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Job Number: 1001154503  
Project Number: 09NK12688 Rev.1  
File Number: MC3181  
Date: October 02, 2009  
Model: NLS1

## Electromagnetic Compatibility Test Report

For

**Chamberlain Group Inc.**

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Job #: 1001154503  
Model Number:  
Client Name:

Project #: 09NK12688 Rev.1  
NLS1  
Chamberlain Group Inc.

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## 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: **October 02, 2009**

Product Type: **900MHz Low Power Transceiver**

Product standards: **FCC Part 15, Subpart C, 15.247, RSS-Gen, RSS-210**

Model Number: **NLS1**

EUT Category: **Frequency Hopping Spread Spectrum Transmitter**

Testing Start Date: **August 27, 2009**

Date Testing Complete: **October 01, 2009**

**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.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
2009/10/27	Rev. 1 – Minor Editorial changes	Bart Mucha	Jack Steiner

**1.0 GENERAL - Product Description**

**1.1 Equipment Description**

The Equipment Under Test (EUT) is a 900MHz wireless intercom system

**1.2 Device Configuration During Test**

**1.2.1 Equipment Used During Test:**

Use	Product Type	Manufacturer	Model	Comments
EUT	Low Power Transceiver	Chamberlain Group Inc.	NLS1	None

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
1	Mains	AC	N	N	AC/DC Adapter

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	6VDC	-	-	DC	-	Internal Battery
2	120V	-	-	60Hz	1	None

**1.3 EUT Configurations**

Mode #	Description
1	EUT was configured with special test software allowing it to be operated in various modes

**1.4 EUT Operation Modes**

Mode #	Description
1	EUT in Receive Mode, Hopping
2	EUT in Transmit Mode (Voice Packet or Wakeup Packet) on either Low, Middle or High Channels
3	EUT Transmitting in hopping mode (Voice) on all channels.

## 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 C, 15.247	Code of Federal Regulations, Part 15, Radio Frequency Devices	2009
RSS-210, Issue 7	Low-Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	June 2007
RSS-Gen, Issue 2	General Requirements and Information for the Certification of Radiocommunication Equipment	June 2007

**2.4 Results Summary**

Requirement – Test	References	Result (Compliant / Non-Compliant)*
Conducted Emissions - mains	47 CFR Part 15.207	Compliant
	RSS-Gen 7.2.2	
Radiated Emissions - Digital	47 CFR Part 15.209	Compliant
	RSS-Gen 7.2.3	
Spurious Emissions (Radiated and Antenna Conducted)	47 CFR Part 15.247(d)	Compliant
	RSS-210 A8.5	
	RSS-Gen 7.2.1 and 7.2.3	
Bandedge Compliance	47 CFR Part 15.247(d)	Compliant
	RSS-210 A8.5	
Carrier Frequency Separation	47 CFR Part 15.247(a)(1)	Compliant
	RSS-210 A8.1(b)	
Number of Hopping Frequencies/Channels	47 CFR Part 15.247(a)(1)(i)	Compliant
	RSS-210 A8.1(c)	
Dwell Time and Duty Cycle Factor	47 CFR Part 15.247(a)(1)(i)	Compliant
	RSS-210 A8.1(c)	
20dB Bandwidth	47 CFR Part 15.247(a)(1)(i)	Compliant
	RSS-210 A8.1(c)	
Maximum Peak Output Power	47 CFR Part 15.247(b)(2)	Compliant
	RSS-210 A8.4(1)	
99% Occupied Bandwidth	RSS-Gen 4.6	Compliant

Test Engineer:



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 Senior Project Engineer  
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 Conformity Assessment Services-

Reviewer:



Jack L. Steiner(Ext.42307)  
 Section Manager  
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 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:

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

Code of Federal Regulations Title 47	Part 15, Subpart B & C, Radio Frequency Devices
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----- Canada -----

Industry Canada	Spectrum Management and Telecommunications Radio Standards Specifications
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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 – 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	FCC Part 15, Subpart C, 15.207 RSS-Gen 7.2.2	
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
<b>Limits - Class B</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 #
2	1	3
Supplementary information: None		

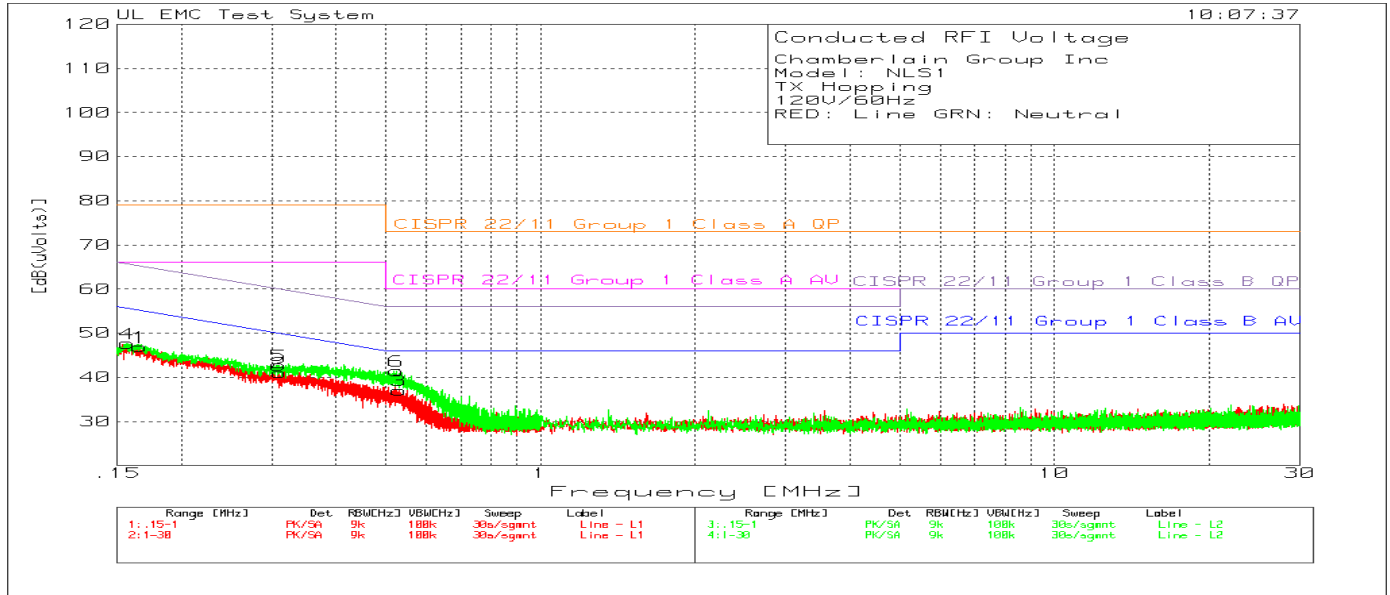
**Table 2 Conducted Emissions Test Equipment**

Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328
Transient Limiter	Electro-Metrics	EM7600-2	EMC4224
HighPass Filter	Solar Electronics	2803-150	885551
Attenuator	HP	8494B	2831A00838
LISN - L1	Solar	8602-50-TS-50-N	EMC4052
LISN - L2	Solar	8602-50-TS-50-N	EMC4064
<b>FILE USED FOR TESTING</b>			
CISPR 22_11 w_ Dongle Line land2.TST			

**Figure 1 Test Setup for Conducted Emissions**



**Figure 2 Conducted Emissions Graph**



No differences recorded in conducted emission noise between transmit mode and receive mode. Only TX mode data provided.

**Table 3 Conducted Emissions Data Points**

Chamberlain Group Inc  
 Model: NLS1  
 TX Hopping  
 120V/60Hz  
 RED: Line GRN: Neutral

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											
1	.16614	31.83 pk	13.4	1.6	46.83	79	66	65.2	55.2	-	-
				Margin [dB]		-32.17	-19.17	-18.37	-8.37	-	-
2	.31053	29.69 pk	10.7	.6	40.99	79	66	60	50	-	-
				Margin [dB]		-38.01	-25.01	-19.01	-9.01	-	-
3	.53052	26.2 pk	10.5	.3	37	73	60	56	46	-	-
				Margin [dB]		-36	-23	-19	-9	-	-
Neutral											
4	.15722	31.87 pk	14	1.8	47.67	79	66	65.6	55.6	-	-
				Margin [dB]		-31.33	-18.33	-17.93	-7.93	-	-
5	.30926	31.46 pk	10.7	.6	42.76	79	66	60	50	-	-
				Margin [dB]		-36.24	-23.24	-17.24	-7.24	-	-
6	.52457	30.65 pk	10.5	.3	41.45	73	60	56	46	-	-
				Margin [dB]		-31.55	-18.55	-14.55	-4.55	-	-

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 - Linear average detector

**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 RSS-Gen 7.2.3		
UL LPG	80-EM-S0029		
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	30MHz – 10GHz	(3 meter or 10 meter)	
<b>Limits - Class B</b>			
Frequency (MHz)	Limit (dBµV/m)		
	Quasi-Peak 10 meter	Quasi-Peak 3 meter	Average
30 - 88	29.54	40	NA
88 - 216	33.06	43.52	NA
216 - 960	35.56	46.02	NA
960 – 1,000	43.52	53.97	NA
1,000 – 10,000	NA	NA	54 (3 meter distance)
Supplementary information: None			

**Table 4 Radiated Emissions EUT Configuration Settings**

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

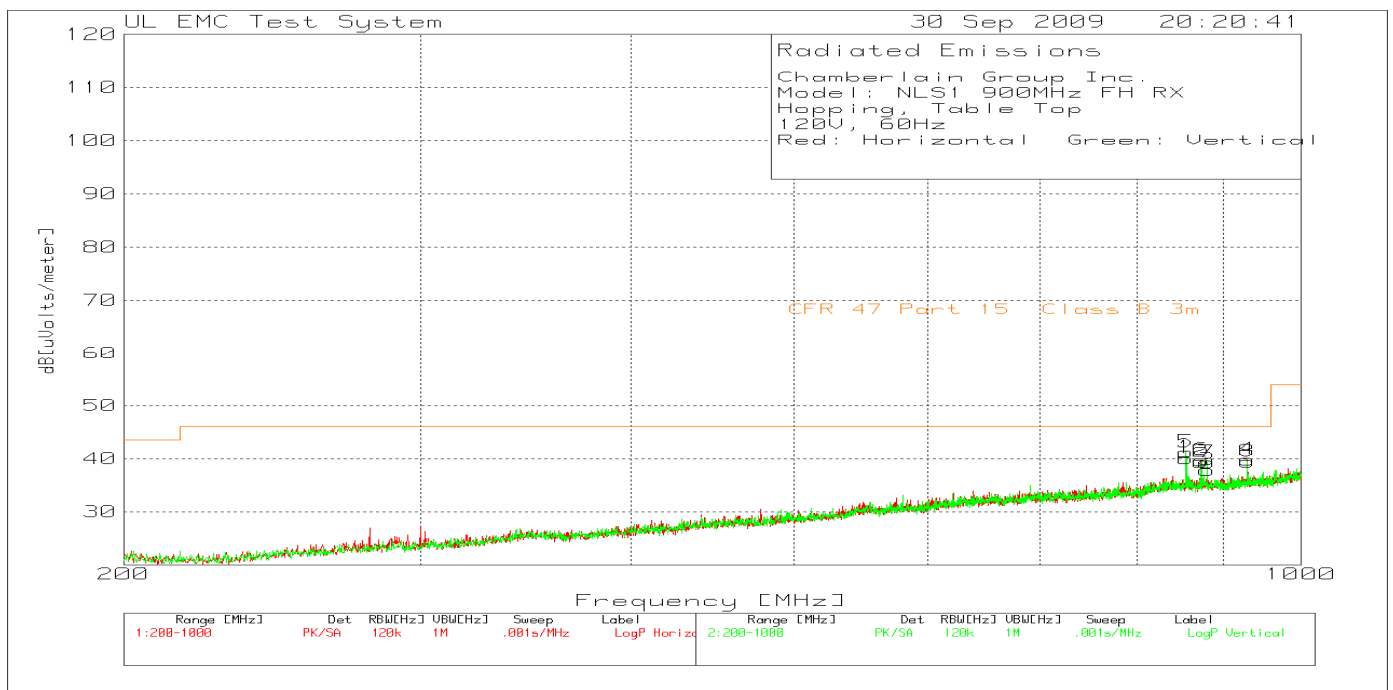
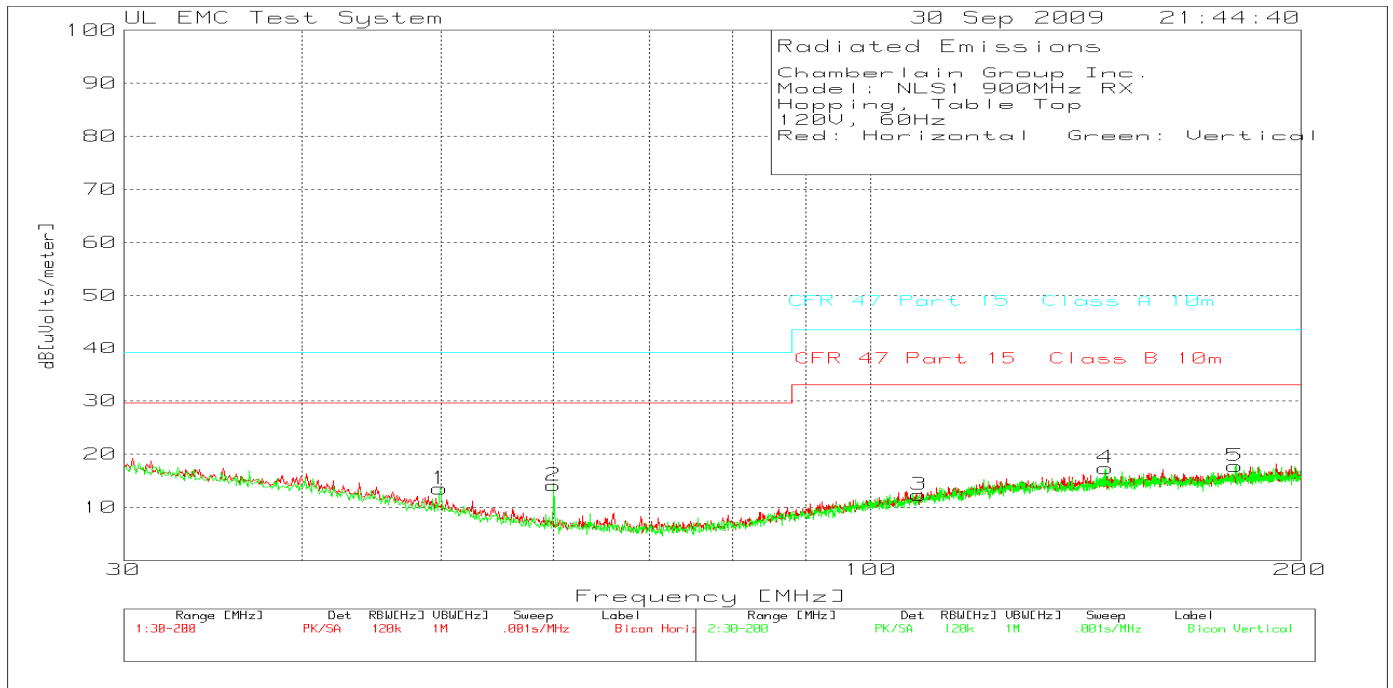
**Table 5 Radiated Emissions Test Equipment**

Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

**Figure 3 Test setup for Radiated Emissions**



Figure 4 Radiated Emissions Graph 30MHz – 200MHz & 200MHz – 1GHz, RX, Table Top



No Emissions from EUT in Receiver mode recorded.

**Table 6 Radiated Emissions Data Points 30MHz – 200MHz & 200MHz – 1GHz, RX, Tabletop**

Chamberlain Group Inc.  
 Model: NLS1 900MHz RX  
 Hopping, Table Top  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 4	Margin 4[dB]	Height [cm]	Polarity
1	49.965	33.8	pk	-30.4	10.1	13.5	29.6	-16.1	100	Vert
2	59.99	37.64	pk	-30.3	6.8	14.14	29.6	-15.46	100	Vert
3	108.076	30.75	pk	-30.1	11.7	12.35	33.1	-20.75	100	Vert
4	145.967	32.89	pk	-30.1	14.6	17.39	33.1	-15.71	100	Vert
5	180.035	32.06	pk	-30	15.7	17.76	33.1	-15.34	100	Vert

LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector

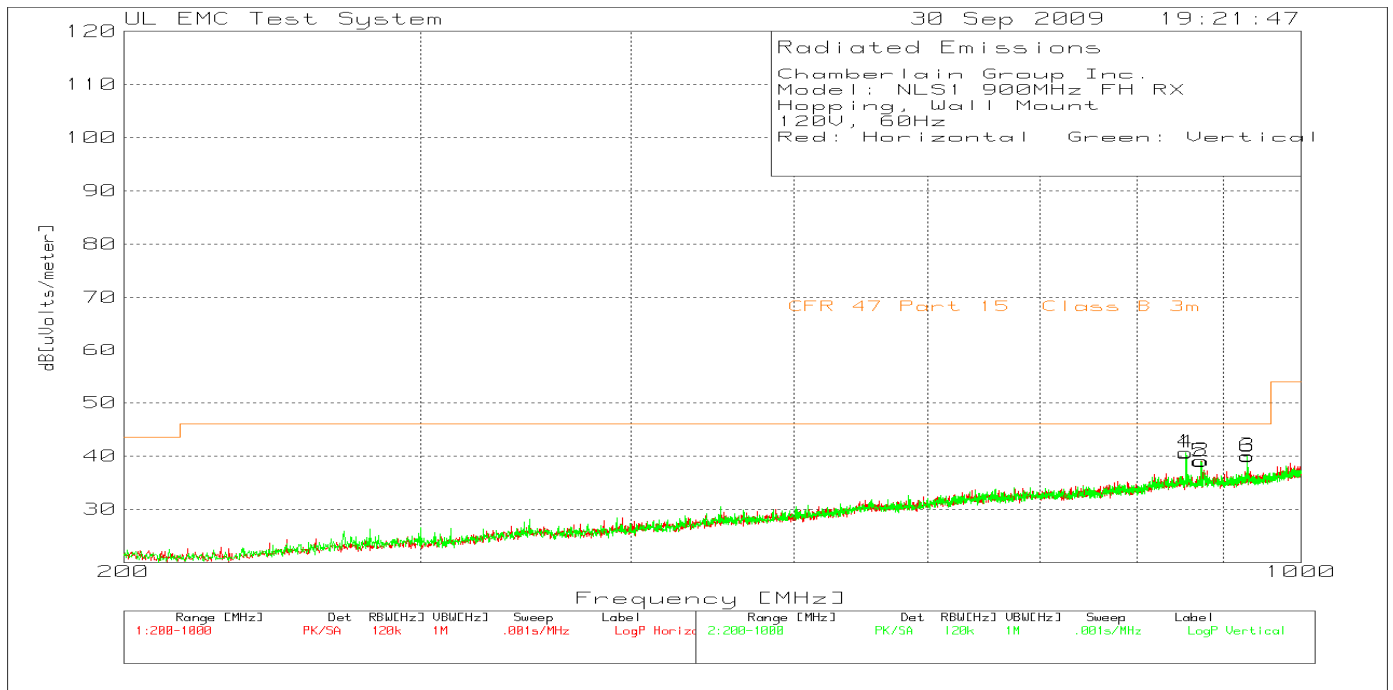
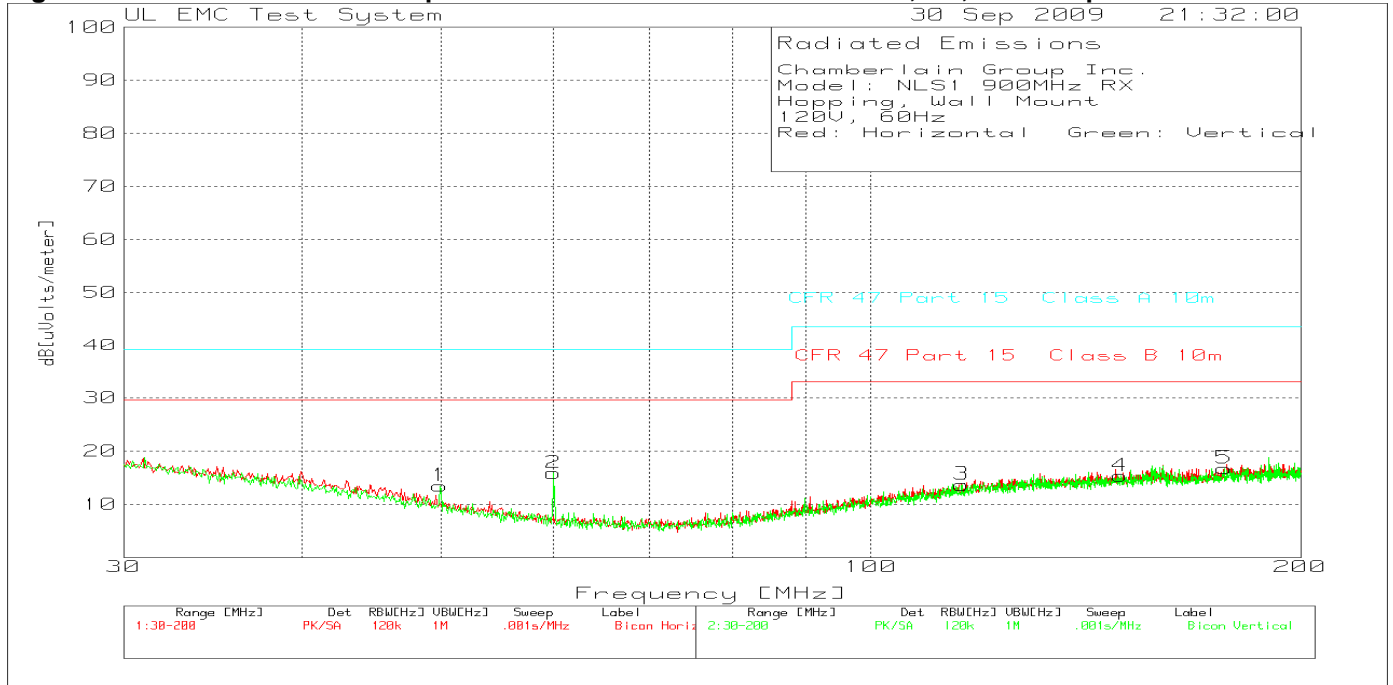
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
1	854.7635	13.47	pk	3.5	23.2	40.17	46	-5.83	150	Horz
2	872.6183	12.95	pk	3.5	23	39.45	46	-6.55	150	Horz
3	879.547	11.27	pk	3.5	23.1	37.87	46	-8.13	250	Horz
4	929.9134	12.53	pk	3.7	23.6	39.83	46	-6.17	150	Horz
5	854.7635	14.56	pk	3.5	23.2	41.26	46	-4.74	150	Vert
6	873.1512	13.24	pk	3.5	23	39.74	46	-6.26	250	Vert
7	879.547	12.72	pk	3.5	23.1	39.32	46	-6.68	100	Vert
8	929.9134	12.14	pk	3.7	23.6	39.44	46	-6.56	200	Vert

LIMIT 2: CFR 47 Part 15 Class B 3m

Note: 854MHz, 872MHz, 879MHz and 929MHz are not from EUT.

PK - Peak detector  
 QP - Quasi-Peak detector

**Figure 5 Radiated Emissions Graph 30MHz – 200MHz & 200MHz – 1GHz, RX, Table Top**



No Emissions from EUT in Receiver mode recorded.



**Table 7 Radiated Emissions Data Points 30MHz – 200MHz & 200MHz – 1GHz, RX, Tabletop**

Chamberlain Group Inc.  
 Model: NLS1 900MHz RX  
 Hopping, Wall Mount  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 4	Margin 4[dB]	Height [cm]	Polarity
1	49.965	33.78	pk	-30.4	10.1	13.48	29.6	-16.12	100	Vert
2	59.99	39.39	pk	-30.3	6.8	15.89	29.6	-13.71	100	Vert
3	115.8071	31.01	pk	-30.1	12.8	13.71	33.1	-19.39	100	Vert
4	149.5352	30.84	pk	-30.2	14.7	15.34	33.1	-17.76	100	Vert
5	176.8066	31.26	pk	-30	15.5	16.76	33.1	-16.34	100	Vert

LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector  
 QP - Quasi-Peak detector

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
1	854.7635	14.02	pk	3.5	23.2	40.72	46	-5.28	200	Horz
2	873.1512	12.63	pk	3.5	23	39.13	46	-6.87	200	Horz
3	929.9134	12.77	pk	3.7	23.6	40.07	46	-5.93	200	Horz
4	854.7635	13.94	pk	3.5	23.2	40.64	46	-5.36	150	Vert
5	872.3518	12.53	pk	3.5	23	39.03	46	-6.97	150	Vert
6	929.9134	12.64	pk	3.7	23.6	39.94	46	-6.06	150	Vert

Note: 854MHz, 872MHz, 879MHz and 929MHz are not from EUT.

LIMIT 2: CFR 47 Part 15 Class B 3m

PK - Peak detector  
 QP - Quasi-Peak detector

Figure 6 Radiated Emissions Graph 1GHz – 10GHz Tabletop

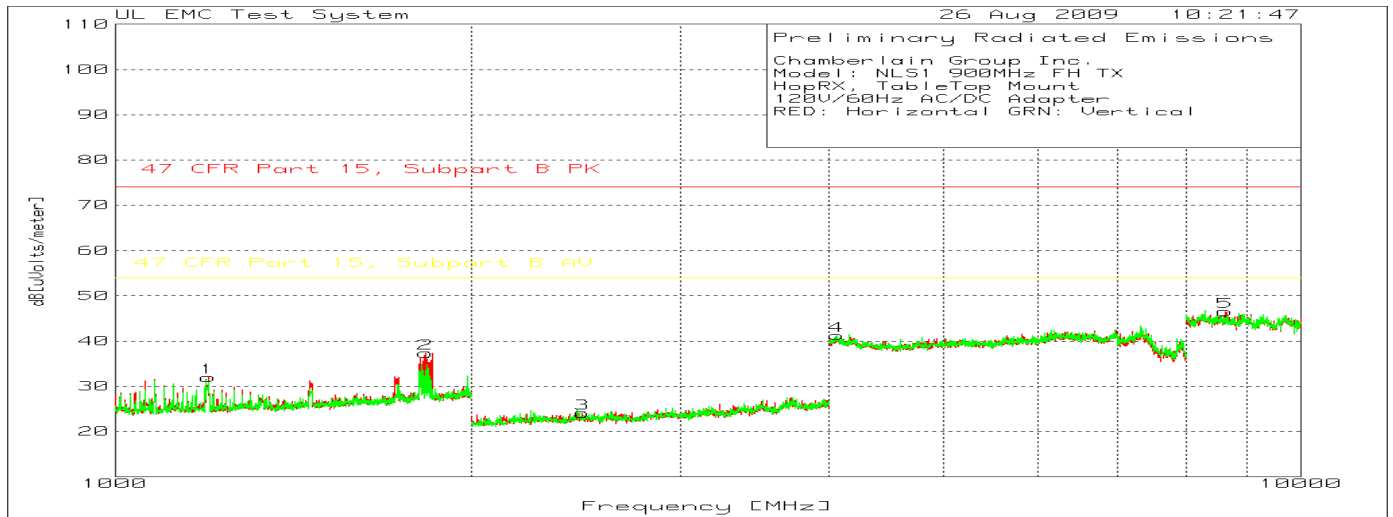
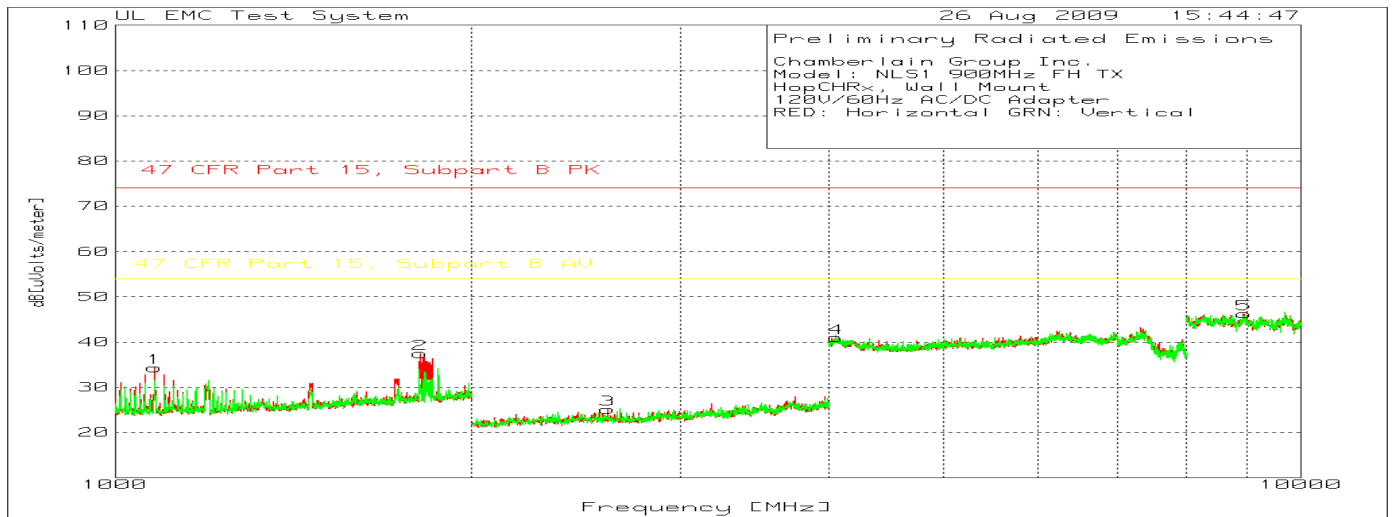


Figure 7 Radiated Emissions Graph 1GHz – 10GHz Wall mount



**4.3 Test Conditions and Results – SPURIOUS EMISSIONS (Antenna Conducted and Radiated)**

Test Description	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).		
Basic Standard	47 CFR Part 15.247(d) RSS-210, A8.5 RSS-Gen 7.2.1 and 7.2.3		
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	10 meter / 3 meter distance as noted / or antenna port	
Fully configured sample scanned over the following frequency range	1GHz – 10GHz	3 meter distance and / or antenna port	
<b>Limits (Antenna Conducted)</b>			
All emissions must be 20dB below the level of the fundamental frequency.			
<b>Limits (Radiated – Restricted Bands Only)</b>			
Frequency (MHz)	Limit (dB $\mu$ V/m)		
	Quasi-Peak (10 meter)	Average (3 meter)	
	General Emissions	Fundamental	Spurious
30 – 88	29.54	-	-
88 – 216	33.06	-	-
216-960	35.56	-	-
960-1000	43.52	-	-
1,000-25,000	-	-	54
Supplementary information: Below 1GHz, spectrum was checked. All emissions related to the transmitter below 1GHz are not in the restricted band therefore only antenna conducted limits apply (20dB below the peak level of the fundamental).			

