-
3662.6319	70.32 pk	-49.55	23.4	44.17	54	-	-	-	-	-	-
Azimuth: 157	Height:152 Vert			Margin [dB]:	-9.83	-	-	-	-	-	-
3662.7101	67.85 av	-49.55	23.4	41.7	54	-	-	-	-	-	-
Azimuth: 157	Height:152 Vert			Margin [dB]:	-12.3	-	-	-	-	-	-

4578.2273	71.19 pk	-52.47	27.7	46.42	54	-	-	-	-	-
Azimuth: 2	Height:118 Horz		Margin [dB]:	-7.58	-	-	-	-	-	
4578.3716	67.44 av	-52.47	27.7	42.67	54	-	-	-	-	-
Azimuth: 2	Height:118 Horz		Margin [dB]:	-11.33	-	-	-	-	-	
4578.2975	74.65 pk	-52.47	27.7	49.88	54	-	-	-	-	-
Azimuth: 20	Height:114 Vert		Margin [dB]:	-4.12	-	-	-	-	-	
4578.3536	72.13 av	-52.47	27.7	47.36	54	-	-	-	-	-
Azimuth: 20	Height:114 Vert		Margin [dB]:	-6.64	-	-	-	-	-	
5494.0334	72.54 pk	-50.23	28.1	50.41	54	-	-	-	-	-
Azimuth: 236	Height:113 Horz		Margin [dB]:	-3.59	-	-	-	-	-	
5494.0134	69.89 av	-50.23	28.1	47.76	54	-	-	-	-	-
Azimuth: 236	Height:113 Horz		Margin [dB]:	-6.24	-	-	-	-	-	
5494.0194	75.73 pk	-50.23	28.1	53.6	54	-	-	-	-	-
Azimuth: 0	Height:142 Vert		Margin [dB]:	-.4	-	-	-	-	-	
5494.0114	73.83 av	-50.23	28.1	51.7	54	-	-	-	-	-
Azimuth: 0	Height:142 Vert		Margin [dB]:	-2.3	-	-	-	-	-	
6409.6781	66.02 pk	-48	29.2	47.22	54	-	-	-	-	-
Azimuth: 192	Height:101 Horz		Margin [dB]:	-6.78	-	-	-	-	-	
6409.6681	61.51 av	-48	29.2	42.71	54	-	-	-	-	-
Azimuth: 192	Height:101 Horz		Margin [dB]:	-11.29	-	-	-	-	-	
6409.5379	65.05 pk	-48	29.2	46.25	54	-	-	-	-	-
Azimuth: 161	Height:113 Vert		Margin [dB]:	-7.75	-	-	-	-	-	
6409.6641	60.7 av	-48	29.2	41.9	54	-	-	-	-	-
Azimuth: 161	Height:113 Vert		Margin [dB]:	-12.1	-	-	-	-	-	
7325.1472	62.76 pk	-46.39	30.6	46.97	54	-	-	-	-	-
Azimuth: 171	Height:110 Horz		Margin [dB]:	-7.03	-	-	-	-	-	
7325.3235	54.06 av	-46.39	30.6	38.27	54	-	-	-	-	-
Azimuth: 171	Height:110 Horz		Margin [dB]:	-15.73	-	-	-	-	-	
7325.2694	60.81 pk	-46.39	30.6	45.02	54	-	-	-	-	-
Azimuth: 172	Height:107 Vert		Margin [dB]:	-8.98	-	-	-	-	-	
7325.3075	55.11 av	-46.39	30.6	39.32	54	-	-	-	-	-
Azimuth: 172	Height:107 Vert		Margin [dB]:	-14.68	-	-	-	-	-	
8240.7576	60.25 pk	-48.61	36.4	48.04	54	-	-	-	-	-
Azimuth: 157	Height:115 Horz		Margin [dB]:	-5.96	-	-	-	-	-	
8282.2253	61.34 pk	-48.89	36.4	48.85	54	-	-	-	-	-
Azimuth: 34	Height:247 Horz		Margin [dB]:	-5.15	-	-	-	-	-	
8282.1111	50.29 av	-48.88	36.4	37.81	54	-	-	-	-	-
Azimuth: 34	Height:247 Horz		Margin [dB]:	-16.19	-	-	-	-	-	
8240.6974	65.73 pk	-48.61	36.4	53.52	54	-	-	-	-	-
Azimuth: 177	Height:101 Vert		Margin [dB]:	-.48	-	-	-	-	-	
8240.962	57.78 av	-48.6	36.4	45.58	54	-	-	-	-	-
Azimuth: 177	Height:101 Vert		Margin [dB]:	-8.42	-	-	-	-	-	

