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Job Number:	772545
File Number:	MC3181
Date:	08 Oct. 2007
Model:	OPE2
FCC ID:	JLFPTE2

Electromagnetic Compatibility Test Report

For

Chamberlain Group Inc.

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Job Number: 772545 File Number: MC3181 Page 2 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.**
1285 Walt Whitman Rd.
Melville, NY 11747

Tests Performed For: **Chamberlain Group Inc.**
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Elmhurst, IL 60126

Applicant Contact: **Hank Sieradzki**
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Test Report Date: **08 Oct. 2007**

Product Type: **Wireless PushToExit**

Product standards **FCC Part 15, Subpart C, 15.231**

Model Number: **OPE2**

Sample Serial Number: **Not Provided**

EUT Category: **Periodic Low Power Transmitter**

Testing Start Date: **24 Sep 2007**

Date Testing Complete: **05 Oct 2007**

Overall Results: Compliant

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Report Directory

1.0	GENERAL - Product Description.....	4
1.1	Equipment Description	4
1.2	Equipment Marking Plate	4
1.3	Device Configuration During Test	5
1.3.1	Equipment Used During Test:.....	5
1.3.2	Input/Output Ports:.....	5
1.3.3	EUT Internal Operating Frequencies:	6
1.3.4	Power Interface:.....	6
1.4	Block Diagram:	7
1.5	EUT Configurations	8
1.6	EUT Operation Modes.....	8
2.0	Summary	9
2.1	Deviations from standard test methods.....	9
2.2	Device Modifications Necessary for Compliance	9
2.3	Reference Standards	10
2.4	Results Summary	10
3.0	Calibration of Equipment Used for Measurement	12
4.0	EMISSIONS TEST RESULTS.....	12
4.1	Test Conditions and Results – OCCUPIED BANDWIDTH	13
4.2	Test Conditions and Results – CEASE OPERATION.....	18
4.3	Test Conditions and Results – PULSE TRAIN	21
4.4	Test Conditions and Results – RADIATED EMISSIONS.....	24
4.5	Fundamental Frequency And Spurious Emissions Measurement Limit Calculations	35
4.5.1	Limit Calculation.....	35
4.5.2	Spurious Emissions Limit.....	35
4.5.3	Radiated Emissions Limit conversion from mV/m to dBmV/m (accordance with paragraph 15.209)	35
4.5.4	Radiated Emissions test data obtained during measurements.	35
Appendix A		36
	Accreditations and Authorizations	36

Job Number: 772545 File Number: MC3181 Page 4 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None	Original	--	--

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The OPE2 is a battery operated push to exit device. It operates with any Oracle wireless gate access intercom system. It is a hybrid device in that it contains a 900MHz transceiver and a 315MHz transmitter. The 900MHz transceiver has been certified previously under FCC ID number: JLFPT2

When the button on the OPE2 is pushed it triggers an Oracle wireless gate access intercom system device to approve the exit and then it will receive a confirmation signal that will allow it to transmit the 315MHz gate-opening signal.

1.2 Equipment Marking Plate

Not applicable.

Job Number: 772545 File Number: MC3181 Page 5 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Low Power Transmitter	Chamberlain Group Inc.	OPE2	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	B	N	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 B = Battery					

Job Number: 772545 File Number: MC3181 Page 6 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

1.3.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
315	Fundamental	902-928	Transmit frequencies

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	6	-	-	DC	-	Battery Operated
1	6	-	-	DC	-	Battery Operated

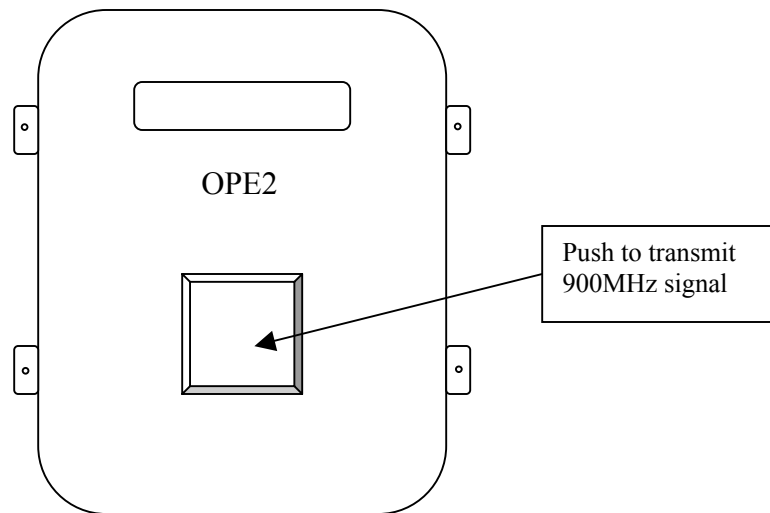
Job Number: 772545
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

File Number: MC3181

Page 7 of 37

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



Job Number: 772545 File Number: MC3181 Page 8 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPTE2

1.5 EUT Configurations

Mode #	Description
1	Stand-alone

1.6 EUT Operation Modes

Mode #	Description
1	Continuous Transmit 315MHz
2	Normal transmit

Job Number: 772545 File Number: MC3181 Page 9 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

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
FCC Part 15, Subpart B	Code of Federal Regulations, Part 15, Radio Frequency Devices	2007
FCC Part 15, Subpart C	Code of Federal Regulations, Part 15, Radio Frequency Devices	2007
RSS-GEN, Issue 2	General Requirements and Information for the Certification of Radiocommunication Equipment	2007
RSS-210, Issue 7	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	2007

Note: only occupied bandwidth requirements were measured for Industry Canada. All other testing required by RSS-GEN and RSS-210 is the responsibility of the manufacturer.