**Table 8 SPURIOUS EMISSIONS EUT Configuration Settings**

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

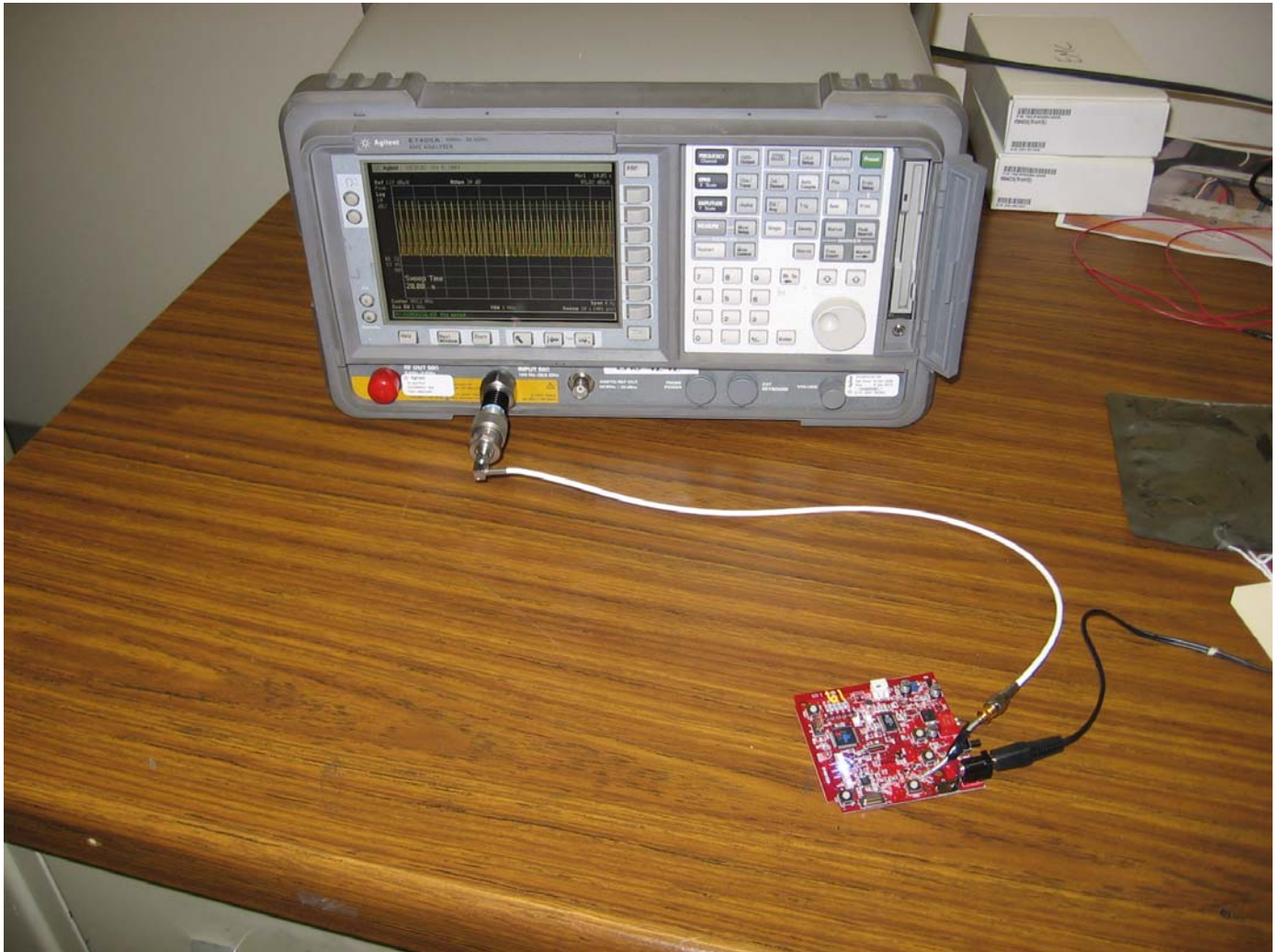
**Table 9 SPURIOUS CONDUCTED EMISSIONS Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 10 SPURIOUS RADIATED EMISSIONS Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

**Test setup for SPURIOUS EMISSIONS – Antenna conducted**



**Test setup for SPURIOUS EMISSIONS – Radiated**

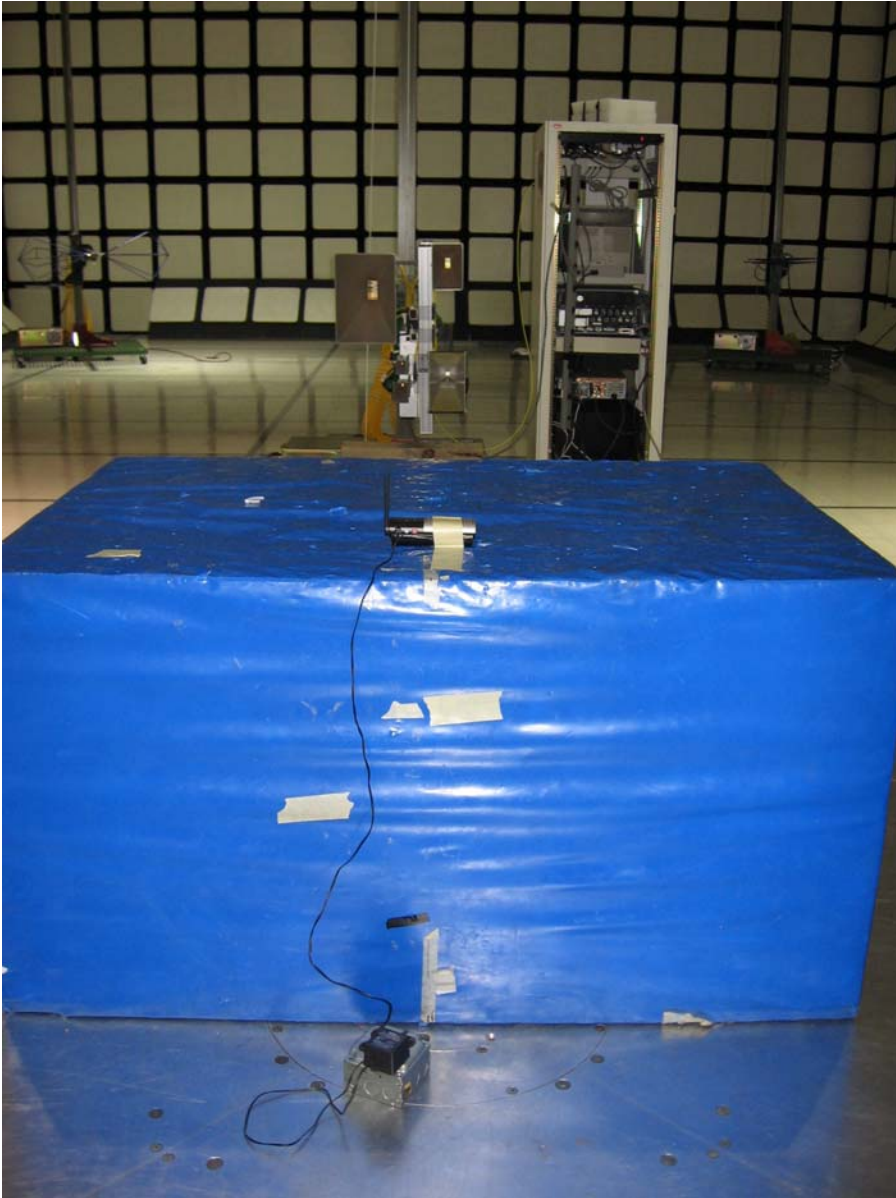
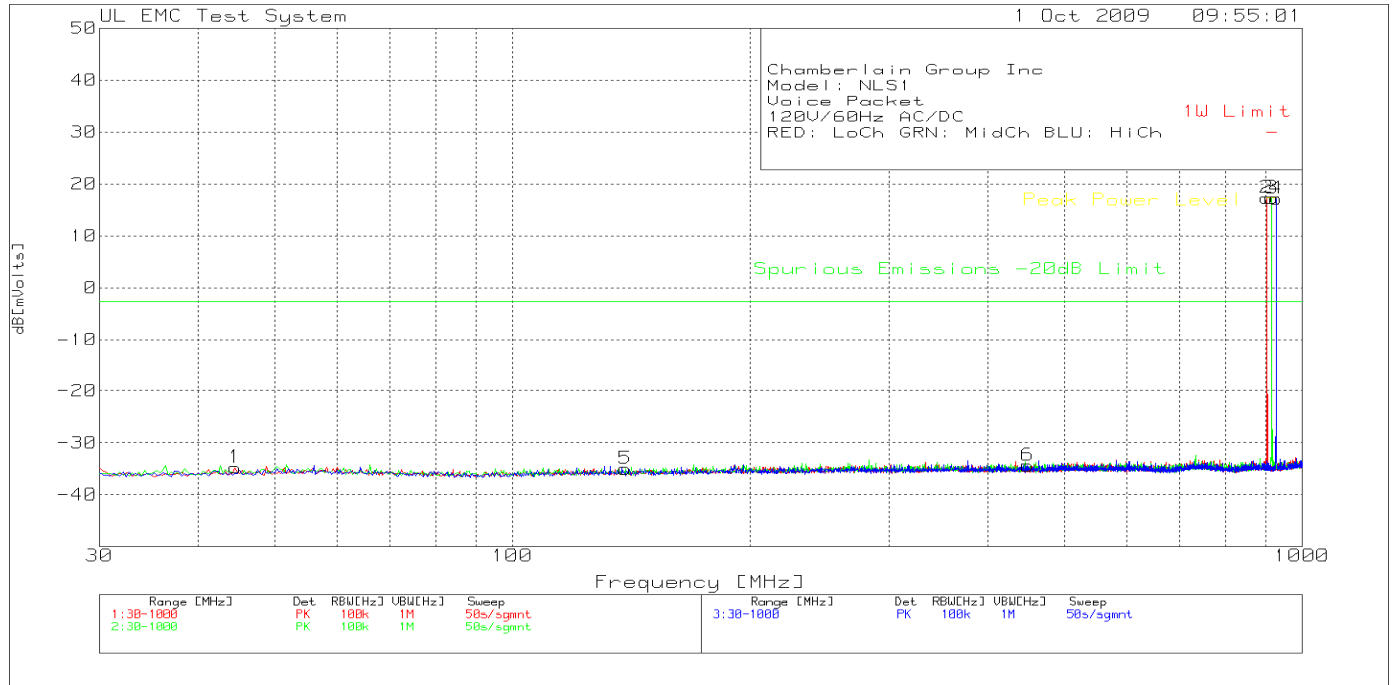
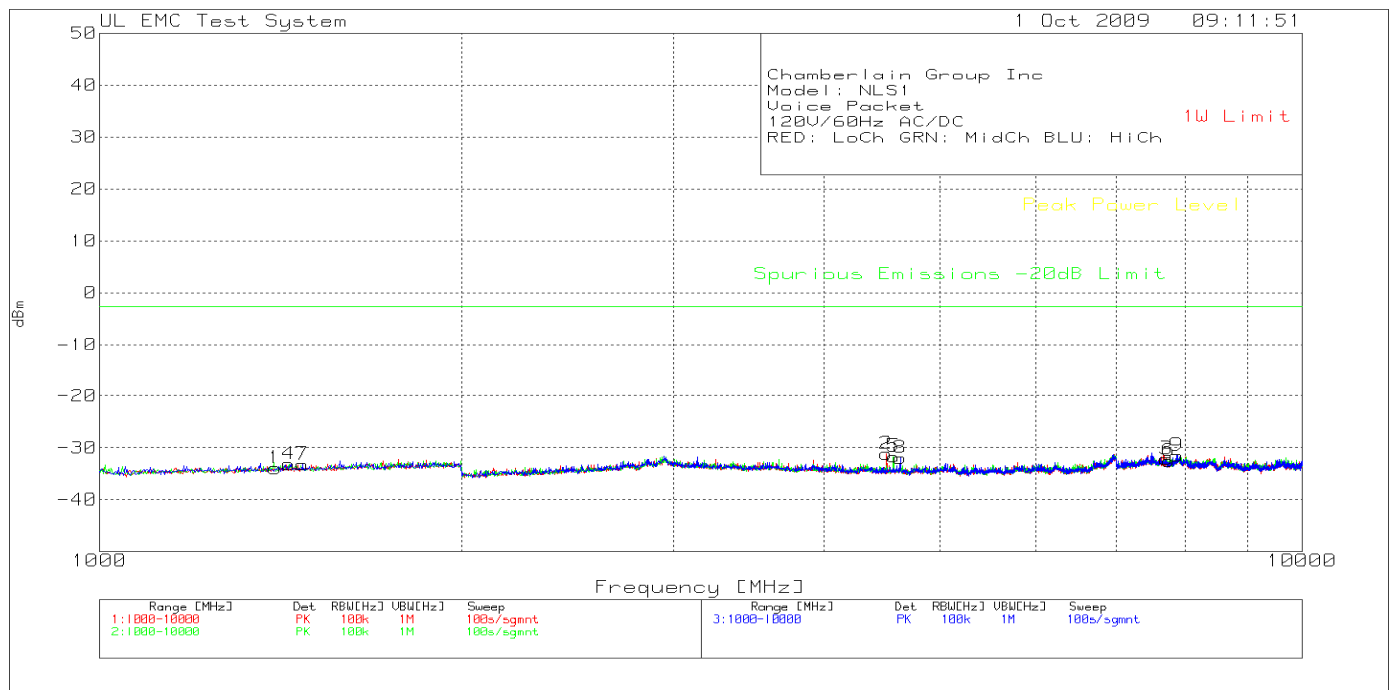


Figure 8 30MHz-1GHz Antenna Port Spurious Emissions, TX Mode, Low, Middle and High Channels, Voice



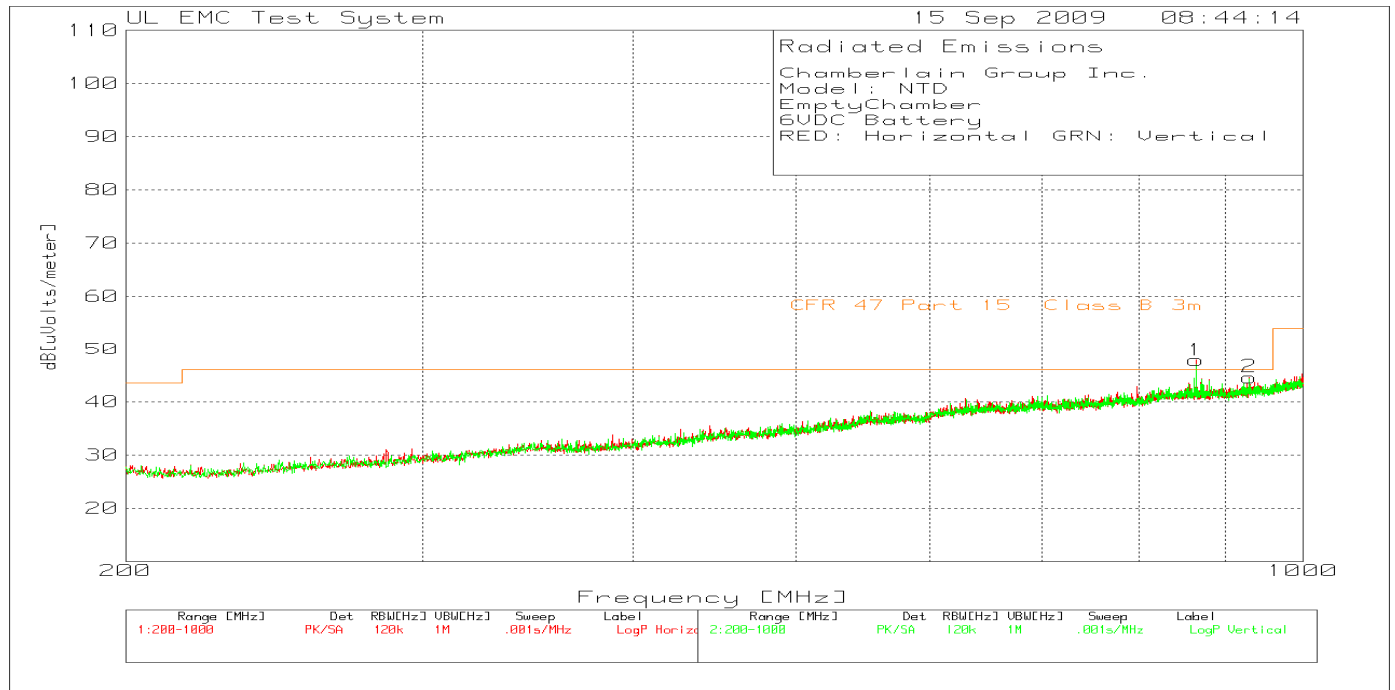
\* There were no emissions within 20dB of the limit recorded.

Figure 9 1GHz-10GHz Antenna Port Spurious Emissions, TX Mode, Low, Middle and High Channels, Voice



\* There were no emissions within 20dB of the limit recorded.

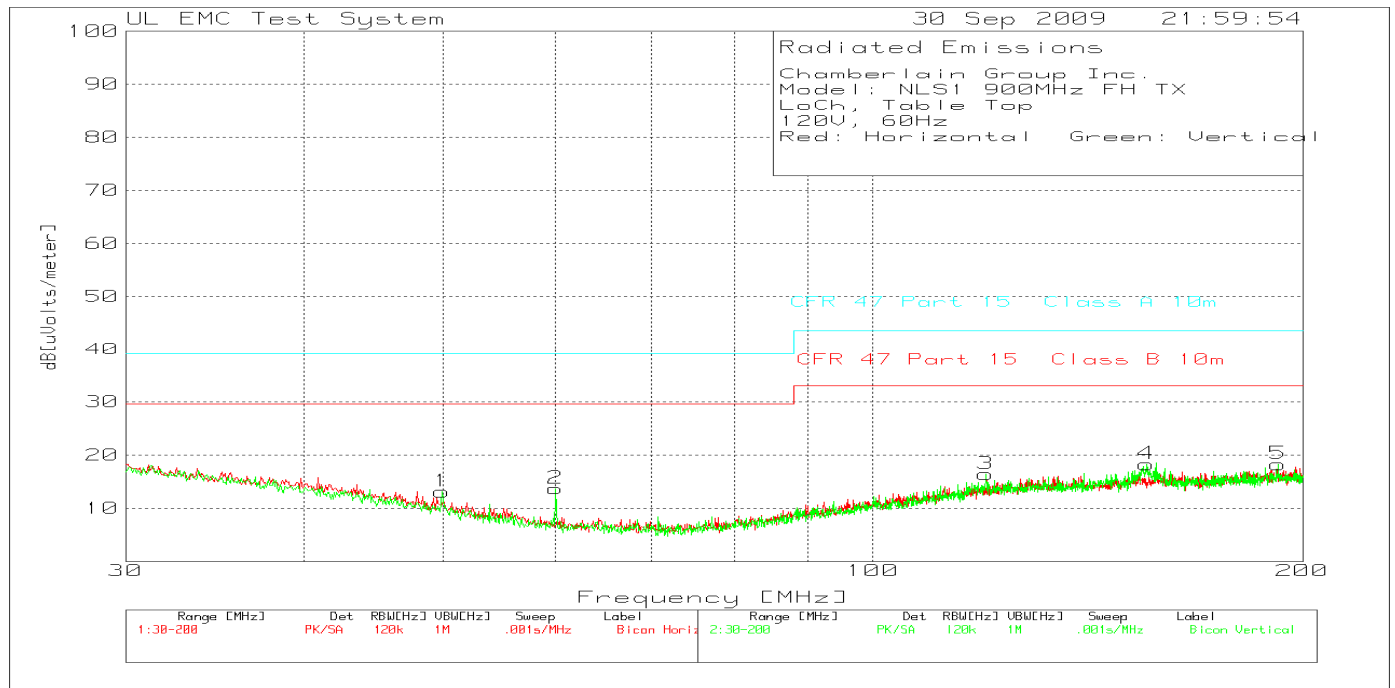
**Figure 10 Radiated Spurious Emissions below 1GHz, 200MHz – 1GHz Ambient Scan**



1	864.3571	Not From EUT
2	929.9134	

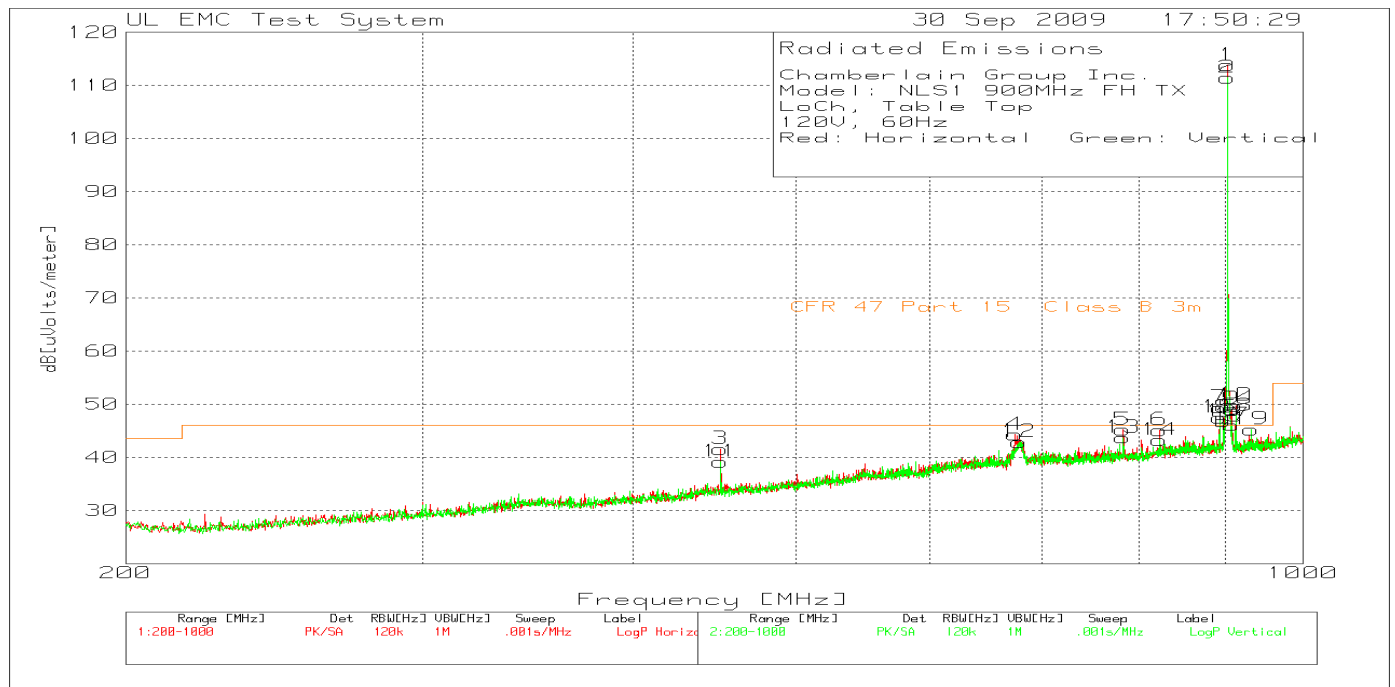


Figure 11 Radiated Spurious Emissions 30MHz-200MHz, Low Channel, Tabletop



\*No emissions close to the limit recorded.