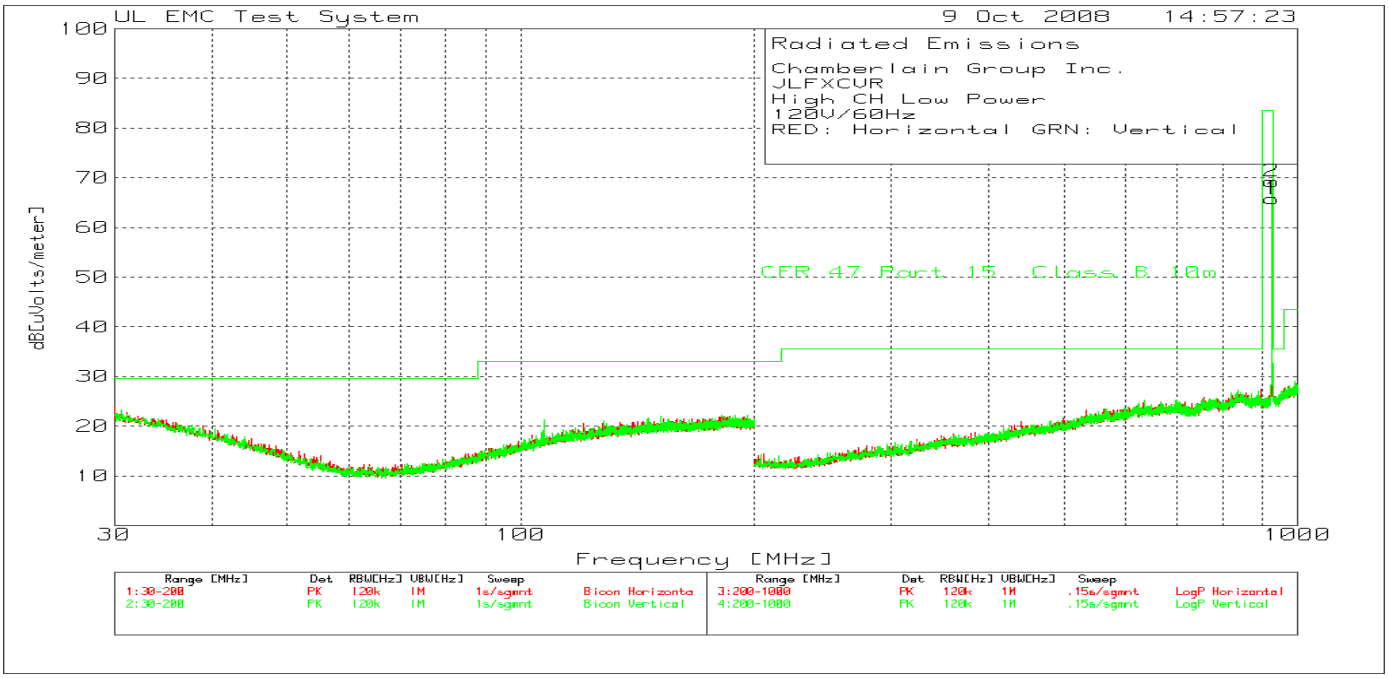
LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

