



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

CLASS II PERMISSIVE CHANGE REPORT

FOR

**WiFi Limited Module
Inside a A-Hub Device**

MODEL NUMBER: MW300

**FCC ID: HBW8522
IC: 2666A-8522**

REPORT NUMBER: 11522654A

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Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--		Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CHAMBERLAIN GROUP INC.
300 Windsor Dr.
Oak Brook, IL 60523

EUT DESCRIPTION: WiFi Limited Module (C2PC)

MODEL: MW300

SERIAL NUMBER: non-serialized

DATE TESTED: 2017-03-14 to 2017-03-30

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247, Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Approved & Released For
UL LLC By: Jeffrey Moser



EMC PROGRAM MANAGER
UL LLC

Tested By: Bart Mucha



EMC STAFF ENGINEER
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 4, RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60062 USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0. The full scope of accreditation can be viewed at <https://www-s.nist.gov/>

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Sample Calculations

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

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)

Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)

Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test	Range	Equipment	Uncertainty k=2
Radiated Emissions	30-200MHz	Bicon 10m Horz	4.27dB
Radiated Emissions	30-200MHz	Bicon 10m Vert	4.28dB
Radiated Emissions	200-1000MHz	LogP 10m Horz	3.33dB
Radiated Emissions	200-1000MHz	LogP 10m Vert	3.39dB
Radiated Emissions	30-200MHz	Bicon 3m Horz	3.30dB
Radiated Emissions	30-130MHz	Bicon 3m Vert	4.84dB
Radiated Emissions	130-200MHz	Bicon 3m Vert	4.94dB
Radiated Emissions	200-1000MHz	LogP 3m Horz	3.46dB
Radiated Emissions	200-1000MHz	LogP 3m Vert	4.98dB
Radiated Emissions	1-6GHz	Horn	5.02dB
Radiated Emissions	6-18GHz	Horn	5.34dB
Radiated Emissions	18-26GHz	Horn	6.60dB
Conducted Ant Port	30MHz-26GHz	Spectrum Analyzer	2.94

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11b/g/n limited modular transceiver. The limited module is installed inside a new host device. The new device is also certified with an 902-928MHz FHSS transceiver, 310MHz – 390MHz periodic transmitter FCC ID: HBW1D7991 / IC: 2666A-7991. The new host devices will be marketed under the following names A-Hub (with LED Light) and Q-Hub (without LED light) and specific model numbers: G821LMB, MYQ-G0101, MYQ-G0301C, MYQ-G0301A, MYQ-G0301-D, MYQ-G0101-4HD, MYQ-G0301-4L, G819LMB, MYQ-G0303-SP. According to manufacturer all devices are electrically identical. The different host names are for product marketing purposes only.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power Original Certification (dBm)	Output Power C2PC Certification (dBm)
2412 - 2462	802.11b	17.34	17.58
2412 - 2462	802.11g	14.28	14.19
2412 - 2462	802.11n HT20	13.33	10.52

List of test reduction.

Output power measurements were conducted for reference only.

Selected radiated spurious emissions was conducted due to the module being installed in a new host.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an trace antenna, with a maximum gain of 0 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was MAW30X_MFG_14.1.36.P84

The EUT driver software installed during testing was FTDI 2.12.24

The test utility software used during testing was DutApiWiFiMW30xBridgeUart

5.5. WORST-CASE CONFIGURATION AND MODE

For radiated emissions the EUT (A-Hub) was oriented so the module was in the same orientation as during original testing.

Radiated emissions (harmonics above 1GHz and band edge measurements) were performed with the EUT set to transmit at low, middle and high channel.

Radiated emissions below 1GHz and line conducted emissions were done with EUT set to middle channel only.

Worst-case data rates as provided by the client and as stated in the LMA certification were:

802.11b mode: 1 Mbps
802.11g mode: 54 Mbps
802.11n HT20mode: MCS7

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
EUT	Chamberlain	A-Hub	non-serialized	HBW1D7991
Power Supply	Generic	GEO101UB-075100W	non serialized	none
*Laptop	Lenovo	T440	-	-
* Used only to program the sample and then disconnected.				

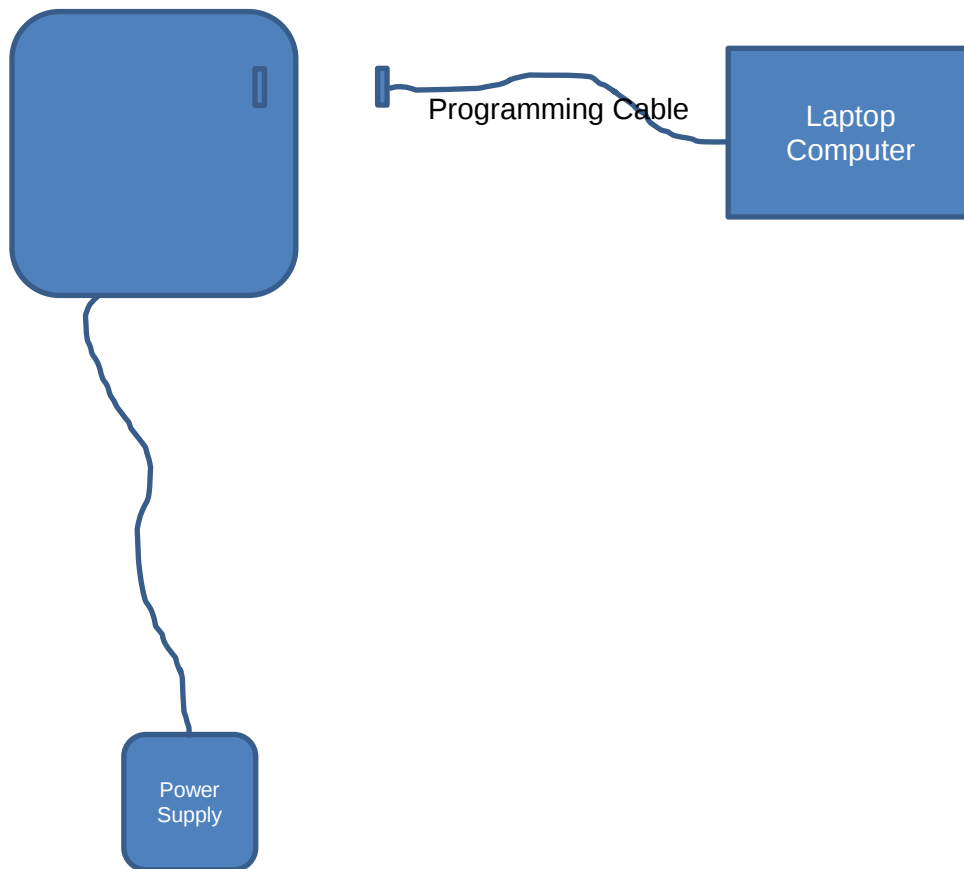
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	I/O	1	pin headers	serial	0.5	only used for programming, unplugged during testing.

TEST SETUP

The limited module was installed inside a A-Hub device. The A-Hub device contains 300MHz band and 400MHz band receivers and 902-928MHz FHSS transceiver (FCC ID: HBW1D7991, IC: 2666A-7991).

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List					
Description	Manufacturer	Model	T No.	Cal Date	Cal Due
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012		
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	20161224	20171231
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328	20161202	20171231
Bicon Antenna	Chase	VBA6106A	EMC4078	20170215	20180228
Log-P Antenna	Chase	UPA6109	EMC4258	20160511	20170531
Antenna Array	UL	BOMS	EMC4276	20151215	20171231
Spectrum Analyzer	Agilent	N9030A (PXA)	EMC4360	20161227	20171231

7. MEASUREMENT METHODS

Output Power: KDB 558074 D01 v03r05, Section 9.2.2.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r05, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.1.

Power line conducted Emissions: C63.10:2013, clause 6.2

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

Duty cycle was verified prior to testing of each mode. In every case it was over 99% (identical to DC recorded when testing original module)

8.1.1. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247, section 5.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power
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Results for 802.11b

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	17.58	17.58	30.00	-12.42
Mid	2437	17.57	17.57	30.00	-12.43
High	2462	17.05	17.05	30.00	-12.95

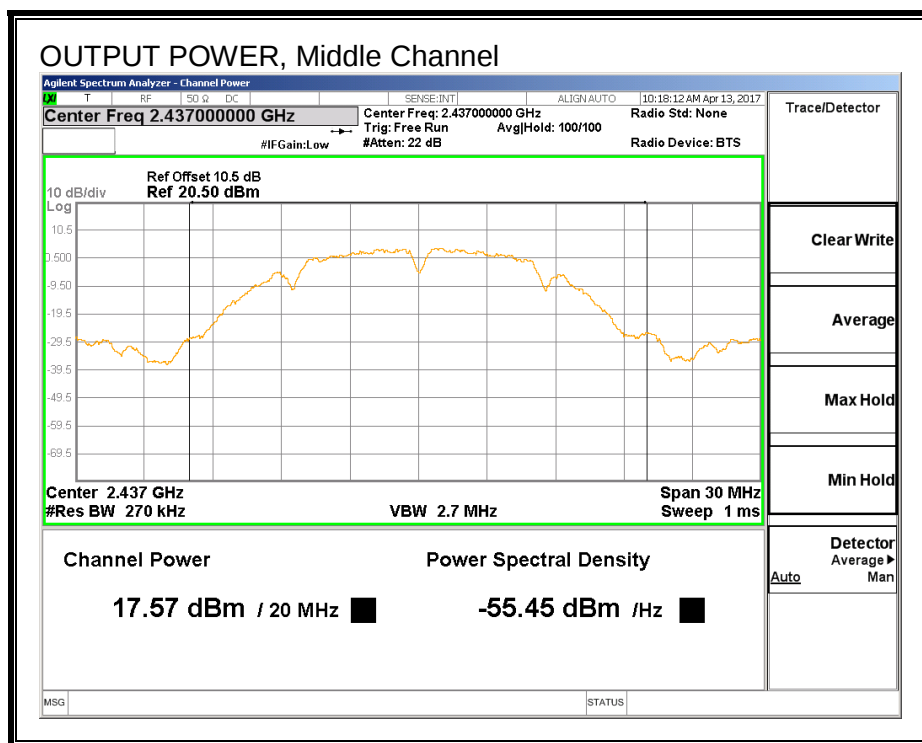
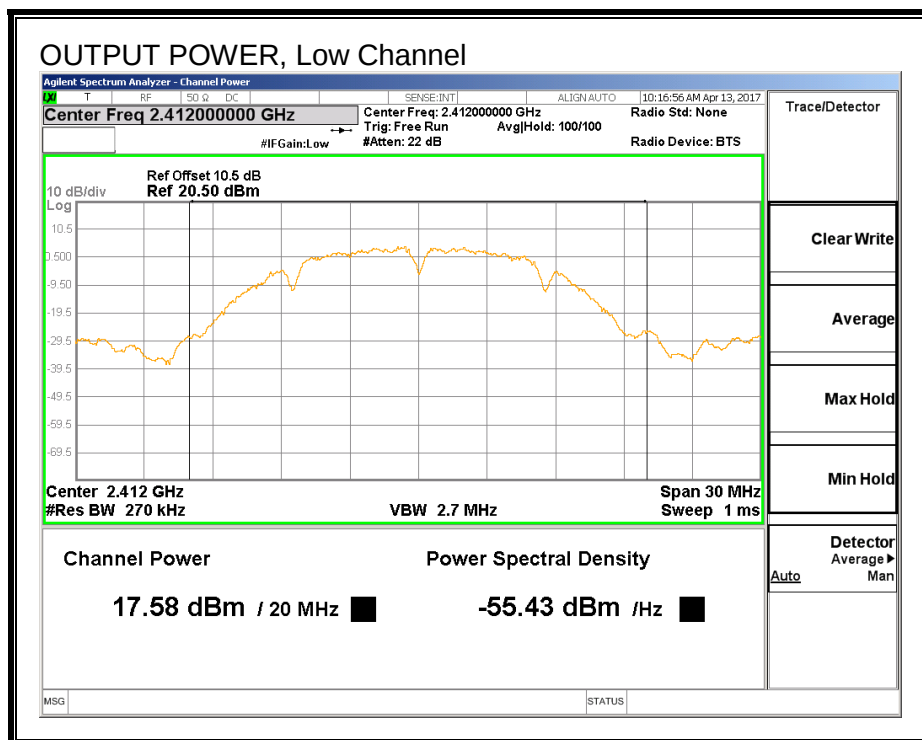
Results for 802.11g

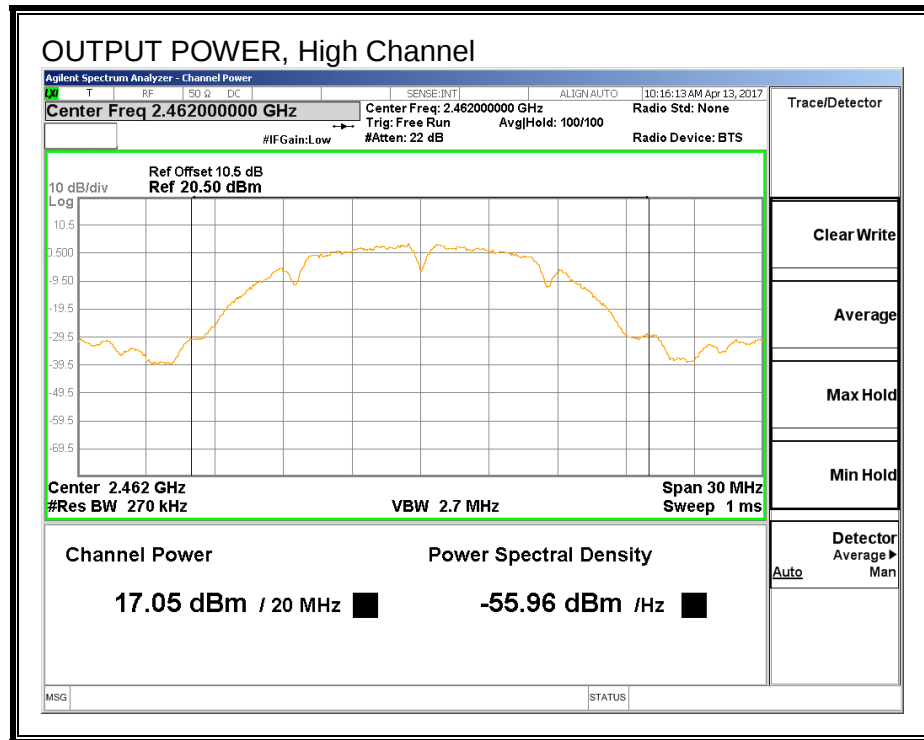
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	14.19	14.19	30.00	-15.81
Mid	2437	14.02	14.02	30.00	-15.98
High	2462	14.10	14.10	30.00	-15.90

Results for 802.11n

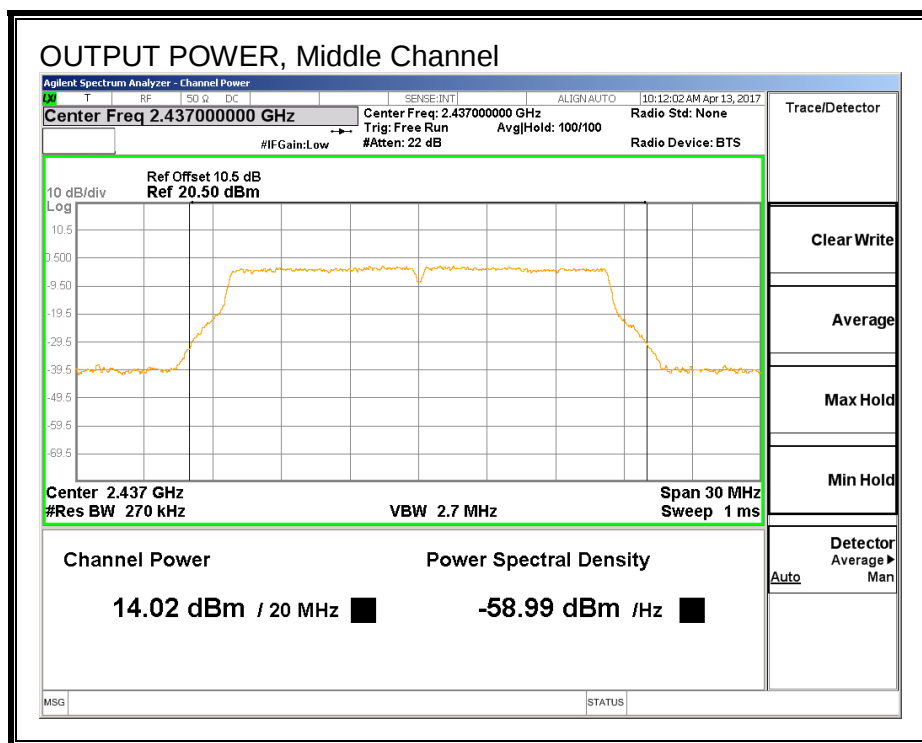
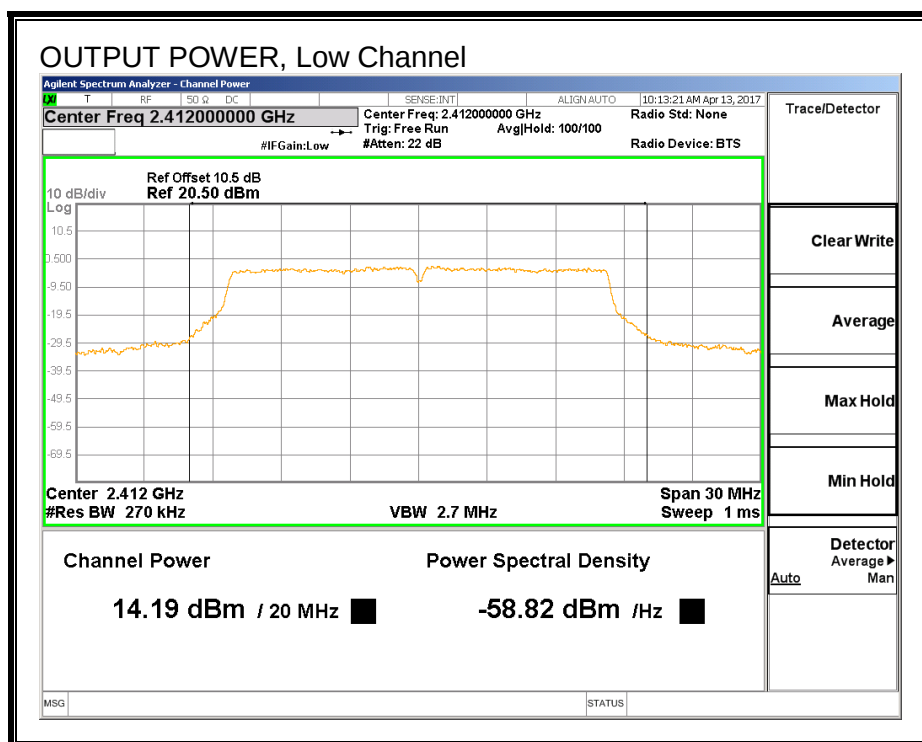
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	10.52	10.52	30.00	-19.48
Mid	2437	10.45	10.45	30.00	-19.55
High	2462	10.52	10.52	30.00	-19.48