2.4 Results Summary

This product is considered a Periodic Transmitter

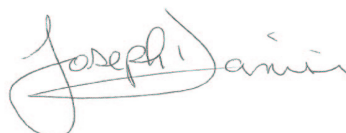
Requirement – Test	Result (Compliant / Non-Compliant)*
15.35 Pulse Train - Averaging Factor	Compliant
15.109 Radiated Emissions - Unintentional	Compliant
15.209 General Radiated Emissions	Compliant
15.231 Fundamental Radiated Emissions	Compliant
15.231 / A1.1.3 Occupied Bandwidth	Compliant
15.231 Cease Operation	Compliant

Test Engineer:



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Reviewer:



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Job Number: 772545 File Number: MC3181 Page 11 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

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:

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

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

----- International -----

Industry Canada	RSS-GEN General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 2
	RSS-210 Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 7

Industry Canada only applied to Occupied Bandwidth tests.

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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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	
Occupied Bandwidth Limits	
0.25% of f_o (0.788MHz)	

Table 1 Occupied Bandwidth Configuration Settings

Power Interface Mode # (See Section 1.3.4)	EUT Configurations Mode # (See Section 1.6)	EUT Operation Mode # (See 1.5)
1	1	1
Supplementary information: None		

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
0.001	-20	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Spectrum analyzer	Advantest	R3261C	5A229
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Measurement Software	UL	Version 9.3	44740

Job Number: 772545

File Number: MC3181

Page 14 of 37

Model Number: OPE2

Client Name: Chamberlain Group Inc.