Figure 12 Radiated Spurious Emissions 200MHz – 1GHz, Low Channel, Tabletop



**Table 11 Radiated Spurious Emissions 200MHz - 1GHz, Low Channel, Tabletop**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 LoCh, Table Top  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

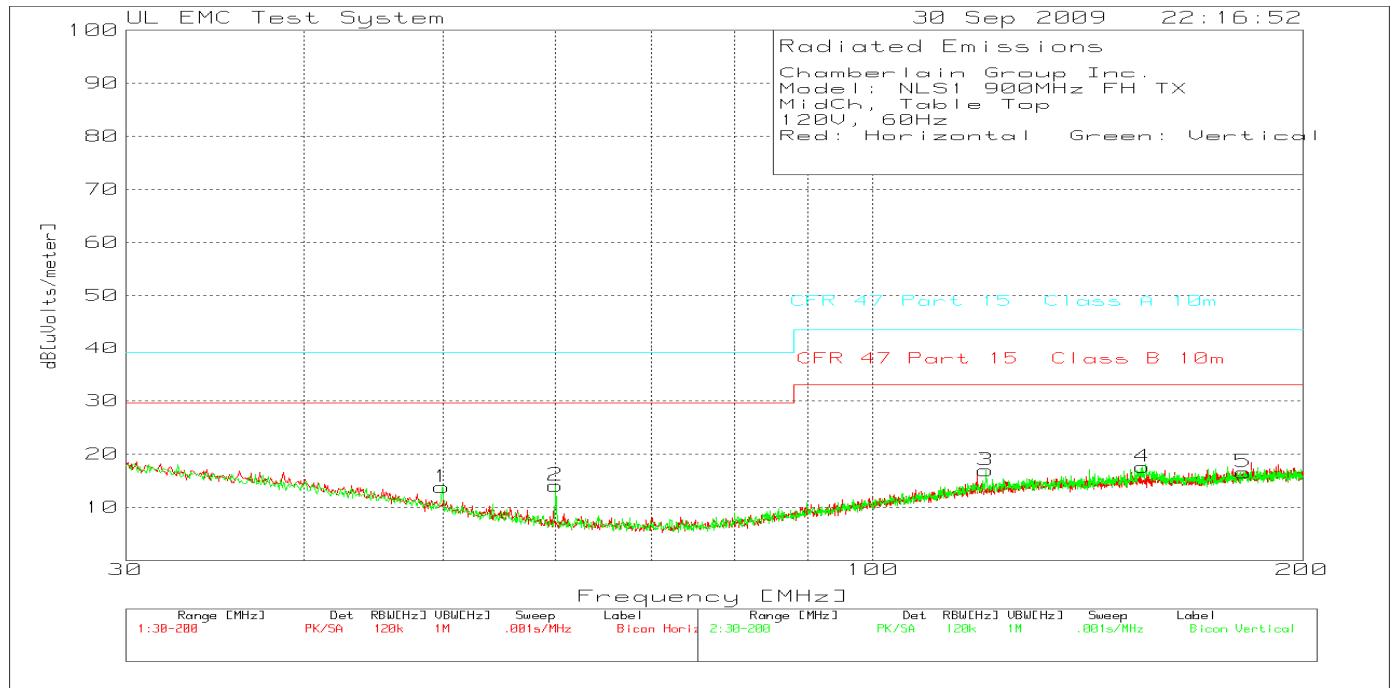
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	Comments
1	902.465	87.22	pk	3.5	23.1	113.82	46	67.82	100	Horz	TX Frequency
3	451.0326	21.8	pk	2.4	17.4	41.6	46	-4.4	200	Horz	Note 1
4	674.6169	20.29	pk	3.2	20.8	44.29	46	-1.71	250	Horz	Note 1
5	782.2785	20.11	pk	3.3	21.8	45.21	46	-.79	200	Horz	Note 1
6	822.2518	19.07	pk	3.4	22.7	45.17	46	-.83	100	Horz	Note 1
7	892.3384	22.6	pk	3.6	23.2	49.4	46	3.4	100	Horz	Note 1
8	897.4017	20.81	pk	3.6	23.1	47.51	46	1.51	100	Horz	Note 1
9	907.5283	22.29	pk	3.6	23.2	49.09	46	3.09	100	Horz	Inside the TX band
10	912.3251	22.89	pk	3.6	23.3	49.79	46	3.79	151	Horz	Inside the TX band
2	902.465	84.87	pk	3.5	23.1	111.47	46	65.47	201	Vert	TX Frequency
11	451.0326	19.41	pk	2.4	17.4	39.21	46	-6.79	100	Vert	Note 1
12	678.3478	18.93	pk	3.2	20.8	42.93	46	-3.07	100	Vert	Note 1
13	782.2785	18.65	pk	3.3	21.8	43.75	46	-2.25	150	Vert	Note 1
14	822.2518	17.17	pk	3.4	22.7	43.27	46	-2.73	150	Vert	Note 1
15	892.3384	20.74	pk	3.6	23.2	47.54	46	1.54	201	Vert	Note 1
16	897.4017	20.12	pk	3.6	23.1	46.82	46	.82	201	Vert	Note 1
17	907.5283	19.31	pk	3.6	23.2	46.11	46	.11	201	Vert	Inside the TX band
18	912.3251	20.95	pk	3.6	23.3	47.85	46	1.85	201	Vert	Inside the TX band
19	932.3118	17.98	pk	3.7	23.6	45.28	46	-.72	201	Vert	Note 1

Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

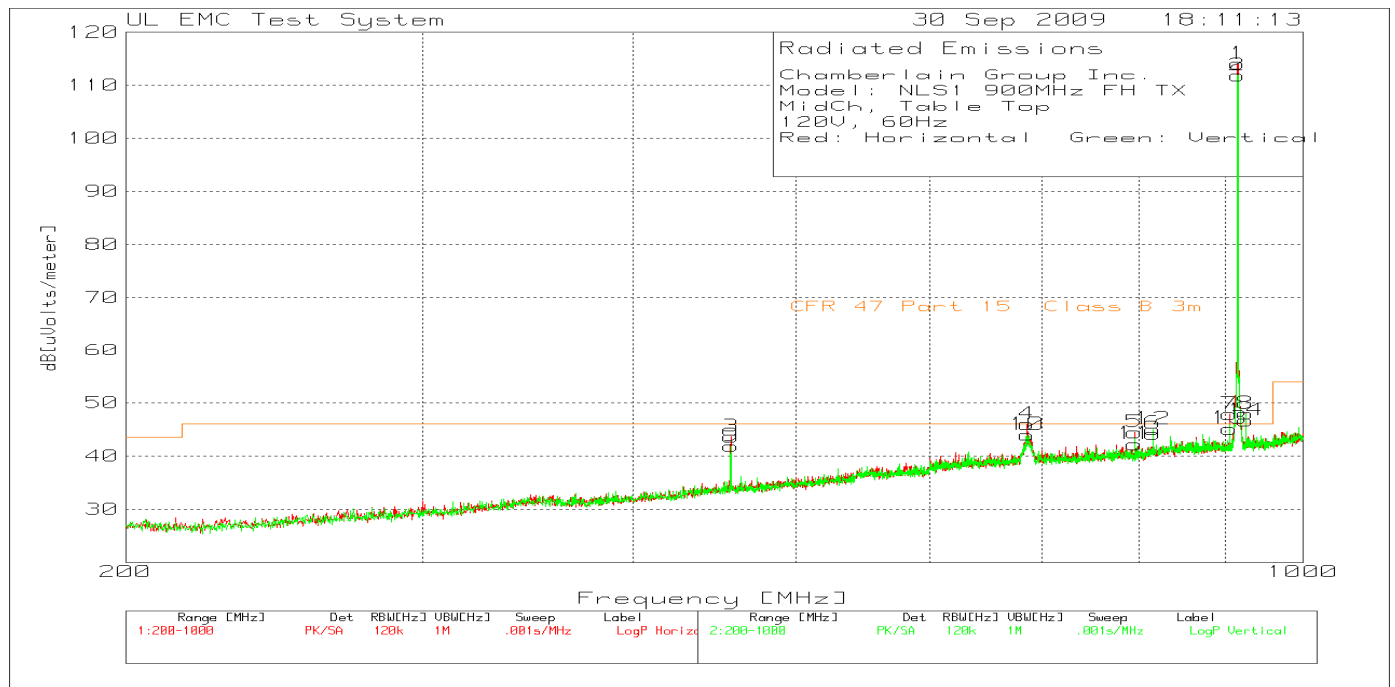
PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Average detector

Figure 13 Radiated Spurious Emissions 30MHz-200MHz, Middle Channel, Tabletop



\*No emissions close to the limit recorded.

Figure 14 Radiated Spurious Emissions 200MHz – 1GHz, Middle Channel, Tabletop



**Table 12 Radiated Spurious Emissions 200MHz - 1GHz, Middle Channel, Tabletop**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 MidCh, Table Top  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

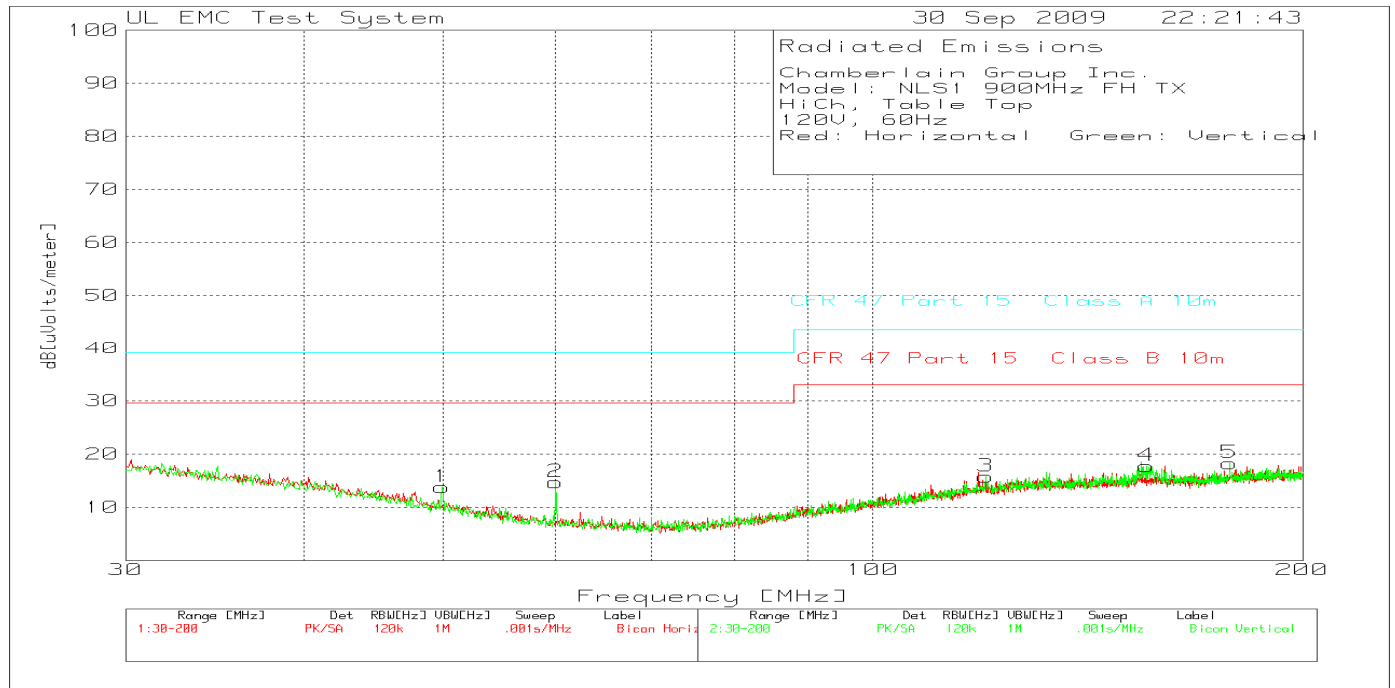
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	Comments
1	914.99	87.16	pk	3.6	23.3	114.06	46	68.06	101	Horz	TX Frequency
3	457.4284	23.67	pk	2.5	17.5	43.67	46	-2.33	201	Horz	Note 1
4	686.0759	21.82	pk	3.3	20.9	46.02	46	.02	101	Horz	Note 1
5	794.8035	19.27	pk	3.3	21.9	44.47	46	-1.53	201	Horz	Note 1
6	815.0566	18.24	pk	3.4	22.6	44.24	46	-1.76	101	Horz	Note 1
7	904.8634	21.18	pk	3.6	23.1	47.88	46	1.88	101	Horz	Inside the TX band
8	924.8501	20.87	pk	3.6	23.5	47.97	46	1.97	101	Horz	Inside the TX band
2	914.8568	84.97	pk	3.6	23.3	111.87	46	65.87	200	Vert	TX Frequency
9	457.4284	21.91	pk	2.5	17.5	41.91	46	-4.09	100	Vert	Note 1
10	686.0759	19.8	pk	3.3	20.9	44	46	-2	150	Vert	Note 1
11	795.07	17.05	pk	3.3	21.9	42.25	46	-3.75	150	Vert	Note 1
12	814.7901	19.06	pk	3.4	22.6	45.06	46	-.94	200	Vert	Note 1
13	905.1299	18.48	pk	3.6	23.1	45.18	46	-.82	100	Vert	Inside the TX band
14	924.8501	19.61	pk	3.6	23.5	46.71	46	.71	100	Vert	Inside the TX band

Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

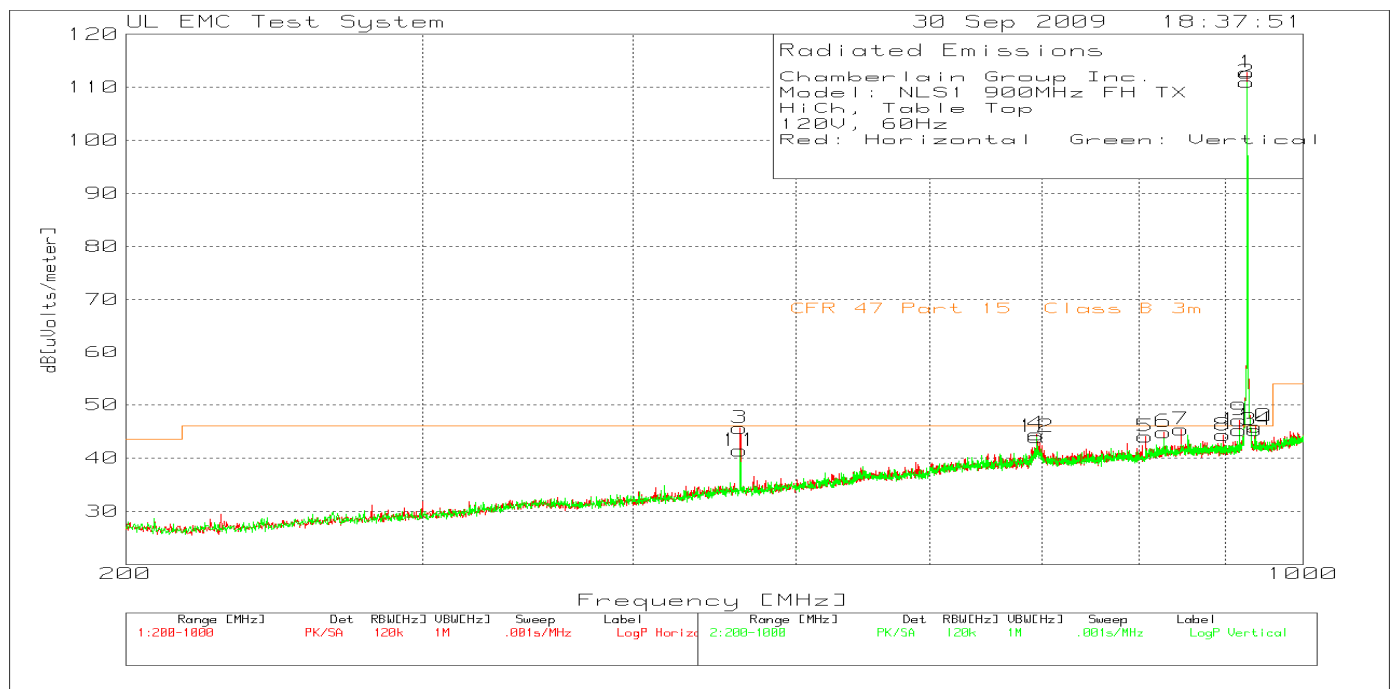
PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Average detector

Figure 15 Radiated Spurious Emissions 30MHz-200MHz, High Channel, Tabletop



\*No emissions close to the limit recorded.

Figure 16 Radiated Spurious Emissions 200MHz – 1GHz, High Channel, Tabletop



**Table 13 Radiated Spurious Emissions 200MHz - 1GHz, High Channel, Tabletop**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 HiCh, Table Top  
 120V, 60Hz  
 Red: Horizontal Green: Vertical

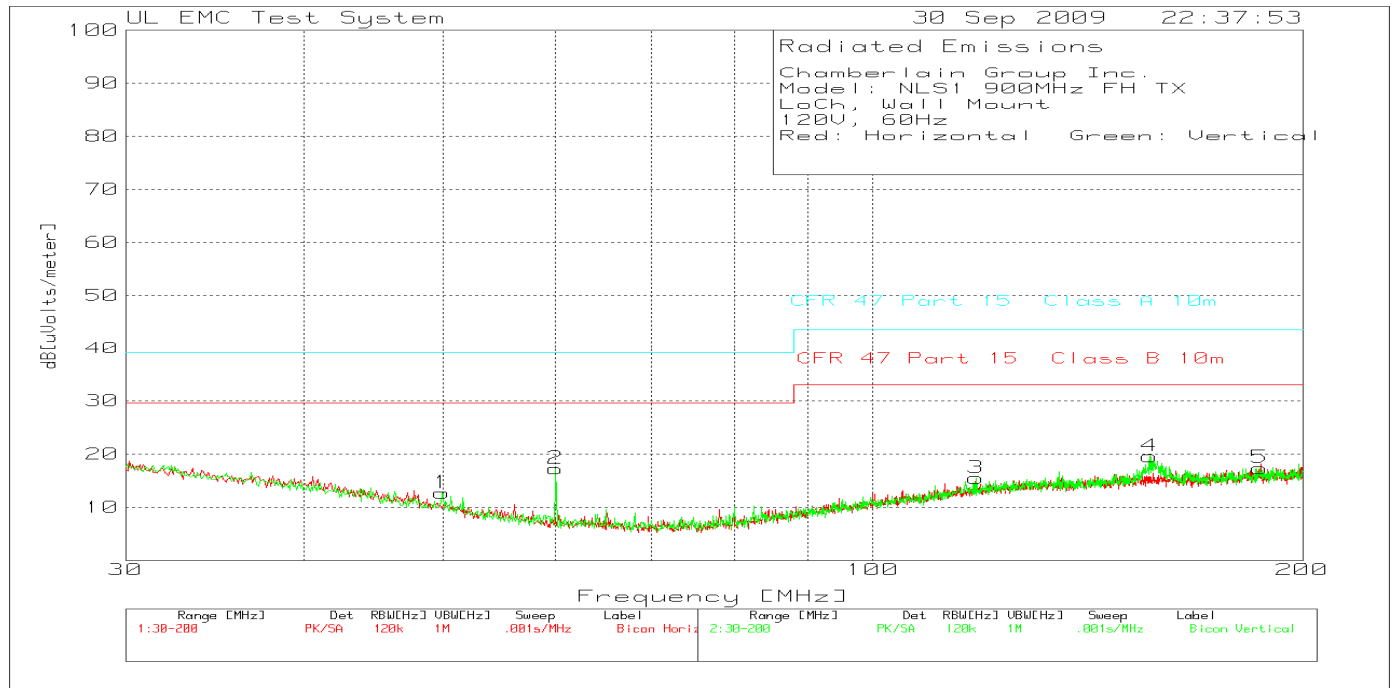
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	Comments
1	926.982	85.56	pk	3.7	23.5	112.76	46	66.76	150	Horz	TX Frequency
3	463.2911	25.55	pk	2.5	17.6	45.65	46	-.35	200	Horz	Note 1
4	695.1366	20.12	pk	3.2	21.2	44.52	46	-1.48	250	Horz	Note 1
5	806.7955	18.54	pk	3.4	22.1	44.04	46	-1.96	200	Horz	Note 1
6	826.7821	18.49	pk	3.6	22.8	44.89	46	-1.11	101	Horz	Note 1
7	847.0353	18.77	pk	3.6	23	45.37	46	-.63	101	Horz	Note 1
8	896.8688	17.69	pk	3.5	23.1	44.29	46	-1.71	101	Horz	Note 1
9	916.8554	20.22	pk	3.6	23.3	47.12	46	1.12	101	Horz	Inside TX band
10	936.8421	18.65	pk	3.7	23.6	45.95	46	-.05	150	Horz	Note 1
2	926.7155	83.91	pk	3.6	23.5	111.01	46	65.01	200	Vert	TX Frequency
11	463.2911	21.3	pk	2.5	17.6	41.4	46	-4.6	250	Vert	Note 1
12	695.1366	19.57	pk	3.2	21.2	43.97	46	-2.03	100	Vert	Note 1
13	916.8554	18.33	pk	3.6	23.3	45.23	46	-.77	200	Vert	Inside TX band
14	936.8421	17.98	pk	3.7	23.6	45.28	46	-.72	200	Vert	Note 1

Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

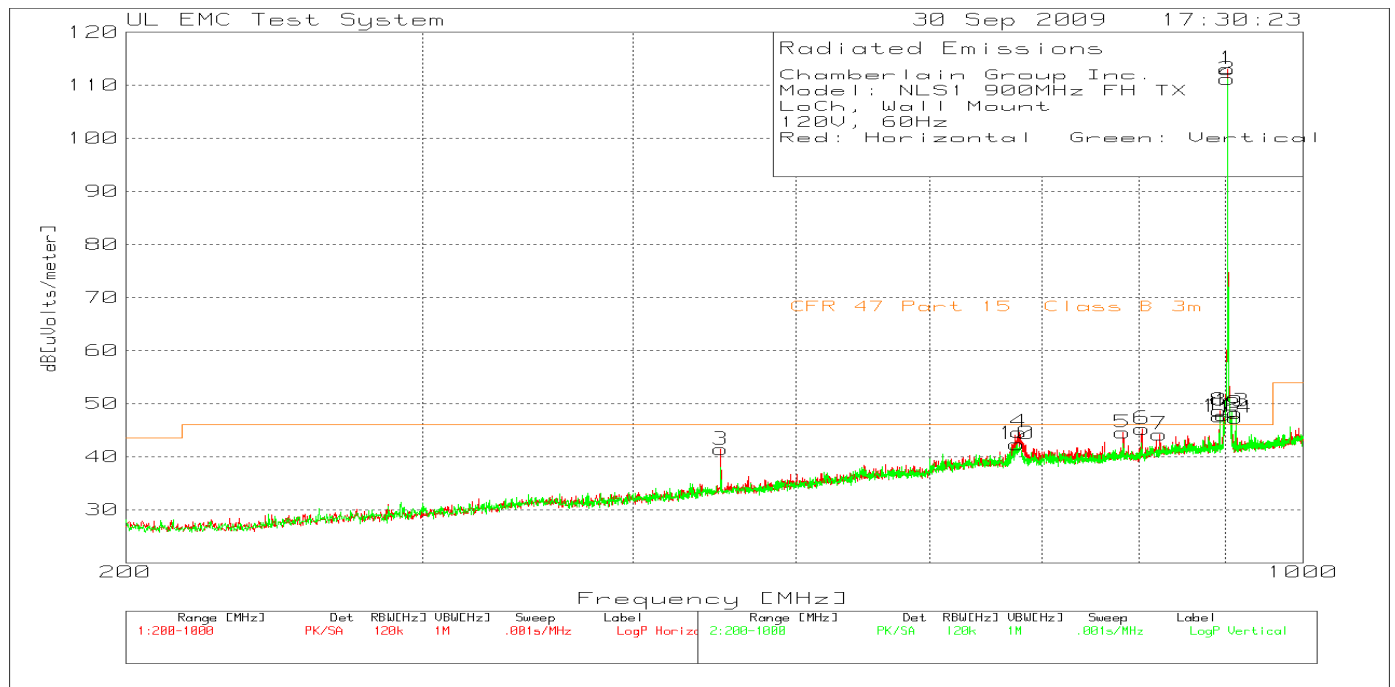
PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Average detector

Figure 17 Radiated Spurious Emissions 30MHz-200MHz, Low Channel, Wall-mount



\*No emissions close to the limit recorded.

Figure 18 Radiated Spurious Emissions 200MHz – 1GHz, Low Channel, Wall-mount



**Table 14 Radiated Spurious Emissions 200MHz - 1GHz, Low Channel, Wall-mount**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 LoCh, Wall Mount  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	Comments
1	902.465	86.48	pk	3.5	23.1	113.08	46	67.08	150	Horz	TX frequency
3	451.2991	21.6	pk	2.4	17.4	41.4	46	-4.6	201	Horz	Note 1
4	678.3478	20.66	pk	3.2	20.8	44.66	46	-1.34	100	Horz	Note 1
5	782.2785	19.48	pk	3.3	21.8	44.58	46	-1.42	100	Horz	Note 1
6	802.5316	19.98	pk	3.3	22	45.28	46	-.72	100	Horz	Note 1
7	822.2518	18.13	pk	3.4	22.7	44.23	46	-1.77	100	Horz	Note 1
8	892.3384	21.93	pk	3.6	23.2	48.73	46	2.73	150	Horz	Note 1
9	912.3251	21.37	pk	3.6	23.3	48.27	46	2.27	150	Horz	Inside TX band
2	902.465	84.58	pk	3.5	23.1	111.18	46	65.18	200	Vert	TX Frequency
10	676.4823	18.39	pk	3.2	20.8	42.39	46	-3.61	250	Vert	Note 1
11	892.3384	20.76	pk	3.6	23.2	47.56	46	1.56	150	Vert	Note 1
12	897.4017	21.13	pk	3.6	23.1	47.83	46	1.83	250	Vert	Note 1
13	907.5283	21.8	pk	3.6	23.2	48.6	46	2.6	101	Vert	Inside TX band
14	912.3251	20.44	pk	3.6	23.3	47.34	46	1.34	200	Vert	Inside TX band

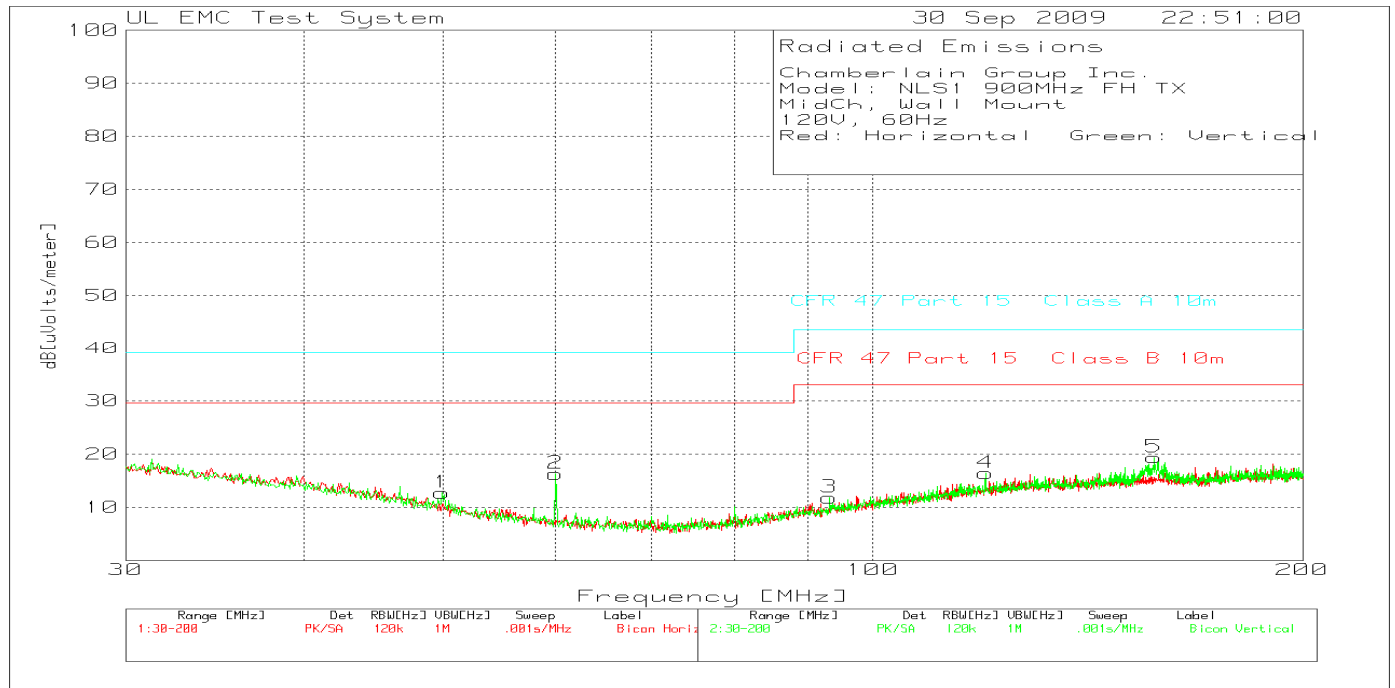
Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Average detector

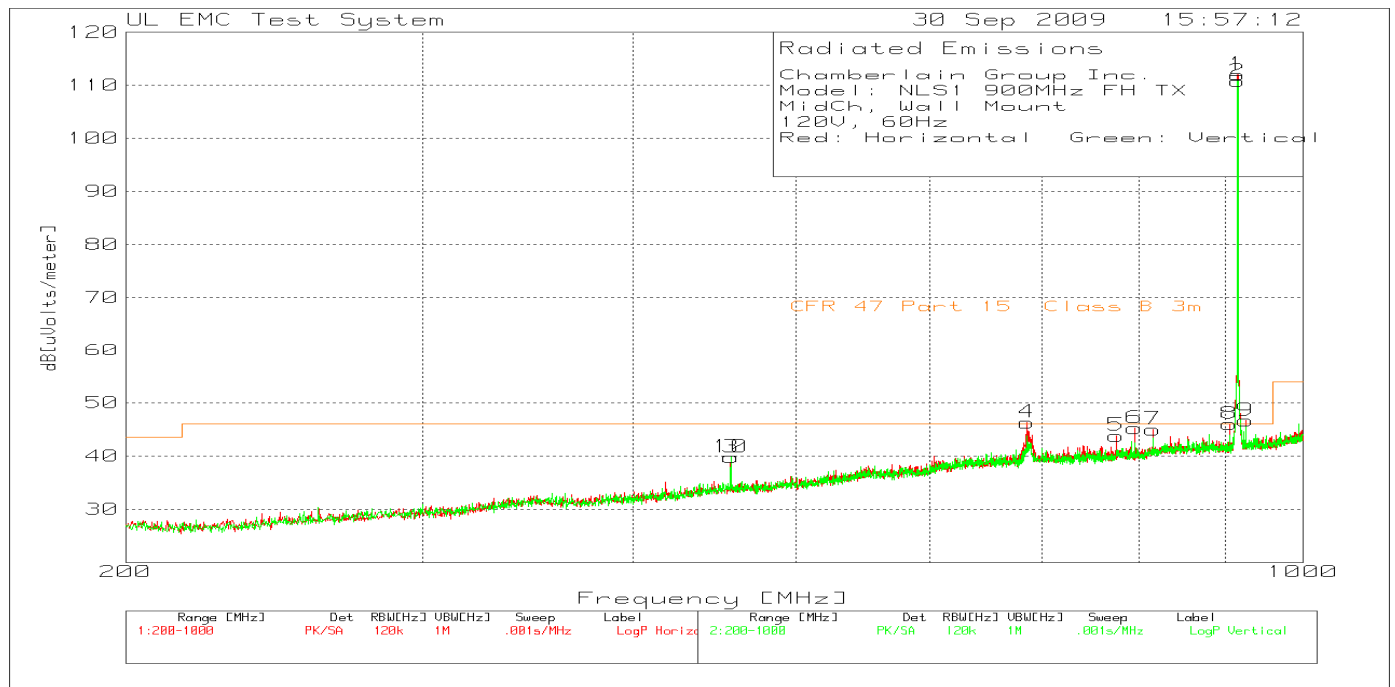


Figure 19 Radiated Spurious Emissions 30MHz-200MHz, Middle Channel, Wall-mount



\*No emissions close to the limit recorded.