4.2.5 Radiated Emissions – High Channel Spurious Emissions

Figure 7 Radiated Spurious Emissions Graphs

30MHz – 1GHz



1GHz – 10GHz

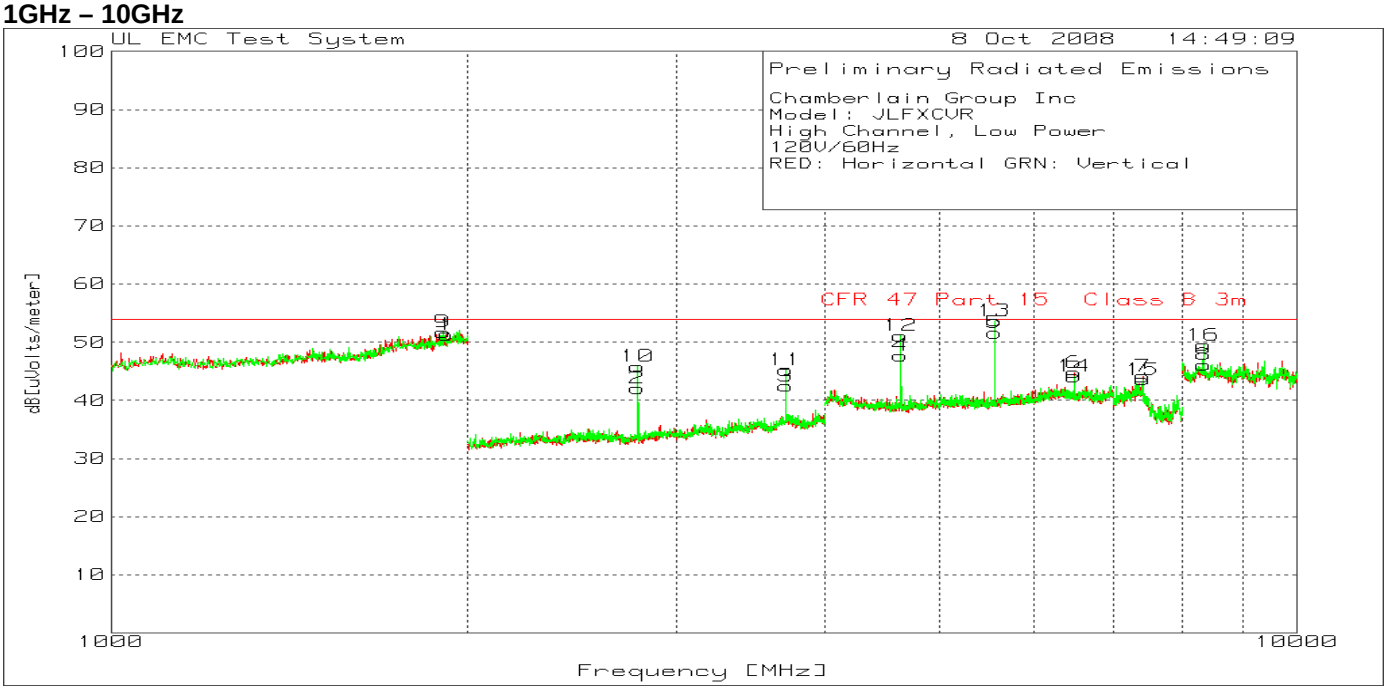


Table 11 Radiated Spurious Emissions Data Points

30MHz – 1GHz

Chamberlain Group Inc.
JLFXCVR
High CH Low Power
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	926.4552	74.6 pk	-31.7	22.9	65.8	-	-	-	83.5	-	-
	Azimuth:322	Height:100 Horz		Margin [dB]		-	-	-	-17.7	-	-
2	926.4552	78.1 pk	-31.7	22.9	69.3	-	-	-	83.5	-	-
	Azimuth:206	Height:202 Vert		Margin [dB]		-	-	-	-14.2	-	-

LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Only Fundamental Frequency Detected – No Measurements were required. For the level of fundamental frequency please refer to section 4.2.1.

1GHz – 10GHz

Chamberlain Group Inc
JLFXCVR
Mid Channel, Low Power
120V/60Hz
RED: Horizontal GRN: Vertical

Frequency [MHz]	Test	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
2780.1323	72.97 pk	-51.01	22.2	44.16	54	-	-	-	-	-	
Azimuth: 267	Height:100 Horz		Margin [dB]:		-9.84	-	-	-	-	-	
2780.2285	70.45 av	-51.02	22.2	41.63	54	-	-	-	-	-	
Azimuth: 267	Height:100 Horz		Margin [dB]:		-12.37	-	-	-	-	-	
2780.0782	76.22 pk	-51.01	22.2	47.41	54	-	-	-	-	-	
Azimuth: 164	Height:173 Vert		Margin [dB]:		-6.59	-	-	-	-	-	
2780.2305	74.49 av	-51.02	22.2	45.67	54	-	-	-	-	-	
Azimuth: 164	Height:173 Vert		Margin [dB]:		-8.33	-	-	-	-	-	
3706.8697	70.16 pk	-49.51	23.5	44.15	54	-	-	-	-	-	
Azimuth: 211	Height:111 Horz		Margin [dB]:		-9.85	-	-	-	-	-	
3706.9419	66.46 av	-49.51	23.5	40.45	54	-	-	-	-	-	
Azimuth: 211	Height:111 Horz		Margin [dB]:		-13.55	-	-	-	-	-	
3706.7234	72.13 pk	-49.5	23.5	46.13	54	-	-	-	-	-	
Azimuth: 70	Height:149 Vert		Margin [dB]:		-7.87	-	-	-	-	-	
3706.9399	68.98 av	-49.51	23.5	42.97	54	-	-	-	-	-	
Azimuth: 70	Height:149 Vert		Margin [dB]:		-11.03	-	-	-	-	-	