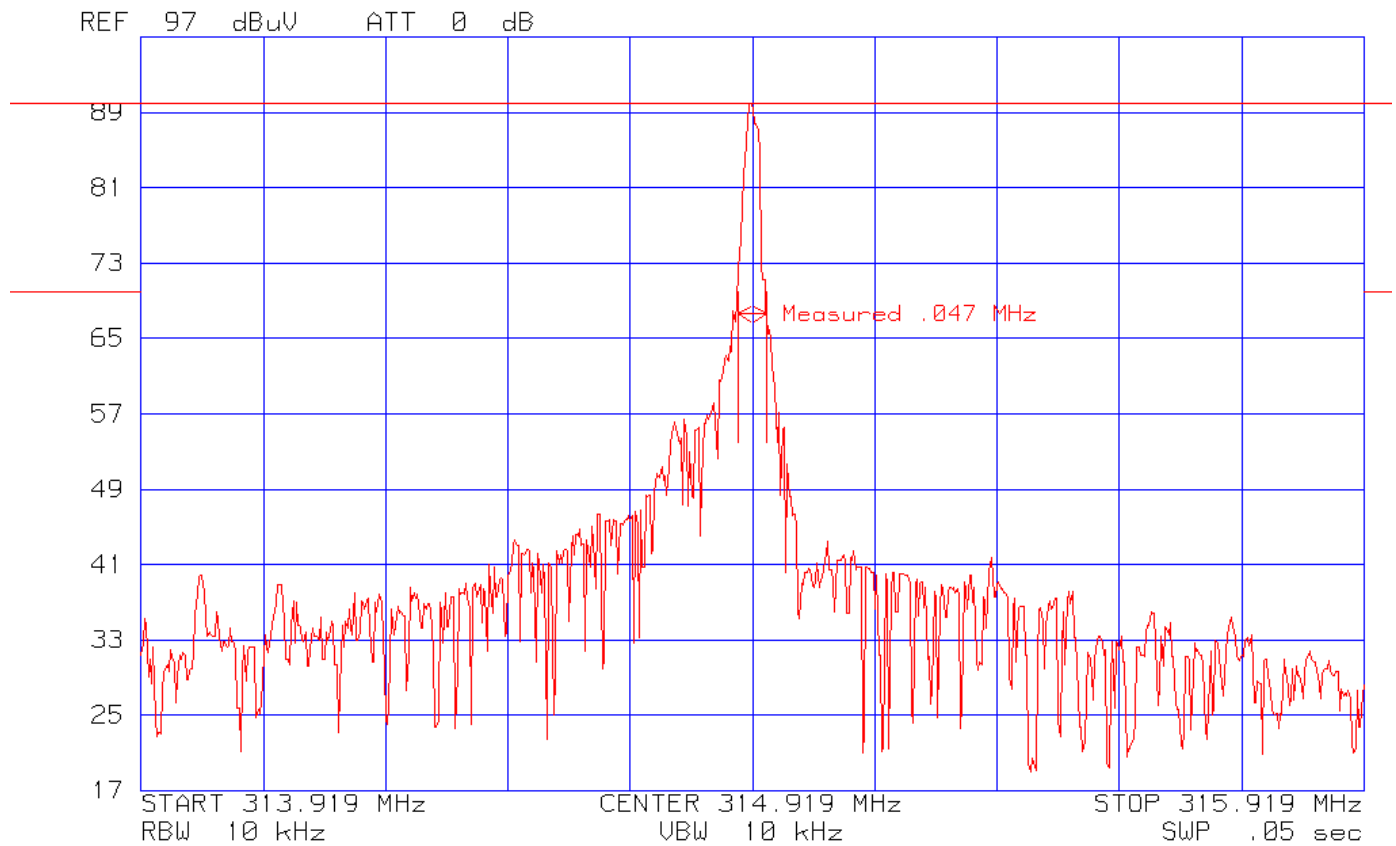
FCC ID: JLFPT2

Figure 1 Test Setup for Occupied Bandwidth



Figure 2 Occupied Bandwidth Graph

20dB Occupied Bandwidth

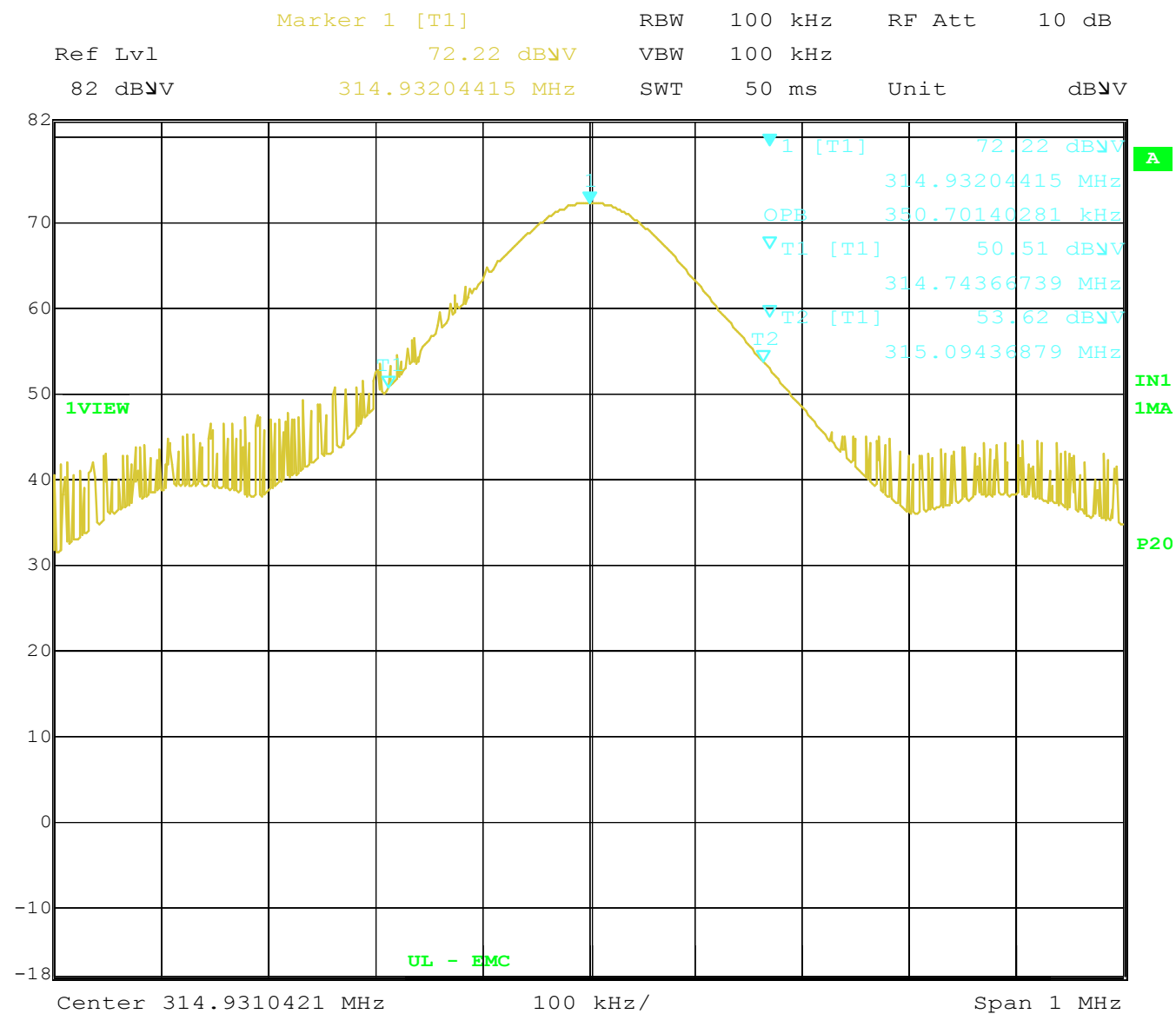


Page 16 of 37

FCC ID: JLFPTE2

Figure 3 Occupied Bandwidth Graph

99% Power Occupied Bandwidth



Date: 25.SEP.2007 10:09:33

Job Number: 772545 File Number: MC3181 Page 17 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Table 4 Occupied Bandwidth Results

Occupied Bandwidth Results	Measured (MHz)		Limit (MHz)	
	dBc	99%	0.788	
	0.047	0.351	Pass	Pass
Supplementary information: None				

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 # (See Section 1.3.4)	EUT Configurations Mode # (See Section 1.6)	EUT Operation Mode # (See 1.5)
1	1	1
Supplementary information: None		

Table 6 Cease Operation Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Advantest	R3261C	5A229
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268
Measurement Software	UL	Version 9.3	44740