Figure 20 Radiated Spurious Emissions 200MHz – 1GHz, Middle Channel, Wall-mount



**Table 15 Radiated Spurious Emissions 200MHz - 1GHz, Middle Channel, Wall-mount**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 MidCh, Wall Mount  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	
1	914.8568	85.15	pk	3.6	23.3	112.05	46	66.05	150	Horz	TX Frequency
3	457.4284	19.79	pk	2.5	17.5	39.79	46	-6.21	200	Horz	Note 1
4	686.0759	22.13	pk	3.3	20.9	46.33	46	.33	100	Horz	Note 1, see table below
5	774.8168	18.84	pk	3.3	21.7	43.84	46	-2.16	100	Horz	Note 1
6	794.8035	20.06	pk	3.3	21.9	45.26	46	-.74	100	Horz	Note 1
7	815.0566	19.01	pk	3.4	22.6	45.01	46	-.99	100	Horz	Note 1
8	904.8634	19.34	pk	3.6	23.1	46.04	46	.04	150	Horz	Inside TX band
9	924.8501	19.56	pk	3.6	23.5	46.66	46	.66	150	Horz	Inside TX band
2	914.99	83.91	pk	3.6	23.3	110.81	46	64.81	200	Vert	TX Frequency
10	457.4284	19.81	pk	2.5	17.5	39.81	46	-6.19	100	Vert	Note 1

Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

PK - Peak detector  
 QP - Quasi-Peak detector

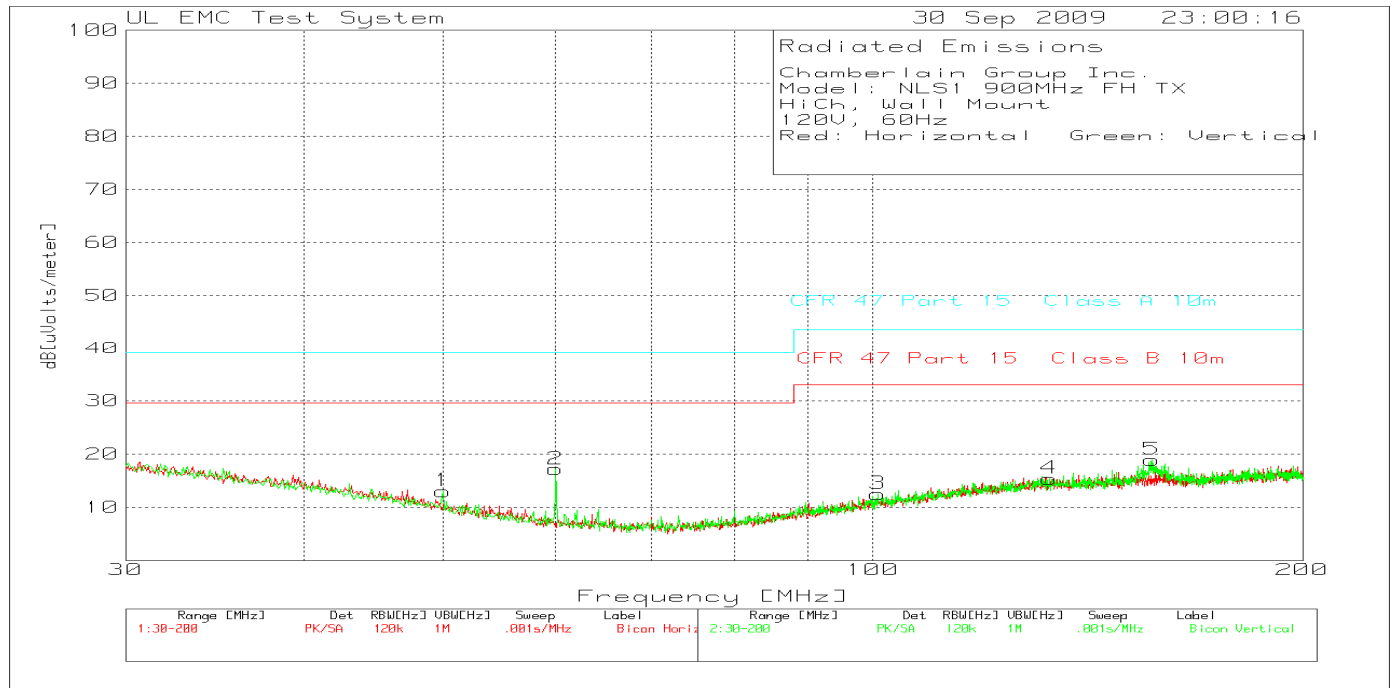
Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 MidCh, Wall Mount  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Azimuth [degs]	Height [cm]	Polarity
686.0712	19.83	qp	3.3	20.9	44.03	46	-1.97	190	116	Horz
686.0712	20.11	qp	3.3	20.9	44.31	46	-1.69	190	116	Horz

LIMIT 2: CFR 47 Part 15 Class B 3m

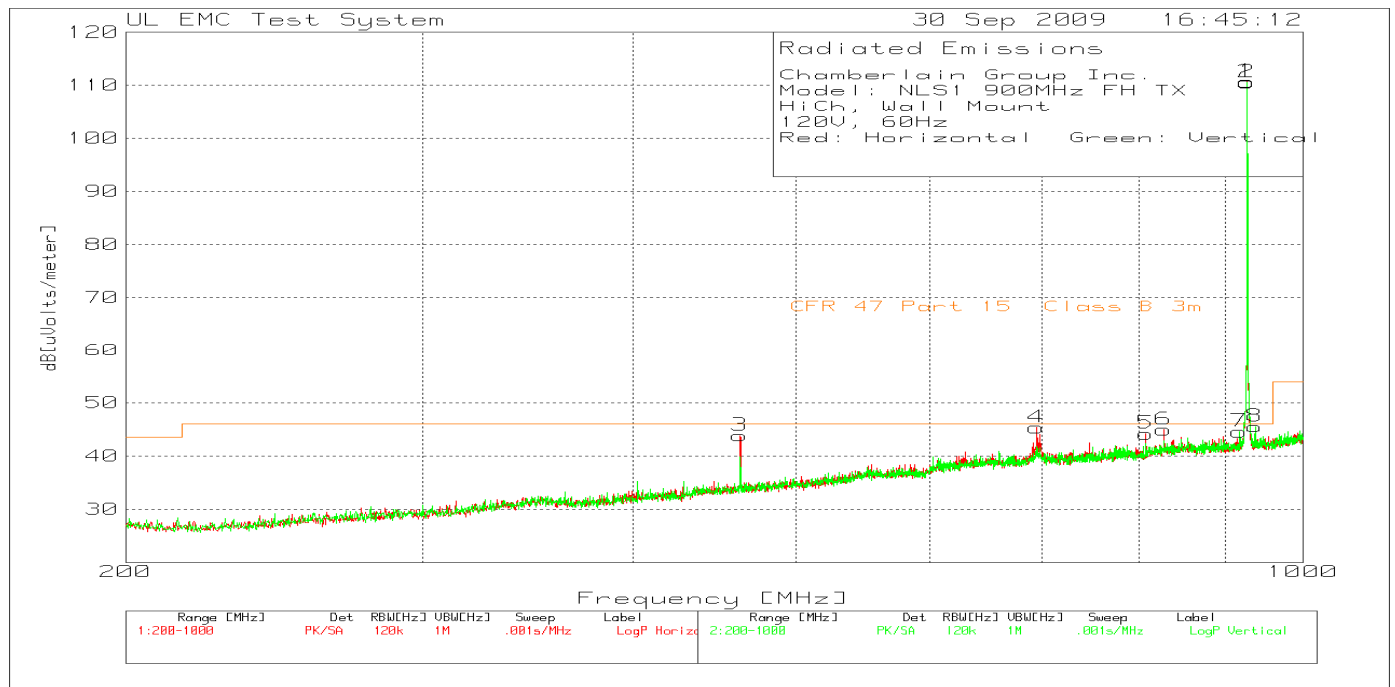
PK - Peak detector  
 QP - Quasi-Peak detector

Figure 21 Radiated Spurious Emissions 30MHz-200MHz, High Channel, Wall-mount



\*No emissions close to the limit recorded.

Figure 22 Radiated Spurious Emissions 200MHz – 1GHz, High Channel, Wall-mount



**Table 16 Radiated Spurious Emissions 200MHz - 1GHz, High Channel, Wall-mount**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 HiCh, Wall Mount  
 120V, 60Hz  
 Red: Horizontal    Green: Vertical

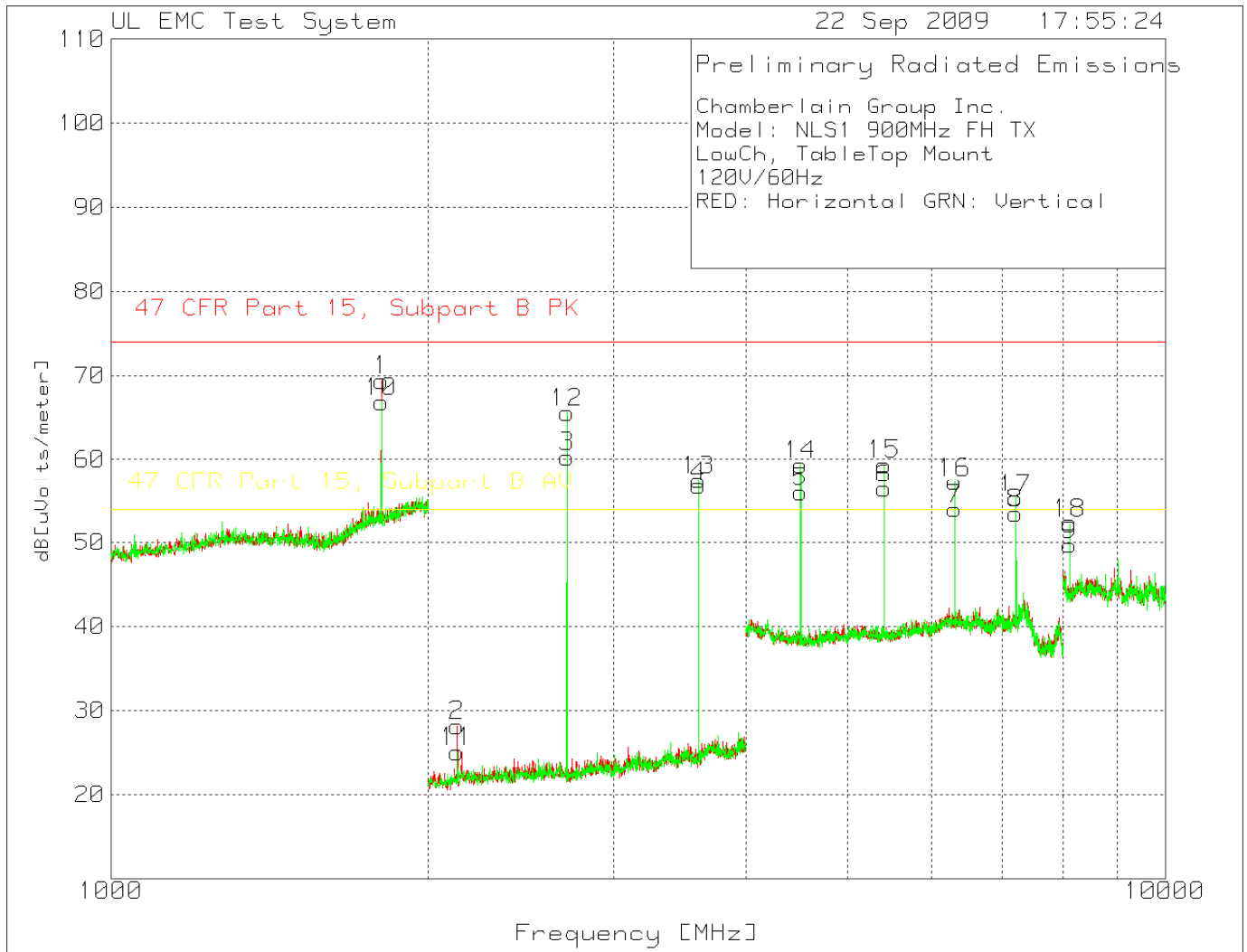
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	Comments
1	926.982	83.53	pk	3.7	23.5	110.73	46	64.73	150	Horz	TX Frequency
3	463.2911	23.78	pk	2.5	17.6	43.88	46	-2.12	200	Horz	Note 1
4	695.1366	20.96	pk	3.2	21.2	45.36	46	-.64	100	Horz	Note 1
5	807.062	18.76	pk	3.4	22.1	44.26	46	-1.74	100	Horz	Note 1
6	826.7821	18.58	pk	3.6	22.8	44.98	46	-1.02	100	Horz	Note 1
2	926.982	83.41	pk	3.7	23.5	110.61	46	64.61	200	Vert	TX Frequency
7	916.8554	17.73	pk	3.6	23.3	44.63	46	-1.37	200	Vert	Inside TX band
8	936.8421	18.28	pk	3.7	23.6	45.58	46	-.42	200	Vert	Note 1

Note 1: Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

LIMIT 2: CFR 47 Part 15 Class B 3m

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Average detector

Figure 23 Radiated Spurious Emissions above 1GHz, Low Channel, Table



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 17 Radiated Spurious Emissions above 1GHz, Low Channel, Table**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 LowCh, TableTop Mount  
 120V/60Hz  
 RED: Horizontal GRN: Vertical

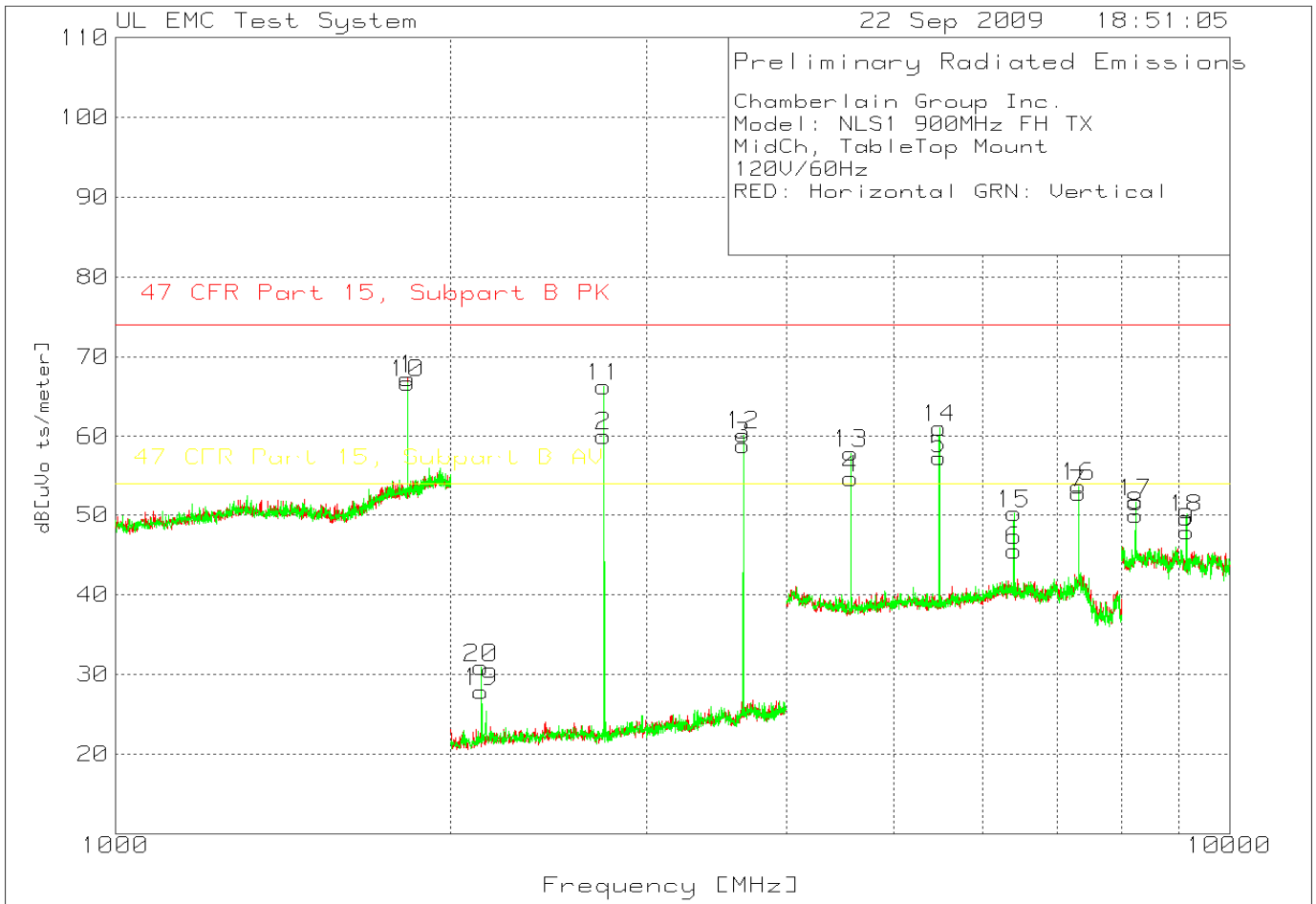
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	Comments
1	1804.805	35.69	pk	3.59	30.1	69.38	74	-4.62	54	15.38	100	Horz	Note 1
2	2130.13	59.37	pk	-52.71	21.5	28.16	74	-45.84	54	-25.84	100	Horz	Note 2
3	2706.707	89.43	pk	-51.23	22.1	60.3	74	-13.7	54	6.3	100	Horz	See table below
4	3609.61	84.53	pk	-50.95	23.2	56.78	74	-17.22	54	2.78	100	Horz	See table below
5	4509.673	80.74	pk	-52.5	27.8	56.04	74	-17.96	54	2.04	100	Horz	See table below
6	5414.276	78.72	pk	-50.15	27.9	56.47	74	-17.53	54	2.47	100	Horz	See table below
7	6316.211	72.81	pk	-48.02	29.2	53.99	74	-20.01	54	-.01	100	Horz	Note 1
8	7218.145	70.76	pk	-47.08	29.8	53.48	74	-20.52	54	-.52	100	Horz	Note 1
9	8120.24	63.43	pk	-49.9	36.2	49.73	74	-24.27	54	-4.27	100	Horz	See table below
10	1804.805	33.12	pk	3.59	30.1	66.81	74	-7.19	54	12.81	100	Vert	Note 1
11	2130.13	56.27	pk	-52.71	21.5	25.06	74	-48.94	54	-28.94	201	Vert	Note 2
12	2706.707	94.67	pk	-51.23	22.1	65.54	74	-8.46	54	11.54	150	Vert	See table below
13	3609.61	85.26	pk	-50.95	23.2	57.51	74	-16.49	54	3.51	150	Vert	See table below
14	4509.673	84.04	pk	-52.5	27.8	59.34	74	-14.66	54	5.34	150	Vert	See table below
15	5414.276	81.61	pk	-50.15	27.9	59.36	74	-14.64	54	5.36	150	Vert	See table below
16	6316.211	76.06	pk	-48.02	29.2	57.24	74	-16.76	54	3.24	150	Vert	Note 1
17	7218.145	72.57	pk	-47.08	29.8	55.29	74	-18.71	54	1.29	150	Vert	Note 1
18	8120.24	65.92	pk	-49.9	36.2	52.22	74	-21.78	54	-1.78	150	Vert	See table below

**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.  
**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Azimuth [deg]	Height [cm]	Polarity
2706.9509	90.65	pk	1MHz/1MHz	-51.23	22.1	0	61.52	74	-12.48			83	111	Horz
2706.8126	84.17	av	1MHz/10Hz	-51.23	22.1	-26	29.04			54	-24.96	83	111	Horz
2706.7104	95.79	pk	1MHz/1MHz	-51.23	22.1	0	66.66	74	-7.34			274	100	Vert
2706.7946	89.34	av	1MHz/10Hz	-51.23	22.1	-26	34.21			54	-19.79	274	100	Vert
3608.8094	90.01	pk	1MHz/1MHz	-50.95	23.2	0	62.26	74	-11.74			290	155	Vert
3609.098	81.21	av	1MHz/10Hz	-50.95	23.2	-26	27.46			54	-26.54	290	155	Vert
3608.8645	88.68	pk	1MHz/1MHz	-50.95	23.2	0	60.93	74	-13.07			239	100	Horz
3609.0629	86.02	av	1MHz/10Hz	-50.95	23.2	-26	32.27			54	-21.73	239	100	Horz
4511.104	79.77	pk	1MHz/1MHz	-52.5	27.8	0	55.07	74	-18.93			38	102	Horz
4511.2603	72.43	av	1MHz/10Hz	-52.5	27.8	-26	21.73			54	-32.27	38	102	Horz
4511.3986	84.94	pk	1MHz/1MHz	-52.5	27.8	0	60.24	74	-13.76			360	113	Vert
4511.2302	78.05	av	1MHz/10Hz	-52.5	27.8	-26	27.35			54	-26.65	360	113	Vert
5413.4305	81	pk	1MHz/1MHz	-50.17	27.9	0	58.73	74	-15.27			3	163	Vert
5413.5086	73.68	av	1MHz/10Hz	-50.17	27.9	-26	25.41			54	-28.59	3	163	Vert
5413.707	79	pk	1MHz/1MHz	-50.16	27.9	0	56.74	74	-17.26			222	114	Horz
5413.4906	71.64	av	1MHz/10Hz	-50.17	27.9	-26	23.37			54	-30.63	222	114	Horz
8119.7139	65.72	pk	1MHz/1MHz	-49.89	36.2	0	52.03	74	-21.97			73	100	Horz
8120.1408	54.4	av	1MHz/10Hz	-49.89	36.2	-26	14.71			54	-39.29	73	100	Horz
8120.0807	68.36	pk	1MHz/1MHz	-49.89	36.2	0	54.67	74	-19.33			158	132	Vert
8120.1709	58.04	av	1MHz/10Hz	-49.89	36.2	-26	18.35			54	-35.65	158	132	Vert

LIMIT 1: 47 CFR Part 15, Subpart B PK  
 LIMIT 2: 47 CFR Part 15, Subpart B AV  
 pk - Peak detector  
 av - Average detector

**Figure 24 Radiated Spurious Emissions above 1GHz, Middle Channel, Table**



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 18 Radiated Spurious Emissions above 1GHz, Middle Channel, Table**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 MidCh, TableTop Mount  
 120V/60Hz  
 RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	
1	1829.83	33.36	pk	3.59	30.3	67.25	74	-6.75	54	13.25	100	Horz	Note 1
2	2744.745	89.18	pk	-51.2	22.1	60.08	74	-13.92	54	6.08	100	Horz	See table below
3	3659.66	85.11	pk	-49.64	23.4	58.87	74	-15.13	54	4.87	100	Horz	See table below
19	2130.13	59.05	pk	-52.71	21.5	27.84	74	-46.16	54	-26.16	200	Horz	Note 2
4	4573.716	79.41	pk	-52.47	27.7	54.64	74	-19.36	54	.64	100	Horz	See table below
5	5488.993	79.37	pk	-50.24	28.1	57.23	74	-16.77	54	3.23	100	Horz	Note 1
6	6404.27	64.28	pk	-47.94	29.2	45.54	74	-28.46	54	-8.46	100	Horz	Note 1
7	7319.546	68.55	pk	-46.37	30.6	52.78	74	-21.22	54	-1.22	100	Horz	See table below
8	8232.465	62.36	pk	-48.8	36.4	49.96	74	-24.04	54	-4.04	100	Horz	See table below
9	9150.301	62.36	pk	-50.77	36.3	47.89	74	-26.11	54	-6.11	150	Horz	Note 2
10	1829.83	32.82	pk	3.59	30.3	66.71	74	-7.29	54	12.71	101	Vert	Note 1
11	2744.745	95.36	pk	-51.2	22.1	66.26	74	-7.74	54	12.26	150	Vert	See table below
12	3659.66	86.46	pk	-49.64	23.4	60.22	74	-13.78	54	6.22	150	Vert	See table below
20	2130.13	62.07	pk	-52.71	21.5	30.86	74	-43.14	54	-23.14	200	Vert	Note 2
13	4573.716	82.67	pk	-52.47	27.7	57.9	74	-16.1	54	3.9	150	Vert	See table below
14	5488.993	83.22	pk	-50.24	28.1	61.08	74	-12.92	54	7.08	150	Vert	Note 1
15	6404.27	68.95	pk	-47.94	29.2	50.21	74	-23.79	54	-3.79	150	Vert	Note 1
16	7319.546	69.42	pk	-46.37	30.6	53.65	74	-20.35	54	-.35	150	Vert	See table below
17	8232.465	64.04	pk	-48.8	36.4	51.64	74	-22.36	54	-2.36	150	Vert	See table below
18	9146.293	64.15	pk	-50.8	36.3	49.65	74	-24.35	54	-4.35	150	Vert	See table below

**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Azimuth [degs]	Height [cm]	Polarity
2744.1764	90.52	pk	1MHz/1MHz	-51.22	22.1	0	61.4	74	-12.6			229	101	Horz
2744.1764	83.79	av	1MHz/10Hz	-51.22	22.1	-26	28.67			54	-25.33	229	101	Horz
2744.1764	94.47	pk	1MHz/1MHz	-51.22	22.1	0	65.35	74	-8.65			273	154	Vert
2744.1764	87.94	av	1MHz/10Hz	-51.22	22.1	-26	32.82			54	-21.18	273	154	Vert
3658.8041	87.4	pk	1MHz/1MHz	-49.67	23.4	0	61.13	74	-12.87			232	105	Horz
3659.0145	79.88	av	1MHz/10Hz	-49.66	23.4	-26	27.62			54	-26.38	232	105	Horz
3658.8627	89.15	pk	1MHz/1MHz	-49.67	23.4	0	62.88	74	-11.12			324	175	Vert
3659.0311	82.1	av	1MHz/10Hz	-49.66	23.4	-26	29.84			54	-24.16	324	175	Vert
4574.011	79.95	pk	1MHz/1MHz	-52.47	27.7	0	55.18	74	-18.82			47	113	Horz
4573.7625	72.53	av	1MHz/10Hz	-52.47	27.7	-26	21.76			54	-32.24	47	113	Horz
4573.9339	83.51	pk	1MHz/1MHz	-52.47	27.7	0	58.74	74	-15.26			360	121	Vert
4573.7896	76.53	av	1MHz/10Hz	-52.47	27.7	-26	25.76			54	-28.24	360	121	Vert
7318.3297	70.66	pk	1MHz/1MHz	-46.36	30.6	0	54.9	74	-19.1			257	103	Horz
7317.9329	62.35	av	1MHz/10Hz	-46.36	30.6	-26	20.59			54	-33.41	257	103	Horz
7317.7735	72.4	pk	1MHz/1MHz	-46.36	30.6	0	56.64	74	-17.36			45	142	Vert
7317.9659	64.18	av	1MHz/10Hz	-46.36	30.6	-26	22.42			54	-31.58	45	142	Vert
8232.4289	66.94	pk	1MHz/1MHz	-48.8	36.4	0	54.54	74	-19.46			261	110	Horz
8232.6453	56.9	av	1MHz/10Hz	-48.79	36.4	-26	18.51			54	-35.49	261	110	Horz
8232.4018	66.79	pk	1MHz/1MHz	-48.8	36.4	0	54.39	74	-19.61			167	116	Vert
8232.6483	56.74	av	1MHz/10Hz	-48.79	36.4	-26	18.35			54	-35.65	167	116	Vert
9147.2986	67.7	pk	1MHz/1MHz	-50.77	36.3	0	53.23	74	-20.77			154	101	Vert
9147.4188	57.54	av	1MHz/10Hz	-50.77	36.3	-26	17.07			54	-36.93	154	101	Vert