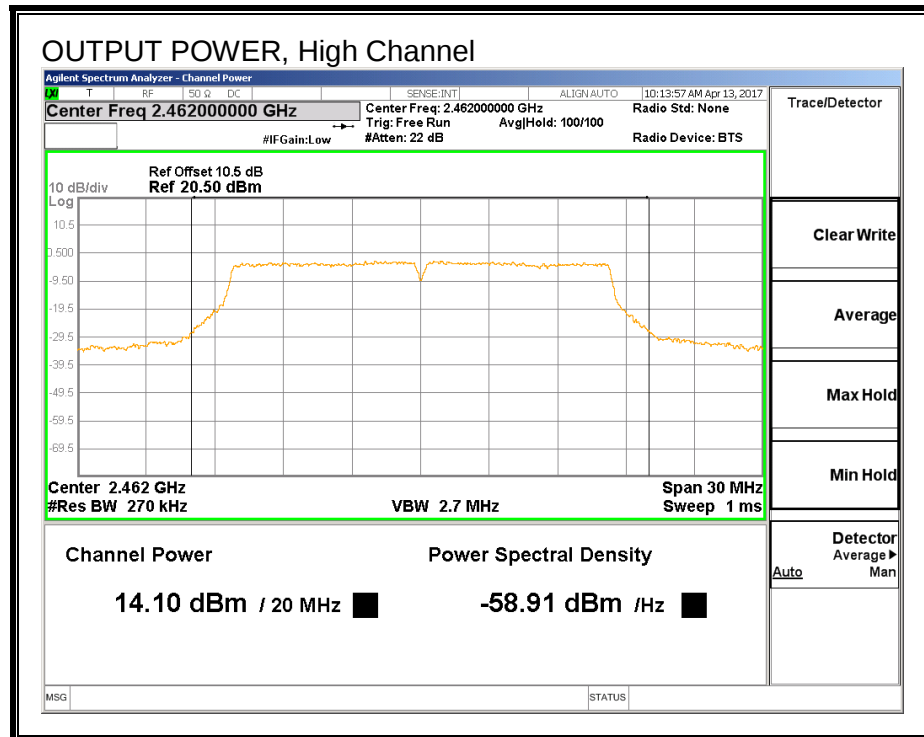
OUTPUT POWER, 802.11b



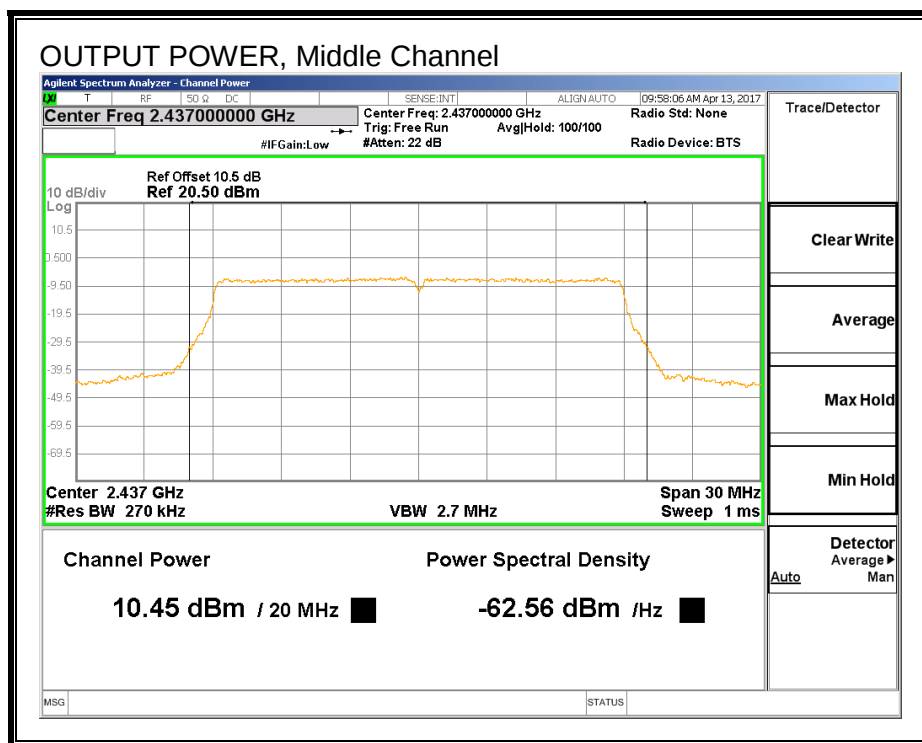
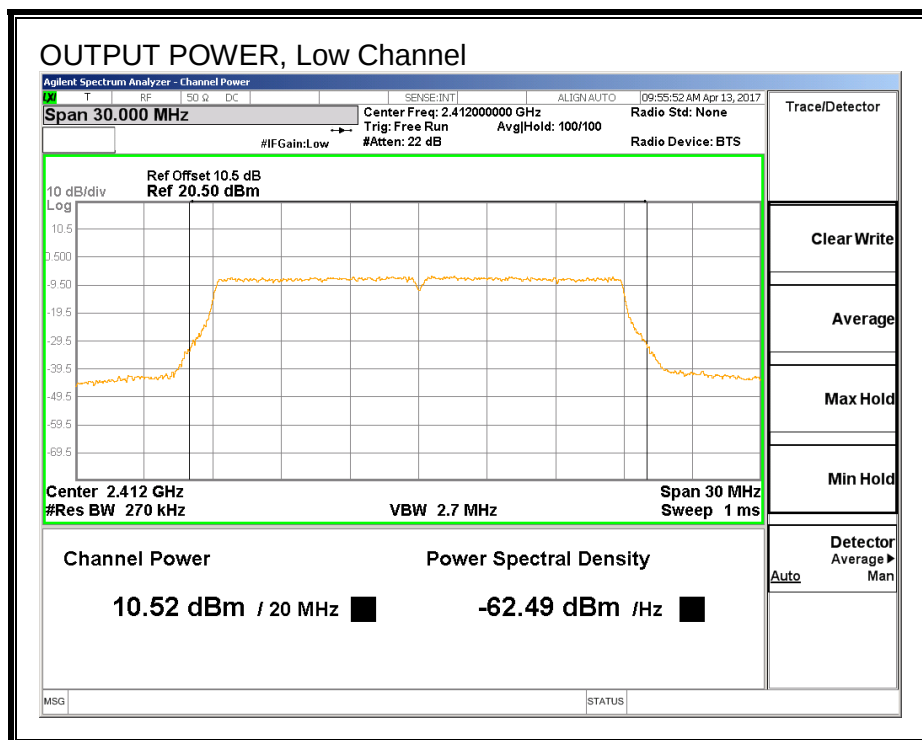


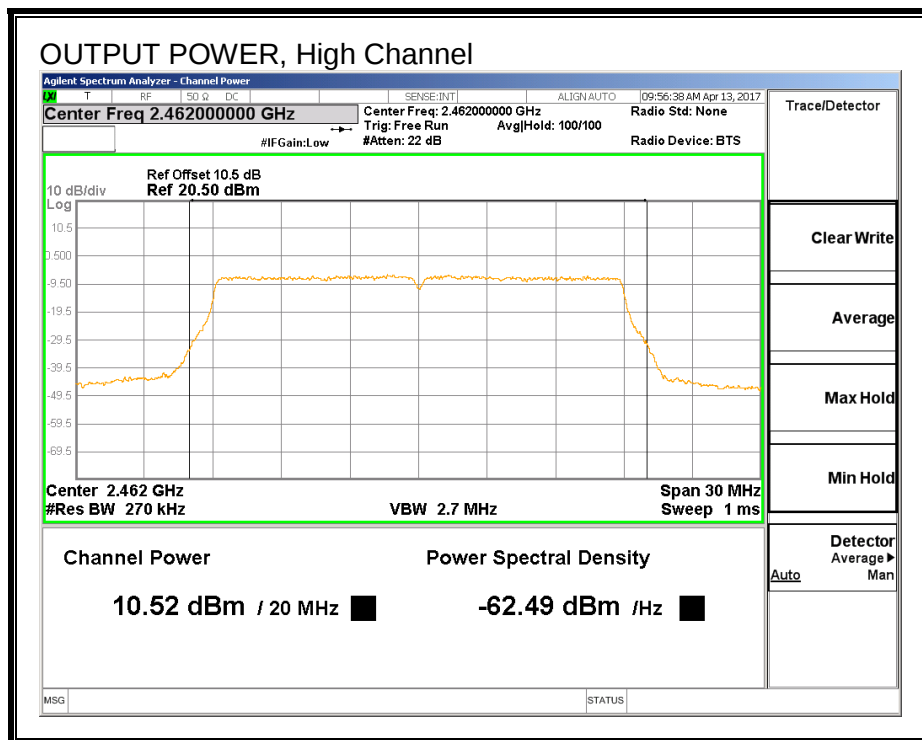
OUTPUT POWER, 802.11g





OUTPUT POWER, 802.11n





9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

FCC §15.205, §15.209, §15.247 (d)

IC RSS-GEN Clause 8.9 (Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. For this evaluation, RMS Power Averaging was used and the resolution/video bandwidth settings were 1MHz/3MHz.

The spectrum from 9 kHz to 30 MHz is investigated with the transmitter set to middle channel in each applicable band.

The spectrum from 30 MHz to 25 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

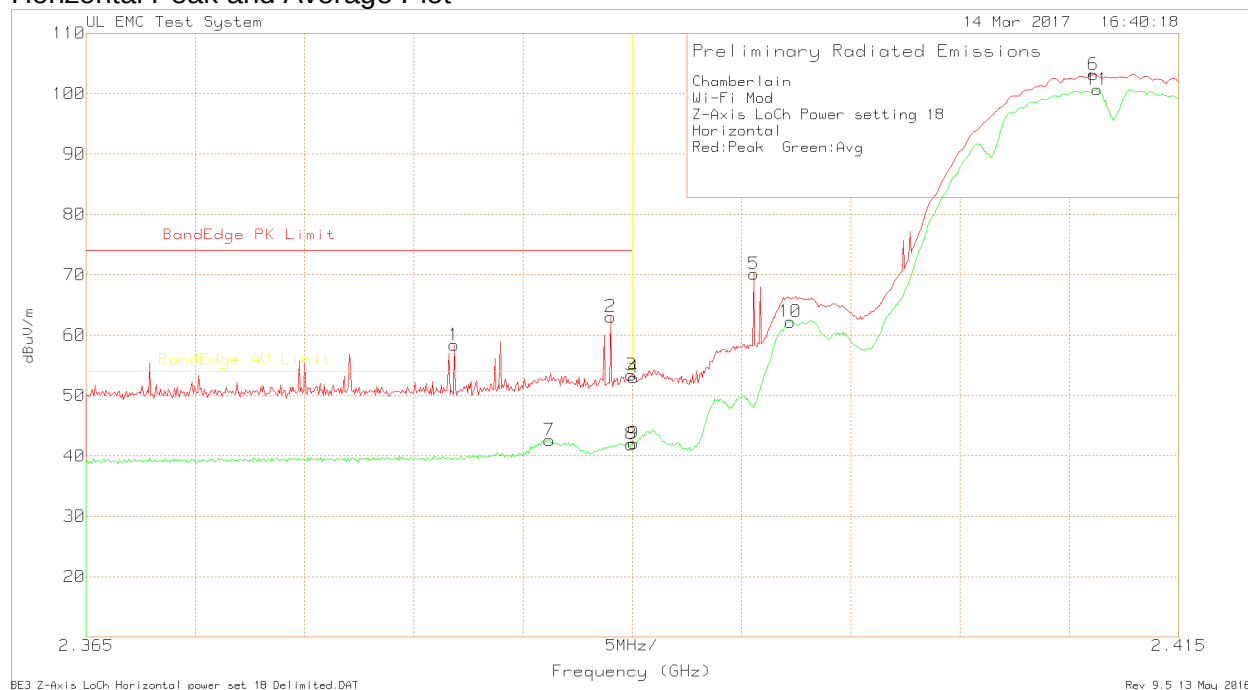
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

Chamberlain
Wi-Fi Mod
Z-Axis LoCh Power setting 18
Horizontal
Red:Peak Green:Avg

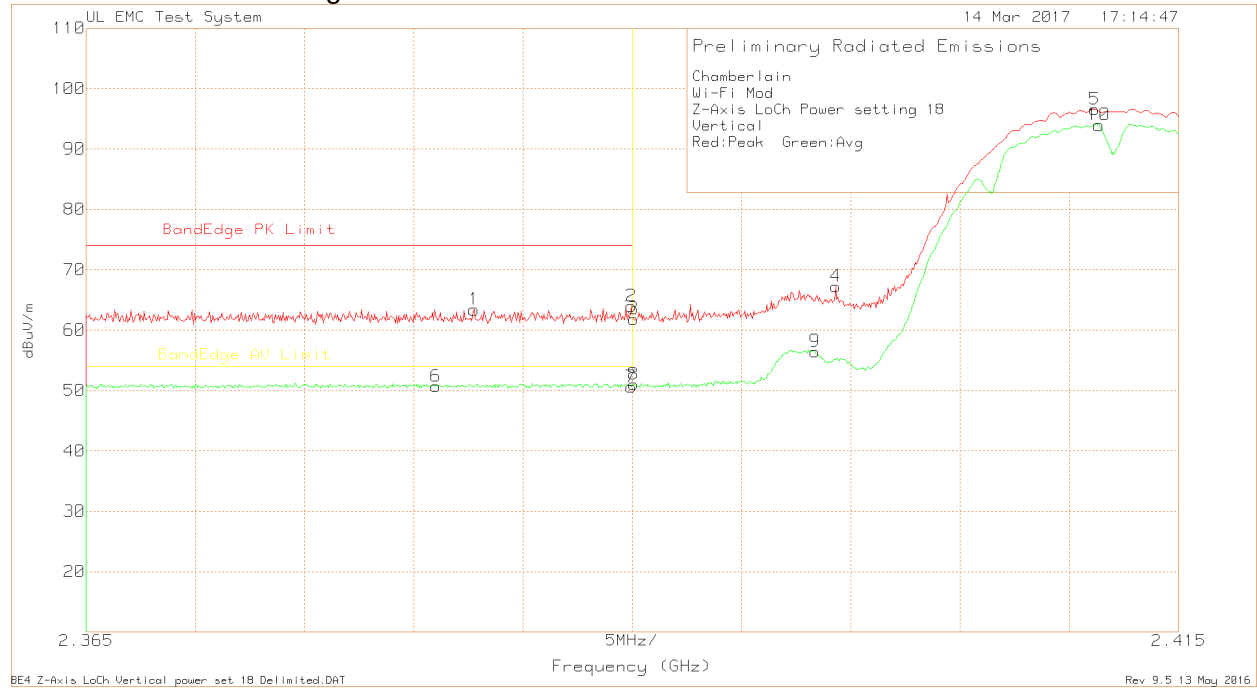
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.38185	31.92dBuV Pk	21.8	4.64	58.36	74	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-15.64	-	-	-
2	2.389	36.59dBuV Pk	21.8	4.65	63.04	74	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-10.96	-	-	-
3	2.38995	26.95dBuV Pk	21.8	4.65	53.4	74	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-20.6	-	-	-
4	2.39	26.55dBuV Pk	21.8	4.65	53	74	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-21	-	-	-
5	2.39555	43.7dBuV Pk	21.8	4.65	70.15	-	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-	-	-	-
6	2.4111	76.72dBuV Pk	21.8	4.65	103.17	-	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-	-	-	-
Average Data									
7	2.3862	16.17dBuV Av	21.8	4.64	42.61	74	54	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-31.39	-11.39	-	-
8	2.38995	15.47dBuV Av	21.8	4.65	41.92	74	54	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-32.08	-12.08	-	-
9	2.39	15.63dBuV Av	21.8	4.65	42.08	74	54	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-31.92	-11.92	-	-
10	2.397225	35.76dBuV Av	21.8	4.65	62.21	-	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-	-	-	-
11	2.411275	74.19dBuV Av	21.8	4.65	100.64	-	-	-	-
		Azimuth:301	Height:146	Horz	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi Mod
Z-Axis LoCh Power setting 18
Vertical
Red:Peak Green:Avg

Trace Markers

Test	Meter	Transducer	Gain/Loss	Corrected	Limit:1	2	3	4
No. 6	Frequency	Reading	Factor	Factor	Reading	dBuV/m		
(GHz)			(dB)	(dB)				
=====								
Peak Data								
1 2.38275	36.96dBuV Pk	21.8	4.64	63.4	74	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-10.6	-	-	-
2 2.38995	37.51dBuV Pk	21.8	4.65	63.96	74	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-10.04	-	-	-
3 2.39	35.41dBuV Pk	21.8	4.65	61.86	74	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-12.14	-	-	-
4 2.3993	40.81dBuV Pk	21.8	4.64	67.25	-	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-	-	-	-
5 2.41115	70.14dBuV Pk	21.8	4.65	96.59	-	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-	-	-	-
Average Data								
6 2.381	24.26dBuV Av	21.8	4.64	50.7	74	54	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-23.3	-3.3	-	-
7 2.38995	24.13dBuV Av	21.8	4.65	50.58	74	54	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-23.42	-3.42	-	-
8 2.39	24.58dBuV Av	21.8	4.65	51.03	74	54	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-22.97	-2.97	-	-
9 2.39835	30.02dBuV Av	21.8	4.64	56.46	-	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-	-	-	-
10 2.41135	67.49dBuV Av	21.8	4.65	93.94	-	-	-	-
	Azimuth:172	Height:115	Vert	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

RESTRICTED BANDEDGE (HIGH CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

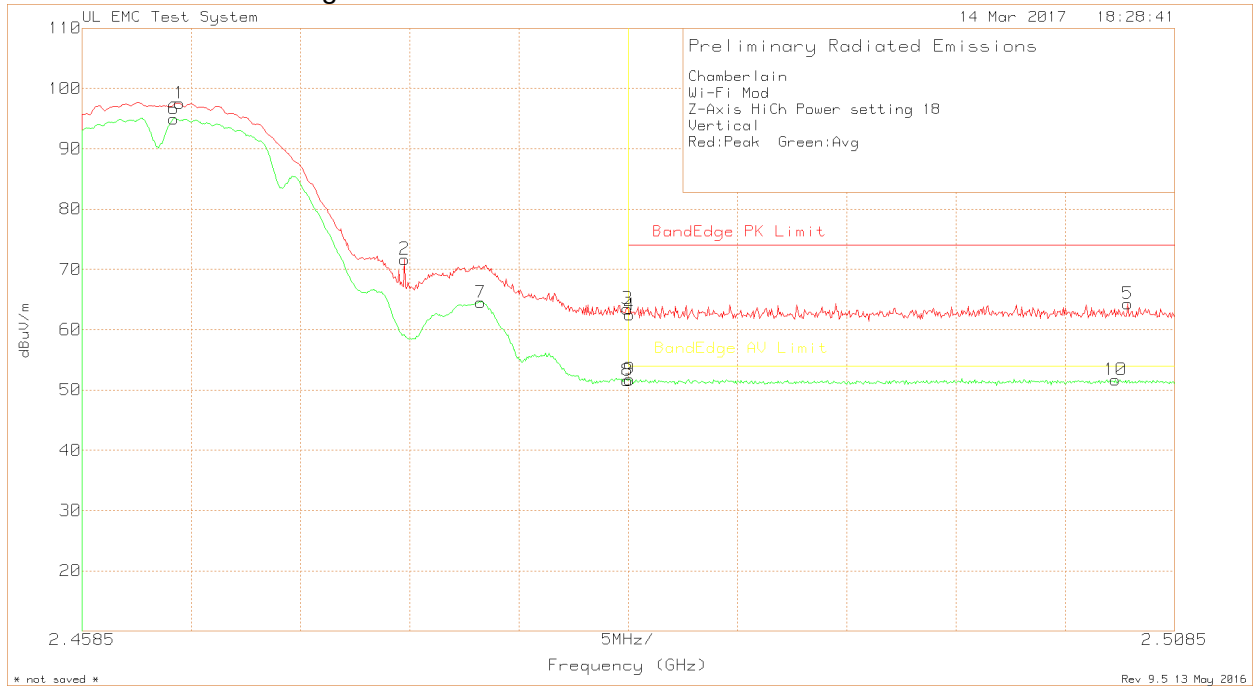
Chamberlain
Wi-Fi Mod
Z-Axis HiCh Power setting 18
Horizontal
Red:Peak Green:Avg

Trace Markers								
No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3
=====								
Peak Data								
1	2.46305	77.27dBuV Pk	22	4.72	103.99	-	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-	-	-
2	2.4733	50.91dBuV Pk	22	4.72	77.63	-	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-	-	-
3	2.4822	40.98dBuV Pk	22	4.76	67.74	-	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-	-	-
4	2.483 5	36.64dBuV Pk	22.1	4.76	63.5	74	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-10.5	-	-
5	2.48355	36.55dBuV Pk	22.1	4.76	63.41	74	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-10.59	-	-
6	2.5053	37.12dBuV Pk	22.1	4.81	64.03	74	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-9.97	-	-
Average Data								
7	2.4627	74.98dBuV Av	22	4.72	101.7	-	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-	-	-
8	2.4769	44.06dBuV Av	22	4.73	70.79	-	-	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-	-	-
9	2.48345	25.83dBuV Av	22.1	4.76	52.69	74	54	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-21.31	-1.31	-
10	2.48355	25.44dBuV Av	22.1	4.76	52.3	74	54	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-21.7	-1.7	-
11	2.508	24.47dBuV Av	22.1	4.79	51.36	74	54	-
		Azimuth:295	Height:147	Horz	Margin (dB)	-22.64	-2.64	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi Mod
Z-Axis HiCh Power setting 18
Vertical