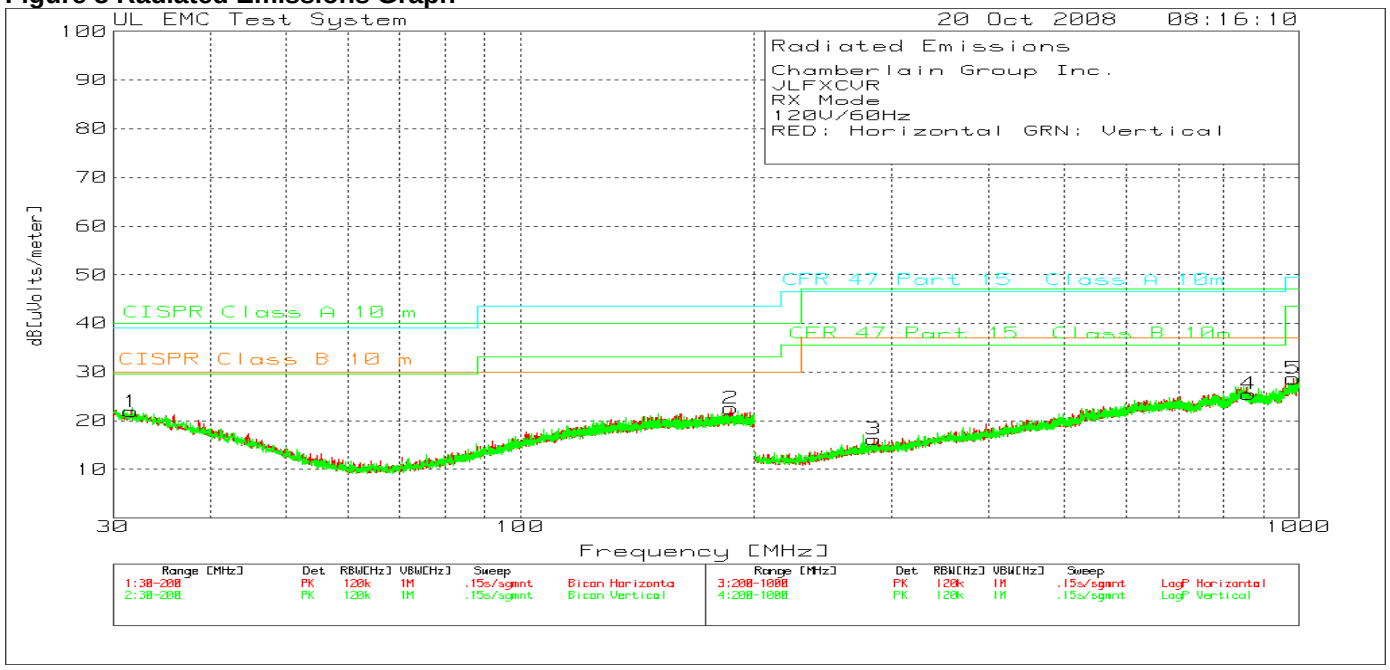
4633.6112	72.79 pk	-52.33	27.7	48.16	54	-	-	-	-	-
Azimuth: 311	Height:100 Horz		Margin [dB]:	-5.84		-	-	-	-	-
4633.6112	70.37 av	-52.33	27.7	45.74	54	-	-	-	-	-
Azimuth: 311	Height:100 Horz		Margin [dB]:	-8.26		-	-	-	-	-
4633.5892	74.96 pk	-52.33	27.7	50.33	54	-	-	-	-	-
Azimuth: 38	Height:114 Vert		Margin [dB]:	-3.67		-	-	-	-	-
4633.5892	73.23 av	-52.33	27.7	48.6	54	-	-	-	-	-
Azimuth: 38	Height:114 Vert		Margin [dB]:	-5.4		-	-	-	-	-
5560.3046	74.8 pk	-50.53	28.3	52.57	54	-	-	-	-	-
Azimuth: 220	Height:100 Horz		Margin [dB]:	-1.43		-	-	-	-	-
5560.3727	72.89 av	-50.53	28.3	50.66	54	-	-	-	-	-
Azimuth: 220	Height:100 Horz		Margin [dB]:	-3.34		-	-	-	-	-
5560.2866	76.21 pk	-50.53	28.3	53.98	54	-	-	-	-	-
Azimuth: 356	Height:140 Vert		Margin [dB]:	-.02		-	-	-	-	-
5560.3707	74.59 av	-50.53	28.3	52.36	54	-	-	-	-	-
Azimuth: 356	Height:140 Vert		Margin [dB]:	-1.64		-	-	-	-	-
6486.9238	64.65 pk	-48.32	29.1	45.43	54	-	-	-	-	-
Azimuth: 201	Height:100 Horz		Margin [dB]:	-8.57		-	-	-	-	-
6487.0962	58.91 av	-48.32	29.1	39.69	54	-	-	-	-	-
Azimuth: 201	Height:100 Horz		Margin [dB]:	-14.31		-	-	-	-	-
6487.0581	65.78 pk	-48.32	29.1	46.56	54	-	-	-	-	-
Azimuth: 160	Height:101 Vert		Margin [dB]:	-7.44		-	-	-	-	-
6487.1102	61.81 av	-48.32	29.1	42.59	54	-	-	-	-	-
Azimuth: 160	Height:101 Vert		Margin [dB]:	-11.41		-	-	-	-	-
7413.7182	62.03 pk	-47.45	31	45.58	54	-	-	-	-	-
Azimuth: 182	Height:100 Horz		Margin [dB]:	-8.42		-	-	-	-	-
7413.8064	56.29 av	-47.45	31	39.84	54	-	-	-	-	-
Azimuth: 182	Height:100 Horz		Margin [dB]:	-14.16		-	-	-	-	-
7413.8725	63.05 pk	-47.45	31	46.6	54	-	-	-	-	-
Azimuth: 307	Height:103 Vert		Margin [dB]:	-7.4		-	-	-	-	-
7413.8124	53.74 av	-47.45	31	37.29	54	-	-	-	-	-
Azimuth: 307	Height:103 Vert		Margin [dB]:	-16.71		-	-	-	-	-
8340.4766	62.55 pk	-50.04	36.5	49.01	54	-	-	-	-	-
Azimuth: 165	Height:104 Horz		Margin [dB]:	-4.99		-	-	-	-	-
8340.4966	54.25 av	-50.01	36.5	40.74	54	-	-	-	-	-
Azimuth: 165	Height:104 Horz		Margin [dB]:	-13.26		-	-	-	-	-
8340.5187	66.3 pk	-50.01	36.5	52.79	54	-	-	-	-	-
Azimuth: 189	Height:109 Vert		Margin [dB]:	-1.21		-	-	-	-	-
8340.5067	60.06 av	-50.01	36.5	46.55	54	-	-	-	-	-
Azimuth: 189	Height:109 Vert		Margin [dB]:	-7.45		-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