LIMIT 1: 47 CFR Part 15, Subpart B PK

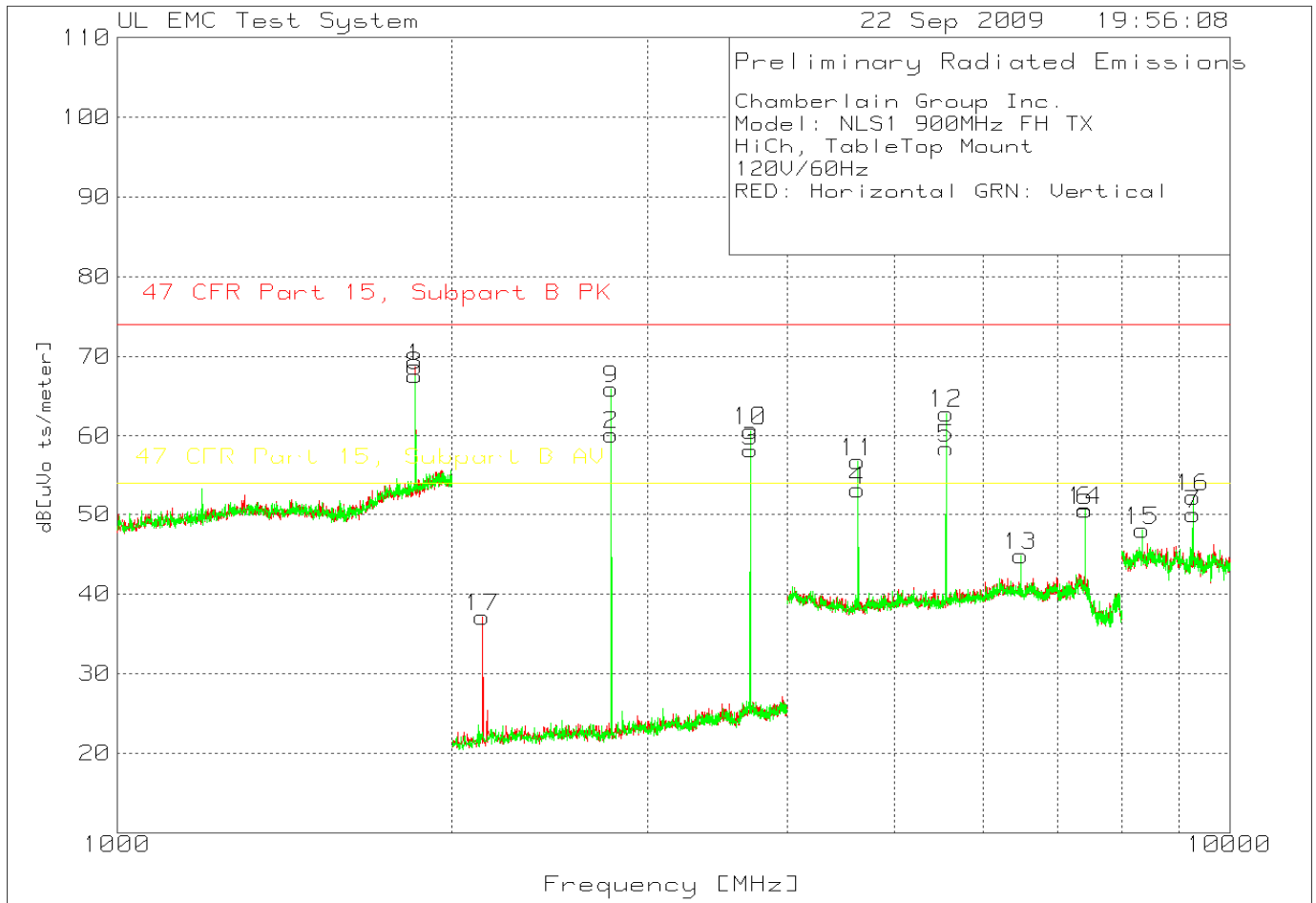
LIMIT 2: 47 CFR Part 15, Subpart B AV

pk - Peak detector

av - Average detector



Figure 25 Radiated Spurious Emissions above 1GHz, High Channel, Table



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 19 Radiated Spurious Emissions above 1GHz, High Channel, Table**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 HiCh, TableTop Mount  
 120V/60Hz  
 RED: Horizontal GRN: Vertical

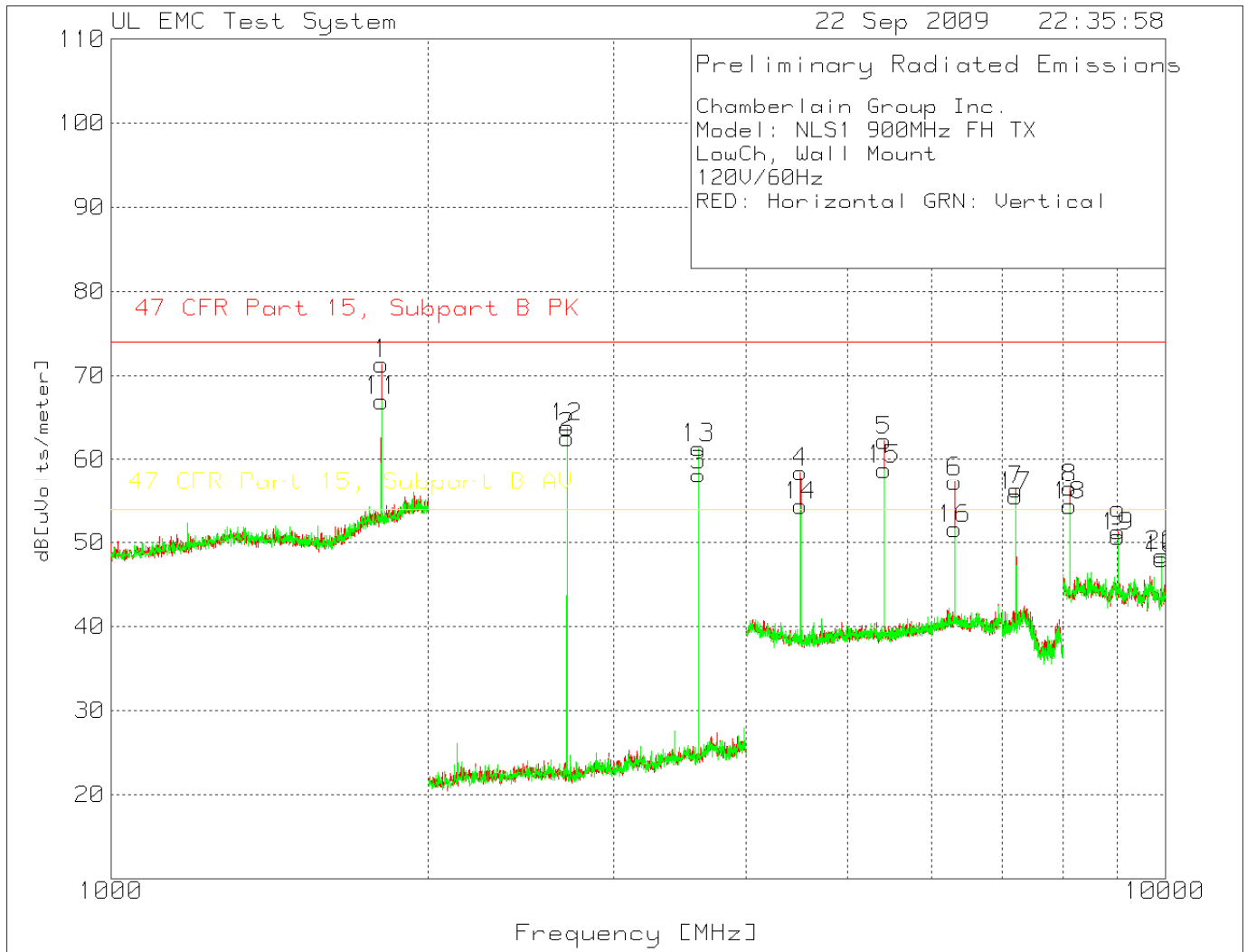
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	Comments
1	1853.854	34.42	pk	3.74	30.5	68.66	74	-5.34	54	14.66	100	Horz	Note 1
2	2780.781	88.99	pk	-51.03	22.2	60.16	74	-13.84	54	6.16	100	Horz	See table below
3	3707.708	84.19	pk	-49.54	23.5	58.15	74	-15.85	54	4.15	100	Horz	See table below
17	2130.13	68.32	pk	-52.71	21.5	37.11	74	-36.89	54	-16.89	100	Horz	Note 2
4	4632.422	77.71	pk	-52.32	27.7	53.09	74	-20.91	54	-9.91	100	Horz	See table below
5	5561.041	80.67	pk	-50.52	28.3	58.45	74	-15.55	54	4.45	100	Horz	Note 1
6	7415.61	66.96	pk	-47.43	31	50.53	74	-23.47	54	-3.47	100	Horz	See table below
7	9266.533	63.02	pk	-49.39	36.4	50.03	74	-23.97	54	-3.97	150	Horz	Note 1
8	1853.854	33.34	pk	3.74	30.5	67.58	74	-6.42	54	13.58	100	Vert	Note 1
9	2780.781	94.72	pk	-51.03	22.2	65.89	74	-8.11	54	11.89	150	Vert	See table below
10	3707.708	86.68	pk	-49.54	23.5	60.64	74	-13.36	54	6.64	150	Vert	See table below
11	4632.422	81.33	pk	-52.32	27.7	56.71	74	-17.29	54	2.71	150	Vert	See table below
12	5561.041	85.07	pk	-50.52	28.3	62.85	74	-11.15	54	8.85	150	Vert	Note 1
13	6486.991	64.05	pk	-48.32	29.1	44.83	74	-29.17	54	-9.17	100	Vert	Note 1
14	7415.61	66.99	pk	-47.43	31	50.56	74	-23.44	54	-3.44	150	Vert	See table below
15	8340.681	61.55	pk	-50.02	36.5	48.03	74	-25.97	54	-5.97	150	Vert	See table below
16	9266.533	65.19	pk	-49.39	36.4	52.2	74	-21.8	54	-1.8	199	Vert	Note 1

**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.  
**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Azimuth [degs]	Height [cm]	Polarity
2780.1473	90.09	pk	1MHz/1MHz	-51.01	22.2	0	61.28	74	-12.72			226	100	Horz
2780.1473	83.49	av	1MHz/10Hz	-51.01	22.2	-26	28.68			54	-25.32	226	100	Horz
2780.1473	94.71	pk	1MHz/1MHz	-51.01	22.2	0	65.9	74	-8.1			348	154	Vert
2780.1473	88.22	av	1MHz/10Hz	-51.01	22.2	-26	33.41			54	-20.59	348	154	Vert
3706.9479	86.06	pk	1MHz/1MHz	-49.51	23.5	0	60.05	74	-13.95			232	107	Horz
3706.9479	78.83	av	1MHz/10Hz	-49.51	23.5	-26	26.82			54	-27.18	232	107	Horz
3706.9479	88.82	pk	1MHz/1MHz	-49.51	23.5	0	62.81	74	-11.19			319	135	Vert
3706.9479	81.77	av	1MHz/10Hz	-49.51	23.5	-26	29.76			54	-24.24	319	135	Vert
4633.6483	78.44	pk	1MHz/1MHz	-52.33	27.7	0	53.81	74	-20.19			46	100	Horz
4633.6483	70.49	av	1MHz/10Hz	-52.33	27.7	-26	19.86			54	-34.14	46	100	Horz
4633.6483	82.35	pk	1MHz/1MHz	-52.33	27.7	0	57.72	74	-16.28			9	119	Vert
4633.6483	74.85	av	1MHz/10Hz	-52.33	27.7	-26	24.22			54	-29.78	9	119	Vert
7413.7445	68.51	pk	1MHz/1MHz	-47.45	31	0	52.06	74	-21.94			261	106	Horz
7413.7445	58.78	av	1MHz/10Hz	-47.45	31	-26	16.33			54	-37.67	261	106	Horz
7413.7445	69.57	pk	1MHz/1MHz	-47.45	31	0	53.12	74	-20.88			261	102	Vert
7413.7445	60.3	av	1MHz/10Hz	-47.45	31	-26	17.85			54	-36.15	261	102	Vert
8341.0511	66.27	pk	1MHz/1MHz	-50.02	36.5	0	52.75	74	-21.25			97	107	Vert
8340.5942	54.45	av	1MHz/10Hz	-50.02	36.5	-26	14.93			54	-39.07	97	107	Vert

LIMIT 1: 47 CFR Part 15, Subpart B PK  
 LIMIT 2: 47 CFR Part 15, Subpart B AV  
 pk - Peak detector  
 av - Average detector

Figure 26 Radiated Spurious Emissions above 1GHz, Low Channel, Wall-mount



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 20 Radiated Spurious Emissions above 1GHz, Low Channel, Wall-mount**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 LowCh, Wall Mount  
 120V/60Hz  
 RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uV/m)]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	Comments
1	1804.805	37.66	pk	3.59	30.1	71.35	74	-2.65	54	17.35	100	Horz	Note 1
2	2706.707	91.73	pk	-51.23	22.1	62.6	74	-11.4	54	8.6	100	Horz	See table below
3	3609.61	85.89	pk	-50.95	23.2	58.14	74	-15.86	54	4.14	100	Horz	See table below
4	4509.673	83.19	pk	-52.5	27.8	58.49	74	-15.51	54	4.49	100	Horz	See table below
5	5414.276	84.47	pk	-50.15	27.9	62.22	74	-11.78	54	8.22	100	Horz	See table below
6	6316.211	76.14	pk	-48.02	29.2	57.32	74	-16.68	54	3.32	100	Horz	Note 1
7	7220.814	73.5	pk	-47.09	29.9	56.31	74	-17.69	54	2.31	100	Horz	Note 1
8	8120.24	70.23	pk	-49.9	36.2	56.53	74	-17.47	54	2.53	150	Horz	See table below
9	9022.044	65.16	pk	-49.92	36.1	51.34	74	-22.66	54	-2.66	150	Horz	Note 2
10	9927.856	62.13	pk	-50.48	36.4	48.05	74	-25.95	54	-5.95	150	Horz	Note 1
11	1804.805	33.31	pk	3.59	30.1	67	74	-7	54	13	100	Vert	Note 1
12	2706.707	92.96	pk	-51.23	22.1	63.83	74	-10.17	54	9.83	101	Vert	See table below
13	3609.61	89.11	pk	-50.95	23.2	61.36	74	-12.64	54	7.36	150	Vert	See table below
14	4509.673	79.08	pk	-52.5	27.8	54.38	74	-19.62	54	.38	100	Vert	See table below
15	5411.608	81.09	pk	-50.19	27.9	58.8	74	-15.2	54	4.8	150	Vert	See table below
16	6316.211	70.45	pk	-48.02	29.2	51.63	74	-22.37	54	-2.37	150	Vert	Note 1
17	7218.145	72.87	pk	-47.08	29.8	55.59	74	-18.41	54	1.59	100	Vert	Note 1
18	8120.24	68.08	pk	-49.9	36.2	54.38	74	-19.62	54	.38	150	Vert	See table below
19	9022.044	64.5	pk	-49.92	36.1	50.68	74	-23.32	54	-3.32	150	Vert	See table below
20	9927.856	62.55	pk	-50.48	36.4	48.47	74	-25.53	54	-5.53	150	Vert	Note 1

**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

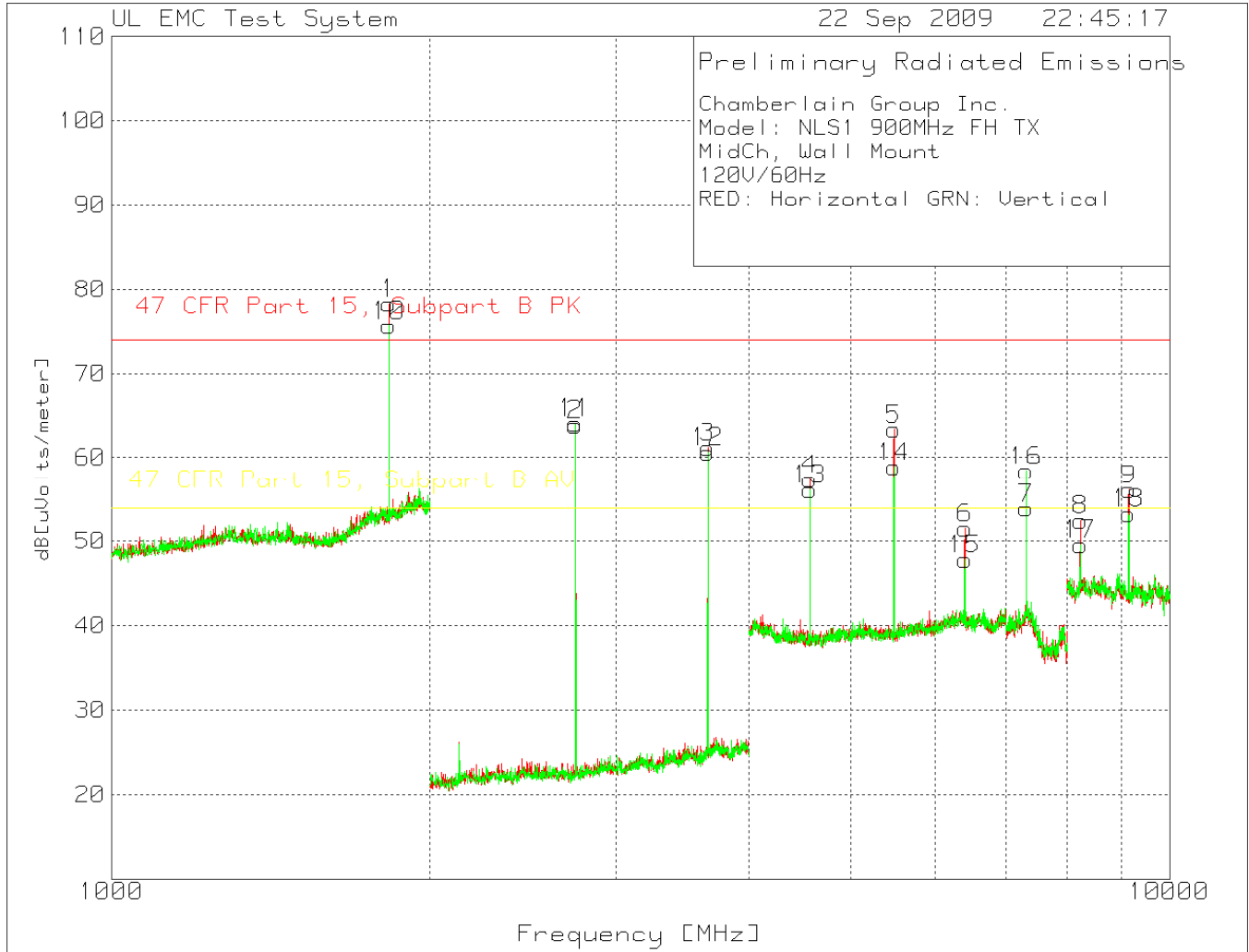
**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor [dB]	Level [dB(uV/m)]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity
2707.0036	93.24	pk	1MHz/1MHz	-51.23	22.1	0	64.11	74	-9.89			351	108 Horz
2706.7631	86.62	av	1MHz/10Hz	-51.23	22.1	-26	31.49			54	-22.51	351	108 Horz
2706.6309	95.89	pk	1MHz/1MHz	-51.23	22.1	0	66.76	74	-7.24			0	119 Vert
2706.7932	89.51	av	1MHz/10Hz	-51.23	22.1	-26	34.38			54	-19.62	0	119 Vert
3608.8545	86.97	pk	1MHz/1MHz	-50.95	23.2	0	59.22	74	-14.78			0	142 Vert
3608.9868	79.78	av	1MHz/10Hz	-50.95	23.2	-26	26.03			54	-27.97	0	142 Vert
3608.6741	88.06	pk	1MHz/1MHz	-50.95	23.2	0	60.31	74	-13.69			302	118 Horz
3609.0048	79.55	av	1MHz/10Hz	-50.95	23.2	-26	25.8			54	-28.2	302	118 Horz
4511.3986	84.12	pk	1MHz/1MHz	-52.5	27.8	0	59.42	74	-14.58			116	104 Horz
4511.2483	77.25	av	1MHz/10Hz	-52.5	27.8	-26	26.55			54	-27.45	116	104 Horz
4511.5549	77.79	pk	1MHz/1MHz	-52.5	27.8	0	53.09	74	-20.91			5	107 Vert
4511.2663	70.21	av	1MHz/10Hz	-52.5	27.8	-26	19.51			54	-34.49	5	107 Vert
5413.3357	78.04	pk	1MHz/1MHz	-50.17	27.9	0	55.77	74	-18.23			187	104 Vert
5413.5281	70.66	av	1MHz/10Hz	-50.17	27.9	-26	22.39			54	-31.61	187	104 Vert
5413.5461	84.47	pk	1MHz/1MHz	-50.16	27.9	0	62.21	74	-11.79			46	100 Horz
5413.516	77.44	av	1MHz/10Hz	-50.17	27.9	-26	29.17			54	-24.83	46	100 Horz
8120.2571	70.73	pk	1MHz/1MHz	-49.9	36.2	0	57.03	74	-16.97			41	142 Horz
8120.1549	61.69	av	1MHz/10Hz	-49.89	36.2	-26	22.			54	-32	41	142 Horz
8120.4615	70.24	pk	1MHz/1MHz	-49.9	36.2	0	56.54	74	-17.46			7	145 Vert
8120.197	61.27	av	1MHz/10Hz	-49.89	36.2	-26	21.58			54	-32.42	7	145 Vert
9021.9107	69.01	pk	1MHz/1MHz	-49.91	36.1	0	55.2	74	-18.8			0	124 Vert
9022.3556	58.57	av	1MHz/10Hz	-49.93	36.1	-26	18.74			54	-35.26	0	124 Vert
9022.0851	67.85	pk	1MHz/1MHz	-49.92	36.1	0	54.03	74	-19.97			259	141 Horz
9022.4218	57.22	av	1MHz/10Hz	-49.93	36.1	-26	17.39			54	-36.61	259	141 Horz

LIMIT 1: 47 CFR Part 15, Subpart B PK LIMIT 2: 47 CFR Part 15, Subpart B AV

pk - Peak detector  
 av - Average detector

**Figure 27 Radiated Spurious Emissions above 1GHz, Middle Channel, Wall-mount**



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 21 Radiated Spurious Emissions above 1GHz, Middle Channel, Wall-mount**

Chamberlain Group Inc.  
 Model: NLS1 900MHz FH TX  
 MidCh, Wall Mount  
 120V/60Hz  
 RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	Comments
1	1829.83	44.4	pk	3.59	30.3	78.29	74	4.29	54	24.29	100	Horz	Note 1
2	2744.745	92.97	pk	-51.2	22.1	63.87	74	-10.13	54	9.87	100	Horz	See table below
3	3659.66	87.44	pk	-49.64	23.4	61.2	74	-12.8	54	7.2	100	Horz	See table below
4	4573.716	82.16	pk	-52.47	27.7	57.39	74	-16.61	54	3.39	100	Horz	See table below
5	5488.993	85.48	pk	-50.24	28.1	63.34	74	-10.66	54	9.34	100	Horz	Note 1
6	6404.27	70.25	pk	-47.94	29.2	51.51	74	-22.49	54	-2.49	100	Horz	Note 1
7	7319.546	69.66	pk	-46.37	30.6	53.89	74	-20.11	54	-1.11	100	Horz	See table below
8	8232.465	64.87	pk	-48.8	36.4	52.47	74	-21.53	54	-1.53	149	Horz	See table below
9	9150.301	70.6	pk	-50.77	36.3	56.13	74	-17.87	54	2.13	149	Horz	See table below
10	1829.83	41.77	pk	3.59	30.3	75.66	74	1.66	54	21.66	149	Vert	Note 1
11	2744.745	93.19	pk	-51.2	22.1	64.09	74	-9.91	54	10.09	150	Vert	See table below
12	3659.66	86.88	pk	-49.64	23.4	60.64	74	-13.36	54	6.64	150	Vert	See table below
13	4573.716	80.92	pk	-52.47	27.7	56.15	74	-17.85	54	2.15	100	Vert	See table below
14	5488.993	81.01	pk	-50.24	28.1	58.87	74	-15.13	54	4.87	150	Vert	Note 1
15	6404.27	66.54	pk	-47.94	29.2	47.8	74	-26.2	54	-6.2	150	Vert	Note 1
16	7319.546	74.17	pk	-46.37	30.6	58.4	74	-15.6	54	4.4	100	Vert	See table below
17	8232.465	61.97	pk	-48.8	36.4	49.57	74	-24.43	54	-4.43	150	Vert	See table below
18	9146.293	67.77	pk	-50.8	36.3	53.27	74	-20.73	54	-7.3	150	Vert	See table below

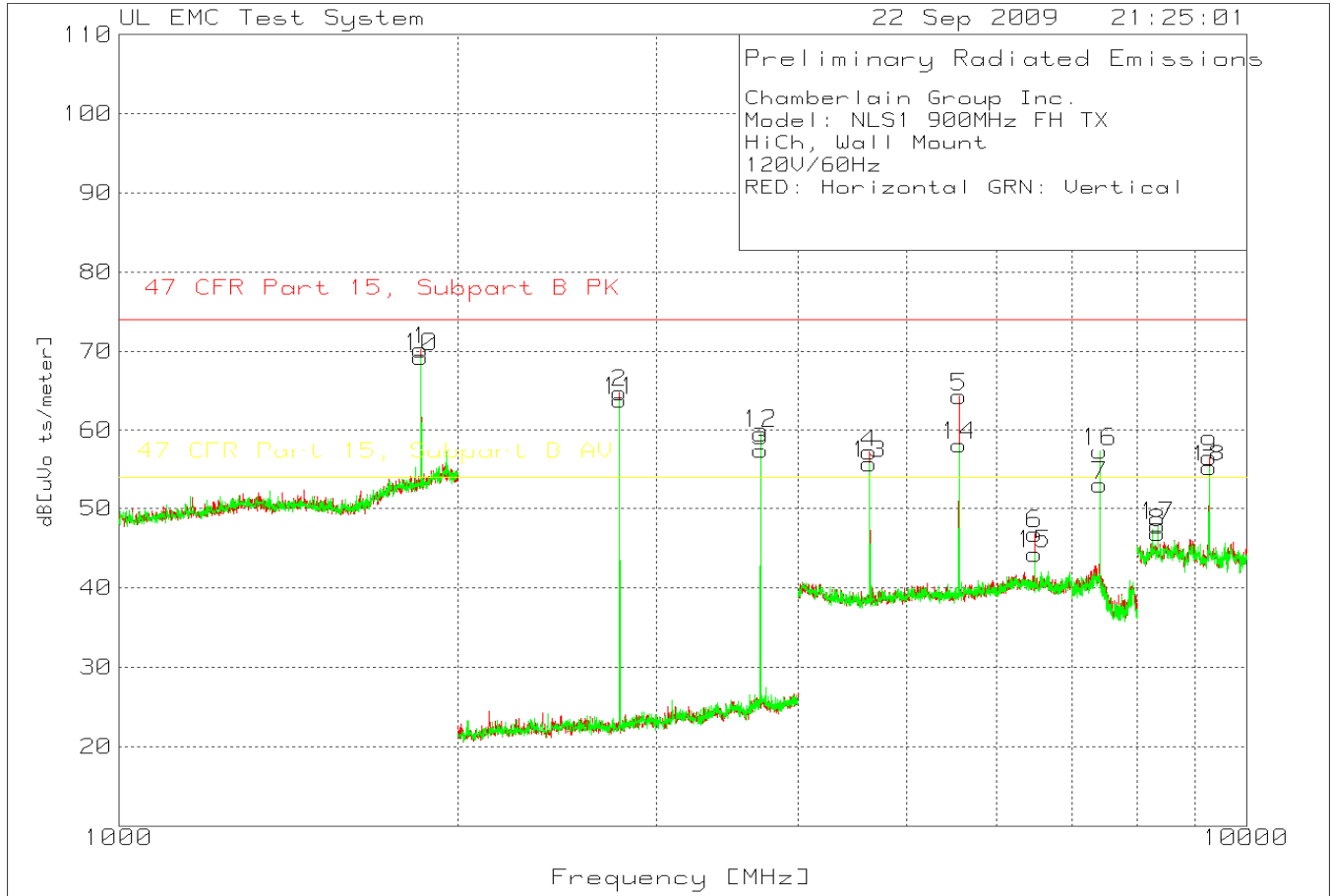
**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Azimuth [deg]	Height [cm]	Polarity
2744.4317	91.35	pk	1MHz/1MHz	-51.21	22.1	0	62.24	74	-11.76			0	115	Horz
2744.2393	84.79	av	1MHz/10Hz	-51.22	22.1	-26	29.67			54	-24.33	0	115	Horz
2744.3655	96.1	pk	1MHz/1MHz	-51.21	22.1	0	66.99	74	-7.01			6	144	Vert
2744.2453	89.74	av	1MHz/10Hz	-51.22	22.1	-26	34.62			54	-19.38	6	144	Vert
3658.8905	88.76	pk	1MHz/1MHz	-49.67	23.4	0	62.49	74	-11.51			332	145	Vert
3659.0287	82.13	av	1MHz/10Hz	-49.66	23.4	-26	29.87			54	-24.13	332	145	Vert
3658.5478	84	pk	1MHz/1MHz	-49.67	23.4	0	57.73	74	-16.27			55	118	Horz
3659.0287	75.12	av	1MHz/10Hz	-49.66	23.4	-26	22.86			54	-31.14	55	118	Horz
4573.9224	82.32	pk	1MHz/1MHz	-52.47	27.7	0	57.55	74	-16.45			111	100	Horz
4573.8022	75.3	av	1MHz/10Hz	-52.47	27.7	-26	24.53			54	-29.47	111	100	Horz
4573.8413	80.83	pk	1MHz/1MHz	-52.47	27.7	0	56.06	74	-17.94			0	100	Vert
4573.7331	73.87	av	1MHz/10Hz	-52.47	27.7	-26	23.1			54	-30.9	0	100	Vert
7317.6273	75.08	pk	1MHz/1MHz	-46.36	30.6	0	59.32	74	-14.68			355	131	Vert
7317.982	67.03	av	1MHz/10Hz	-46.36	30.6	-26	25.27			54	-28.73	355	131	Vert
7317.7174	73.66	pk	1MHz/1MHz	-46.36	30.6	0	57.9	74	-16.1			274	107	Horz
7317.982	65.49	av	1MHz/10Hz	-46.36	30.6	-26	23.73			54	-30.27	274	107	Horz
8232.5	68.88	pk	1MHz/1MHz	-48.8	36.4	0	56.48	74	-17.52			14	160	Horz
8232.6383	59.36	av	1MHz/10Hz	-48.79	36.4	-26	20.97			54	-33.03	14	160	Horz
8232.2234	65.54	pk	1MHz/1MHz	-48.8	36.4	0	53.14	74	-20.86			18	143	Vert
8232.7705	55.58	av	1MHz/10Hz	-48.79	36.4	-26	17.19			54	-36.81	18	143	Vert
9147.3527	71.43	pk	1MHz/1MHz	-50.77	36.3	0	56.96	74	-17.04			357	142	Vert
9147.4128	62.17	av	1MHz/10Hz	-50.77	36.3	-26	21.7			54	-32.3	357	142	Vert
9147.8998	71.98	pk	1MHz/1MHz	-50.77	36.3	0	57.51	74	-16.49			21	152	Horz
9147.4489	62.63	av	1MHz/10Hz	-50.77	36.3	-26	22.16			54	-31.84	21	152	Horz

LIMIT 1: 47 CFR Part 15, Subpart B PK  
 LIMIT 2: 47 CFR Part 15, Subpart B AV  
 pk - Peak detector  
 av - average detector  
 av - Average detector

Figure 28 Radiated Spurious Emissions above 1GHz, High Channel, Wall-mount



\*Above plot shows noise floor and second harmonic emissions over the class B limits. The area between 1GHz and 2GHz was checked with different configuration using pre-amplifier and it was found that other than the second harmonic emission, no other emissions were present.