Red:Peak Green:Avg

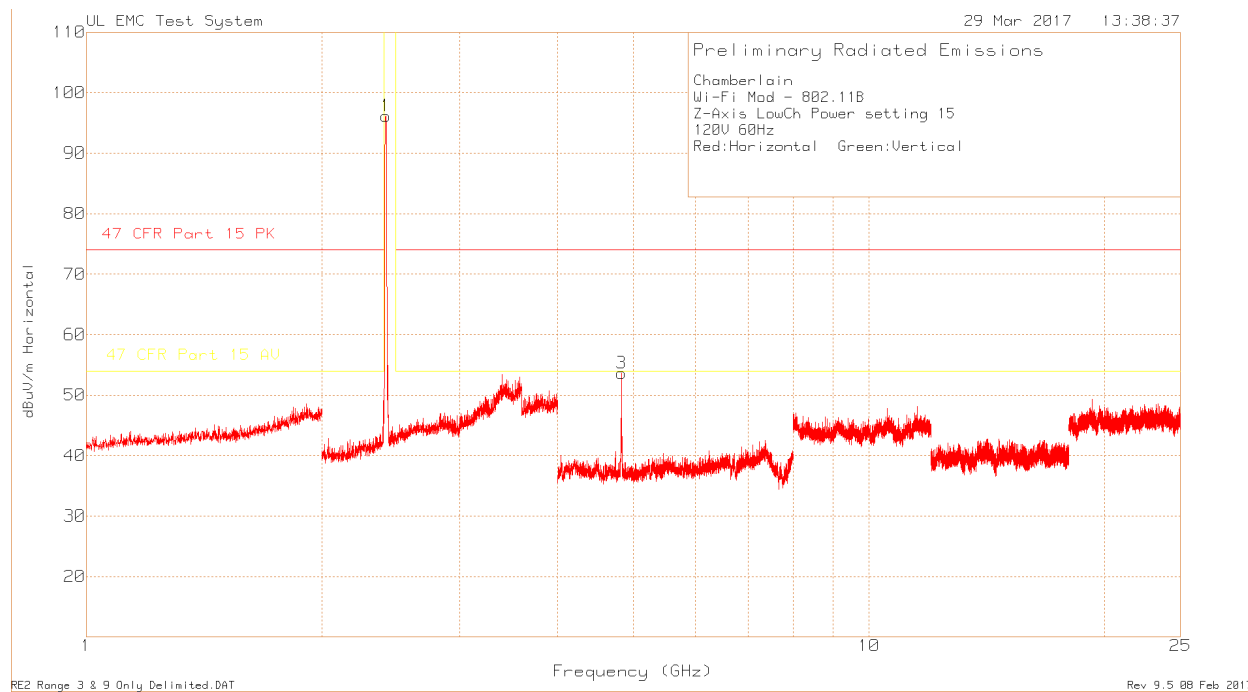
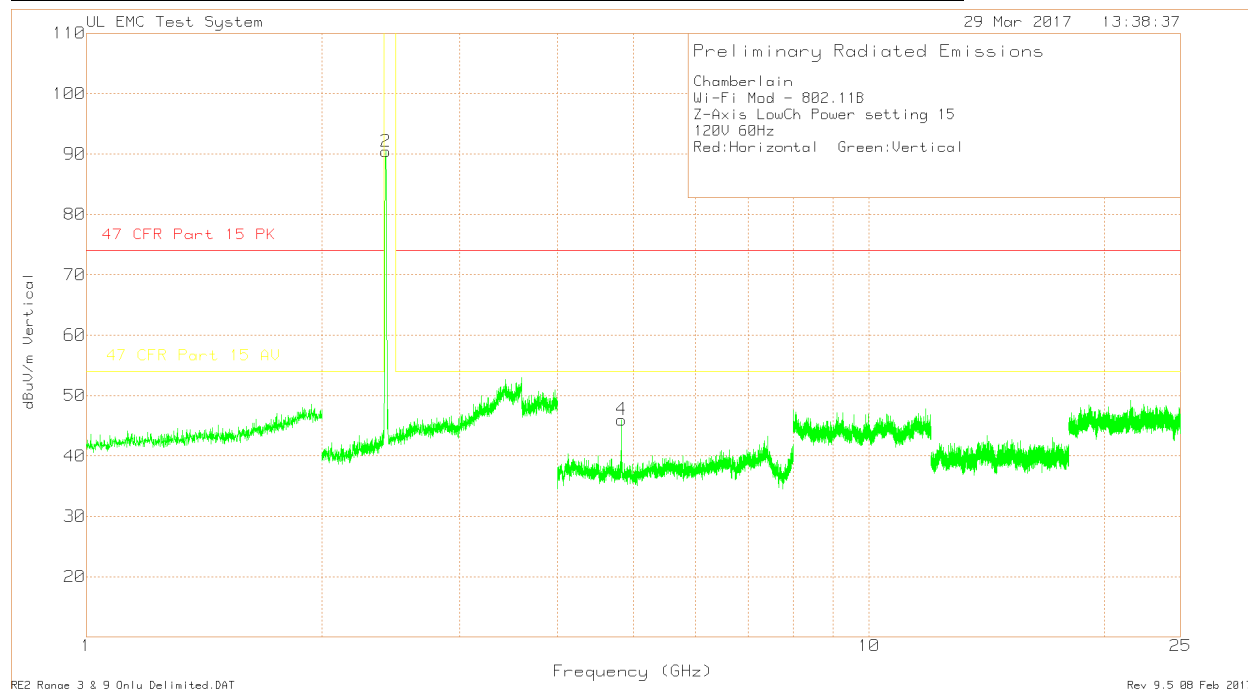
Trace Markers

No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
=====									
Peak Data									
1	2.46295	70.81dBuV Pk	22	4.72	97.53	-	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-	-	-	-
2	2.47325	44.96dBuV Pk	22	4.72	71.68	-	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-	-	-	-
3	2.483 5	36.61dBuV Pk	22.1	4.76	63.47	74	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-10.53	-	-	-
4	2.48355	35.62dBuV Pk	22.1	4.76	62.48	74	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-11.52	-	-	-
5	2.50635	37.39dBuV Pk	22.1	4.8	64.29	74	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-9.71	-	-	-
Average Data									
6	2.4627	68.23dBuV Av	22	4.72	94.95	-	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-	-	-	-
7	2.47675	37.8dBuV Av	22	4.73	64.53	-	-	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-	-	-	-
8	2.483 5	24.73dBuV Av	22.1	4.76	51.59	74	54	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-22.41	-2.41	-	-
9	2.48355	24.88dBuV Av	22.1	4.76	51.74	74	54	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-22.26	-2.26	-	-
10	2.5058	24.78dBuV Av	22.1	4.81	51.69	74	54	-	-
		Azimuth:174	Height:112	Vert	Margin (dB)	-22.31	-2.31	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel - Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel – Data

Chamberlain
Wi-Fi Mod - 802.11B
Z-Axis LowCh Power setting 15
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	2.412	69.7dBuV Pk	21.8	4.65	96.15	-	-	-	-
		Azimuth:0-360	Height:148	Horz	Margin (dB)	-	-	-	-
3	4.824	77.25dBuV Pk	27.7	-51.31	53.64	74	54	-	-
		Azimuth:0-360	Height:148	Horz	Margin (dB)	-20.36	-.36	-	-
2	2.412	63.97dBuV Pk	21.8	4.65	90.42	-	-	-	-
		Azimuth:0-360	Height:148	Vert	Margin (dB)	-	-	-	-
4	4.824	69.61dBuV Pk	27.7	-51.31	46	74	54	-	-
		Azimuth:0-360	Height:148	Vert	Margin (dB)	-28	-8	-	-

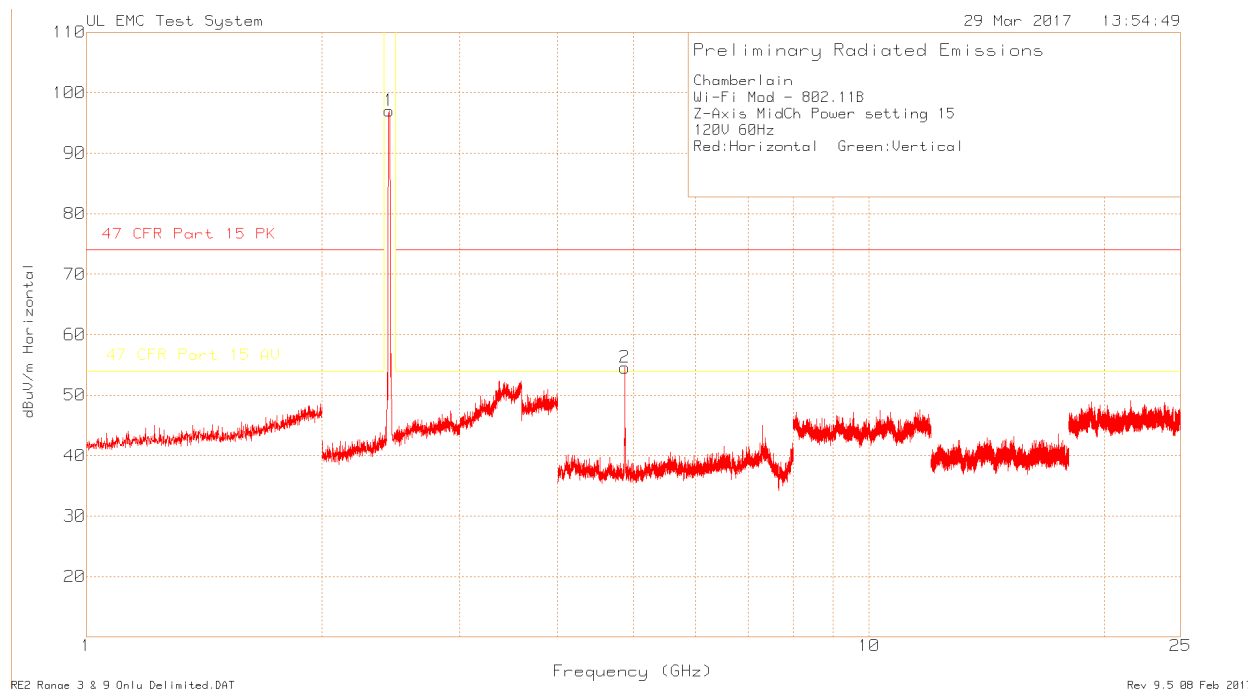
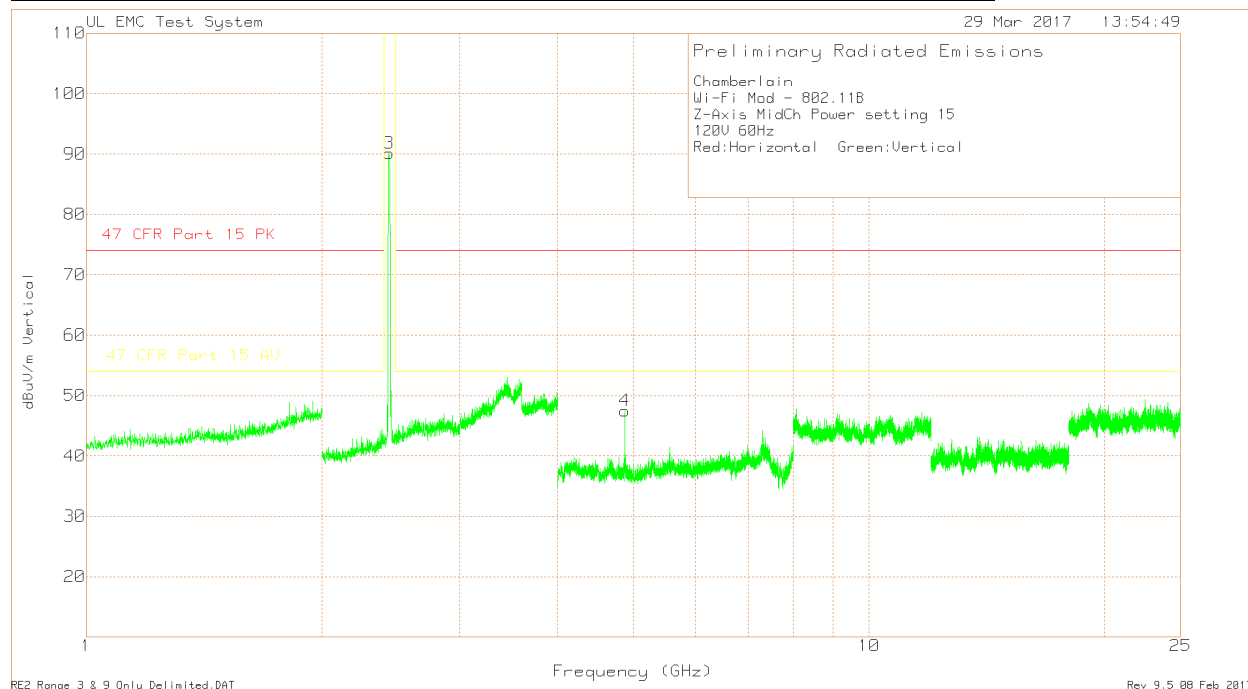
Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.824	78.23dBuV Pk	27.7	-51.31	54.62	74	-	-	-
	Azimuth: 177	Height:149	Horz	Margin (dB):	-19.38	-	-	-
4.824	76.55dBuV Av	27.7	-51.31	52.94	74	54	-	-
	Azimuth: 177	Height:149	Horz	Margin (dB):	-21.06	-1.06	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel - Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel – Data

Chamberlain
Wi-Fi Mod - 802.11B
Z-Axis MidCh Power setting 15
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
1	2.436	70.4dBuV Pk	21.9	4.72	97.02	-	-	-	-
		Azimuth:0-360	Height:149	Horz	Margin (dB)	-	-	-	-
2	4.874	77.7dBuV Pk	27.7	-50.85	54.55	74	54	-	-
		Azimuth:0-360	Height:149	Horz	Margin (dB)	-19.45	.55	-	-
3	2.436	63.45dBuV Pk	21.9	4.72	90.07	-	-	-	-
		Azimuth:0-360	Height:149	Vert	Margin (dB)	-	-	-	-
4	4.874	70.63dBuV Pk	27.7	-50.85	47.48	74	54	-	-
		Azimuth:0-360	Height:149	Vert	Margin (dB)	-26.52	-6.52	-	-

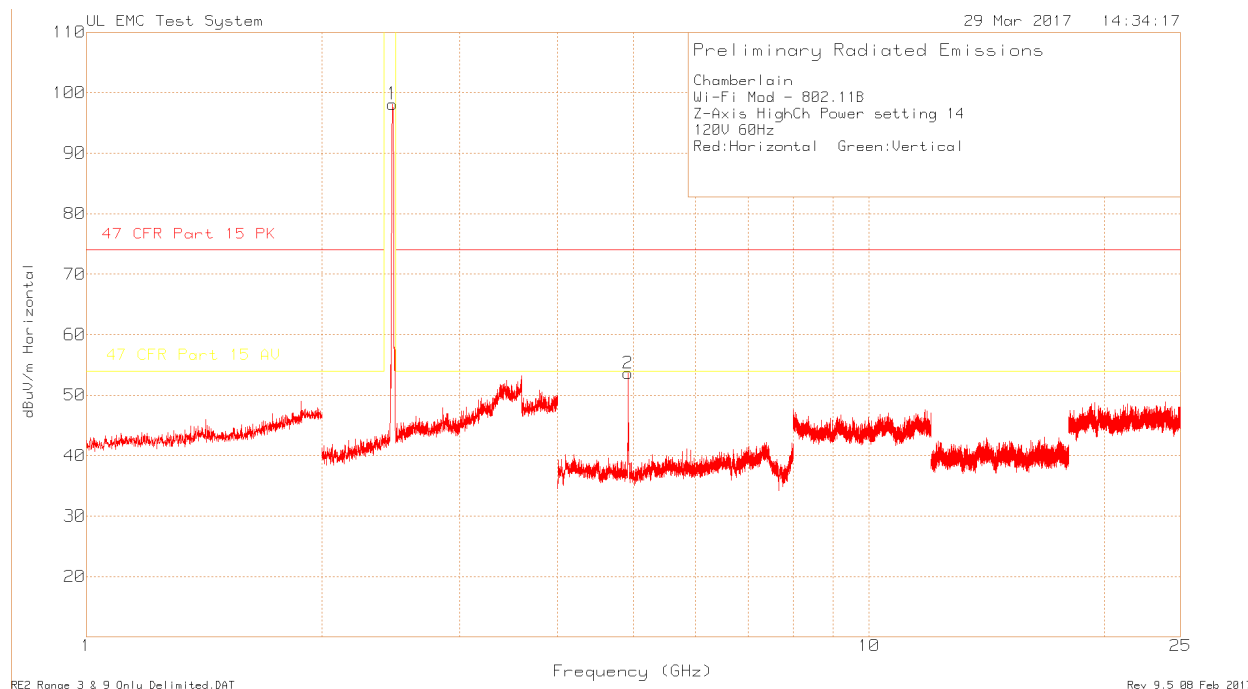
Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
4.8739	78.73dBuV Pk	27.7	-50.85	55.58	74	-	-	-
	Azimuth: 178	Height:150	Horz	Margin (dB):	-18.42	-	-	-
4.874	76.81dBuV Av	27.7	-50.85	53.66	74	54	-	-
	Azimuth: 178	Height:150	Horz	Margin (dB):	-20.34	-.34	-	-
4.874	71.19dBuV Pk	27.7	-50.85	48.04	74	-	-	-
	Azimuth: 327	Height:150	Vert	Margin (dB):	-25.96	-	-	-
4.874	67.32dBuV Av	27.7	-50.85	44.17	74	54	-	-
	Azimuth: 327	Height:150	Vert	Margin (dB):	-29.83	-9.83	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel - Data

Chamberlain
Wi-Fi Mod - 802.11B
Z-Axis HighCh Power setting 14
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	2.461	71.41dBuV Pk	22	4.72	98.13	-	-	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-	-	-	-
2	4.924	76.09dBuV Pk	27.8	-50.27	53.62	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-20.38	-1.38	-	-
3	2.463	61.48dBuV Pk	22	4.72	88.2	-	-	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-	-	-	-
4	4.924	69.45dBuV Pk	27.8	-50.27	46.98	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-27.02	-7.02	-	-

Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.924	76.86dBuV Pk	27.8	-50.27	54.39	74	-	-	-
	Azimuth: 151	Height:152	Horz	Margin (dB):	-19.61	-	-	-
4.924	74.92dBuV Av	27.8	-50.27	52.45	74	54	-	-
	Azimuth: 151	Height:152	Horz	Margin (dB):	-21.55	-1.55	-	-

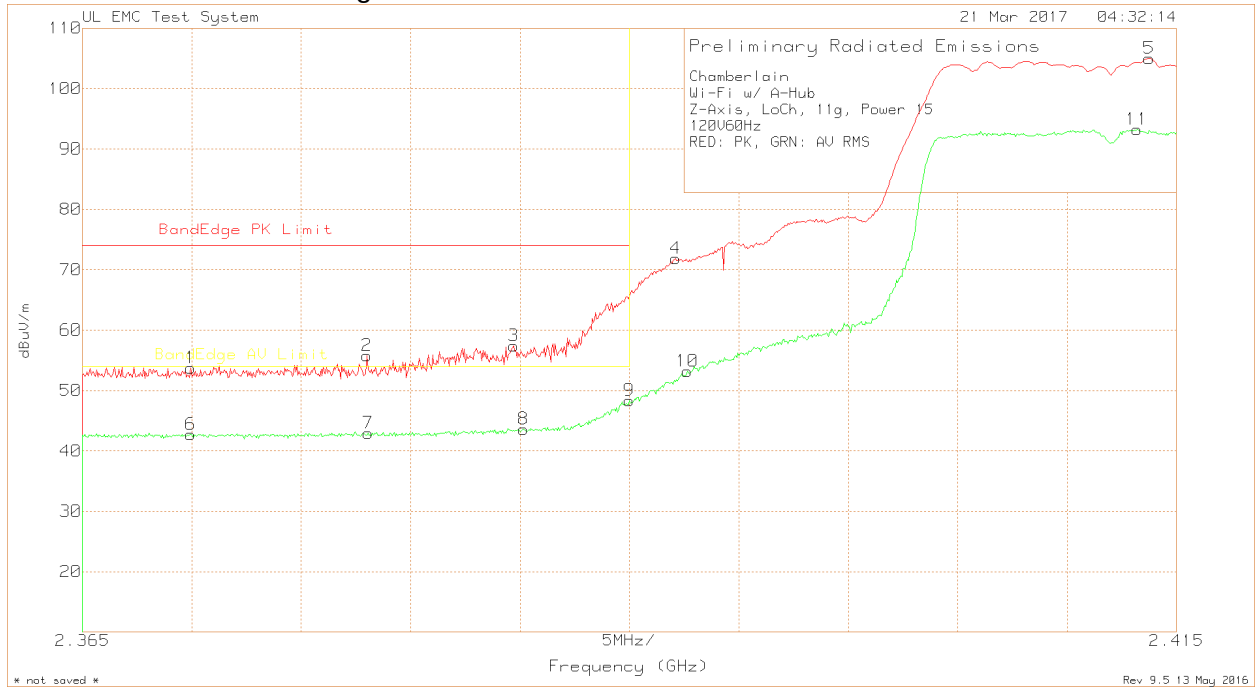
LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