Job Number: 772545

File Number: MC3181

Page 19 of 37

Model Number: OPE2

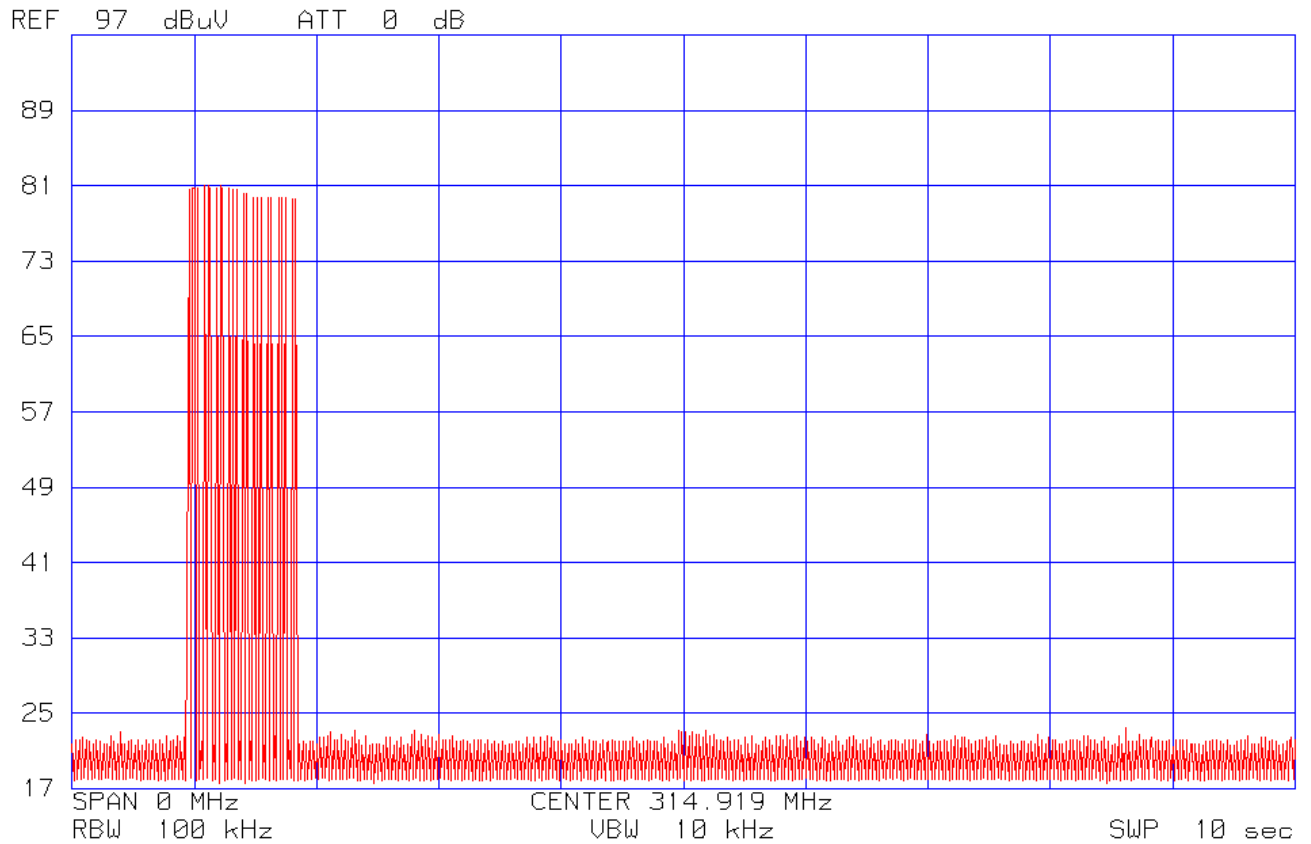
Client Name: Chamberlain Group Inc.

FCC ID: JLFPT2

Figure 4 Test Setup for Cease Operation



Figure 5 Cease Operation Graph



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 # (See Section 1.3.4)	EUT Configurations Mode # (See Section 1.6)	EUT Operation Mode # (See 1.5)
1	1	2
Supplementary information: None		

Table 8 Pulse Train Calculation

Pulse Width (mS)	Total Transmission time or 100ms which ever is lesser	Average Correction Factor (dB) $20 \log \left(\frac{PulseWidth}{TotalTransmissionTime} \right)$
30.6	100	-10.2

Table 9 Pulse Train Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268
Measurement Software	UL	Version 9.3	44740