**Table 22 Radiated Spurious Emissions above 1GHz, High Channel, Wall-mount**

Chamberlain Group Inc.

Model: NLS1 900MHz FH TX

HiCh, Wall Mount

120V/60Hz

RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uV/m)]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity	Comments
1	1853.854	35.91	pk	3.74	30.5	70.15	74	-3.85	54	16.15	100	Horz	Note 1
2	2780.781	93.59	pk	-51.03	22.2	64.76	74	-9.24	54	10.76	100	Horz	See table below
3	3707.708	83.41	pk	-49.54	23.5	57.37	74	-16.63	54	3.37	100	Horz	See table below
4	4632.422	81.76	pk	-52.32	27.7	57.14	74	-16.86	54	3.14	100	Horz	See table below
5	5561.041	86.48	pk	-50.52	28.3	64.26	74	-9.74	54	10.26	100	Horz	Note 1
6	6486.991	66.06	pk	-48.32	29.1	46.84	74	-27.16	54	-7.16	100	Horz	Note 1
7	7415.61	69.4	pk	-47.43	31	52.97	74	-21.03	54	-1.03	100	Horz	See table below
8	8340.681	60.46	pk	-50.02	36.5	46.94	74	-27.06	54	-7.06	100	Horz	Note 2
9	9266.533	69.44	pk	-49.39	36.4	56.45	74	-17.55	54	2.45	150	Horz	Note 1
10	1853.854	35.5	pk	3.74	30.5	69.74	74	-4.26	54	15.74	150	Vert	Note 1
11	2780.781	92.64	pk	-51.03	22.2	63.81	74	-10.19	54	9.81	200	Vert	See table below
12	3707.708	85.66	pk	-49.54	23.5	59.62	74	-14.38	54	5.62	149	Vert	See table below
13	4632.422	80.31	pk	-52.32	27.7	55.69	74	-18.31	54	1.69	100	Vert	See table below
14	5561.041	80.33	pk	-50.52	28.3	58.11	74	-15.89	54	4.11	149	Vert	Note 1
15	6486.991	63.49	pk	-48.32	29.1	44.27	74	-29.73	54	-9.73	149	Vert	Note 1
16	7415.61	73.72	pk	-47.43	31	57.29	74	-16.71	54	3.29	100	Vert	See table below
17	8340.681	61.36	pk	-50.02	36.5	47.84	74	-26.16	54	-6.16	150	Vert	Note 2
18	9266.533	68.17	pk	-49.39	36.4	55.18	74	-18.82	54	1.18	150	Vert	Note 1

**Note 1:** Spurious Product of the Transmitter, not in restricted band, Radiated Emissions Limits do not apply.

**Note 2:** Sufficient peak margin based on pre-scan peak data. EUT has 26dB duty cycle correction factor applicable to average limit.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor [dB]	Level [dB(uV/m)]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Azimuth [deg]	Height [cm]	Polarity
2780.1473	93.68	pk	1MHz/1MHz	-51.01	22.2	0	64.87	74	-9.13	54		0	108	Horz
2780.1473	87.18	av	1MHz/10Hz	-51.01	22.2	-26	32.37			54	-21.63	0	108	Horz
2780.1473	95.44	pk	1MHz/1MHz	-51.01	22.2	0	66.63	74	-7.37	54		0	117	Vert
2780.1473	89	av	1MHz/10Hz	-51.01	22.2	-26	34.19			54	-19.81	0	117	Vert
3706.9479	86.31	pk	1MHz/1MHz	-49.51	23.5	0	60.3	74	-13.7	54		295	114	Horz
3706.9479	78.26	av	1MHz/10Hz	-49.51	23.5	-26	26.25			54	-27.75	295	114	Horz
3706.9479	88.24	pk	1MHz/1MHz	-49.51	23.5	0	62.23	74	-11.77	54		4	165	Vert
3706.9479	81.25	av	1MHz/10Hz	-49.51	23.5	-26	29.24			54	-24.76	4	165	Vert
4633.6483	82.42	pk	1MHz/1MHz	-52.33	27.7	0	57.79	74	-16.21	54		119	106	Horz
4633.6483	75.19	av	1MHz/10Hz	-52.33	27.7	-26	24.56			54	-29.44	119	106	Horz
4633.6483	80.62	pk	1MHz/1MHz	-52.33	27.7	0	55.99	74	-18.01	54		343	116	Vert
4633.6483	73.13	av	1MHz/10Hz	-52.33	27.7	-26	22.5			54	-31.5	343	116	Vert
7413.7445	71.29	pk	1MHz/1MHz	-47.45	31	0	54.84	74	-19.16	54		280	104	Horz
7413.7445	62.34	av	1MHz/10Hz	-47.45	31	-26	19.89			54	-34.11	280	104	Horz
7413.7445	76	pk	1MHz/1MHz	-47.45	31	0	59.55	74	-14.45	54		1	126	Vert
7413.7445	67.8	av	1MHz/10Hz	-47.45	31	-26	25.35			54	-28.65	1	126	Vert

LIMIT 1: 47 CFR Part 15, Subpart B PK

LIMIT 2: 47 CFR Part 15, Subpart B AV

pk - Peak detector  
av - Average detector



**4.4 Test Conditions and Results – BAND EDGE COMPLIANCE**

Test Description	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).	
Basic Standard	47 CFR Part 15.247(d) RSS-210, A8.5	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	902MHz – 928MHz	Antenna Conducted
<b>Limits</b>		
Measurement Type		
Conducted	Antenna Conducted – 20dB below the fundamental	
Radiated	Radiated only required if emissions are in the restricted band	
Supplementary information: Only Antenna Conducted Measurements required. No restricted bands close to the allocated frequency band.		

**Table 23 Band Edge Compliance EUT Configuration Settings**

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

**Table 24 Band Edge Compliance Test Equipment**

<b>Test Equipment Used</b>			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Test setup for Band Edge Compliance – Conducted**

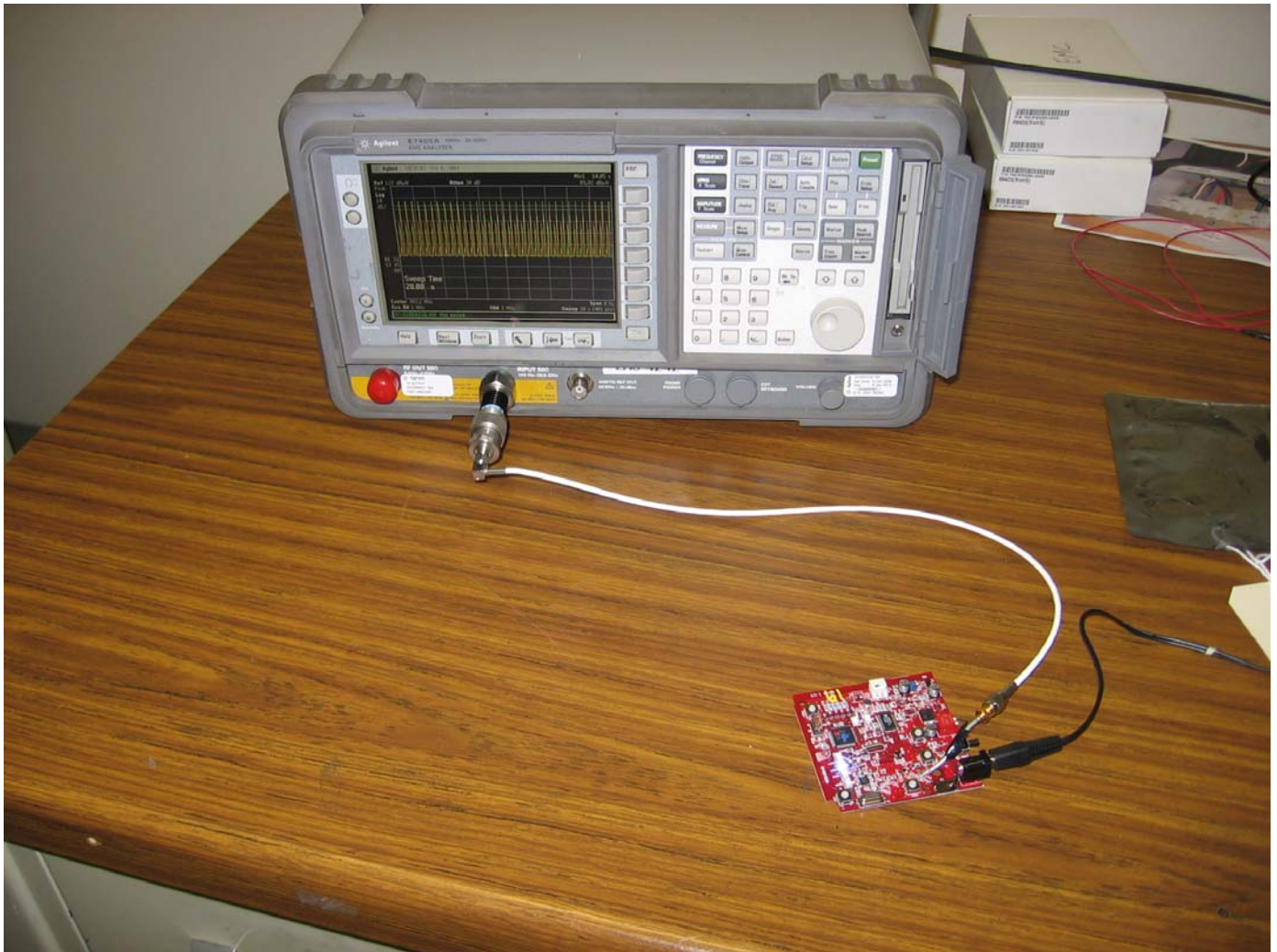
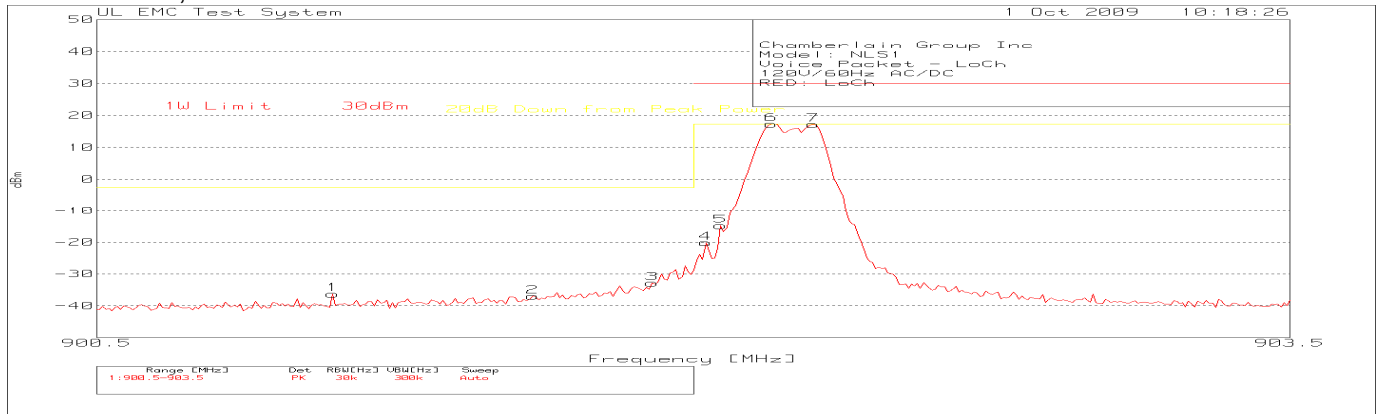
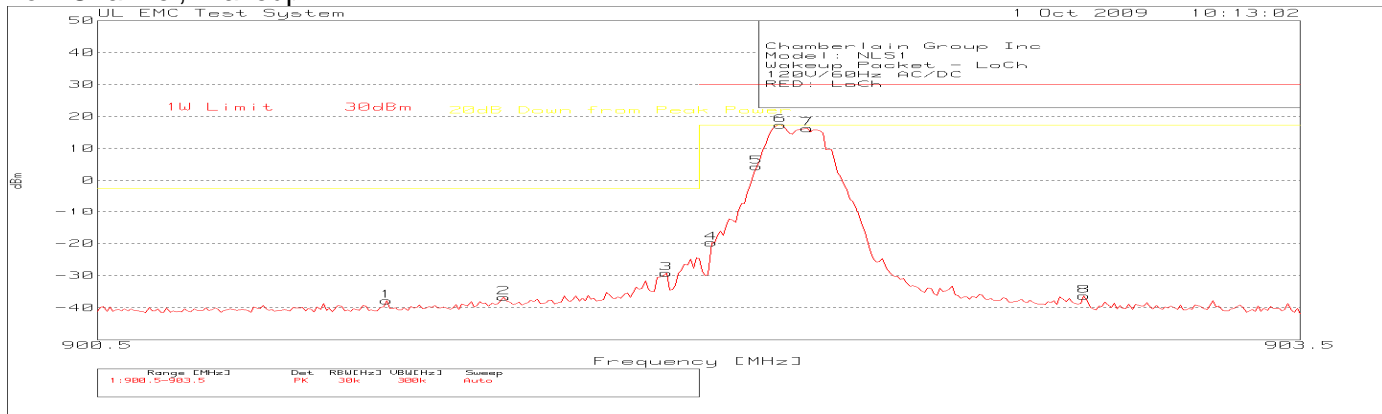


Figure 29 Conducted Band Edge Compliance Graph, Low Channel

Low Channel, Voice



Low Channel, Wakeup



Low Channel, Voice, Hopping

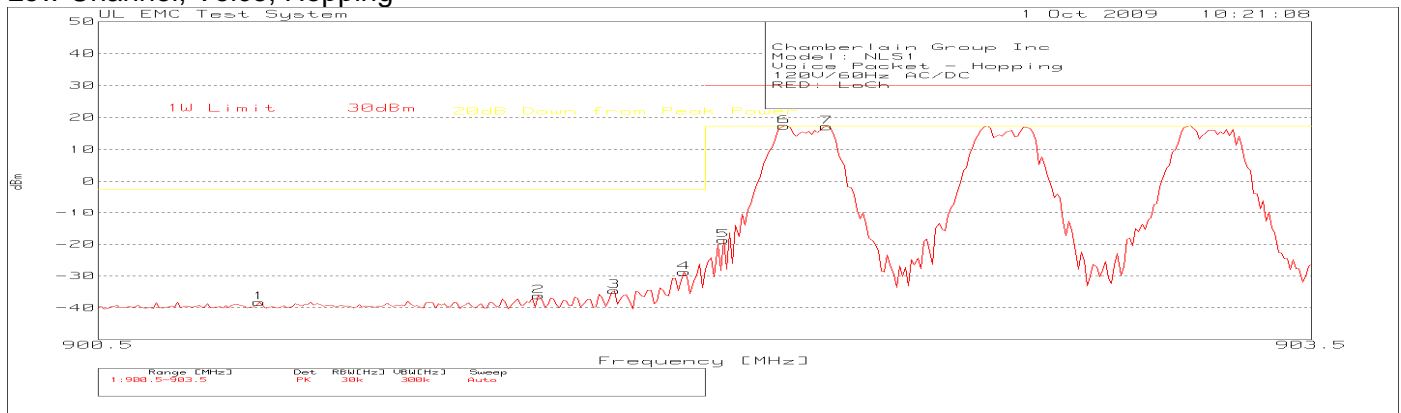
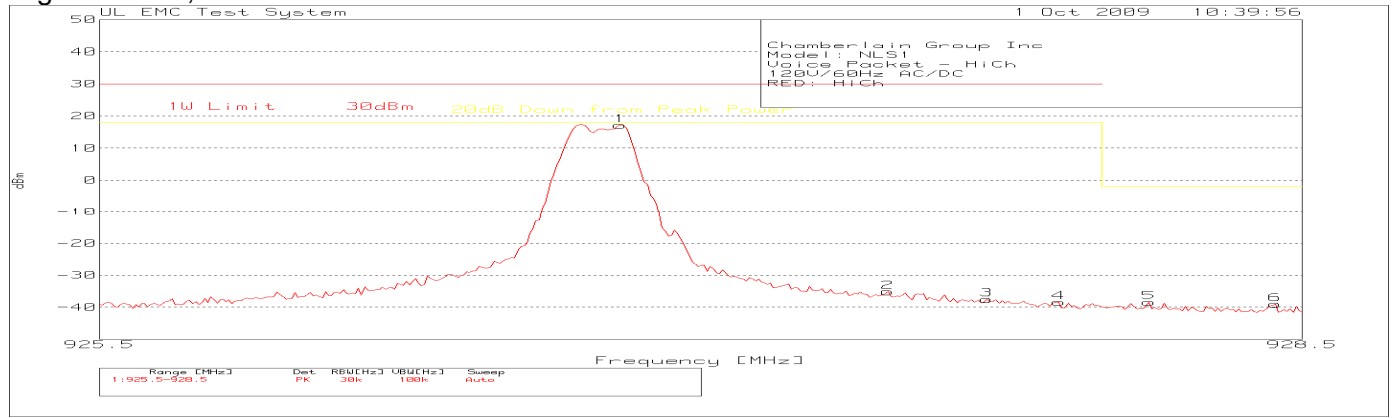
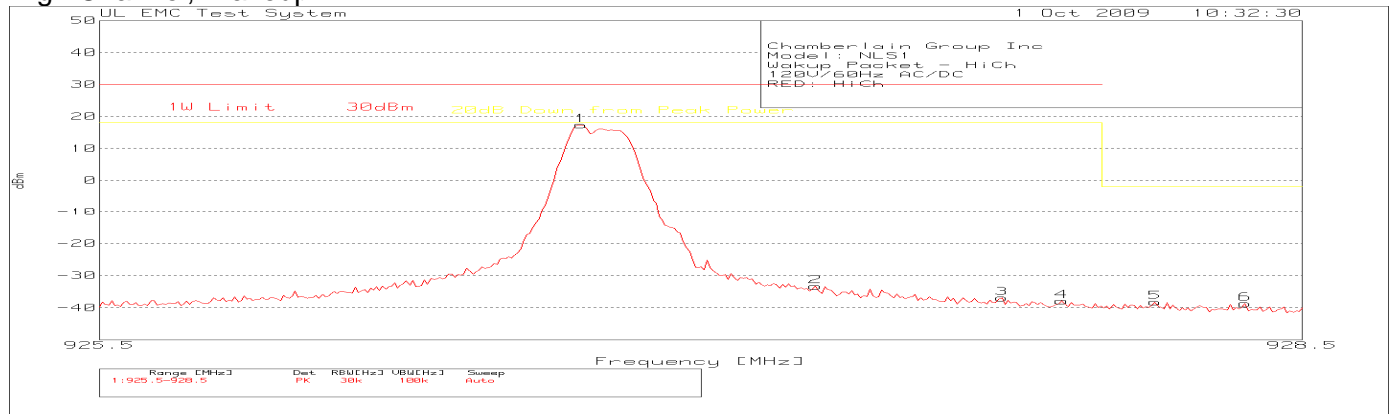


Figure 30 Conducted Band Edge Compliance Graph, Low Channel

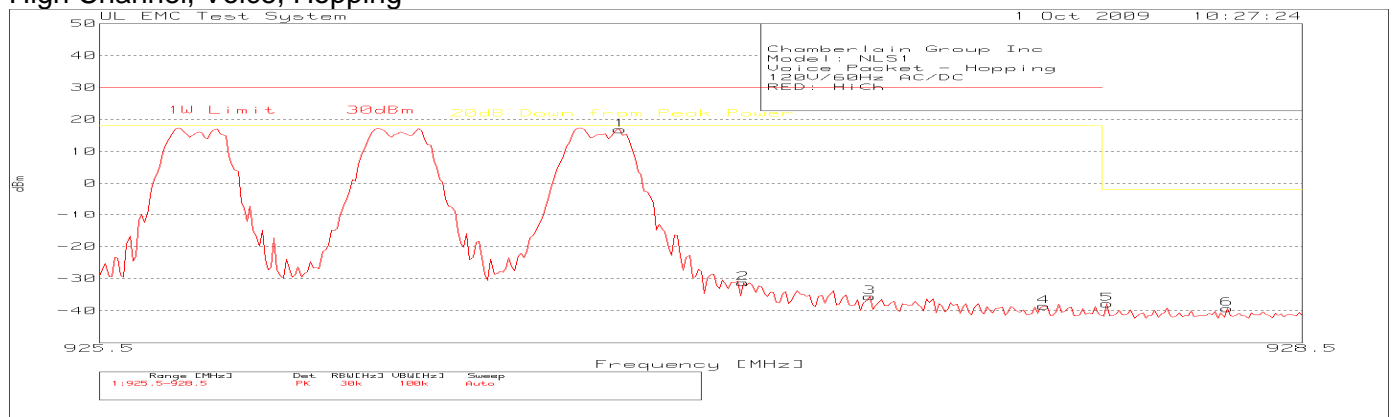
High Channel, Voice



High Channel, Wakeup



High Channel, Voice, Hopping



**Table 25 Band Edge Compliance Data Points, Low Channel**

**Low Channel, Voice**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	901.0925	60.42	pk	10.3	-107	-36.28	0	-36.28	-2.6	-33.68	Out-of-Band
2	901.595	59.7	pk	10.3	-107	-37	0	-37	-2.6	-34.4	Out-of-Band
3	901.895	63.87	pk	10.3	-107	-32.83	0	-32.83	-2.6	-30.23	Out-of-Band
4	902.03	76.56	pk	10.3	-107	-20.14	30	-50.14	17.4	-37.54	In-Band
5	902.0675	81.91	pk	10.3	-107	-14.79	30	-44.79	17.4	-32.19	In-Band
6	902.195	114.04	pk	10.3	-107	17.34	30	-12.66	17.4	-.06	In-Band
7	902.3	113.91	pk	10.3	-107	17.21	30	-12.79	17.4	-.19	In-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**Low Channel, Wakeup**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	901.22	58.88	pk	10.3	-107	-37.82	0	-37.82	-2.6	-35.22	Out-of-Band
2	901.5125	59.99	pk	10.3	-107	-36.71	0	-36.71	-2.6	-34.11	Out-of-Band
3	901.9175	67.46	pk	10.3	-107	-29.24	0	-29.24	-2.6	-26.64	Out-of-Band
4	902.03	76.98	pk	10.3	-107	-19.72	30	-49.72	17.4	-37.12	In-Band
5	902.1425	101.01	pk	10.3	-107	4.31	30	-25.69	17.4	-13.09	In-Band
6	902.2025	114.02	pk	10.3	-107	17.32	30	-12.68	17.4	-.08	In-Band
7	902.27	112.99	pk	10.3	-107	16.29	30	-13.71	17.4	-1.11	In-Band
8	902.96	60.37	pk	10.3	-107	-36.33	30	-66.33	17.4	-53.73	In-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**Low Channel, Voice, Hopping**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	900.8975	58.39	pk	10.3	-107	-38.31	0	-38.31	-2.6	-35.71	Out-of-Band
2	901.5875	60.49	pk	10.3	-107	-36.21	0	-36.21	-2.6	-33.61	Out-of-Band
3	901.775	62.09	pk	10.3	-107	-34.61	0	-34.61	-2.6	-32.01	Out-of-Band
4	901.9475	67.86	pk	10.3	-107	-28.84	0	-28.84	-2.6	-26.24	Out-of-Band
5	902.045	77.96	pk	10.3	-107	-18.74	30	-48.74	17.4	-36.14	In-Band
6	902.195	113.99	pk	10.3	-107	17.29	30	-12.71	17.4	-.11	In-Band
7	902.3	113.85	pk	10.3	-107	17.15	30	-12.85	17.4	-.25	In-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**Table 26 Band Edge Compliance Data Points, High Channel**

**High Channel, Voice**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	926.7975	113.83	pk	10.3	-107	17.13	30	-12.87	18	-1.87	In-Band
2	927.465	61.61	pk	10.3	-107	-35.09	30	-65.09	18	-53.09	In-Band
3	927.7125	59.21	pk	10.3	-107	-37.49	30	-67.49	18	-55.49	In-Band
4	927.8925	58.31	pk	10.3	-107	-38.39	30	-68.39	18	-56.39	In-Band
5	928.1175	58.3	pk	10.3	-107	-38.4	0	-38.4	-2	-36.4	Out-of-Band
6	928.4325	57.69	pk	10.3	-107	-39.01	0	-39.01	-2	-37.01	Out-of-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**High Channel, Wakeup**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	926.7	114.06	pk	10.3	-107	17.36	30	-12.64	18	-1.64	In-Band
2	927.285	63.39	pk	10.3	-107	-33.31	30	-63.31	18	-51.31	In-Band
3	927.75	59.76	pk	10.3	-107	-36.94	30	-66.94	18	-54.94	In-Band
4	927.9	58.8	pk	10.3	-107	-37.9	30	-67.9	18	-55.9	In-Band
5	928.1325	58.48	pk	10.3	-107	-38.22	0	-38.22	-2	-36.22	Out-of-Band
6	928.3575	58.01	pk	10.3	-107	-38.69	0	-38.69	-2	-36.69	Out-of-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**High Channel, Voice, Hopping**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Comments
1	926.7975	113.56	pk	10.3	-107	16.86	30	-13.14	18	-1.14	In-Band
2	927.105	65.41	pk	10.3	-107	-31.29	30	-61.29	18	-49.29	In-Band
3	927.42	61.06	pk	10.3	-107	-35.64	30	-65.64	18	-53.64	In-Band
4	927.855	58.09	pk	10.3	-107	-38.61	30	-68.61	18	-56.61	In-Band
5	928.0125	58.89	pk	10.3	-107	-37.81	0	-37.81	-2	-35.81	Out-of-Band
6	928.3125	57.4	pk	10.3	-107	-39.3	0	-39.3	-2	-37.3	Out-of-Band

LIMIT 1: 1W Limit 30dBm  
 LIMIT 2: 20dB Down from Peak Power  
 pk - Peak detector

**4.5 Test Conditions and Results – Carrier Frequency Separation**

Test Description	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. See section 4.8 for 20dB data.		
Basic Standard	47 CFR Part 15.247(a)(1) RSS-210, A8.1(b)		

**Table 27 Carrier Frequency Separation Configuration Settings**

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
2	1	3
Supplementary information: Separation frequencies were measured for each channel and then averaged.		