9.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, LoCh, 11g, Power 15
120V60Hz
RED: PK, GRN: AV RMS

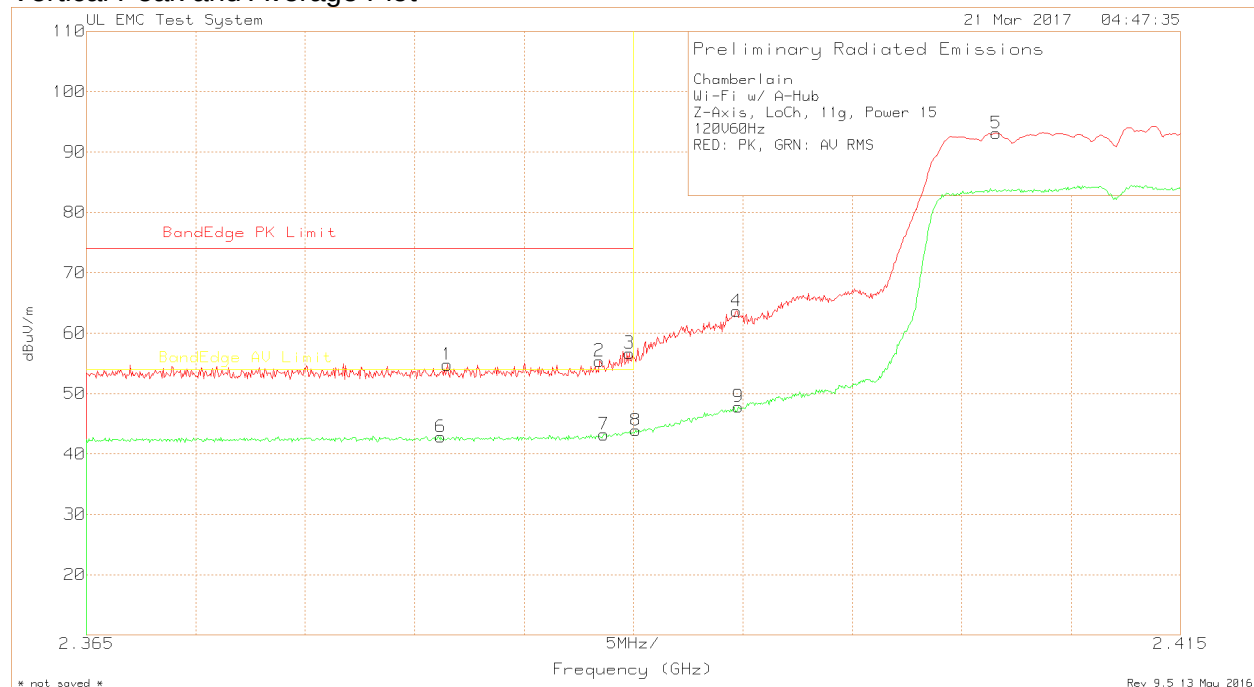
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.36995	27.27dBuV Pk	21.8	4.63	53.7	74	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-20.3	-	-	-
2	2.378	29.33dBuV Pk	21.8	4.64	55.77	74	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-18.23	-	-	-
3	2.3847	30.95dBuV Pk	21.8	4.64	57.39	74	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-16.61	-	-	-
4	2.3921	45.4dBuV Pk	21.8	4.65	71.85	-	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-	-	-	-
5	2.41375	78.56dBuV Pk	21.8	4.65	105.01	-	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-	-	-	-
Average Data									
6	2.36995	16.29dBuV Av	21.8	4.63	42.72	74	54	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-31.28	-11.28	-	-
7	2.37805	16.49dBuV Av	21.8	4.64	42.93	74	54	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-31.07	-11.07	-	-
8	2.38515	17.17dBuV Av	21.8	4.64	43.61	74	54	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-30.39	-10.39	-	-
9	2.39	21.86dBuV Av	21.8	4.65	48.31	74	54	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-25.69	-5.69	-	-
10	2.39265	26.76dBuV Av	21.8	4.65	53.21	-	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-	-	-	-
11	2.4132	66.76dBuV Av	21.8	4.65	93.21	-	-	-	-
		Azimuth:332	Height:144	Horz	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, LoCh, 11g, Power 15
120V60Hz
RED: PK, GRN: AV RMS

Trace Markers

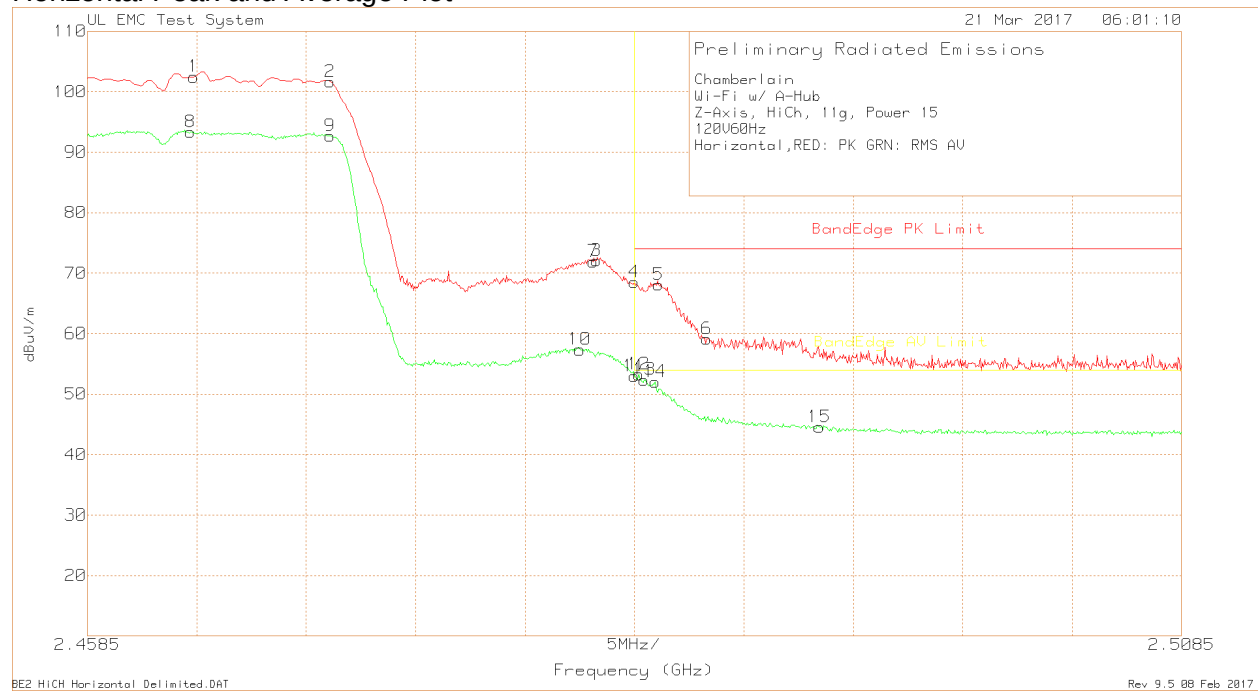
Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.3815	28.33dBuV Pk	21.8	4.64	54.77	74	-	-	-
		Azimuth:27	Height:107	Vert	Margin (dB)	-19.23	-	-	-
2	2.38845	28.94dBuV Pk	21.8	4.65	55.39	74	-	-	-
		Azimuth:27	Height:107	Vert	Margin (dB)	-18.61	-	-	-
3	2.3898	30.23dBuV Pk	21.8	4.65	56.68	74	-	-	-
		Azimuth:27	Height:107	Vert	Margin (dB)	-17.32	-	-	-
4	2.3947	37.2dBuV Pk	21.8	4.65	63.65	-	-	-	-
		Azimuth:27	Height:107	Vert	Margin (dB)	-	-	-	-
5	2.406575	66.68dBuV Pk	21.8	4.64	93.12	-	-	-	-
		Azimuth:27	Height:107	Vert	Margin (dB)	-	-	-	-
Average Data									
6	2.3812	16.38dBuV Av	21.8	4.64	42.82	74	54	-	-
		Azimuth:27	Height:102	Vert	Margin (dB)	-31.18	-11.18	-	-
7	2.38865	16.77dBuV Av	21.8	4.65	43.22	74	54	-	-
		Azimuth:27	Height:102	Vert	Margin (dB)	-30.78	-10.78	-	-
8	2.3901	17.46dBuV Av	21.8	4.65	43.91	-	-	-	-
		Azimuth:27	Height:102	Vert	Margin (dB)	-	-	-	-
9	2.3948	21.37dBuV Av	21.8	4.65	47.82	-	-	-	-
		Azimuth:27	Height:102	Vert	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

RESTRICTED BANDEDGE (HIGH CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, HiCh, 11g, Power 15
120V60Hz
RED: PK, GRN: AV RMS

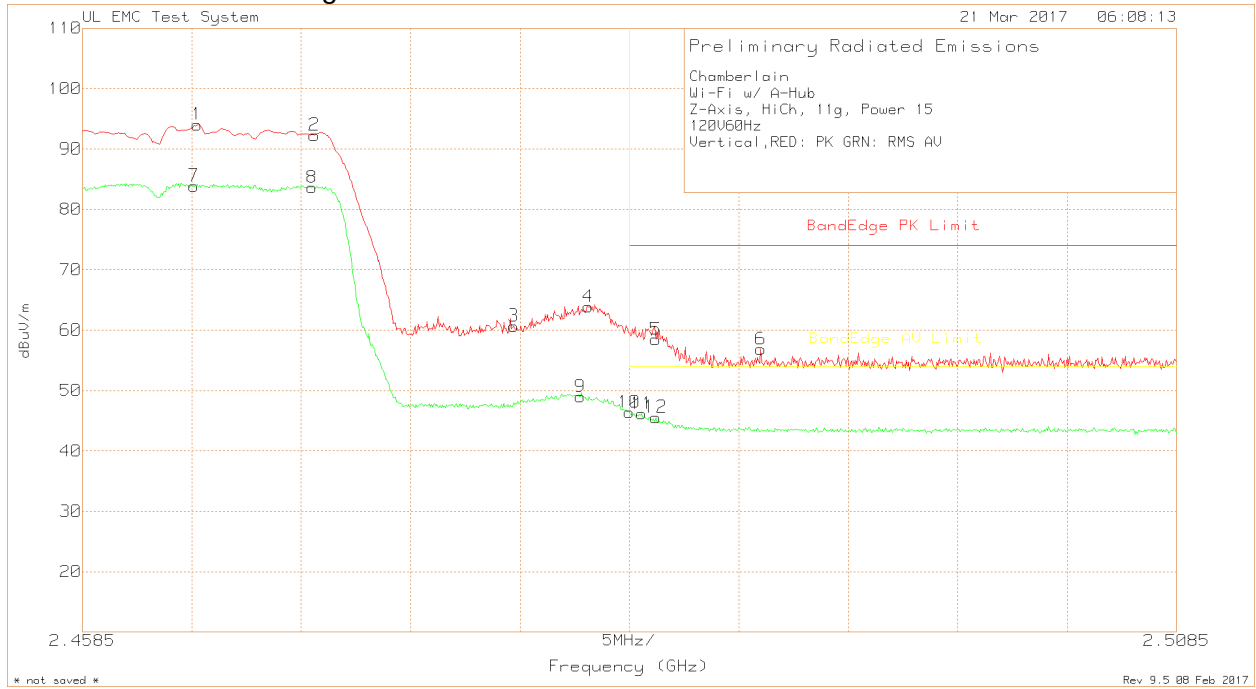
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.46335	75.74dBuV Pk	22	4.72	102.46	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
2	2.4696	74.96dBuV Pk	22	4.71	101.67	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
3	2.48175	45.32dBuV Pk	22	4.76	72.08	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
4	2.4835	41.64dBuV Pk	22.1	4.76	68.5	74	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-5.5	-	-	-
5	2.4846	41.23dBuV Pk	22.1	4.76	68.09	74	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-5.91	-	-	-
6	2.4868	32.26dBuV Pk	22.1	4.76	59.12	74	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-14.88	-	-	-
7	2.4816	45.15dBuV Pk	22	4.75	71.9	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
Average Data									
8	2.4632	66.62dBuV Av	22	4.72	93.34	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
9	2.4696	65.98dBuV Av	22	4.71	92.69	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
10	2.481	30.6dBuV Av	22	4.75	57.35	-	-	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-	-	-	-
11	2.4835	26.13dBuV Av	22.1	4.76	52.99	74	54	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-21.01	-1.01	-	-
12	2.4837	26.39dBuV Av	22.1	4.76	53.25	74	54	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-20.75	-1.75	-	-
13	2.48395	25.52dBuV Av	22.1	4.76	52.38	74	54	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-21.62	-1.62	-	-
14	2.48445	25.18dBuV Av	22.1	4.76	52.04	74	54	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-21.96	-1.96	-	-
15	2.49195	17.71dBuV Av	22.1	4.76	44.57	74	54	-	-
		Azimuth:322	Height:150	Horz	Margin (dB)	-29.43	-9.43	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, HiCh, 11g, Power 15
120V60Hz
RED: PK, GRN: AV RMS

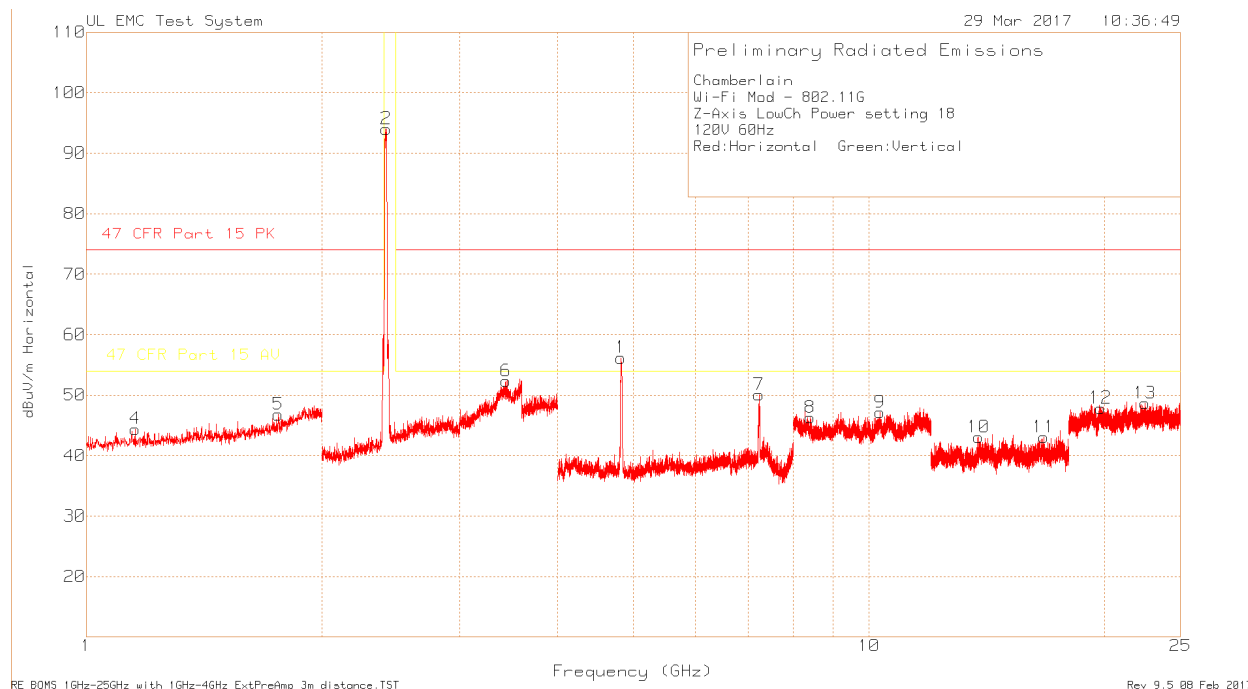
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.46375	67.32dBuV Pk	22	4.72	94.04	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
2	2.4691	65.59dBuV Pk	22	4.71	92.3	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
3	2.4782	33.94dBuV Pk	22	4.73	60.67	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
4	2.4816	37.09dBuV Pk	22	4.75	63.84	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
5	2.4847	31.62dBuV Pk	22.1	4.76	58.48	74	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-15.52	-	-	-
6	2.4895	30dBuV Pk	22.1	4.75	56.85	74	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-17.15	-	-	-
Average Data									
7	2.4636	57.15dBuV Av	22	4.72	83.87	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
8	2.469	56.93dBuV Av	22	4.71	83.64	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
9	2.48125	22.25dBuV Av	22	4.75	49	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
10	2.4835	19.55dBuV Av	22.1	4.76	46.41	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-27.59	-7.59	-	-
11	2.48405	19.3dBuV Av	22.1	4.76	46.16	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-27.84	-7.84	-	-
12	2.4847	18.7dBuV Av	22.1	4.76	45.56	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-28.44	-8.44	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel - Data

Chamberlain
Wi-Fi Mod - 802.11G
Z-Axis LowCh Power setting 18
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4	1.154	16.12dBuV Pk	24.8	3.47	44.39	74	54	-	-
		Azimuth:0-360	Height:150	Horz	Margin (dB)	-29.61	-9.61	-	-
5	1.759	16.21dBuV Pk	26.5	4.07	46.78	74	54	-	-
		Azimuth:0-360	Height:150	Horz	Margin (dB)	-27.22	-7.22	-	-
2	2.416	67.57dBuV Pk	21.8	4.65	94.02	-	-	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-	-	-	-
6	3.438	22.97dBuV Pk	23.5	5.86	52.33	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-21.67	-1.67	-	-
1	4.822	79.8dBuV Pk	27.7	-51.34	56.16	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-17.84	2.16	-	-
7	7.233	66.45dBuV Pk	29.9	-46.27	50.08	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-23.92	-3.92	-	-
8	8.41	58.34dBuV Pk	36.6	-48.66	46.28	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-27.72	-7.72	-	-
9	10.323	58.04dBuV Pk	36.2	-47.1	47.14	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-26.86	-6.86	-	-
10	13.801	46.27dBuV Pk	39.9	-43.11	43.06	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-30.94	-10.94	-	-
11	16.719	43.75dBuV Pk	40	-40.74	43.01	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-30.99	-10.99	-	-
12	19.75	56.73dBuV Pk	40.3	-49.2	47.83	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-26.17	-6.17	-	-
13	22.533	53.44dBuV Pk	40.5	-45.32	48.62	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-25.38	-5.38	-	-
14	1.179	15.59dBuV Pk	24.9	3.48	43.97	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-30.03	-10.03	-	-
15	1.729	15.59dBuV Pk	26.3	4.07	45.96	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-28.04	-8.04	-	-
3	2.408	55.65dBuV Pk	21.8	4.64	82.09	-	-	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-	-	-	-
16	3.399	22.53dBuV Pk	23.5	5.9	51.93	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-22.07	-2.07	-	-
17	4.828	66.41dBuV Pk	27.7	-51.25	42.86	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-31.14	-11.14	-	-
18	7.237	66.45dBuV Pk	30	-46.24	50.21	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-23.79	-3.79	-	-
19	9.112	58.54dBuV Pk	36.2	-48.32	46.42	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-27.58	-7.58	-	-
20	10.557	58.13dBuV Pk	36.3	-47.22	47.21	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-26.79	-6.79	-	-
21	13.011	47.65dBuV Pk	39.8	-44.49	42.96	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-31.04	-11.04	-	-
22	16.406	43.9dBuV Pk	39.7	-40.29	43.31	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-30.69	-10.69	-	-
23	19.701	57.85dBuV Pk	40.3	-49.62	48.53	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-25.47	-5.47	-	-
24	22.855	52.46dBuV Pk	40.4	-45.07	47.79	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-26.21	-6.21	-	-