4.2.6 Radiated Emissions – Standby / Receive Mode

Figure 8 Radiated Emissions Graph



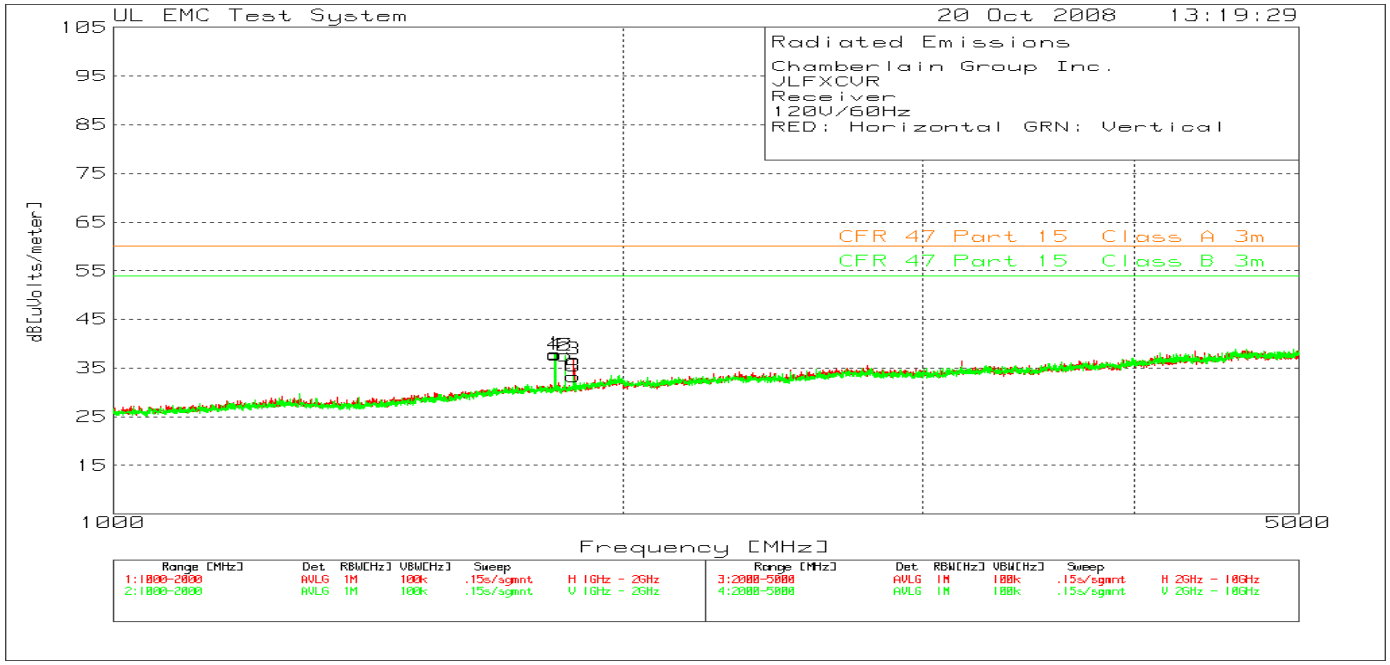


Table 12 Radiated Emissions Data Points

Chamberlain Group Inc.
JLFXCVR
RX Mode
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	31.6422	35 pk	-30.4	17.3	21.9	40	30	39.1	29.6	-	-
	Azimuth:182	Height:100 Horz		Margin [dB]		-18.1	-8.1	-17.2	-7.7	-	-
2	186.3524	36.2 pk	-29.8	16.2	22.6	40	30	43.5	33.1	-	-
	Azimuth:54	Height:100 Horz		Margin [dB]		-17.4	-7.4	-20.9	-10.5	-	-
3	284.3367	36.1 pk	-33	13.1	16.2	47	37	46.4	35.6	-	-
	Azimuth:346	Height:200 Horz		Margin [dB]		-30.8	-20.8	-30.2	-19.4	-	-
4	861.7037	34.5 pk	-31.6	22.6	25.5	47	37	46.4	35.6	-	-
	Azimuth:45	Height:103 Horz		Margin [dB]		-21.5	-11.5	-20.9	-10.1	-	-
5	983.2126	35.8 pk	-30.8	23.7	28.7	47	37	49.5	43.5	-	-
	Azimuth:194	Height:402 Horz		Margin [dB]		-18.3	-8.3	-20.8	-14.8	-	-