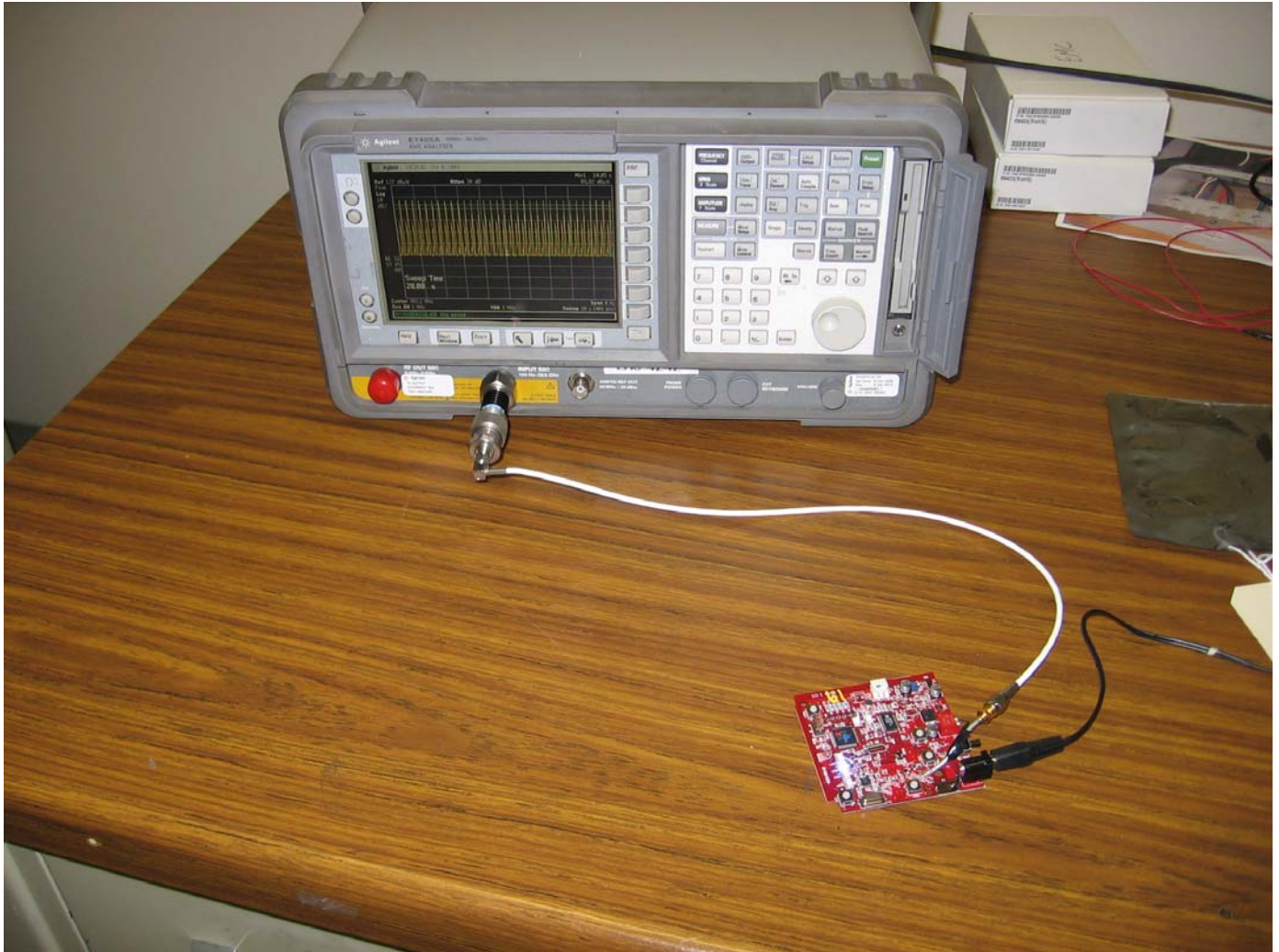
**Table 28 Carrier Frequency Separation Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 29 Carrier Frequency Separation Results**

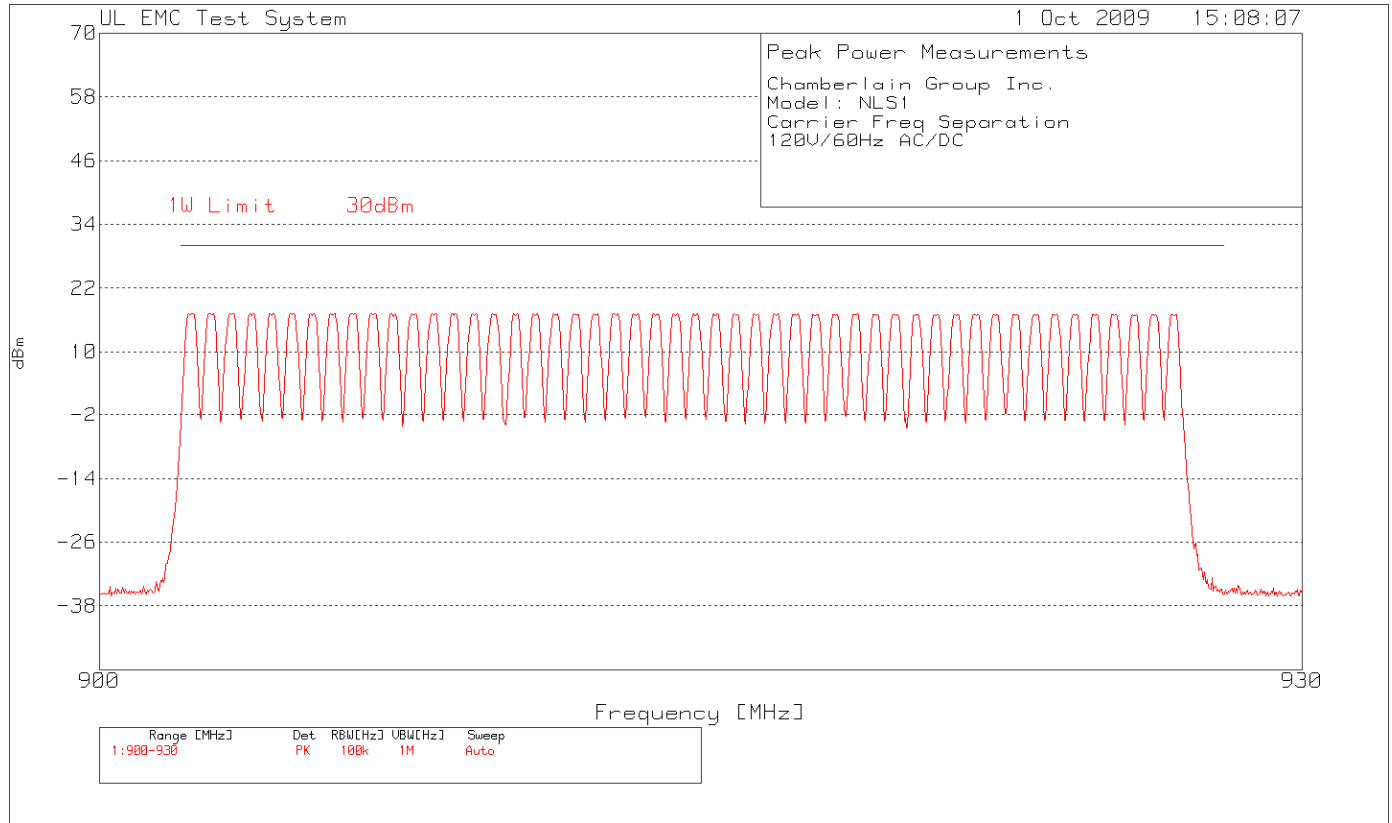
Mode	Channel	Carrier Frequency Separation Limit	Channel Separation
TX Hopping	Low Side	> 20dB Bandwidth (aprx. 210kHz)	0.4991 MHz
	Middle		0.4990 MHz
	High Side		0.4992 MHz
	Overall Average		0.4991 MHz

### Test Setup for Carrier Frequency Separation





**Figure 31 Carrier Frequency Separation Graphs**



**Table 30 Carrier Frequency Separation (Frequency List)**

#	Frequency MHz	#	Frequency MHz	#	Frequency MHz	#	Frequency MHz	#	Frequency MHz
1	902.2463	11	907.2379	21	912.2546	31	917.2463	41	922.2629
2	902.7454	12	907.7371	22	912.7537	32	917.7454	42	922.7621
3	903.2446	13	908.2363	23	913.2529	33	918.2446	43	923.2612
4	903.7438	14	908.7354	24	913.7521	34	918.7438	44	923.7604
5	904.2429	15	909.2346	25	914.2512	35	919.2429	45	924.2596
6	904.7421	16	909.7338	26	914.7504	36	919.7421	46	924.7587
7	905.2413	17	910.2579	27	915.2496	37	920.2912	47	925.2579
8	905.7404	18	910.7571	28	915.7488	38	920.7654	48	925.7571
9	906.2396	19	911.2812	29	916.2479	39	921.2646	49	926.2562
10	906.7388	20	911.7554	30	916.7471	40	921.7637	50	926.7554

**4.6 Test Conditions and Results – NUMBER OF HOPPING FREQUENCIES**

Test Description	For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.	
Basic Standard	47 CFR Part 15.247(a)(1)(i) RSS-210, A8.1(c)	

**Table 31 Number of Hopping Frequencies Configuration Settings**

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

**Table 32 Number of Hopping Frequencies Test Equipment**

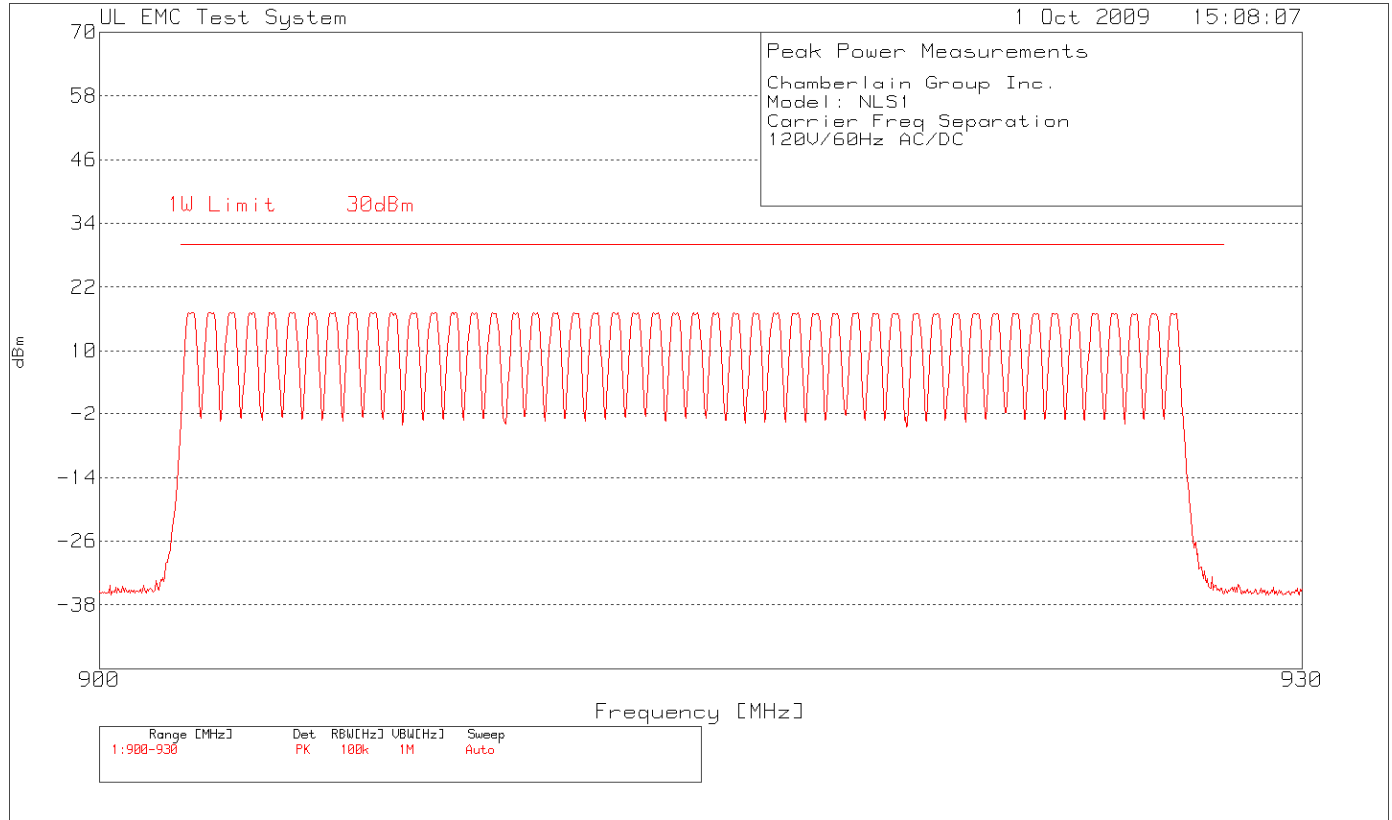
Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 33 Number of Hopping Frequencies Results**

Mode	Number of Channels	Minimum Number Required
TX, Hopping	50	50

**Test Setup for Number of Hopping Frequencies**

**Figure 32 Number of Hopping Frequencies Graphs**



**Table 34 Number of Hopping Channels (Frequency List)**

#	Frequency MHz	#	Frequency MHz	#	Frequency MHz	#	Frequency MHz	#	Frequency MHz
1	902.2463	11	907.2379	21	912.2546	31	917.2463	41	922.2629
2	902.7454	12	907.7371	22	912.7537	32	917.7454	42	922.7621
3	903.2446	13	908.2363	23	913.2529	33	918.2446	43	923.2612
4	903.7438	14	908.7354	24	913.7521	34	918.7438	44	923.7604
5	904.2429	15	909.2346	25	914.2512	35	919.2429	45	924.2596
6	904.7421	16	909.7338	26	914.7504	36	919.7421	46	924.7587
7	905.2413	17	910.2579	27	915.2496	37	920.2912	47	925.2579
8	905.7404	18	910.7571	28	915.7488	38	920.7654	48	925.7571
9	906.2396	19	911.2812	29	916.2479	39	921.2646	49	926.2562
10	906.7388	20	911.7554	30	916.7471	40	921.7637	50	926.7554

**4.7 Test Conditions and Results – Dwell Time and Duty Cycle Correction**

Test Description	For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.	
Basic Standard	47 CFR Part 15.247(a)(1)(i) RSS-210, A8.1(c)	

**Table 35 Dwell Time Configuration Settings**

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
2	1	3
Supplementary information: Duty cycle also measured/calculated for use in radiated spurious measurements		

**Table 36 Dwell Time Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 37 Dwell Time Results**

Mode	Number of Channels	Maximum Time Allowed in 20s.	Measured Dwell Time in 20s.
TX Hopping Low Channel	50	0.400s	170.85mS

**Table 38 Duty Cycle Correction Factor**

Mode	Number of TX in 100mS	TX Duration in 100mS	Duty Cycle Correction (dB) $20 \times \log\left(\frac{TX (ms)}{100ms}\right)$
TX Hopping Low Channel	1	5.025mS	26dB

### Test Setup for Dwell Time

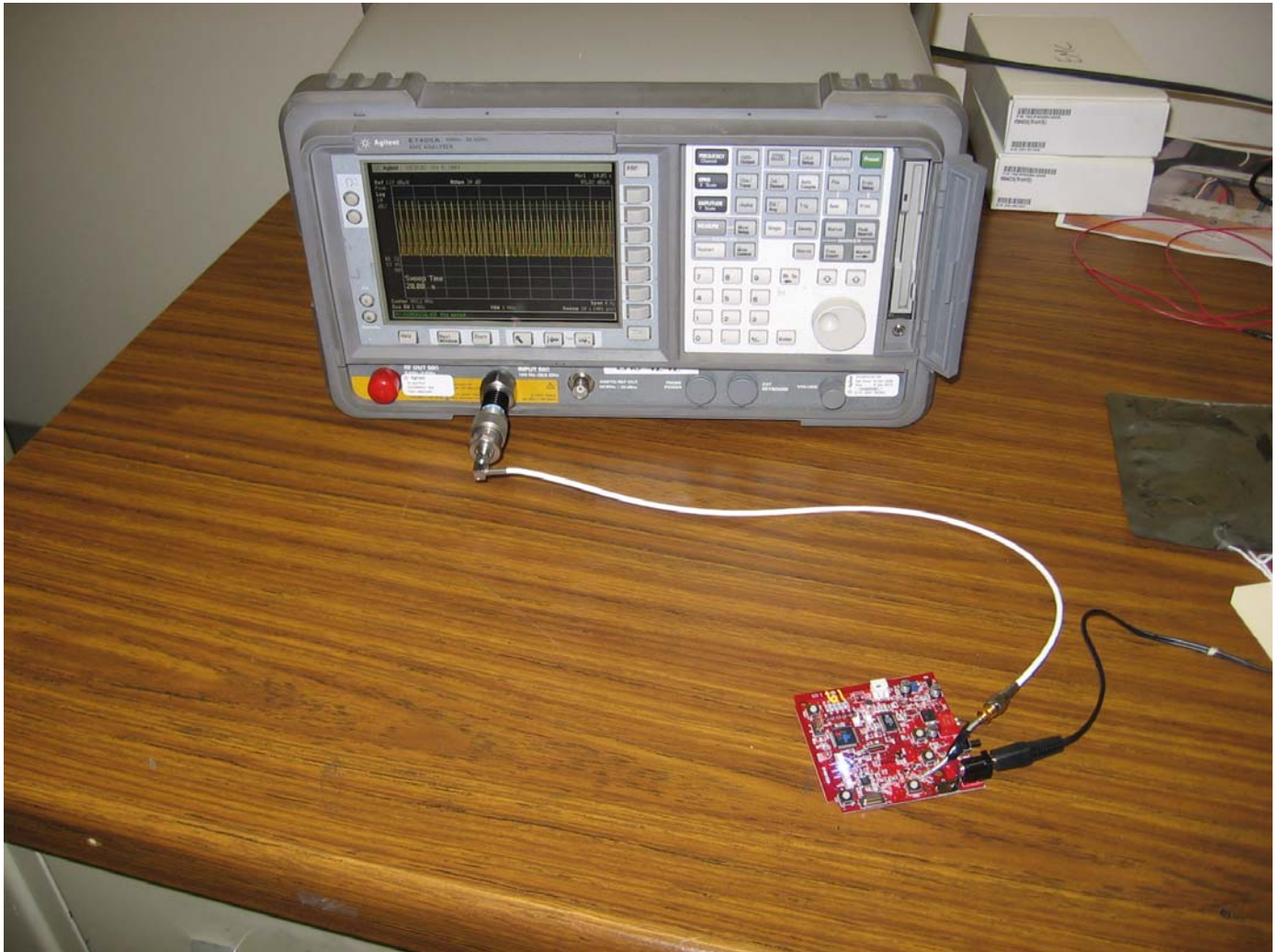
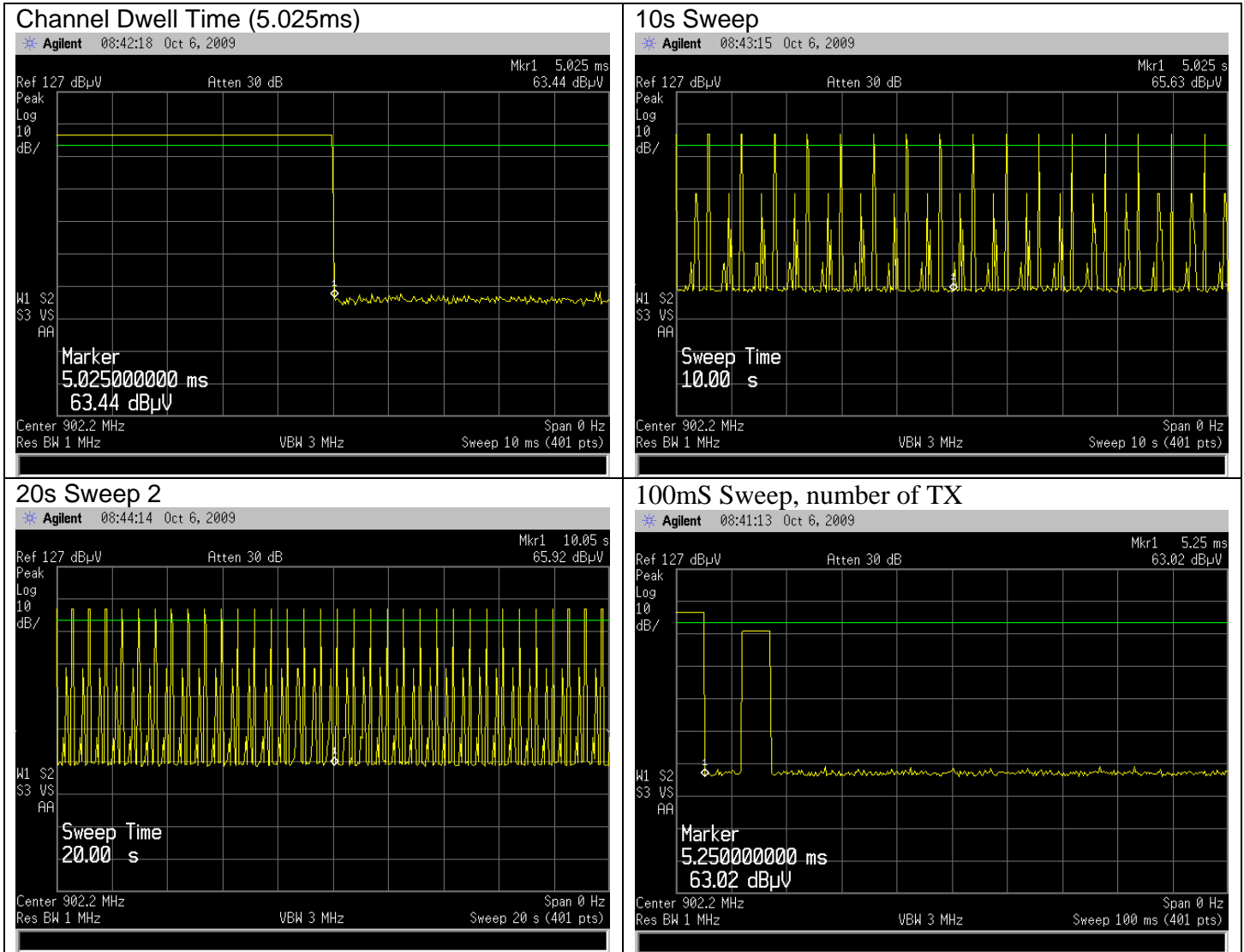


Figure 33 Dwell Time Graphs



The number of transitions plots show only the single channel. It was checked that the number of transitions was the same on other channels do to equal channel use. The total number of transitions counted in 20s is: 34. Total maximum transmit time: 170.85mS within 20s.

**4.8 Test Conditions and Results – 20DB BANDWIDTH**

Test Description	For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.		
Basic Standard	47 CFR Part 15.247(a)(1)(i) RSS-210, A8.1(c)		

**Table 39 20dB Bandwidth Configuration Settings**

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

**Table 40 20dB Bandwidth Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 41 20dB Bandwidth Results**

Mode	Channel	20dB Bandwidth in kHz	
		Voice	Wakeup
TX	Low	206.25	201.25
	Middle	202.50	201.25
	High	197.50	190.00

**Test Setup for 20dB Bandwidth**

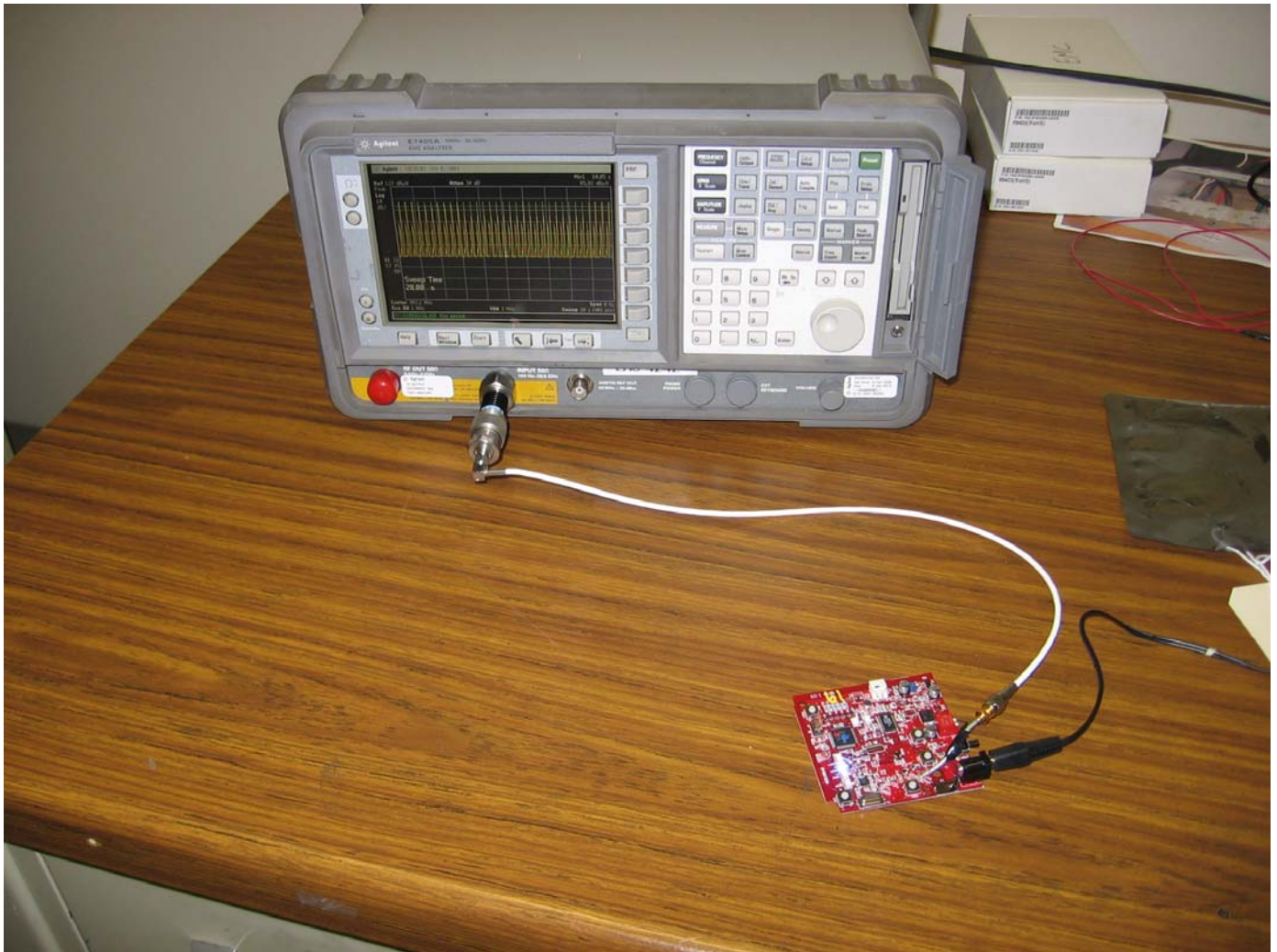
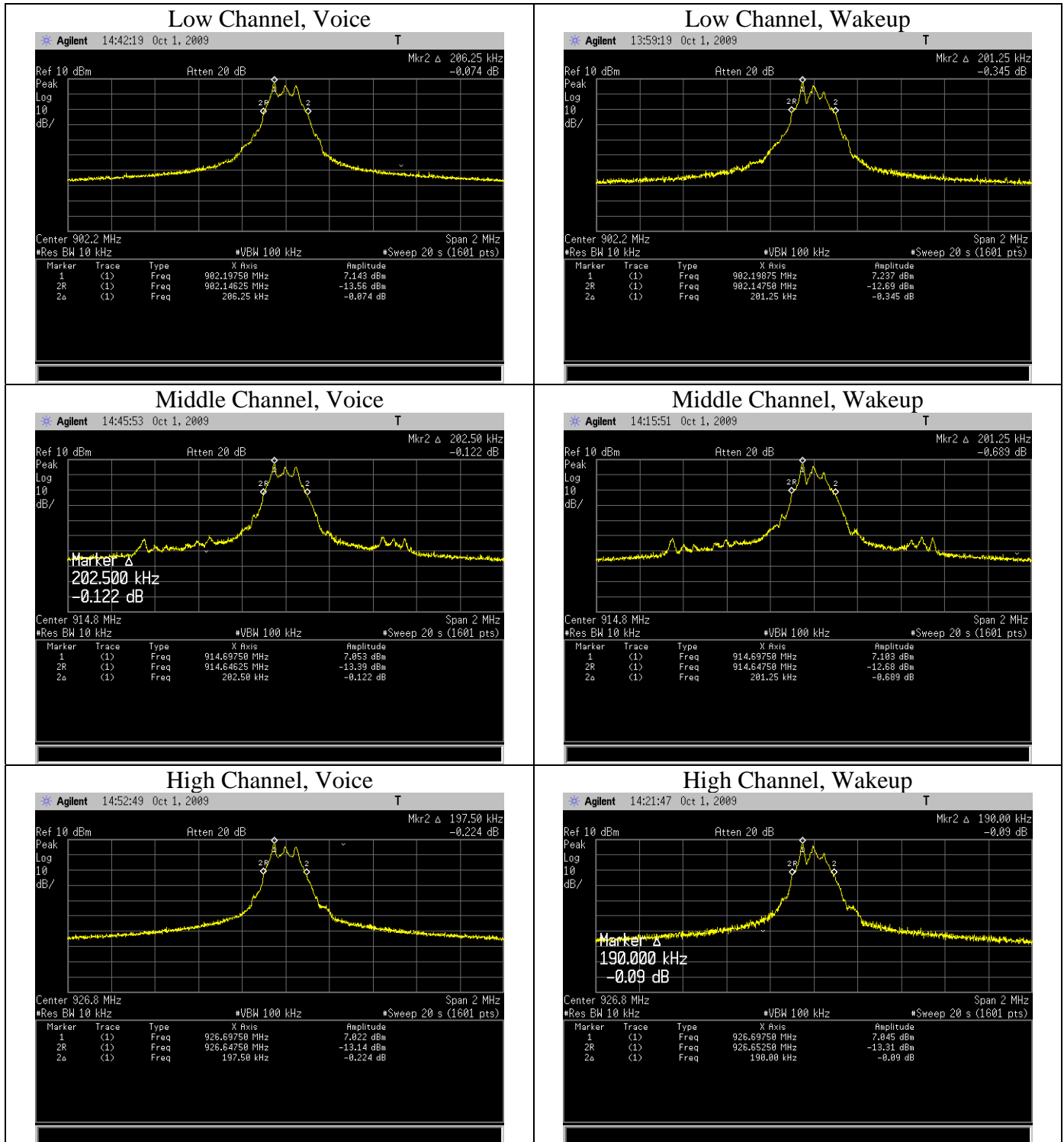