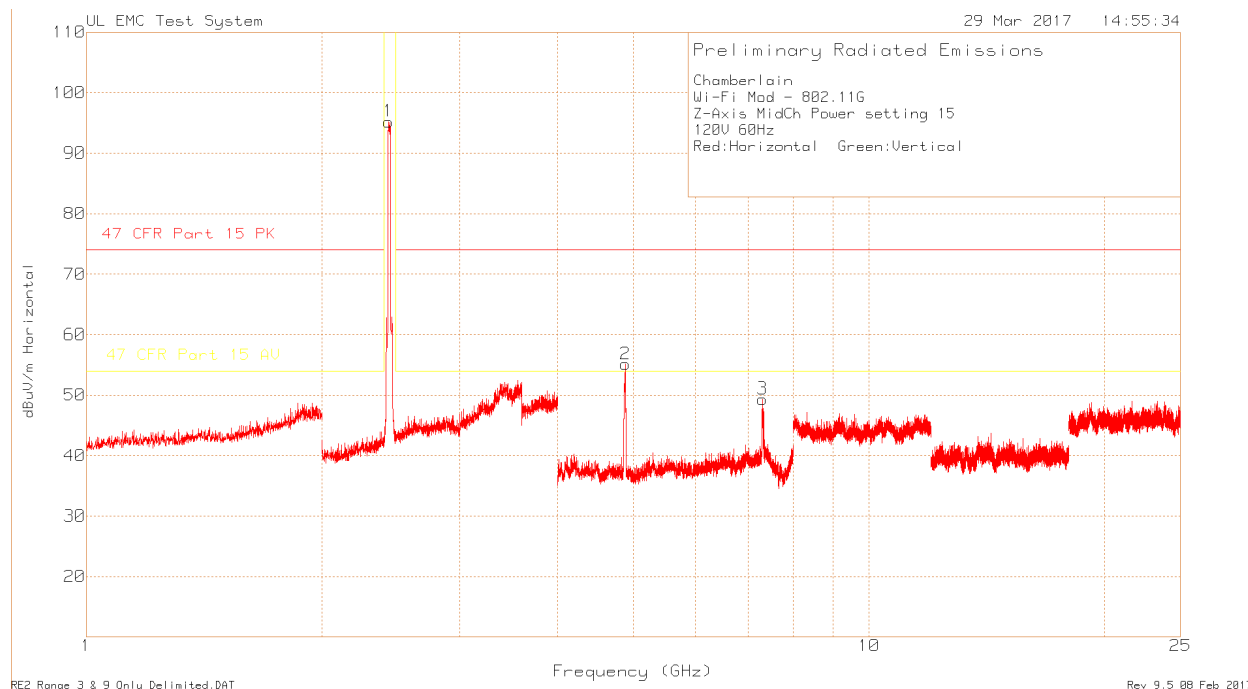
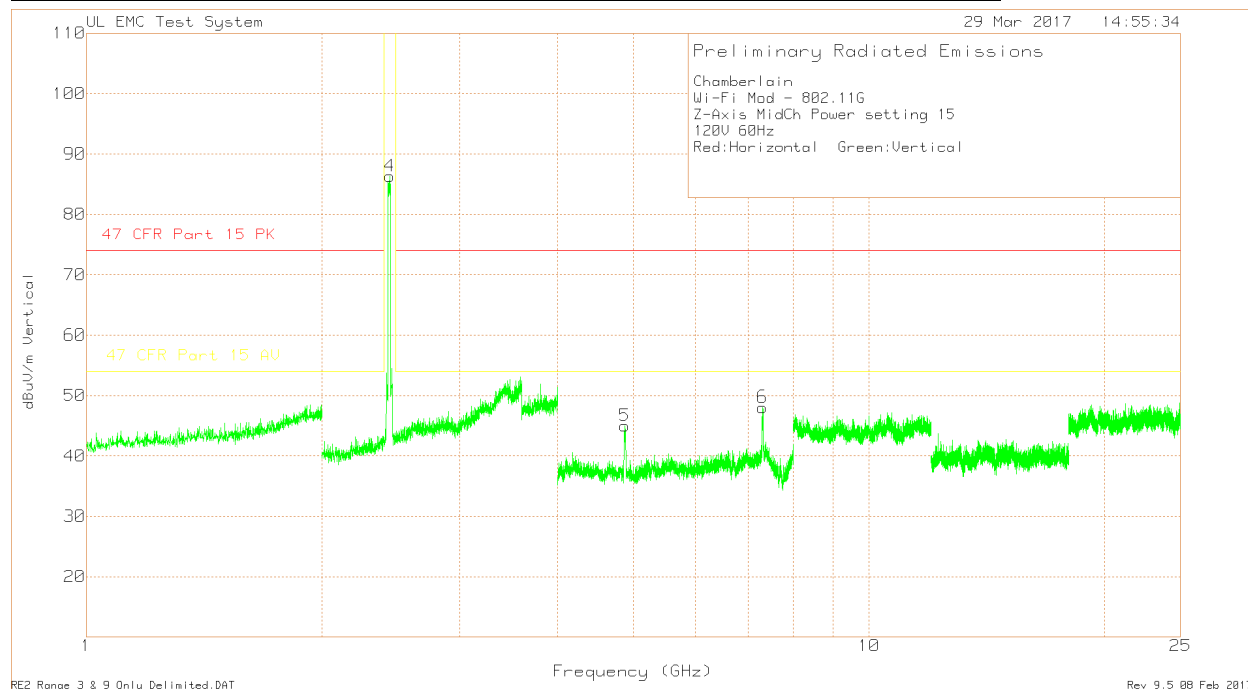
Radiated Emission Data

No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.8251		82.98dBuV Pk	27.7	-51.29	59.39	74	54	-	-
	Azimuth: 139	Height:152	Horz		Margin (dB):	-14.61	-	-	-
4.8253		70.34dBuV Av	27.7	-51.29	46.75	74	54	-	-
	Azimuth: 139	Height:152	Horz		Margin (dB):	-27.25	-7.25	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel - Data

Chamberlain
Wi-Fi Mod - 802.11G
Z-Axis MidCh Power setting 15
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	2.433	68.61dBuV Pk	21.9	4.71	95.22	-	-	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-	-	-	-
2	4.881	78.23dBuV Pk	27.7	-50.78	55.15	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-18.85	1.15	-	-
3	7.308	64.84dBuV Pk	30.5	-45.99	49.35	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-24.65	-4.65	-	-
4	2.443	59.7dBuV Pk	21.9	4.72	86.32	-	-	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-	-	-	-
5	4.872	68.16dBuV Pk	27.7	-50.88	44.98	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-29.02	-9.02	-	-
6	7.306	63.53dBuV Pk	30.5	-45.99	48.04	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-25.96	-5.96	-	-

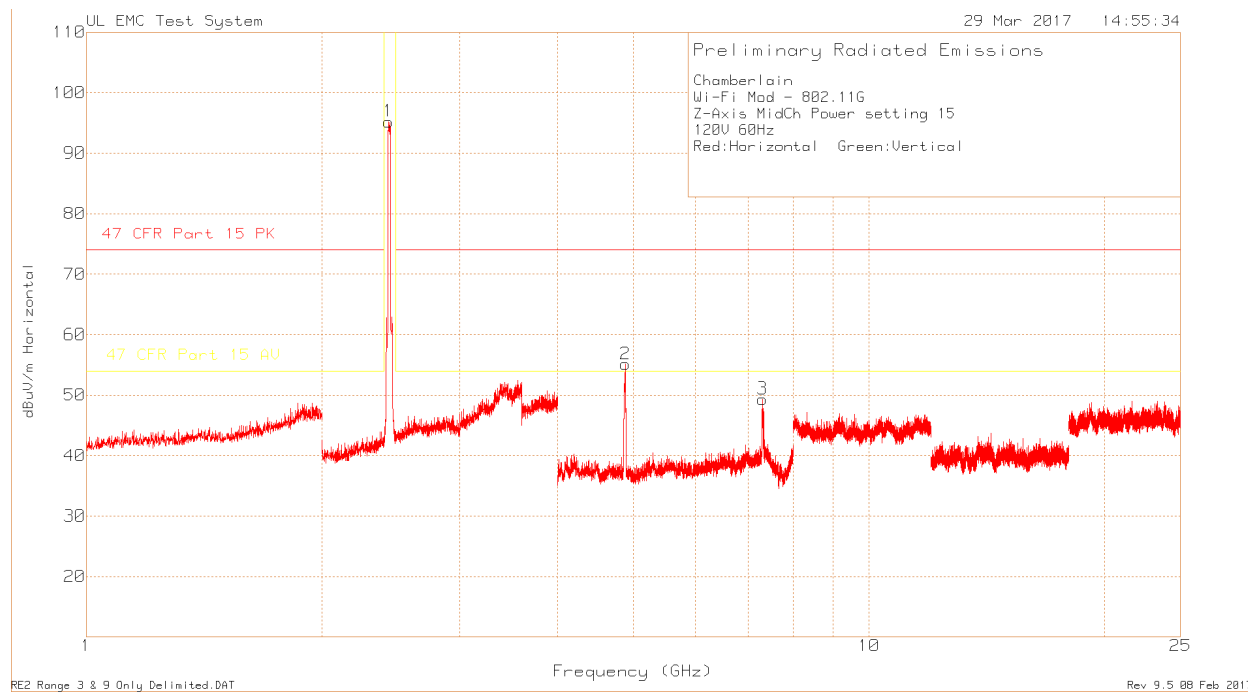
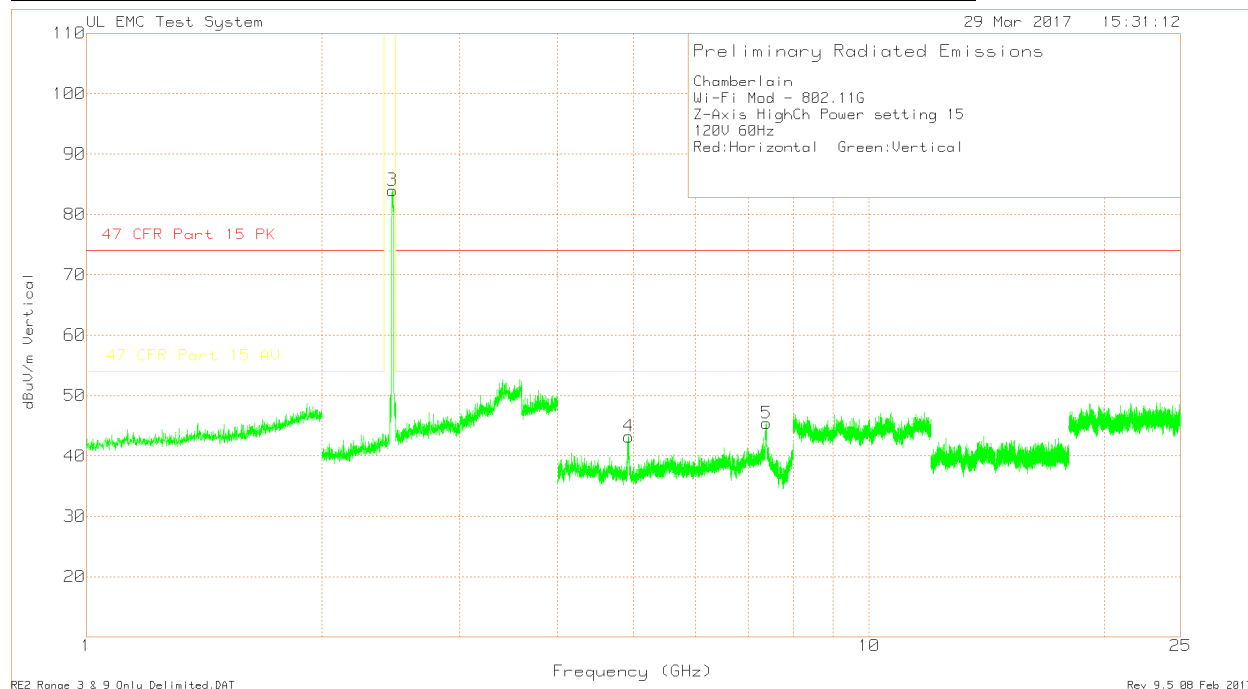
Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.8748	80.61dBuV Pk	27.7	-50.85	57.46	74	-	-	-
	Azimuth: 174	Height:153	Horz	Margin (dB):	-16.54	-	-	-
4.8757	67.17dBuV Av	27.7	-50.84	44.03	74	54	-	-
	Azimuth: 174	Height:153	Horz	Margin (dB):	-29.97	-9.97	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel - Data

Chamberlain
Wi-Fi Mod - 802.11G
Z-Axis HighCh Power setting 15
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	2.461	67.11dBuV Pk	22	4.72	93.83	-	-	-	-
		Azimuth:0-360	Height:150	Horz	Margin (dB)	-	-	-	-
2	4.933	75.27dBuV Pk	27.8	-50.13	52.94	74	54	-	-
		Azimuth:0-360	Height:150	Horz	Margin (dB)	-21.06	-1.06	-	-
3	2.462	57.27dBuV Pk	22	4.72	83.99	-	-	-	-
		Azimuth:0-360	Height:150	Vert	Margin (dB)	-	-	-	-
4	4.931	65.57dBuV Pk	27.8	-50.16	43.21	74	54	-	-
		Azimuth:0-360	Height:150	Vert	Margin (dB)	-30.79	-10.79	-	-
5	7.392	61.31dBuV Pk	31.1	-46.98	45.43	74	54	-	-
		Azimuth:0-360	Height:150	Vert	Margin (dB)	-28.57	-8.57	-	-

Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.9312	77.83dBuV Pk	27.8	-50.15	55.48	74	-	-	-
	Azimuth: 173	Height:151	Horz	Margin (dB):	-18.52	-	-	-
4.9234	64.26dBuV Av	27.8	-50.29	41.77	74	54	-	-
	Azimuth: 173	Height:151	Horz	Margin (dB):	-32.23	-12.23	-	-

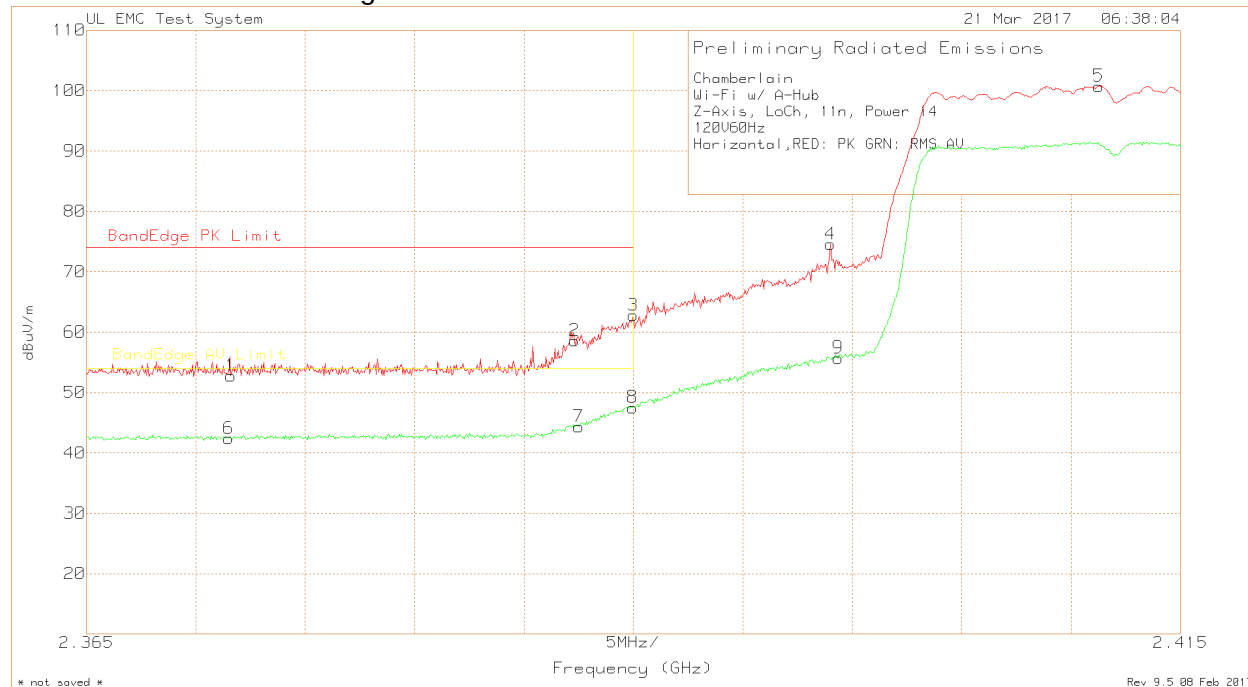
LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

9.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, LoCh, 11n, Power 14
120V60Hz
RED: PK, GRN: AV RMS

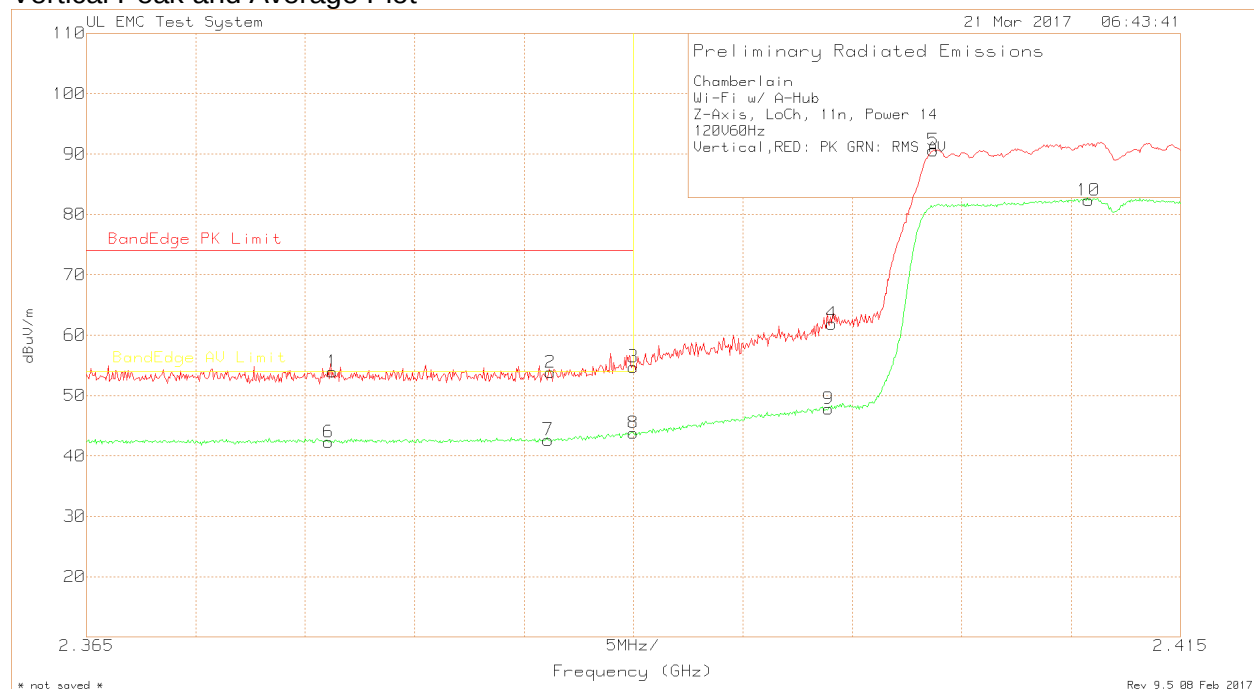
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
=====									
Peak Data									
1	2.3716	26.31dBuV Pk	21.8	4.64	52.75	74	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-21.25	-	-	-
2	2.3873	32.11dBuV Pk	21.8	4.65	58.56	74	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-15.44	-	-	-
3	2.39	36.35dBuV Pk	21.8	4.65	62.8	74	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-11.2	-	-	-
4	2.399	48.14dBuV Pk	21.8	4.64	74.58	-	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-	-	-	-
5	2.41125	74.27dBuV Pk	21.8	4.65	100.72	-	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-	-	-	-
Average Data									
6	2.3715	15.92dBuV Av	21.8	4.64	42.36	74	54	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-31.64	-11.64	-	-
7	2.3875	17.89dBuV Av	21.8	4.65	44.34	74	54	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-29.66	-9.66	-	-
8	2.39	21.06dBuV Av	21.8	4.65	47.51	74	54	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-26.49	-6.49	-	-
9	2.39935	29.26dBuV Av	21.8	4.64	55.7	-	-	-	-
		Azimuth:332	Height:138	Horz	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, LoCh, 11n, Power 14
120V60Hz
RED: PK, GRN: AV RMS