LIMIT 1: CISPR Class A 10 m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Chamberlain Group Inc.
JLFXCVR
Receiver
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	1822.089	34.7 pk	-27.2	30.4	37.9	54	60	-	-	-	-
		Height:102 Horz		Margin [dB]		-16.1	-22.1	-	-	-	-
2	1846.577	34.2 pk	-27.1	30.5	37.6	54	60	-	-	-	-
		Height:102 Horz		Margin [dB]		-16.4	-22.4	-	-	-	-
3	1869.065	33.3 pk	-27.2	30.7	36.8	54	60	-	-	-	-
		Height:102 Horz		Margin [dB]		-17.2	-23.2	-	-	-	-
4	1821.589	34.5 pk	-27.2	30.4	37.7	54	60	-	-	-	-
		Height:151 Vert		Margin [dB]		-16.3	-22.3	-	-	-	-
5	1846.577	34.1 pk	-27.1	30.6	37.6	54	60	-	-	-	-
		Height:151 Vert		Margin [dB]		-16.4	-22.4	-	-	-	-
6	1868.566	29.7 pk	-27.2	30.8	33.3	54	60	-	-	-	-
		Height:201 Vert		Margin [dB]		-20.7	-26.7	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: CFR 47 Part 15 Class A 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection

No emissions close to the limit were detected therefore final measurements were considered not required.

4.3 Test Conditions and Results – Occupied Bandwidth / 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 15.215 (c) RSS-Gen Section 4.6
Occupied Bandwidth / 99% Bandwidth Measurement	
The 20dB down measurement must fit in the allocated band.	

Table 13 Occupied Bandwidth / 99% Bandwidth Configuration Settings

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

Table 14 Occupied Bandwidth / 99% Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
0.01	-20	99
Supplementary information: None		

Table 15 Occupied Bandwidth / 99% Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analzer	Agilent	E7405A	EMC4242
Near Filed Probe	EMCO	-	-

Table 16 Occupied Bandwidth / 99% BW Measurement Results

Measurement	**Low Channel**	**Middle Channel**	**High Channel**	**Low Channel -20dB Frequency**	**High Channel -20dB Frequency**
20dB Bandwidth	673.077kHz	336.585kHz	352.546kHz	902.881MHz	926.897MHz
99% Bandwidth	903.218kHz	1,026.000kHz	625.000kHz	N/A	N/A