Job Number: 772545
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

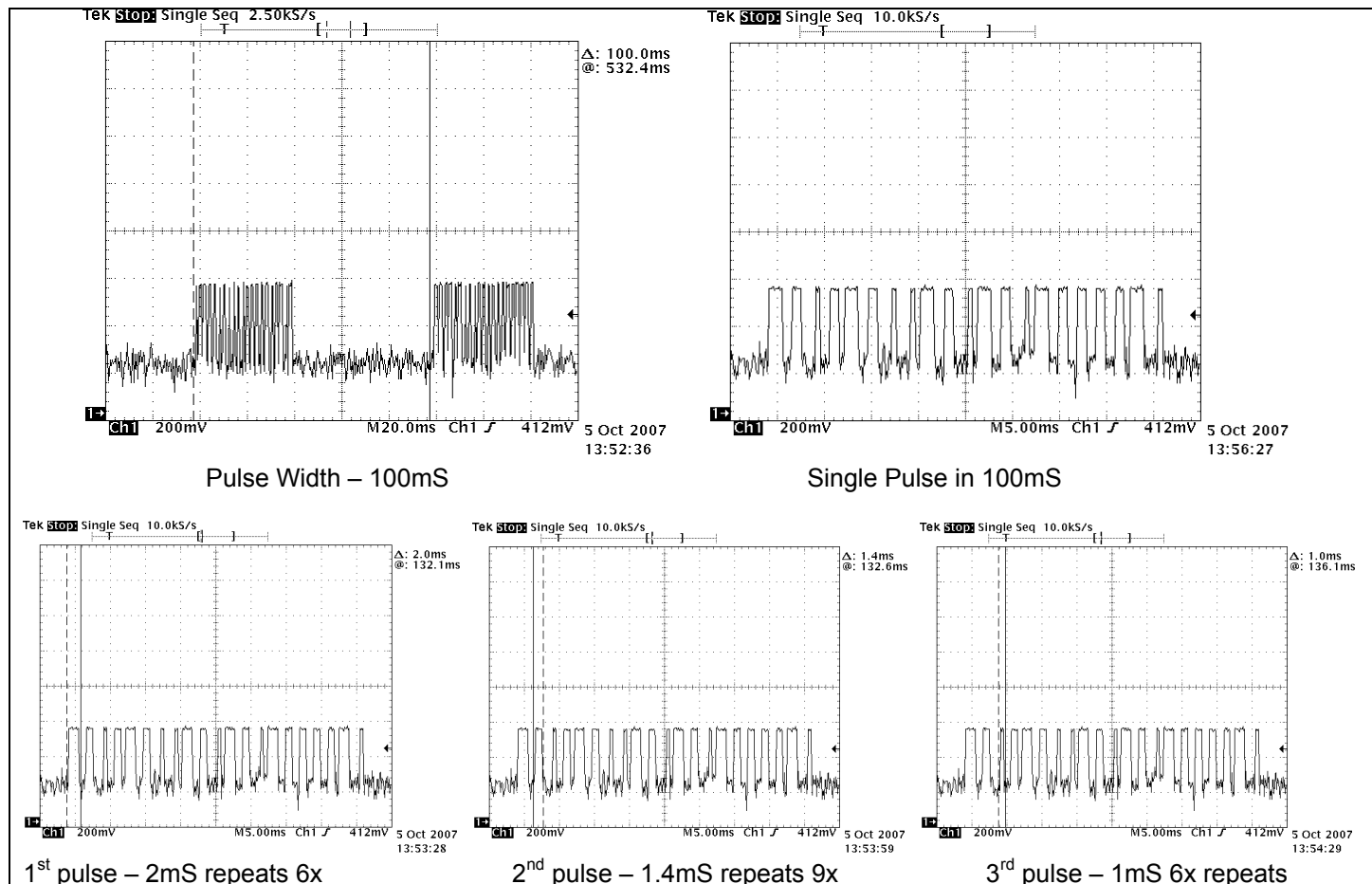
File Number: MC3181

Page 22 of 37

Figure 6 Test Setup for Pulse Train



Figure 7 Pulse Train Graph



4.4 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 3-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			
UL LPG		80-EM-S0029	
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	0.009 MHz – 1GHz	(3 meter measurement distance)	
Fully configured sample scanned over the following frequency range	1GHz – 5GHz	(3 meter measurement distance)	
Limits			
Frequency (MHz)	Limit (dBµV/m)		
	Quasi-Peak	Average	
	General Emissions	Fundamental	Spurious
0.009 – 0.490	128.5 – 93.8	-	-
0.490 – 1.705	73.8 – 63	-	-
1.705 – 30	69.5	-	-
30 – 88	40	-	-
88 – 216	43.5	-	-
216-960	46	-	
1000-10000	-	-	54
315	-	75.6	
315 - 3150	-		55.6
Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits.			

Job Number: 772545
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

File Number: MC3181

Page 25 of 37

Table 10 Radiated Emissions EUT Configuration Settings

Power Interface Mode # (See Section 1.3.4)	EUT Configurations Mode # (See Section 1.6)	EUT Operation Mode # (See 1.5)
1	1	1
Supplementary information: If the maximized peak of the fundamental or fundamental spurious emissions is less than the limit, no averaging factor was applied.		

Table 11 Radiated Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
9kHz-30MHz			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Active Loop Antenna	EMCO	6507	ME5A-288
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Bicon Antenna	Schaffner	VBA6106A	54
Log-P Antenna	Schaffner	UPA6109	44067
Bias Tee	Miteq	AM-1523-7687	44392
Bias Tee	Miteq	AM-1523-7687	44393
Preamp	Miteq	AM-3A-000110-7687	44391
Preamp	Miteq	AM-3A-000110-7687	44394
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740

Job Number: 772545 File Number: MC3181 Page 26 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268
Above 1GHz			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Horn Antenna	Electro-Metrics	RGA-180	ME5-565
Preamplifier (1 - 26GHz)	HP	8449B	ME5-914
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/ Pressure Meter	Cole Parmer	99760-00	4268

Figure 8 Test setup for Radiated Emissions (30MHz-1GHz)

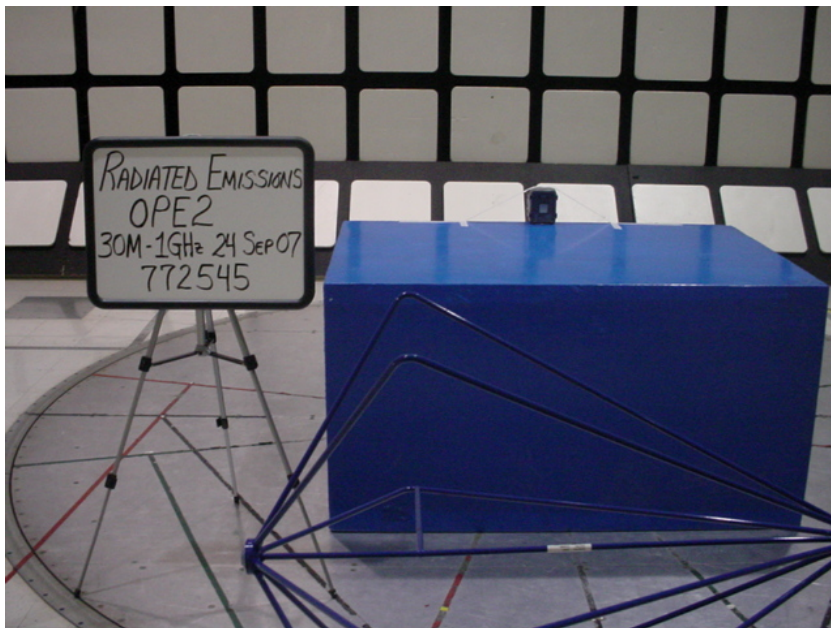


Figure 9 Test setup for Radiated Emissions (1-5GHz)