Trace Markers

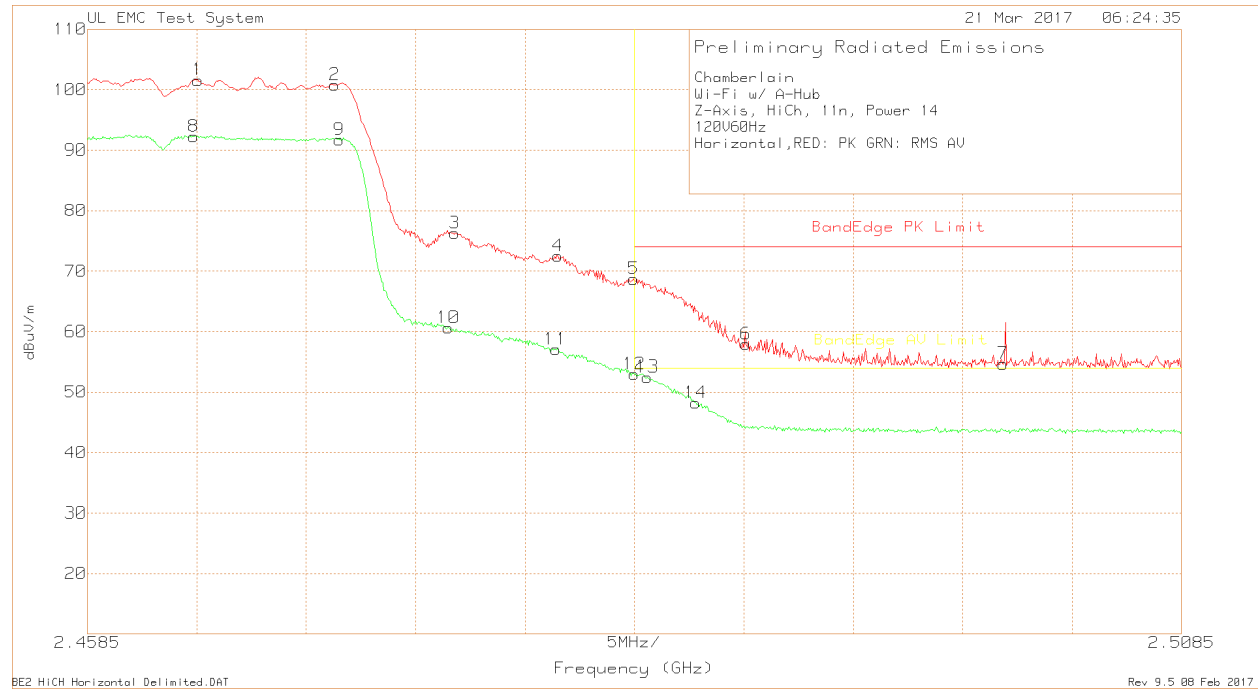
Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
=====									
Peak Data									
1	2.37625	27.5dBuV Pk	21.8	4.64	53.94	74	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-20.06	-	-	-
2	2.3862	27.38dBuV Pk	21.8	4.64	53.82	74	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-20.18	-	-	-
3	2.39	28.28dBuV Pk	21.8	4.65	54.73	74	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-19.27	-	-	-
4	2.39905	35.45dBuV Pk	21.8	4.64	61.89	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
5	2.4037	64.16dBuV Pk	21.8	4.64	90.6	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
Average Data									
6	2.37605	15.85dBuV Av	21.8	4.64	42.29	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-31.71	-11.71	-	-
7	2.3861	16.2dBuV Av	21.8	4.64	42.64	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-31.36	-11.36	-	-
8	2.39	17.36dBuV Av	21.8	4.65	43.81	74	54	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-30.19	-10.19	-	-
9	2.3989	21.37dBuV Av	21.8	4.64	47.81	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-
10	2.4108	55.9dBuV Av	21.8	4.65	82.35	-	-	-	-
		Azimuth:55	Height:150	Vert	Margin (dB)	-	-	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

RESTRICTED BANDEGE (HIGH CHANNEL)

Horizontal Peak and Average Plot



Horizontal Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, HiCh, 11n, Power 14
120V60Hz
RED: PK, GRN: AV RMS

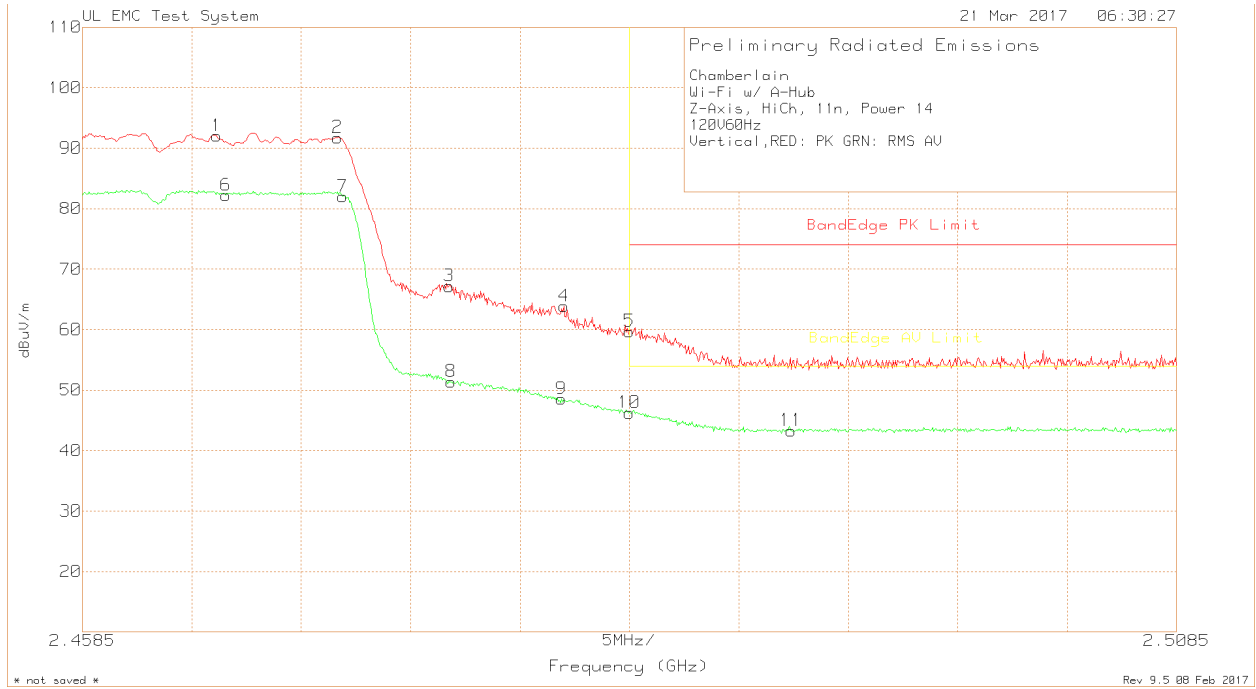
Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
=====									
Peak Data									
1	2.46355	74.87dBuV Pk	22	4.72	101.59	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
2	2.4698	74.1dBuV Pk	22	4.71	100.81	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
3	2.4753	49.59dBuV Pk	22	4.72	76.31	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
4	2.48	45.75dBuV Pk	22	4.74	72.49	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
5	2.4835	41.83dBuV Pk	22.1	4.76	68.69	74	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-5.31	-	-	-
6	2.4886	31.05dBuV Pk	22.1	4.76	57.91	74	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-16.09	-	-	-
7	2.50035	27.73dBuV Pk	22.1	4.82	54.65	74	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-19.35	-	-	-
Average Data									
8	2.46335	65.51dBuV Av	22	4.72	92.23	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
9	2.47	64.99dBuV Av	22	4.71	91.7	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
10	2.475	33.89dBuV Av	22	4.72	60.61	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
11	2.4799	30.35dBuV Av	22	4.74	57.09	-	-	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-	-	-	-
12	2.4835	26.11dBuV Av	22.1	4.76	52.97	74	54	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-21.03	-1.03	-	-
13	2.4841	25.61dBuV Av	22.1	4.76	52.47	74	54	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-21.53	-1.53	-	-
14	2.4863	21.33dBuV Av	22.1	4.76	48.19	74	54	-	-
		Azimuth:325	Height:181	Horz	Margin (dB)	-25.81	-5.81	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average detector

Vertical Peak and Average Plot



Vertical Peak and Average Data

Chamberlain
Wi-Fi w/ A-Hub
Z-Axis, HiCh, 11n, Power 14
120V60Hz
RED: PK, GRN: AV RMS

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
=====									
Peak Data									
1	2.46465	65.33dBuV Pk	22	4.72	92.05	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
2	2.47015	65.05dBuV Pk	22	4.71	91.76	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
3	2.47525	40.46dBuV Pk	22	4.72	67.18	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
4	2.4805	37.13dBuV Pk	22	4.75	63.88	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
5	2.4835	32.85dBuV Pk	22.1	4.76	59.71	74	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-14.29	-	-	-
Average Data									
6	2.46505	55.5dBuV Av	22	4.72	82.22	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
7	2.4704	55.3dBuV Av	22	4.71	82.01	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
8	2.47535	24.67dBuV Av	22	4.72	51.39	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
9	2.4804	21.8dBuV Av	22	4.75	48.55	-	-	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-	-	-	-
10	2.4835	19.38dBuV Av	22.1	4.76	46.24	74	54	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-27.76	-7.76	-	-
11	2.4909	16.45dBuV Av	22.1	4.75	43.3	74	54	-	-
		Azimuth:56	Height:149	Vert	Margin (dB)	-30.7	-10.7	-	-

LIMIT 1: BandEdge PK Limit
LIMIT 2: BandEdge AV Limit

Pk - Peak detector
Av - Average Detector

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Low Channel - Data

Chamberlain
Wi-Fi Mod - 802.11N
Z-Axis LowCh Power setting 14
120V 60Hz
Red: Horizontal Green: Vertical

Trace Markers

No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	1.099	15.84dBuV Pk	24.6	3.52	43.96	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-30.04	-10.04	-	-
2	1.747	16.22dBuV Pk	26.4	4.07	46.69	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-27.31	-7.31	-	-
3	2.42	67.46dBuV Pk	21.9	4.67	94.03	-	-	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-	-	-	-
4	3.424	22.59dBuV Pk	23.5	5.93	52.02	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-21.98	-1.98	-	-
5	4.827	77.08dBuV Pk	27.7	-51.26	53.52	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-20.48	-1.48	-	-
6	7.232	63.77dBuV Pk	29.9	-46.28	47.39	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-26.61	-6.61	-	-
7	9.102	58.42dBuV Pk	36.2	-48.47	46.15	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-27.85	-7.85	-	-
8	10.641	56.41dBuV Pk	36.4	-47.01	45.8	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-28.2	-8.2	-	-
9	13.072	46.1dBuV Pk	39.8	-44.16	41.74	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-32.26	-12.26	-	-
10	16.592	43.92dBuV Pk	39.8	-40.6	43.12	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-30.88	-10.88	-	-
11	19.688	57.4dBuV Pk	40.3	-49.59	48.11	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-25.89	-5.89	-	-
12	23.886	53.64dBuV Pk	40.3	-45.71	48.23	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-25.77	-5.77	-	-
13	1.077	15.26dBuV Pk	24.5	3.48	43.24	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-30.76	-10.76	-	-
14	1.524	16.46dBuV Pk	25.2	3.91	45.57	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-28.43	-8.43	-	-
15	2.41	58.54dBuV Pk	21.8	4.65	84.99	-	-	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-	-	-	-
16	3.401	22.63dBuV Pk	23.5	5.92	52.05	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-21.95	-1.95	-	-
17	4.822	65.98dBuV Pk	27.7	-51.34	42.34	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-31.66	-11.66	-	-
18	7.24	63.76dBuV Pk	30	-46.2	47.56	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-26.44	-6.44	-	-
19	9.079	58.42dBuV Pk	36.2	-48.87	45.75	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-28.25	-8.25	-	-
20	10.605	58.09dBuV Pk	36.3	-47.2	47.19	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-26.81	-6.81	-	-
21	13.292	47.1dBuV Pk	39.8	-44.22	42.68	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-31.32	-11.32	-	-
22	16.668	42.72dBuV Pk	39.9	-40.5	42.12	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-31.88	-11.88	-	-
23	19.64	59.52dBuV Pk	40.3	-49.68	50.14	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-23.86	-3.86	-	-
24	22.763	53.96dBuV Pk	40.4	-45.22	49.14	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-24.86	-4.86	-	-

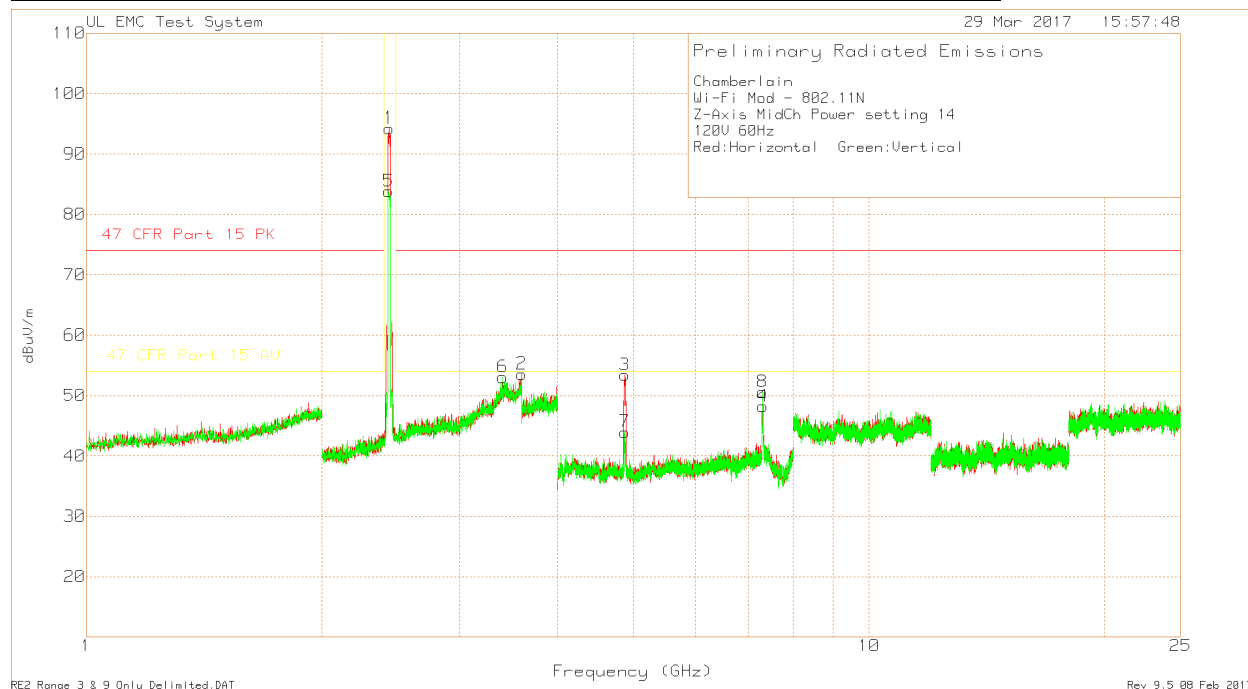
Radiated Emission Data

No.	Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
4.8317		79.55dBuV Pk	27.7	-51.22	56.03	74	-	-	-
	Azimuth: 174	Height:152	Horz		Margin (dB):	-17.97	-	-	-
4.8234		66.32dBuV Av	27.7	-51.32	42.7	74	54	-	-
	Azimuth: 174	Height:152	Horz		Margin (dB):	-31.3	-11.3	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – Middle Channel - Data

Chamberlain
Wi-Fi Mod - 802.11N
Z-Axis MidCh Power setting 14
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
1	2.435	67.63dBuV Pk	21.9	4.71	94.24	-	-	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-	-	-	-
2	3.599	24.72dBuV Pk	23.2	5.64	53.56	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-20.44	-1.44	-	-
3	4.874	76.56dBuV Pk	27.7	-50.85	53.41	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-20.59	-1.59	-	-
4	7.316	63.6dBuV Pk	30.6	-46.01	48.19	74	54	-	-
		Azimuth:0-360	Height:151	Horz	Margin (dB)	-25.81	-5.81	-	-
5	2.431	57.22dBuV Pk	21.9	4.7	83.82	-	-	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-	-	-	-
6	3.405	23.64dBuV Pk	23.5	5.9	53.04	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-20.96	-1.96	-	-
7	4.872	67.14dBuV Pk	27.7	-50.88	43.96	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-30.04	-10.04	-	-
8	7.309	66.05dBuV Pk	30.5	-45.99	50.56	74	54	-	-
		Azimuth:0-360	Height:151	Vert	Margin (dB)	-23.44	-3.44	-	-

Radiated Emission Data

Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1 dBuV/m	2	3	4
3.5802	32.71dBuV Pk	23.3	5.69	61.7	74	-	-	-
	Azimuth: 360	Height:152	Horz	Margin (dB):	-12.3	-	-	-
3.5991	20.64dBuV Av	23.2	5.64	49.48	74	54	-	-
	Azimuth: 360	Height:152	Horz	Margin (dB):	-24.52	-4.52	-	-
4.8649	79.87dBuV Pk	27.7	-50.96	56.61	74	-	-	-
	Azimuth: 176	Height:152	Horz	Margin (dB):	-17.39	-	-	-
4.8739	66.99dBuV Av	27.7	-50.85	43.84	74	54	-	-
	Azimuth: 176	Height:152	Horz	Margin (dB):	-30.16	-10.16	-	-
3.394	28.4dBuV Pk	23.5	5.81	57.71	74	-	-	-
	Azimuth: 0	Height:152	Vert	Margin (dB):	-16.29	-	-	-
3.387	19.36dBuV Av	23.4	5.75	48.51	74	54	-	-
	Azimuth: 0	Height:152	Vert	Margin (dB):	-25.49	-5.49	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel – Plots



HARMONICS AND SPURIOUS EMISSIONS – 1-25GHz – High Channel - Data

Chamberlain
Wi-Fi Mod - 802.11N
Z-Axis HighCh Power setting 14
120V 60Hz
Red:Horizontal Green:Vertical

Trace Markers

Test No.	Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
1	2.47	65.64dBuV Pk	22	4.71	92.35	-	-	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-	-	-	-
2	3.588	23.27dBuV Pk	23.2	5.68	52.15	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-21.85	-1.85	-	-
3	4.924	73.29dBuV Pk	27.8	-50.27	50.82	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-23.18	-3.18	-	-
4	7.393	60.23dBuV Pk	31.1	-47	44.33	74	54	-	-
		Azimuth:0-360	Height:152	Horz	Margin (dB)	-29.67	-9.67	-	-
5	2.461	55.05dBuV Pk	22	4.72	81.77	-	-	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-	-	-	-
6	3.589	23.96dBuV Pk	23.2	5.67	52.83	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-21.17	-1.17	-	-
7	4.929	62.96dBuV Pk	27.8	-50.19	40.57	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-33.43	-13.43	-	-
8	7.377	58.93dBuV Pk	31	-46.58	43.35	74	54	-	-
		Azimuth:0-360	Height:152	Vert	Margin (dB)	-30.65	-10.65	-	-

Radiated Emission Data

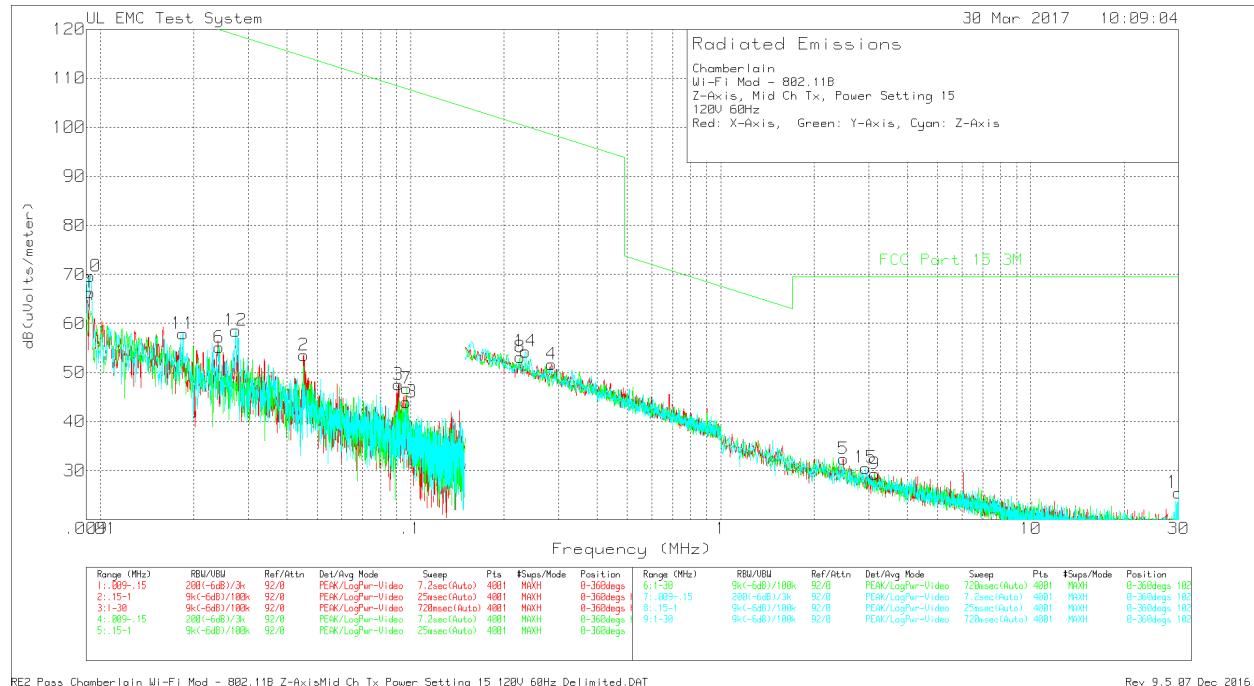
Test Frequency (GHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV/m	Limit:1	2	3	4
3.5999	32.34dBuV Pk	23.2	5.64	61.18	74	-	-	-
	Azimuth: 360	Height:153	Horz	Margin (dB):	-12.82	-	-	-
3.5998	20.73dBuV Av	23.2	5.64	49.57	74	54	-	-
	Azimuth: 360	Height:153	Horz	Margin (dB):	-24.43	-4.43	-	-
4.9227	76.31dBuV Pk	27.8	-50.3	53.81	74	-	-	-
	Azimuth: 185	Height:153	Horz	Margin (dB):	-20.19	-	-	-
4.9239	61.33dBuV Av	27.8	-50.28	38.85	74	54	-	-
	Azimuth: 185	Height:153	Horz	Margin (dB):	-35.15	-15.15	-	-
3.5946	32dBuV Pk	23.2	5.65	60.85	74	-	-	-
	Azimuth: 121	Height:153	Vert	Margin (dB):	-13.15	-	-	-
3.6	20.76dBuV Av	23.2	5.64	49.6	74	54	-	-
	Azimuth: 121	Height:153	Vert	Margin (dB):	-24.4	-4.4	-	-