Figure 34 20dB Bandwidth Graphs



**4.9 Test Conditions and Results – MAXIMUM PEAK OUTPUT POWER**

Test Description	For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.	
Basic Standard	47 CFR Part 15.247(b)(2) RSS-210, A8.4(1)	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	902MHz – 928MHz	Antenna Conducted
<b>Limits</b>		
Frequency (MHz)	Limit mW	
	Peak	
902 - 928	1000 (30dBm – gain of Antenna over 6dBi)	
Supplementary information: None		

**Table 42 Maximum Peak Output Power EUT Configuration Settings**

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

**Table 43 Maximum Peak Output Power Test Equipment**

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Spectrum Analyser	Agilent	E7405A	EMC4242
Attenuator with Cable	Pasternak	10dB	none

**Table 44 Maximum Peak Output Power Results**

Channel	Declared Antenna Gain (dBi)	Limit (dBm)	Power dBm	Power mW
Low Channel Voice	5.14	30	17.36	54.45
Middle Channel Voice	5.14	30	17.3	53.70
High Channel Voice	5.14	30	17.26	53.21
Low Channel Wakeup	5.14	30	17.31	53.83
Middle Channel Wakeup	5.14	30	17.27	53.33
High Channel Wakeup	5.14	30	17.24	52.97

**Test setup for Maximum Peak Output Power**

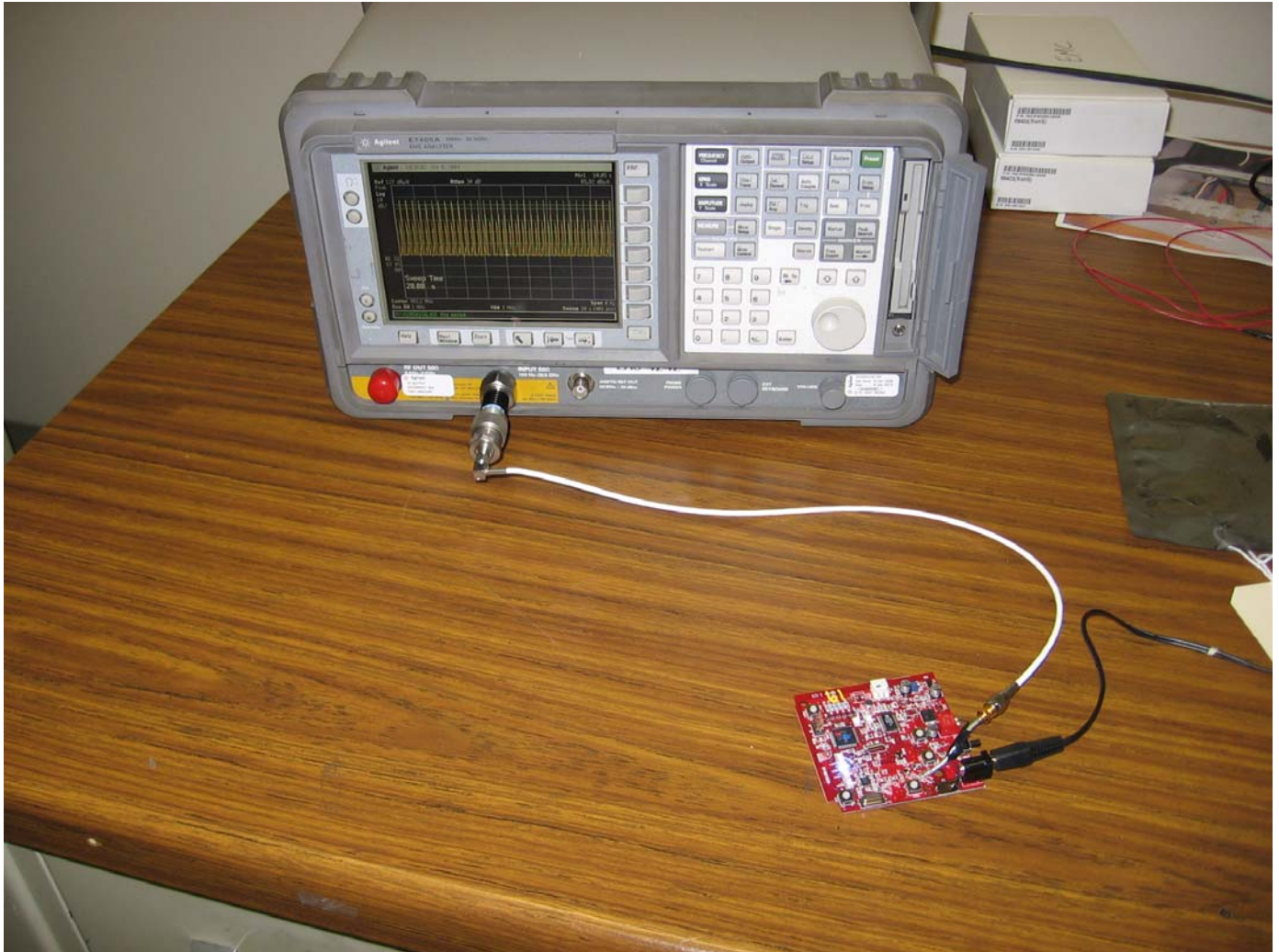
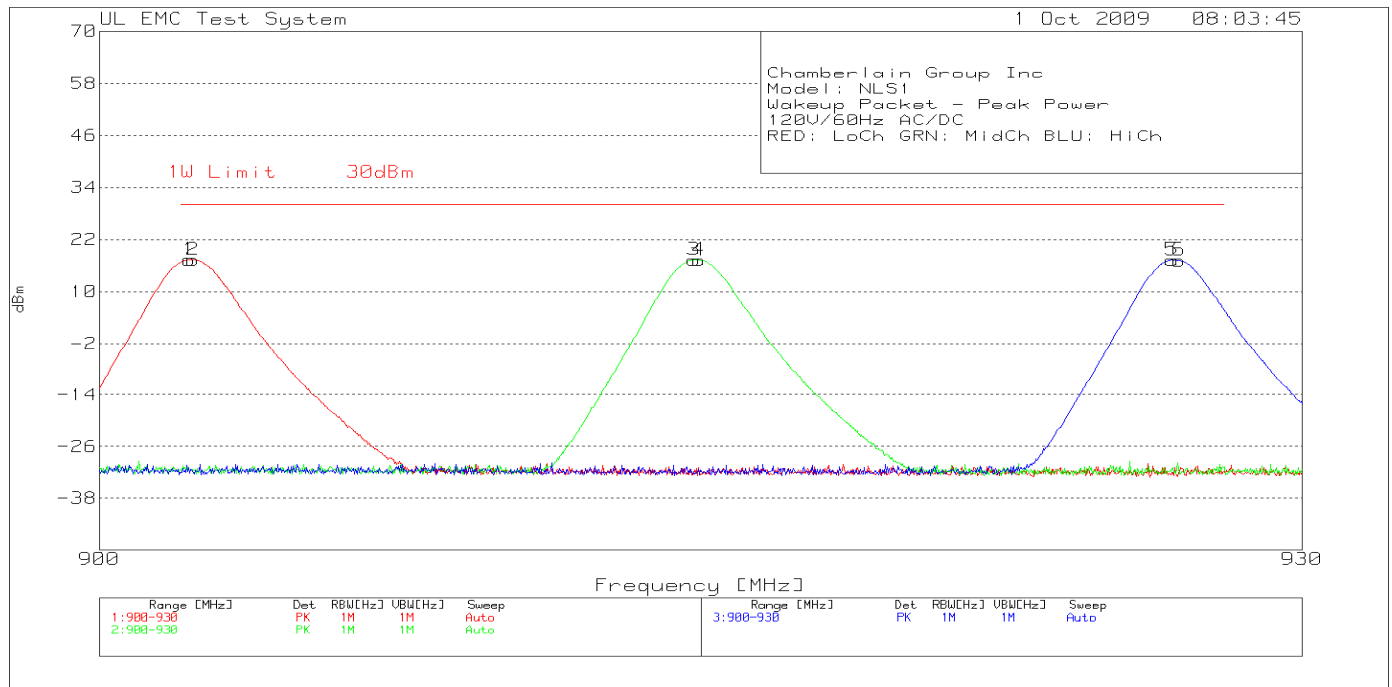
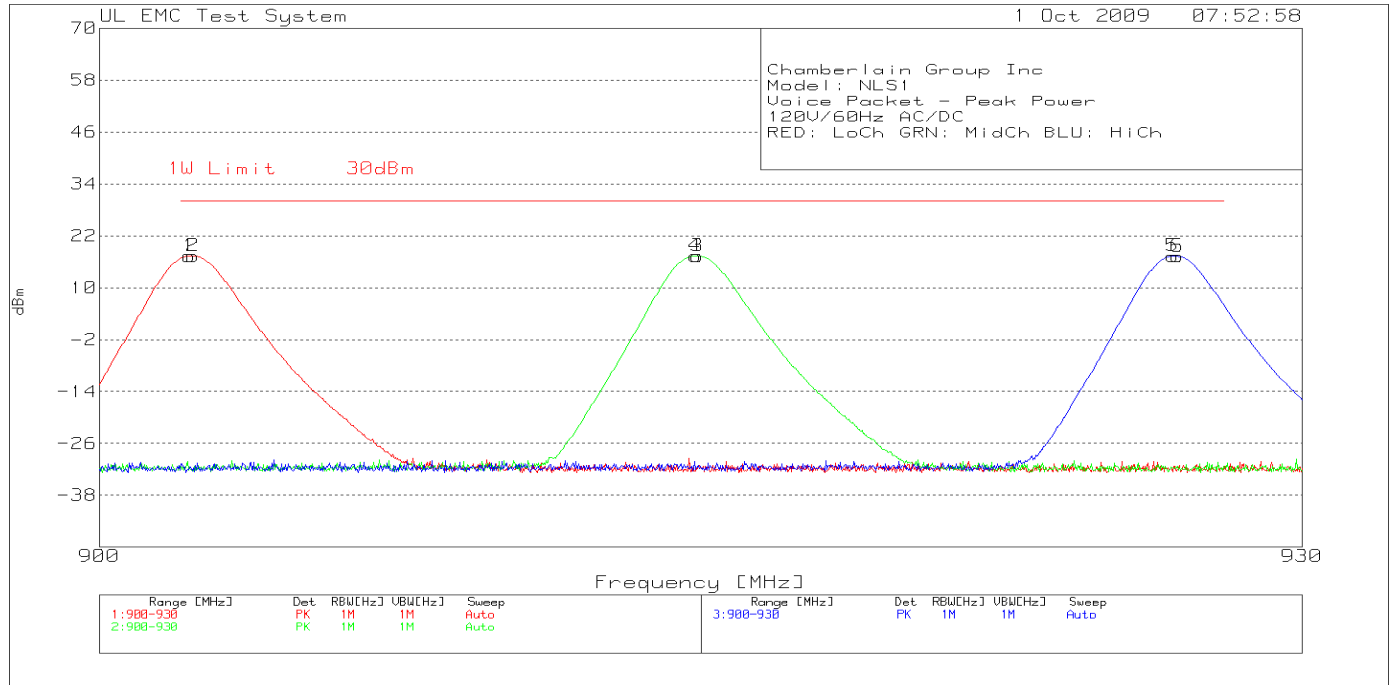


Figure 35 Maximum Peak Output Power Graph



**Table 45 Maximum Peak Output Power Emissions Data Points**

Chamberlain Group Inc  
 Model: NLS1  
 Voice Packet - Peak Power  
 120V/60Hz AC/DC  
 RED: LoCh GRN: MidCh BLU: HiCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(mW)]	Limit 1	Margin 1 [dB]
1	902.1963	114.06	pk	10.3	-107	17.36	30	-12.64
2	902.2962	114.05	pk	10.3	-107	17.35	30	-12.65
3	914.7879	114	pk	10.3	-107	17.3	30	-12.7
4	914.7379	113.99	pk	10.3	-107	17.29	30	-12.71
5	926.718	113.96	pk	10.3	-107	17.26	30	-12.74
6	926.8428	113.95	pk	10.3	-107	17.25	30	-12.75

LIMIT 1: 1W Limit 30dBm

pk - Peak detector

Chamberlain Group Inc  
 Model: NLS1  
 Wakeup Packet - Peak Power  
 120V/60Hz AC/DC  
 RED: LoCh GRN: MidCh BLU: HiCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(mV)]	Limit 1	Margin 1 [dB]
1	902.1963	114.01	pk	10.3	-107	17.31	30	-12.69
2	902.2962	113.99	pk	10.3	-107	17.29	30	-12.71
3	914.7005	113.97	pk	10.3	-107	17.27	30	-12.73
4	914.8253	113.94	pk	10.3	-107	17.24	30	-12.76
5	926.7055	113.94	pk	10.3	-107	17.24	30	-12.76
6	926.8802	113.88	pk	10.3	-107	17.18	30	-12.82

LIMIT 1: 1W Limit 30dBm

pk - Peak detector

**4.10 Test Conditions and Results – 99% Bandwidth**

Test Description	When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emissions bandwidth, as calculated or measured. The transmitter shall be operated at its maximum carrier power measured under normal test condition.	
Basic Standard	RSS-Gen, 4.6	

**Table 46 20dB Bandwidth Configuration Settings**

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

**Table 47 20dB Bandwidth Test Equipment**

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Agilent	E7405A	EMC4242
Attenuator w/ Cable	Pasternek	10dB	None

**Table 48 20dB Bandwidth Results**

Mode	Channel	99% Power Bandwidth (kHz)	
		Voice	Wakeup
TX	Low	181.250	185.000
	Middle	182.500	187.500
	High	176.250	175.000
	All Channels Hopping	24,600.000	

**Test Setup for 20dB Bandwidth**

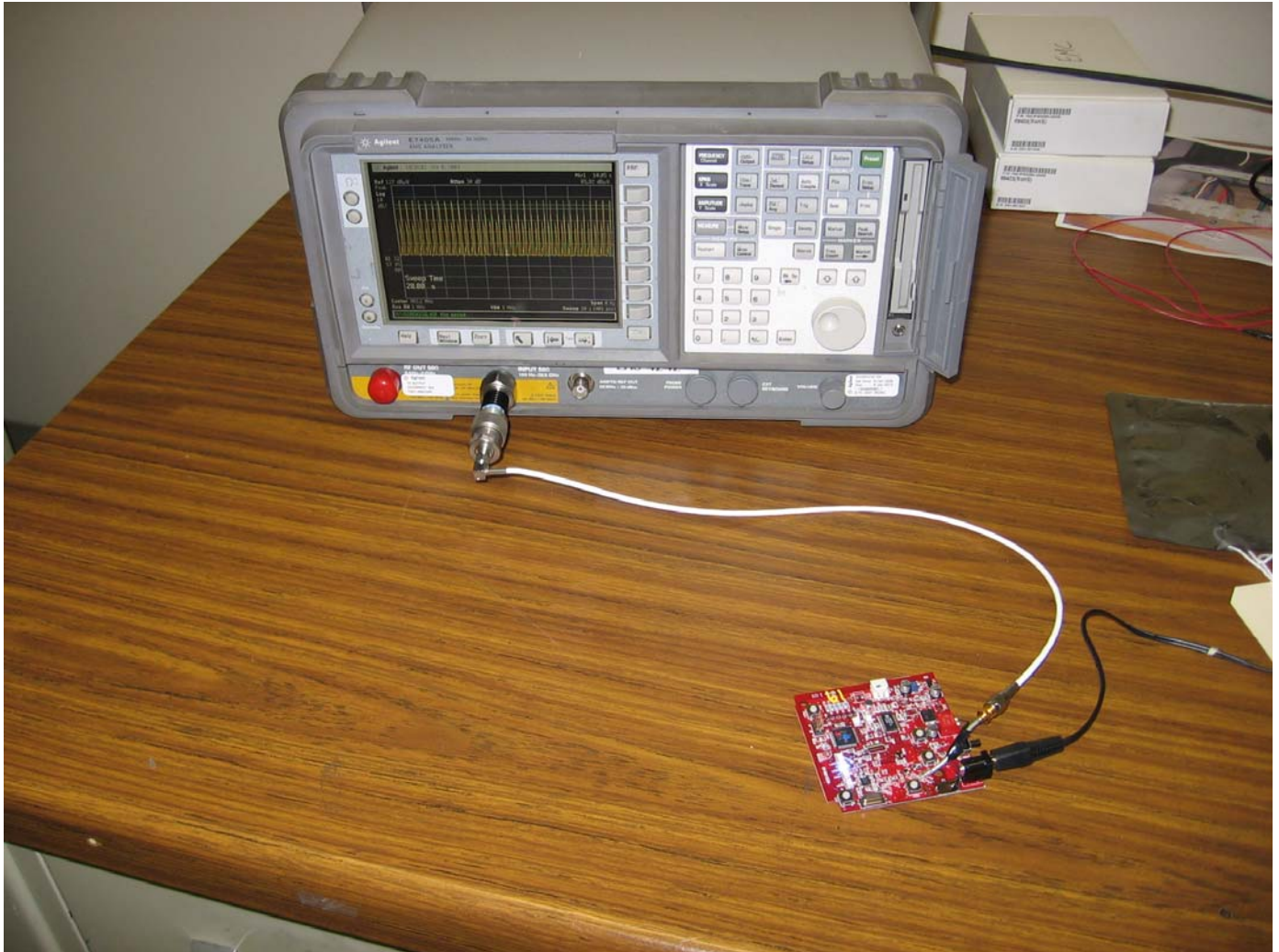
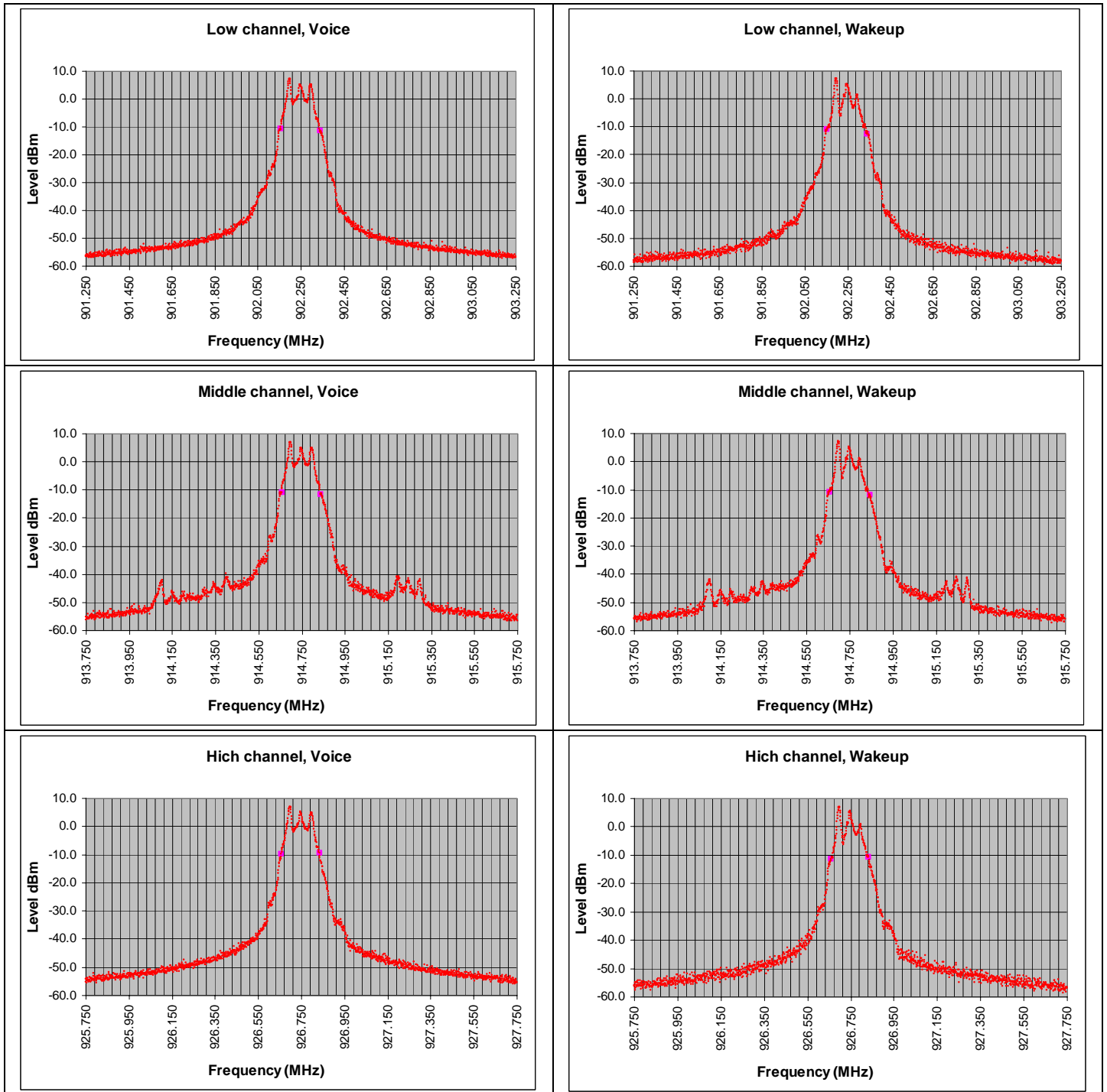
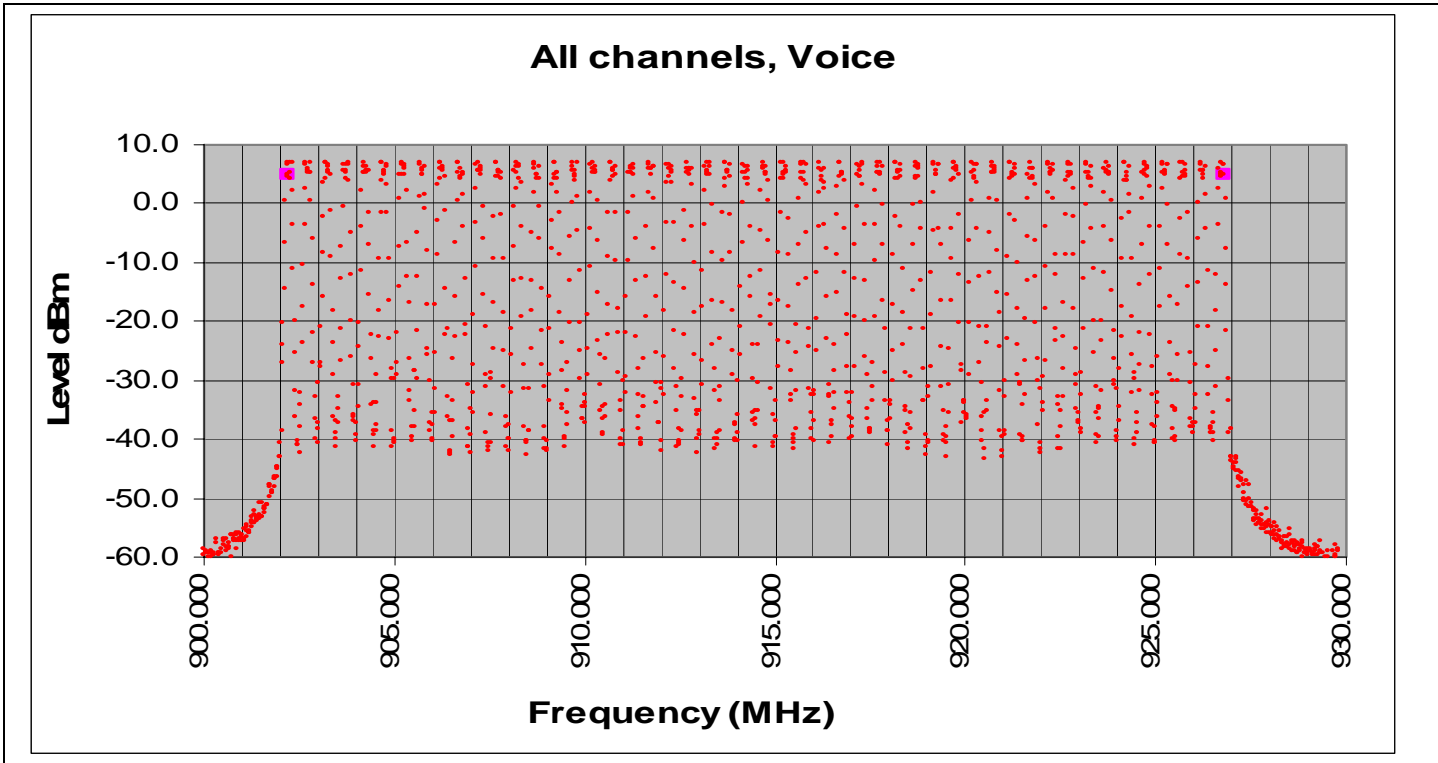


Figure 36 - 99% Power Bandwidth Plots







## 5.0    IMMUNITY TEST RESULTS

The immunity tests was not conducted nor is required by the standard.

## 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 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