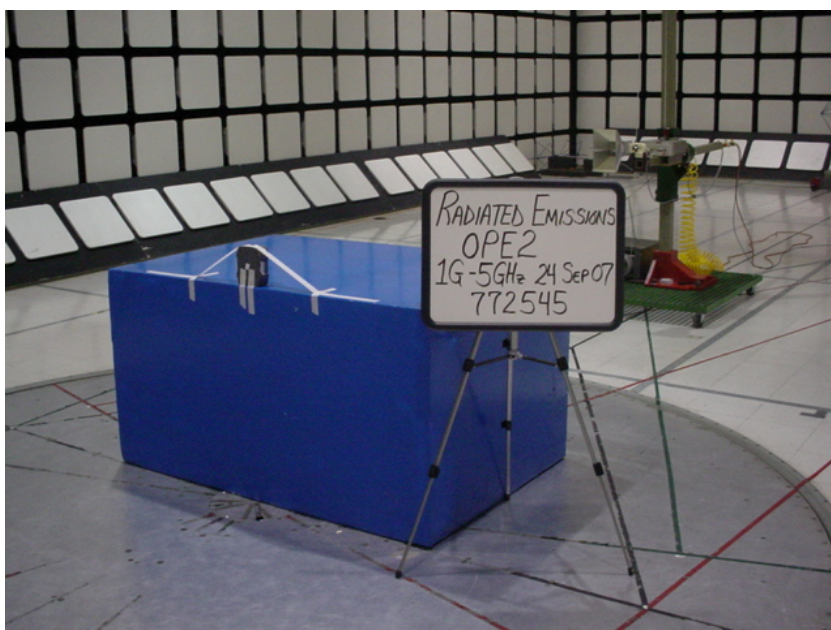
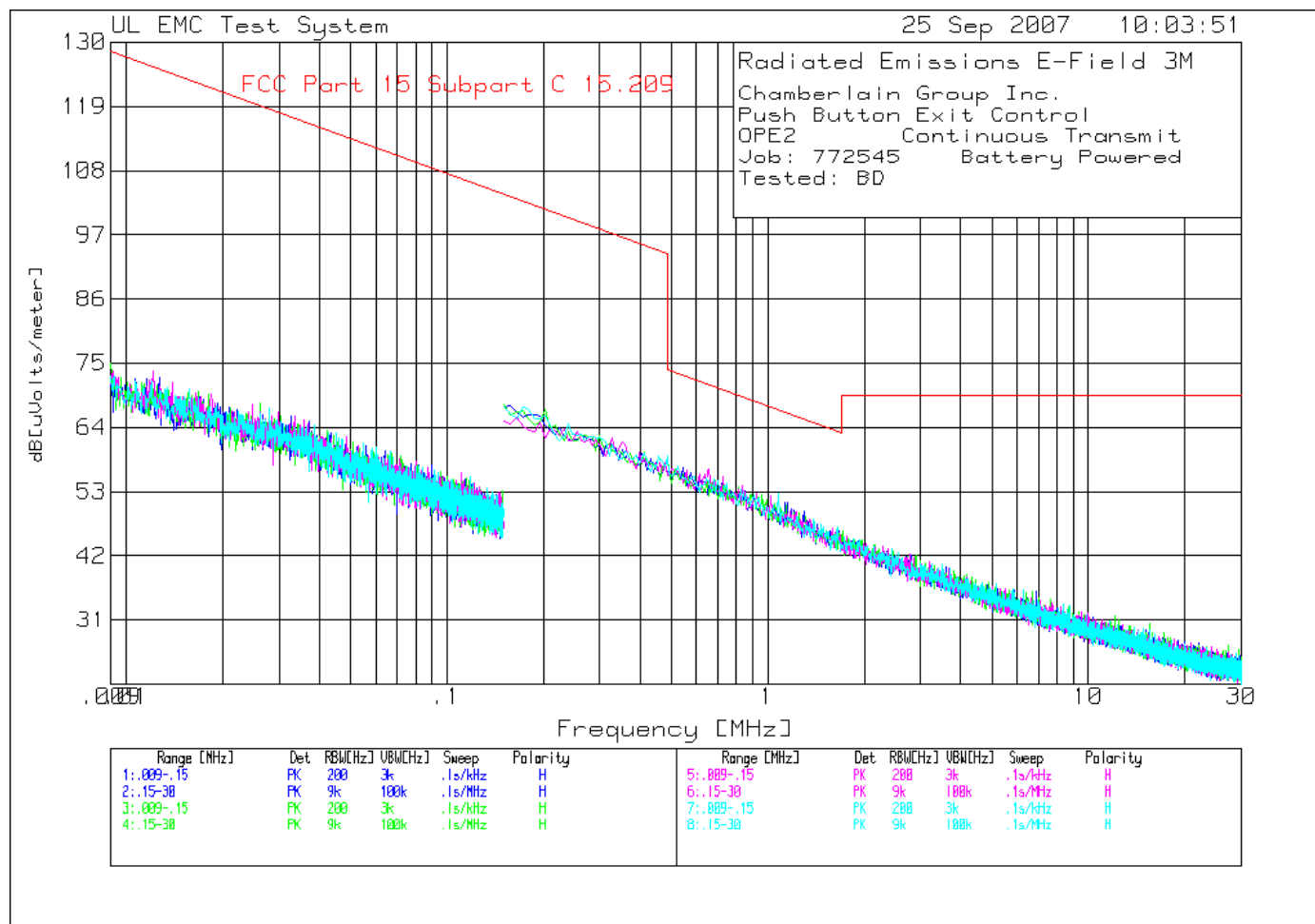