LIMIT 1: 47 CFR Part 15 PK
LIMIT 2: 47 CFR Part 15 AV

Pk - Peak detector
Av - Average detection

9.3. Transmitter RADIATED BELOW 1GHz

9.3.1. SPURIOUS EMISSIONS 9kHz-30MHz 802.11b

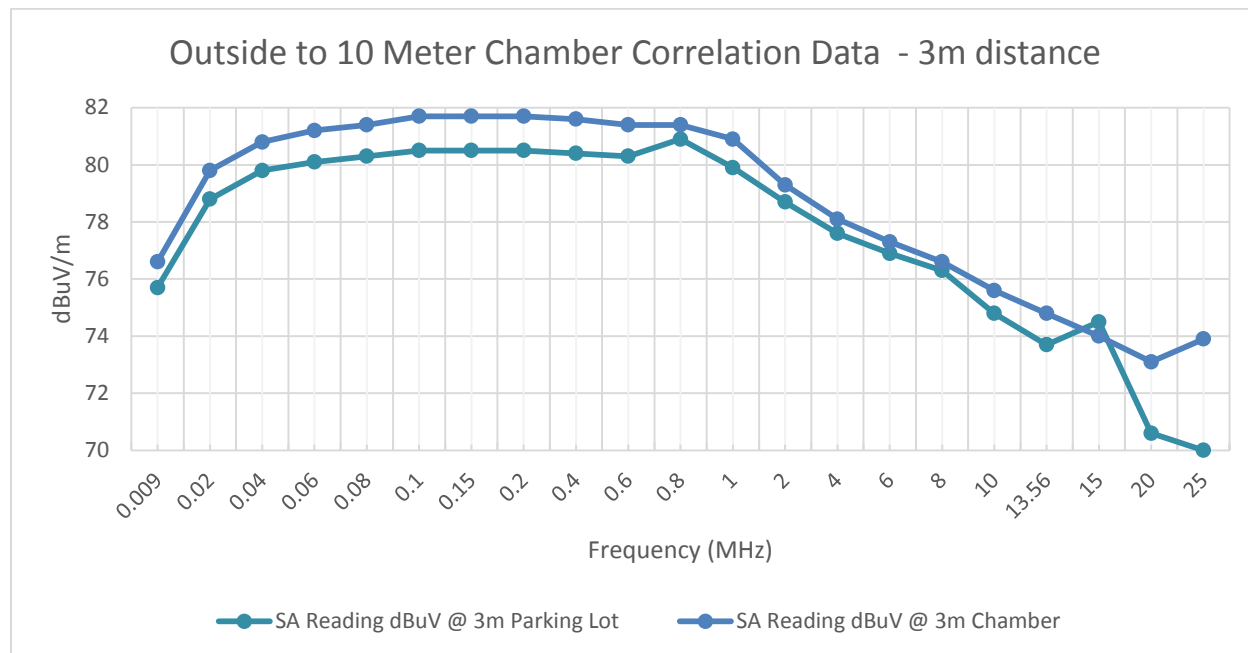


Trace Markers											
Marker No.	Test Frequency (MHz)	Meter Reading dBuV	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	FCC Part 15 3M dBuV/m	Margin dB	Azimuth [Degs]	Height [cm]	Polarity	
Parallel to EUT											
1	0.009245	44.1	Pk	22.2	0	66.3	128.27	-61.97	0-360	102	H
2	0.04519	40.41	Pk	13.1	0	53.51	114.49	-60.98	0-360	102	H
3	0.09132	35.9	Pk	11.6	0	47.5	108.38	-60.88	0-360	102	H
4	0.28483	40.34	Pk	11.3	0	51.64	98.51	-46.87	0-360	102	H
5	2.48625	20.74	Pk	11.5	0.1	32.34	69.54	-37.2	0-360	102	H
Perpendicular to EUT											
6	0.024155	39.18	Pk	15.9	0	55.08	119.93	-64.85	0-360	102	H
7	0.09729	35.2	Pk	11.5	0	46.7	107.83	-61.13	0-360	102	H
8	0.22562	41.83	Pk	11.3	0	53.13	100.53	-47.4	0-360	102	H
9	3.13875	17.68	Pk	11.5	0.1	29.28	69.54	-40.26	0-360	102	H
Parallel to Ground											
10	0.009245	47.43	Pk	22.2	0	69.63	128.27	-58.64	0-360	102	H
11	0.01845	40.69	Pk	17.2	0	57.89	122.27	-64.38	0-360	102	H
12	0.027305	43.03	Pk	15.5	0	58.53	118.87	-60.34	0-360	102	H
13	0.09673	32.48	Pk	11.5	0	43.98	107.88	-63.9	0-360	102	H
14	0.23477	42.97	Pk	11.3	0	54.27	100.19	-45.92	0-360	102	H
15	2.93575	18.97	Pk	11.5	0.1	30.57	69.54	-38.97	0-360	102	H
16	29.913	17.2	Pk	8	0.3	25.5	69.54	-44.04	0-360	102	H
Pk - Peak detector											

*Only mode with highest output power setting was tested.

9.3.2. SPURIOUS EMISSIONS 9kHz-30MHz Open Field to 10 Meter Chamber Correlation Data

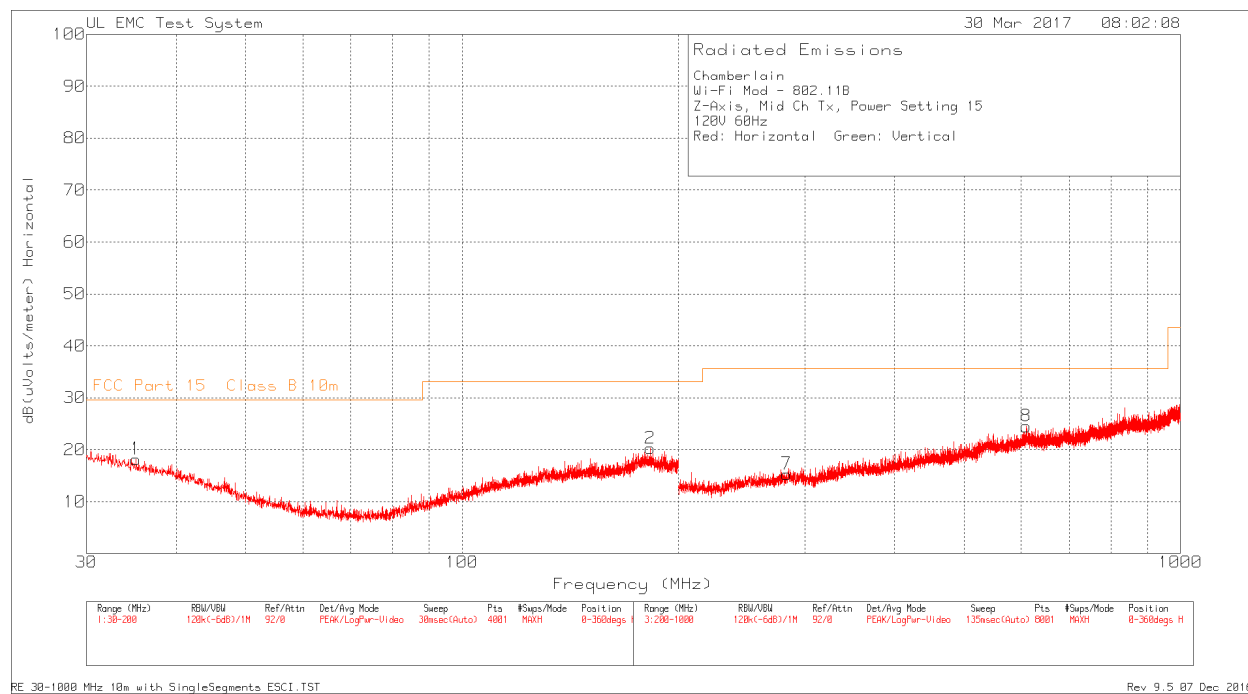
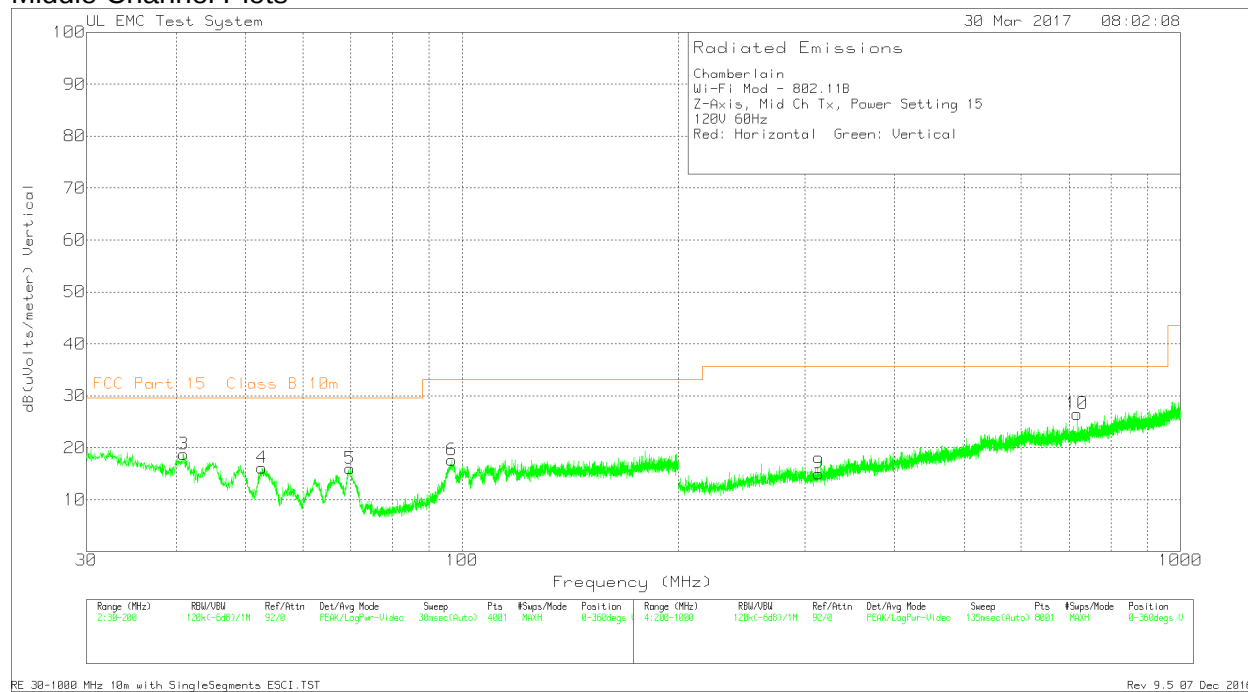
Correlation Data for measurements 9kHz-30MHz between Outside and 10m semi-anechoic chamber in at Underwriter Laboratories in Northbrook, IL.



Correlation measurements were conducted using a signal source with an antenna outside in open area (parking lot). Immediately following the measurements the same setup was moved inside the 10 meter semi-anechoic chamber and the measurements were repeated. The above plot shows the difference in levels measured between outside and the 10 meter semi anechoic chamber.

9.3.3. SPURIOUS EMISSIONS 30 TO 1000 MHz for 802.11b

Middle Channel Plots

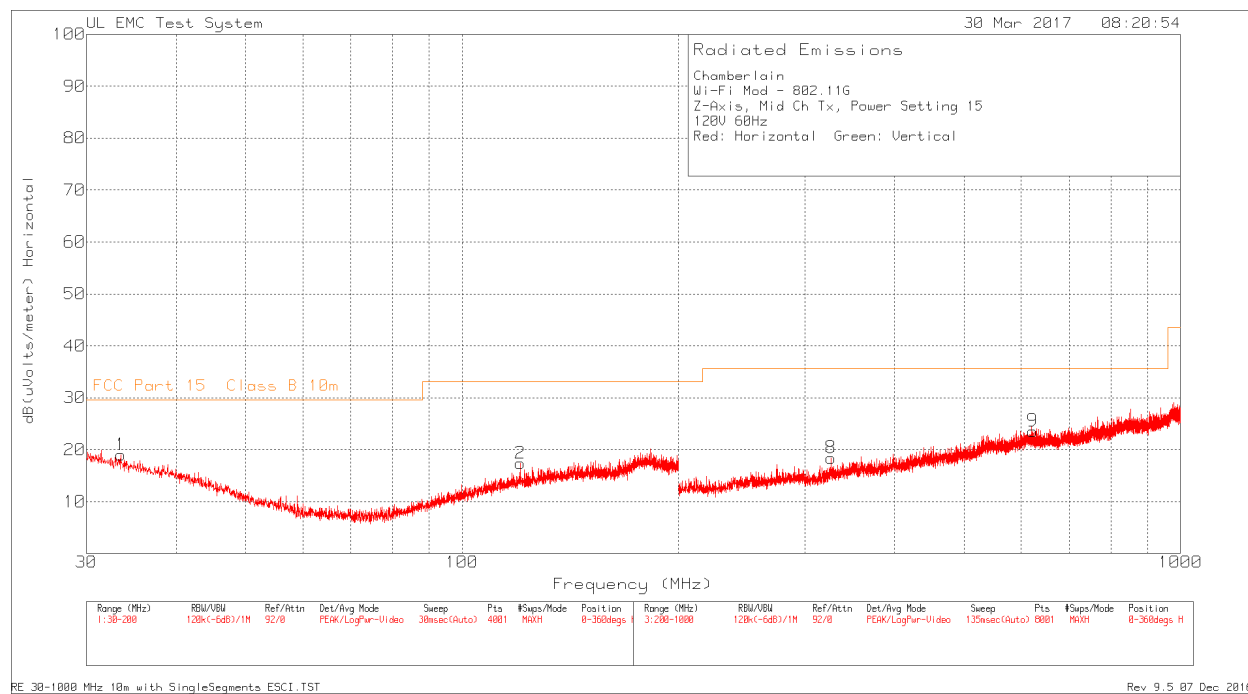
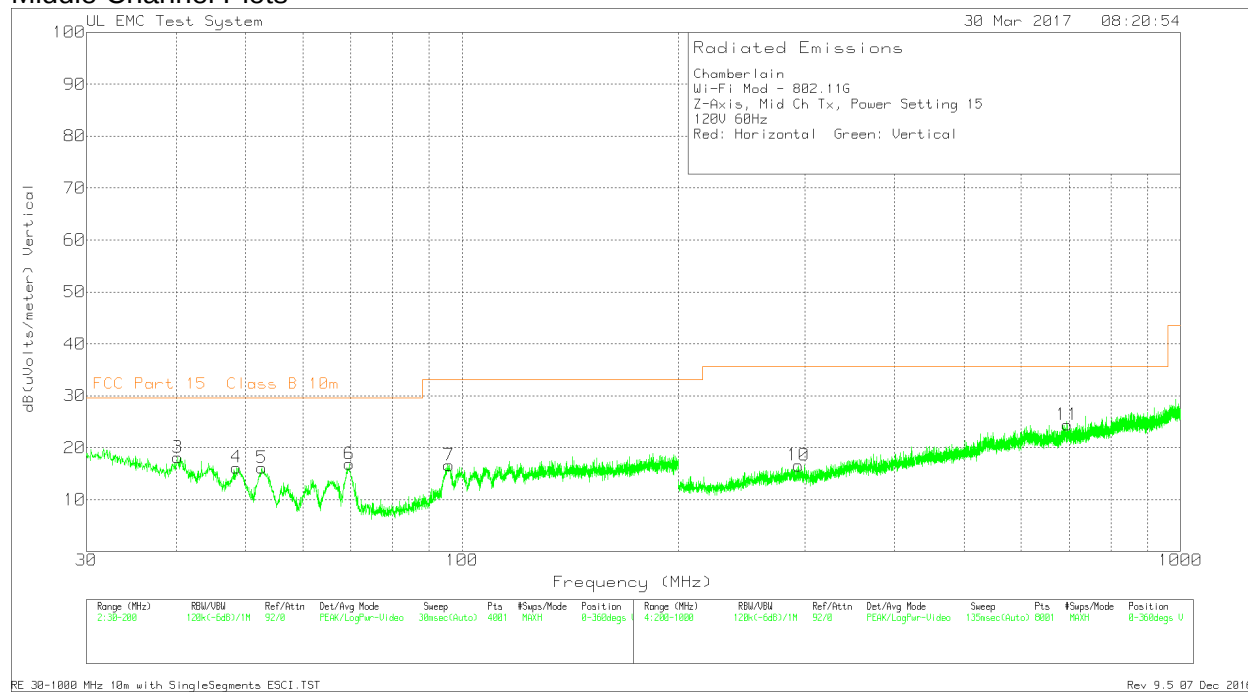


Middle Channel Data

Trace Markers											
Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	FCC Part 15 Class B 10m dBuV/m	Margin dB	Azimuth [Degs]	Height [cm]	Polarity
1	35.185	31.9	Pk	16.2	-29.9	18.2	29.55	-11.35	0-360	100	H
2	182.7025	33.68	Pk	15.8	-29.2	20.28	33.07	-12.79	0-360	398	H
3	40.9225	34.88	Pk	13.9	-30	18.78	29.55	-10.77	0-360	251	V
4	52.6525	37.15	Pk	9	-30	16.15	29.55	-13.4	0-360	251	V
5	69.865	39.51	Pk	6.4	-29.9	16.01	29.55	-13.54	0-360	251	V
6	96.6825	37.21	Pk	10.2	-29.8	17.61	33.07	-15.46	0-360	102	V
7	282.9	31.31	Pk	13	-29	15.31	35.57	-20.26	0-360	399	H
8	609.6	31.51	Pk	20.2	-27.2	24.51	35.57	-11.06	0-360	199	H
9	313.3	30.67	Pk	13.2	-28.8	15.07	35.57	-20.5	0-360	399	V
10	718.2	33.61	Pk	20.2	-27.3	26.51	35.57	-9.06	0-360	202	V
Pk - Peak detector											