Figure 9 Test Setup for Occupied Bandwidth

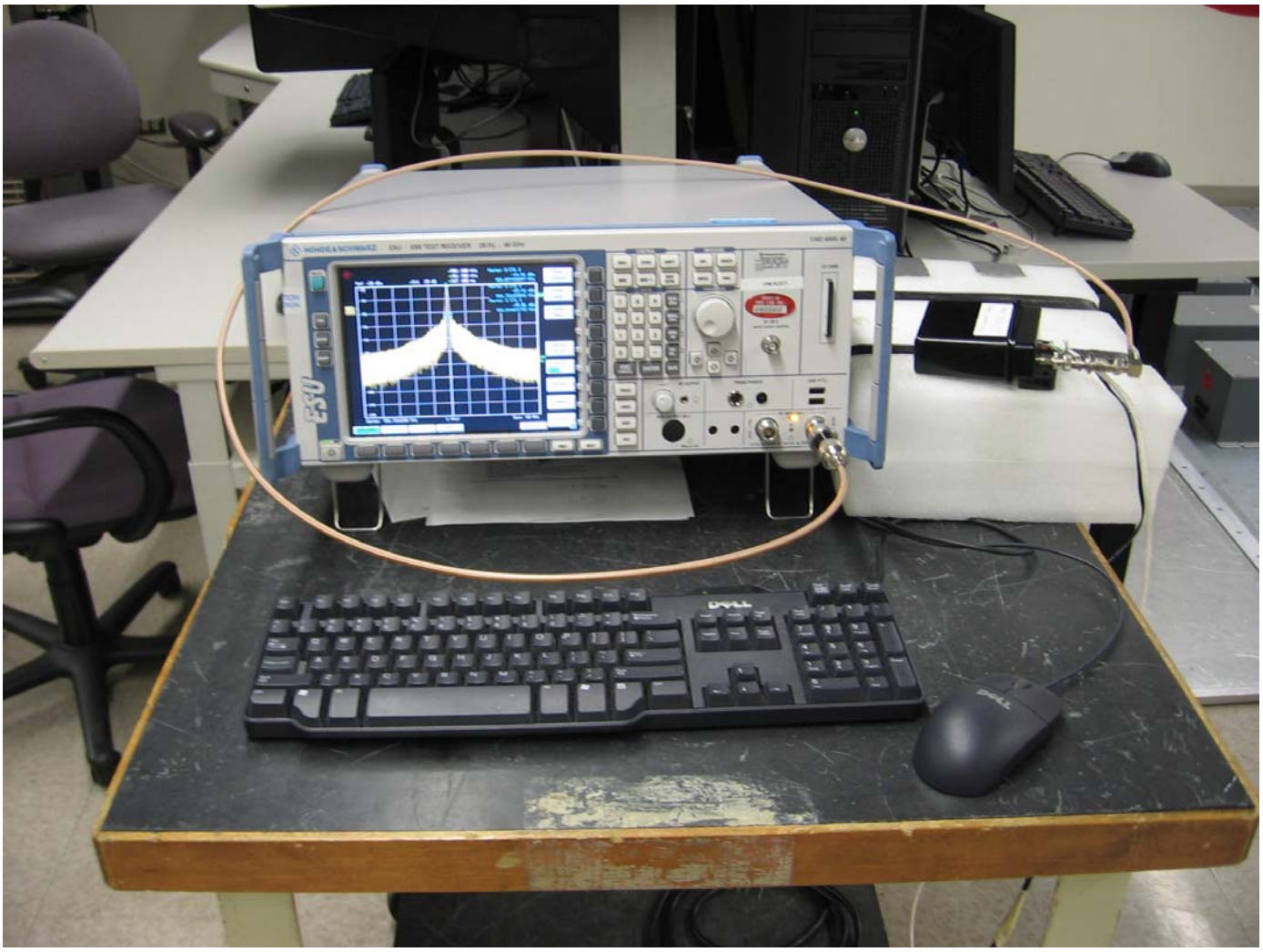
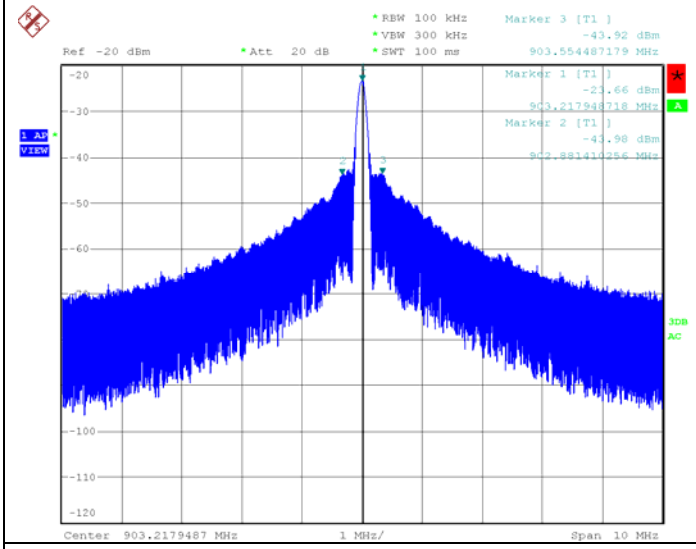
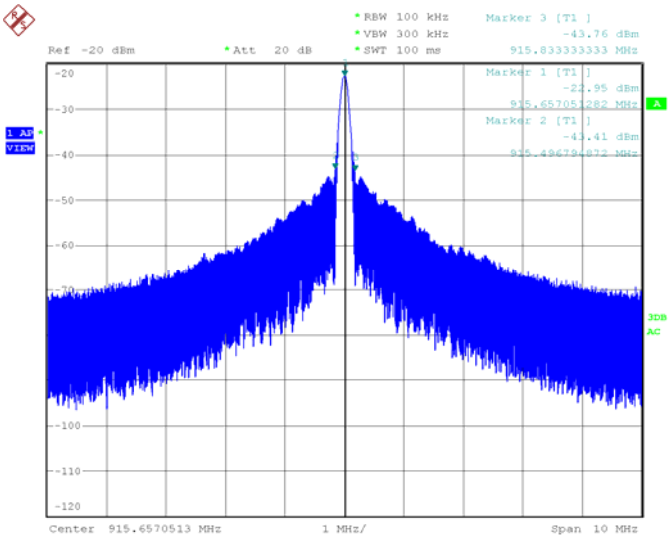