Figure 11 Radiated Emissions Graph



Job Number: 772545 File Number: MC3181 Page 29 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Table 13 Radiated Emissions Data Points

Chamberlain Group Inc.
 Push Button Exit Control
 OPE2 Continuous Transmit
 Job: 772545 Battery Powered
 Tested: BD

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
0°	.009 - .15MHz	-----									
1	.01069	43.59 pk	0	28.8	72.39	127	-	-	-	-	-
	Azimuth:224	Height:100	Horz	Margin [dB]	-54.61		-	-	-	-	-
0°	.15 - 30MHz	-----									
2	.15746	51.98 pk	.1	15.7	67.78	103.7	-	-	-	-	-
	Azimuth:1	Height:100	Horz	Margin [dB]	-35.92		-	-	-	-	-
45°	.009 - .15MHz	-----									
3	.01357	43.21 pk	0	27.1	70.31	124.9	-	-	-	-	-
	Azimuth:353	Height:120	Horz	Margin [dB]	-54.59		-	-	-	-	-
45°	.15 - 30MHz	-----									
4	.15	52.09 pk	.1	15.7	67.89	104.1	-	-	-	-	-
	Azimuth:329	Height:120	Horz	Margin [dB]	-36.21		-	-	-	-	-
90°	.009 - .15MHz	-----									
5	.0165	44.33 pk	.1	25.4	69.83	123.2	-	-	-	-	-
	Azimuth:354	Height:139	Horz	Margin [dB]	-53.37		-	-	-	-	-
90°	.15 - 30MHz	-----									
6	.23211	47.93 pk	.1	15.6	63.63	100.3	-	-	-	-	-
	Azimuth:221	Height:139	Horz	Margin [dB]	-36.67		-	-	-	-	-
135°	.009 - .15MHz	-----									
7	.02395	42.78 pk	.2	22.6	65.58	120	-	-	-	-	-
	Azimuth:285	Height:159	Horz	Margin [dB]	-54.42		-	-	-	-	-
135°	.15 - 30MHz	-----									
8	.41125	43.92 pk	.1	15.5	59.52	95.3	-	-	-	-	-
	Azimuth:159	Height:159	Horz	Margin [dB]	-35.78		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

Job Number: 772545 File Number: MC3181 Page 31 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Table 14 Radiated Emissions Data Points

Chamberlain Group Inc.
 Push Button Exit Control
 OPE2 Continuous Transmit
 Job: 772545 Battery Powered
 Tested: RM

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	Averaging	Corrected Level 4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]		Factor	dB[uVolts/meter]		
[MHz]	[dB(uV)]	[dB]	[dB]						
=====									
Horizontal 30 - 200MHz	-----								
33.8559	1.91 pk	-.3	17.1	18.71	40	-	-	-	-
Azimuth:37	Height:400	Horz	Margin [dB]		-21.29	-	-	-	-
130.3669	4.07 pk	0	13.9	17.97	43.5	-	-	-	-
Azimuth:106	Height:250	Horz	Margin [dB]		-25.53	-	-	-	-
Horizontal 200 - 1000MHz									
314.9345	53.82 pk	.5	14.1	68.42	75.6	-	-	-	-
Azimuth: 168	Height:102	Horz	Margin [dB]:		-7.18	-	-	-	-
629.8756	29.93 pk	1.2	20.4	51.53	55.6	-	-	-	-
Azimuth: 21	Height:179	Horz	Margin [dB]:		-4.07	-	-	-	-
944.8061	27.35 pk	1.6	23.6	52.55	55.6	-	-	-	-
Azimuth: 19	Height:212	Horz	Margin [dB]:		-3.05	-	-	-	-
Vertical 200 - 1000MHz									
314.935	58.93 pk	.5	14.3	73.73	75.6	-	-	-	-
Azimuth: 80	Height:179	Vert	Margin [dB]:		-1.87	-	-	-	-
629.8729	41.77 pk	1.2	20.7	63.67	55.6	-10.2	53.47	-	-
Azimuth: 49	Height:102	Vert	Margin [dB]:		-2.13	-	-	-	-
944.8011	32.26 pk	1.6	24.2	58.06	55.6	-10.2	47.86	-	-
Azimuth: 61	Height:120	Vert	Margin [dB]:		-7.74	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209 / 15.231

pk - Peak detector (maximized peak values)

Job Number: 772545 File Number: MC3181 Page 33 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Table 15 Radiated Emissions Data Points

Chamberlain Group Inc.
 Push Button Exit Control
 OPE2 Continuous Transmit
 Job: 772545 Battery Powered
 Tested: RM