Figure 10 20dB Bandwidth Graph

Low Channel 20dB Bandwidth



Middle Channel 20dB Bandwidth



High Channel 20dB Bandwidth

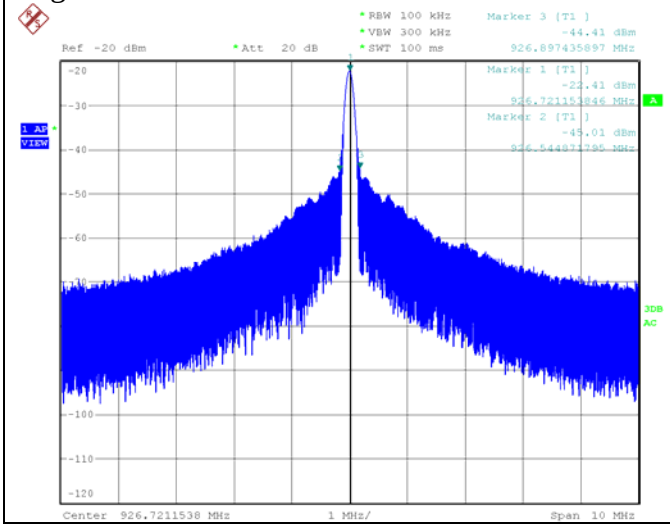
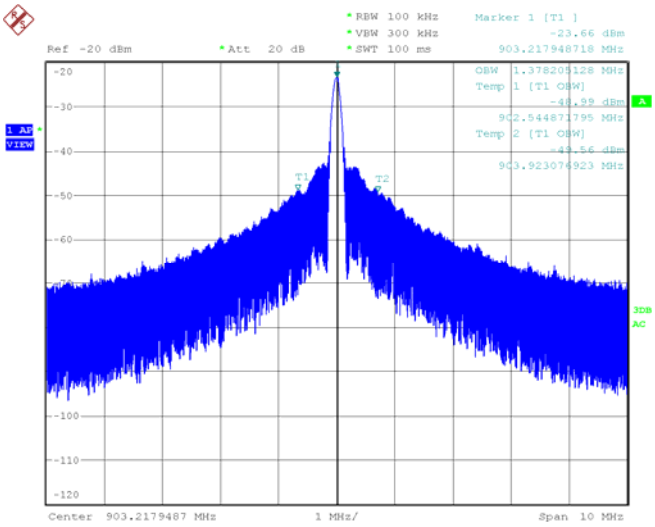
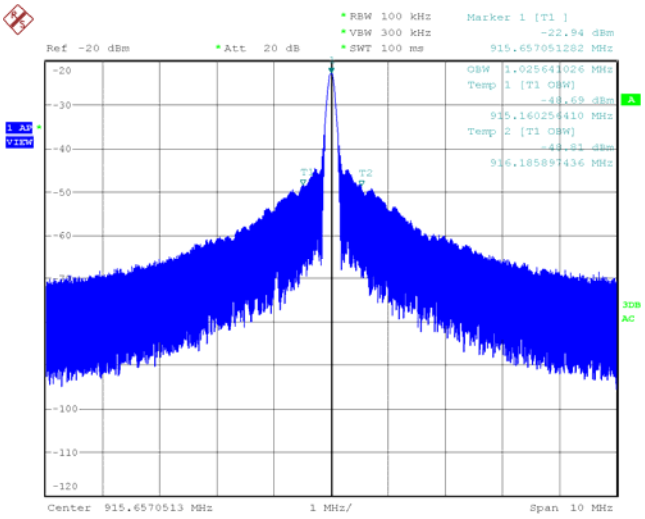


Figure 11 99% Bandwidth Graph

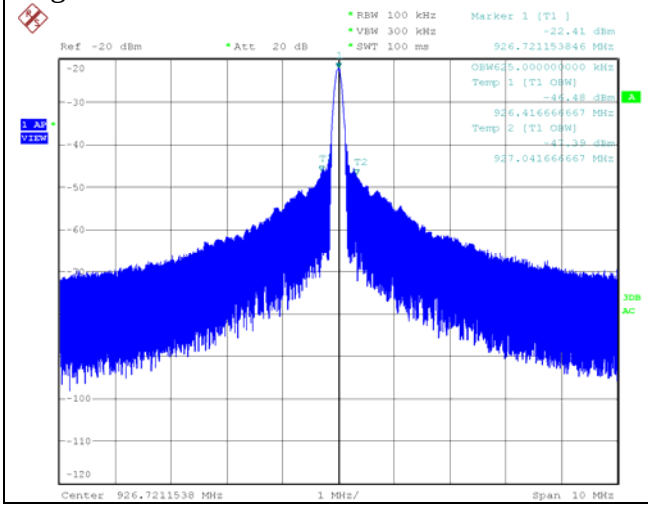
Low Channel 99% Bandwidth



Middle Channel 99% Bandwidth



High Channel 99% Bandwidth



5 IMMUNITY TEST RESULTS

Immunity testing was not requested nor required.

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. 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 89/336/EEC, Article 10 (2). 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