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 1000 - 2500MHz										
1259.6558	44.89 pk	-34.7	25.3	35.49	54	55.6	-	-	-	-
Azimuth: 355	Height:101	Horz		Margin [dB]:	-18.51	-	-	-	-	-
1574.6622	45.67 pk	-34.1	25.7	37.27	54	*	-	-	-	-
Azimuth: 19	Height:128	Horz		Margin [dB]:	-16.73	*	-	-	-	-
1889.6014	48.24 pk	-33.6	27.2	41.84	54	55.6	-	-	-	-
Azimuth: 192	Height:104	Horz		Margin [dB]:	-12.16	-	-	-	-	-
2204.5527	44.91 pk	-33.2	28.3	40.01	54	*	-	-	-	-
Azimuth: 171	Height:123	Horz		Margin [dB]:	-13.99	*	-	-	-	-
Horizontal 2500 - 5000MHz										
2519.5821	39.6 pk	-32.8	28.9	35.7	54	55.6	-	-	-	-
Azimuth: 191	Height:137	Horz		Margin [dB]:	-18.3	-	-	-	-	-
2834.3516	38.63 pk	-32.5	29.7	35.83	54	*	-	-	-	-
Azimuth: 346	Height:135	Horz		Margin [dB]:	-18.17	*	-	-	-	-
3153.769	36.95 pk	-32.2	30.6	35.35	54	55.6	-	-	-	-
Azimuth: 22	Height:148	Horz		Margin [dB]:	-18.65	-	-	-	-	-
3470.647	36.61 pk	-31.3	31.5	36.81	54	55.6	-	-	-	-
Azimuth: 190	Height:193	Horz		Margin [dB]:	-17.19	-	-	-	-	-
3470.647	22.96 ave	-31.3	31.5	23.16	54	55.6	-	-	-	-
Azimuth: 190	Height:193	Horz		Margin [dB]:	-30.84	-	-	-	-	-
3777.518	35.38 pk	-31.2	32.1	36.28	54	*	-	-	-	-
Azimuth: 117	Height:153	Horz		Margin [dB]:	-17.72	*	-	-	-	-

* Frequency located in a restricted band and only subject to 15.209 limits.
 LIMIT 1: FCC Part 15.209
 LIMIT 2: FCC Part 15.231

pk - Peak detector (maximized peak values)

Job Number: 772545 File Number: MC3181 Page 34 of 37
 Model Number: OPE2
 Client Name: Chamberlain Group Inc.
 FCC ID: JLFPT2

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB (uV)]	[dB]	[dB]							
=====										
Horizontal 2500 - 5000MHz										
4097.732	35.27 pk	-30.4	32.5	37.37	54	*	-	-	-	-
Azimuth: 166	Height:153	Horz	Margin	[dB]:	-16.63	*	-	-	-	-
4411.274	34.86 pk	-30.4	32.3	36.76	54	55.6	-	-	-	-
Azimuth: 304	Height:122	Horz	Margin	[dB]:	-17.24	-	-	-	-	-
4723.149	34.21 pk	-30.1	32.7	36.81	54	*	-	-	-	-
Azimuth: 97	Height:156	Horz	Margin	[dB]:	-17.19	*	-	-	-	-
Vertical 1000 - 2500MHz										
1259.7251	51.15 pk	-34.7	25.4	41.85	54	55.6	-	-	-	-
Azimuth: 238	Height:102	Vert	Margin	[dB]:	-12.15	-	-	-	-	-
1574.663	48.58 pk	-34.1	25.7	40.18	54	*	-	-	-	-
Azimuth: 226	Height:144	Vert	Margin	[dB]:	-13.82	*	-	-	-	-
1889.6325	49.71 pk	-33.6	27.2	43.31	54	55.6	-	-	-	-
Azimuth: 107	Height:108	Vert	Margin	[dB]:	-10.69	-	-	-	-	-
Vertical 1000 - 2500MHz										
2204.5797	46.07 pk	-33.2	28.1	40.97	54	*	-	-	-	-
Azimuth: 127	Height:126	Vert	Margin	[dB]:	-13.03	*	-	-	-	-

* Frequency located in a restricted band and only subject to 15.209 limits.

LIMIT 1: FCC Part 15.209

LIMIT 2: FCC Part 15.231

pk - Peak detector (maximized peak values)

Job Number: 772545 File Number: MC3181 Page 35 of 37
Model Number: OPE2
Client Name: Chamberlain Group Inc.
FCC ID: JLFPT2

4.5 Fundamental Frequency And Spurious Emissions Measurement Limit Calculations

4.5.1 Limit Calculation

Fundamental Frequency is $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$.

Limit = $41.6667(315\text{MHz}) - 7083.3333$

Limit = $20 \cdot \log(\text{mV/m})$

Limit = $20 \cdot \log(6041.6772)$

Limit = 75.6dBuV/m

4.5.2 Spurious Emissions Limit

20dB lower than Fundamental Limit

Limit = 75.6dBuV/m – 20dB

Limit = 55.6dBuV/m

4.5.3 Radiated Emissions Limit conversion from mV/m to dBmV/m (accordance with paragraph 15.209)

Radiated Emissions Limit (dBmV/m) = $20 \cdot \log(\text{mV/m})$

Radiated Emissions Limit (dBmV/m) = $20 \cdot \log(90)$

Radiated Emissions Limit (dBmV/m) = 39.1

4.5.4 Radiated Emissions test data obtained during measurements.

Field Strength (dBmV/m) = Measured field strength (dBmV/m) + Antenna Factor (dB) + Cable Factor (dB)

Field Strength (dBmV/m) = 58.93dBuV + 14.3dB/m + 0.5dB

Field Strength (dBmV/m) = 73.73 dBuV/m

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100255-0

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/1002550.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. 91040).



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 2181



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-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.



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