9.3.4. SPURIOUS EMISSIONS 30 TO 1000 MHz for 802.11g

Middle Channel Plots

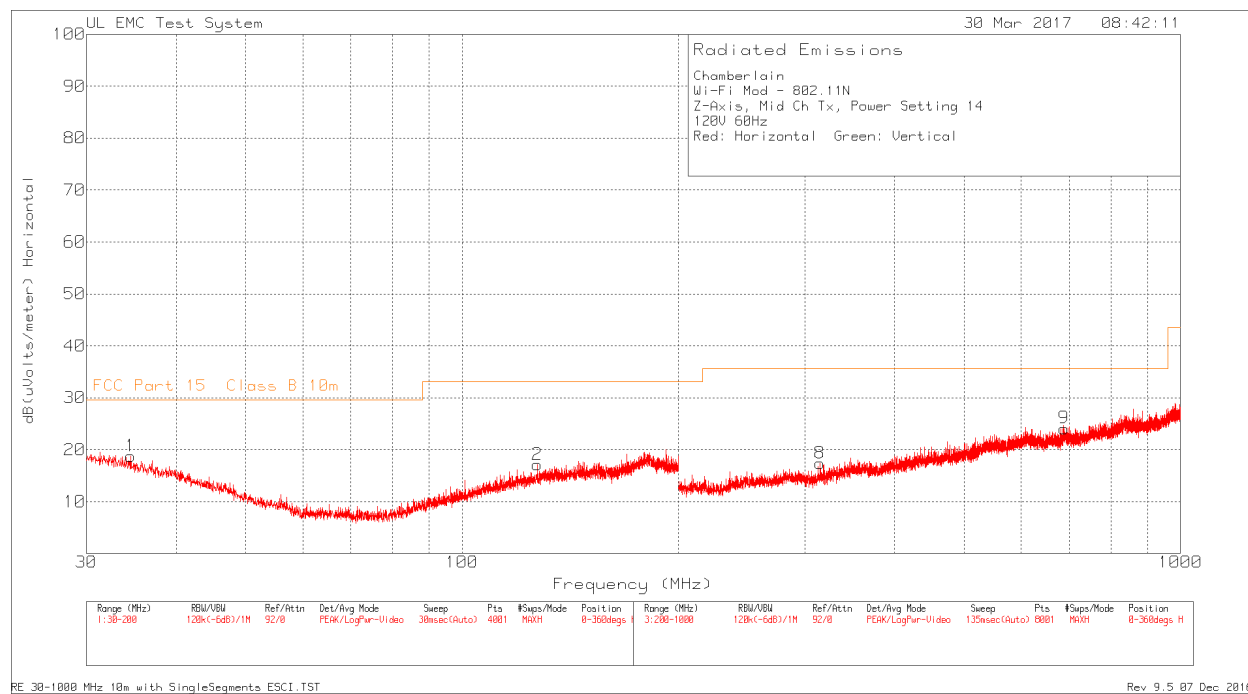
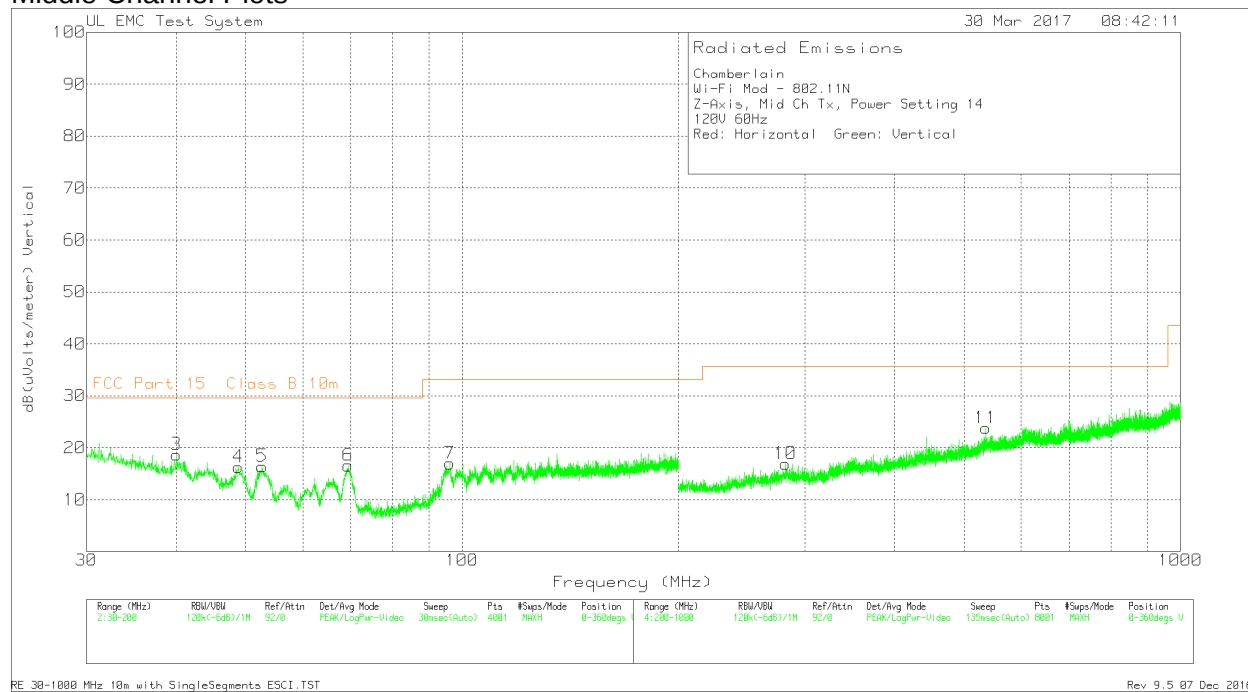


Middle Channel Data

Trace Markers											
Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	FCC Part 15 Class B 10m dBuV/m	Margin dB	Azimuth [Degs]	Height [cm]	Polarity
1	33.485	32.15	Pk	16.9	-30	19.05	29.55	-10.5	0-360	398	H
2	120.44	33.89	Pk	13.2	-29.7	17.39	33.07	-15.68	0-360	398	H
3	40.2	33.92	Pk	14.2	-30	18.12	29.55	-11.43	0-360	102	V
4	48.4875	35.5	Pk	10.7	-30	16.2	29.55	-13.35	0-360	251	V
5	52.6525	37.14	Pk	9	-30	16.14	29.55	-13.41	0-360	102	V
6	69.695	40.39	Pk	6.4	-29.9	16.89	29.55	-12.66	0-360	251	V
7	95.875	36.34	Pk	10.1	-29.8	16.64	33.07	-16.43	0-360	251	V
8	326.4	33.23	Pk	13.9	-28.7	18.43	35.57	-17.14	0-360	199	H
9	622.3	30.8	Pk	20	-27.2	23.6	35.57	-11.97	0-360	99	H
10	294	32.68	Pk	12.9	-29	16.58	35.57	-18.99	0-360	202	V
11	695.8	31.29	Pk	20.4	-27.3	24.39	35.57	-11.18	0-360	202	V
Pk - Peak detector											

9.3.5. SPURIOUS EMISSIONS 30 TO 1000 MHz for 802.11n

Middle Channel Plots



Middle Channel Data

Trace Markers											
Marker No.	Test Frequency MHz	Meter Reading dBuV	Detector	Antenna Factor dB/m	Path Factor dB	Level dBuV/m	FCC Part 15 Class B 10m dBuV/m	Margin dB	Azimuth [Degs]	Height [cm]	Polarity
1	34.5475	32.29	Pk	16.5	-30	18.79	29.55	-10.76	0-360	398	H
2	127.1975	32.9	Pk	13.9	-29.7	17.1	33.07	-15.97	0-360	398	H
3	40.03	34.39	Pk	14.3	-30	18.69	29.55	-10.86	0-360	101	V
4	48.785	35.7	Pk	10.6	-30	16.3	29.55	-13.25	0-360	101	V
5	52.695	37.43	Pk	9	-30	16.43	29.55	-13.12	0-360	101	V
6	69.3975	40.08	Pk	6.4	-29.9	16.58	29.55	-12.97	0-360	251	V
7	96.215	36.67	Pk	10.1	-29.8	16.97	33.07	-16.1	0-360	101	V
8	314.8	32.78	Pk	13.3	-28.7	17.38	35.57	-18.19	0-360	98	H
9	688.5	30.61	Pk	20.5	-27	24.11	35.57	-11.46	0-360	399	H
10	282	32.92	Pk	13	-29	16.92	35.57	-18.65	0-360	198	V
11	535.4	32.4	Pk	19.1	-27.7	23.8	35.57	-11.77	0-360	102	V
Pk - Peak detector											

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 [*]	56 to 46 [*]
0.5-5	56	46
5-30	60	50

^{*} Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

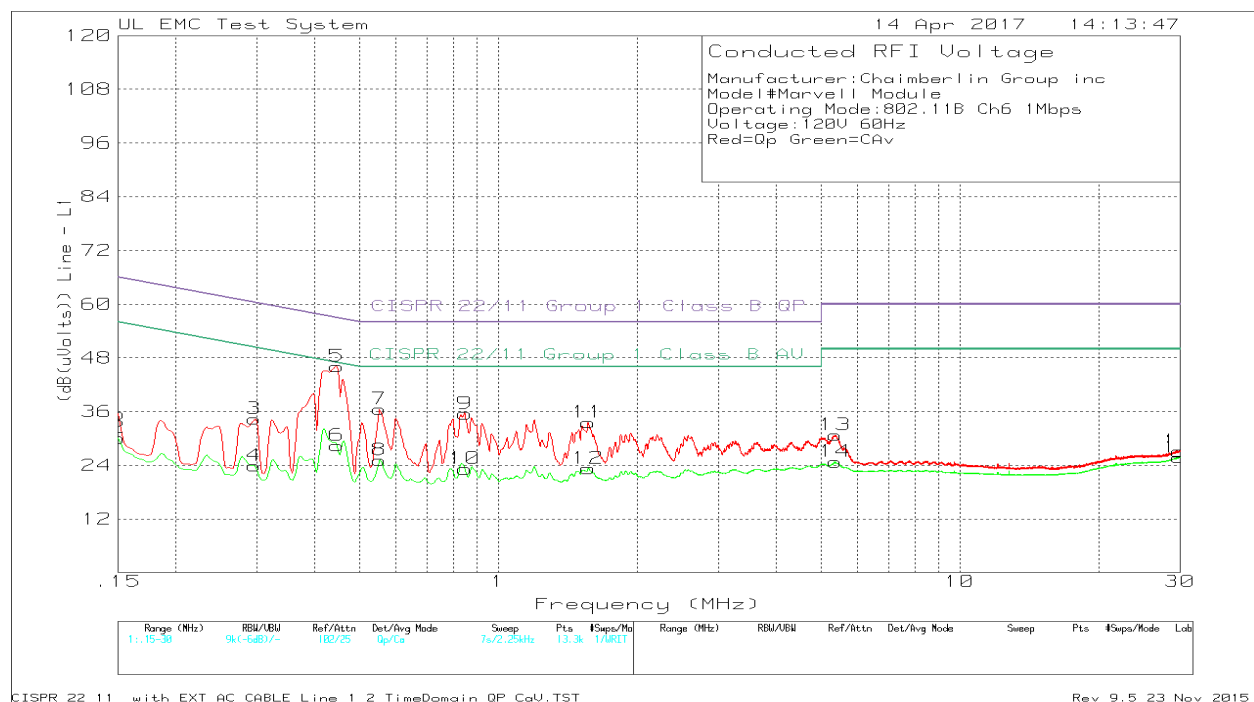
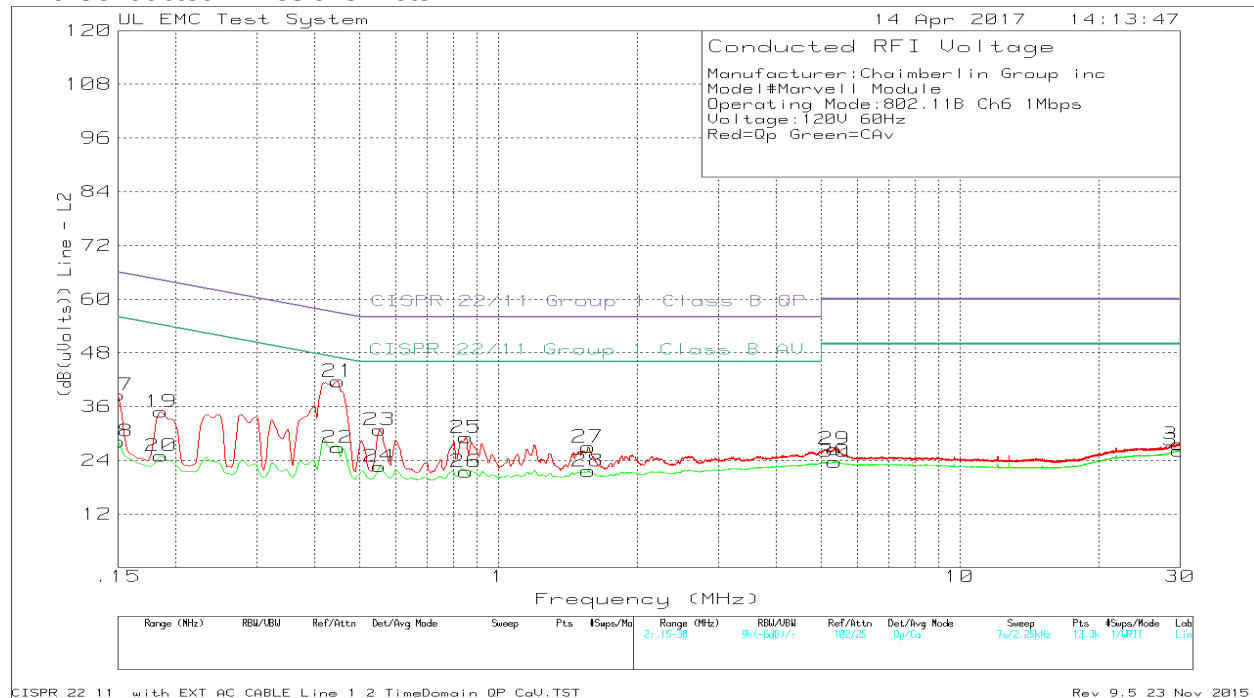
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

10.1. 802.11b results

Line Conducted Emissions Plots



Line Conducted Emissions Data

Manufacturer:Chaimberlin Group inc
Model#Marvell Module
Operating Mode:802.11B Ch6 1Mbps
Voltage:120V 60Hz
Red=Qp Green=CAV

Trace Markers

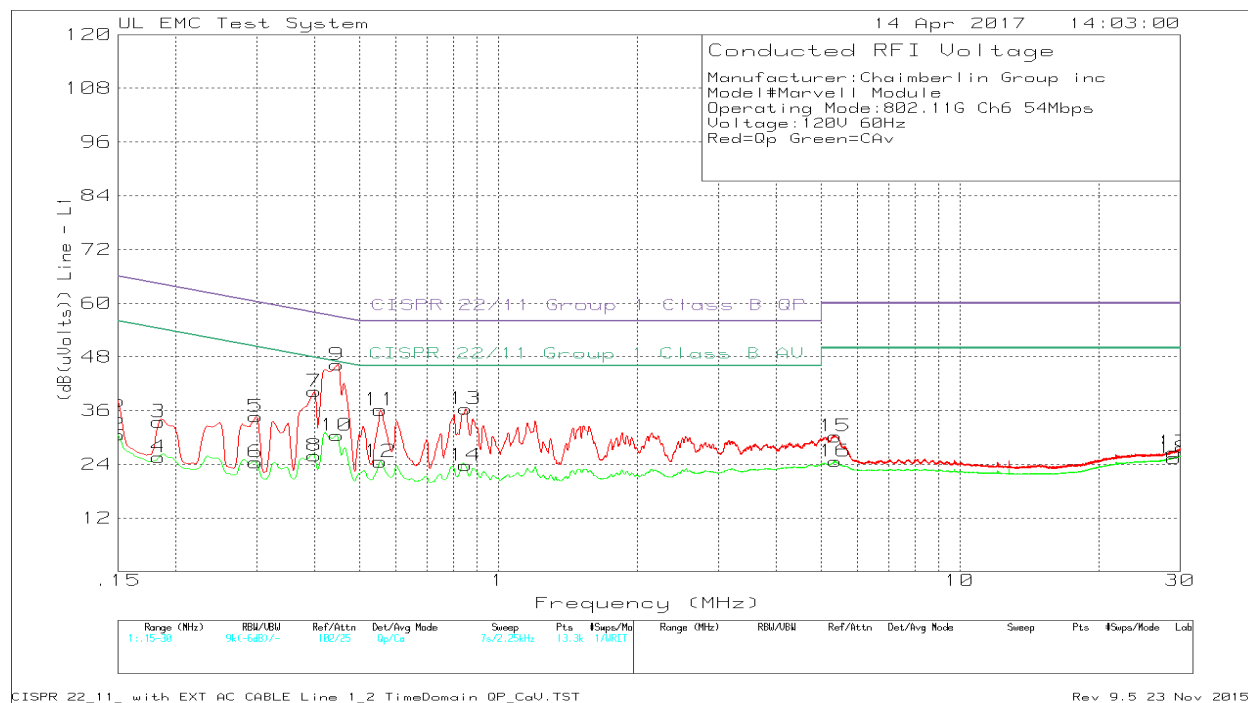
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2
=====							
Line							
1	.15	20.82dBuV Qp	.1	14.6	35.52	66	-
					Margin (dB)	-30.48	-
2	.15	15.4dBuV Ca	.1	14.6	30.1	-	56
					Margin (dB)	-	-25.9
3	.29625	23.48dBuV Qp	0	10.9	34.38	60.35	-
					Margin (dB)	-25.97	-
4	.29625	13.01dBuV Ca	0	10.9	23.91	-	50.35
					Margin (dB)	-	-26.44
5	.447	35.39dBuV Qp	0	10.7	46.09	56.93	-
					Margin (dB)	-10.84	-
6	.447	17.73dBuV Ca	0	10.7	28.43	-	46.93
					Margin (dB)	-	-18.5
7	.55275	25.94dBuV Qp	0	10.6	36.54	56	-
					Margin (dB)	-19.46	-
8	.55275	14.54dBuV Ca	0	10.6	25.14	-	46
					Margin (dB)	-	-20.86
9	.8475	24.89dBuV Qp	0	10.6	35.49	56	-
					Margin (dB)	-20.51	-
10	.8475	12.6dBuV Ca	0	10.6	23.2	-	46
					Margin (dB)	-	-22.8
11	1.56525	22.96dBuV Qp	0	10.6	33.56	56	-
					Margin (dB)	-22.44	-
12	1.56525	12.69dBuV Ca	0	10.6	23.29	-	46
					Margin (dB)	-	-22.71
13	5.3745	19.84dBuV Qp	0	10.9	30.74	60	-
					Margin (dB)	-29.26	-
14	5.3745	13.85dBuV Ca	0	10.9	24.75	-	50
					Margin (dB)	-	-25.25
15	29.86125	13.91dBuV Qp	-.1	13.3	27.11	60	-
					Margin (dB)	-32.89	-
16	29.86125	12.58dBuV Ca	-.1	13.3	25.78	-	50
					Margin (dB)	-	-24.22
Neutral							
17	.15	23.27dBuV Qp	.1	15.2	38.57	66	-
					Margin (dB)	-27.43	-
18	.15	12.91dBuV Ca	.1	15.2	28.21	-	56
					Margin (dB)	-	-27.79
19	.186	22.62dBuV Qp	.1	12.1	34.82	64.21	-
					Margin (dB)	-29.39	-
20	.186	12.77dBuV Ca	.1	12.1	24.97	-	54.21
					Margin (dB)	-	-29.24
21	.44925	30.39dBuV Qp	0	11.2	41.59	56.89	-
					Margin (dB)	-15.3	-
22	.44925	15.63dBuV Ca	0	11.2	26.83	-	46.89
					Margin (dB)	-	-20.06
23	.55275	19.69dBuV Qp	0	11.1	30.79	56	-
					Margin (dB)	-25.21	-
24	.55275	11.54dBuV Ca	0	11.1	22.64	-	46
					Margin (dB)	-	-23.36
25	.852	17.97dBuV Qp	0	11.1	29.07	56	-
					Margin (dB)	-26.93	-
26	.852	10.35dBuV Ca	0	11.1	21.45	-	46
					Margin (dB)	-	-24.55
27	1.56525	15.83dBuV Qp	0	11.1	26.93	56	-
					Margin (dB)	-29.07	-
28	1.56525	10.48dBuV Ca	0	11.1	21.58	-	46
					Margin (dB)	-	-24.42
29	5.352	15.07dBuV Qp	0	11.4	26.47	60	-
					Margin (dB)	-33.53	-
30	5.352	12.28dBuV Ca	0	11.4	23.68	-	50
					Margin (dB)	-	-26.32
31	29.86125	13.99dBuV Qp	-.1	13.7	27.59	60	-
					Margin (dB)	-32.41	-
32	29.86125	12.58dBuV Ca	-.1	13.7	26.18	-	50
					Margin (dB)	-	-23.82

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

Qp - Quasi-Peak detector
Ca - CISPR Average detection

10.2. 802.11g results

Line Conducted Emissions Plots



Line Conducted Emissions Data

Manufacturer:Chaimberlin Group inc
Model#Marvell Module
Operating Mode:802.11G Ch6 54Mbps
Voltage:120V 60Hz
Red=Qp Green=CAV

Trace Markers

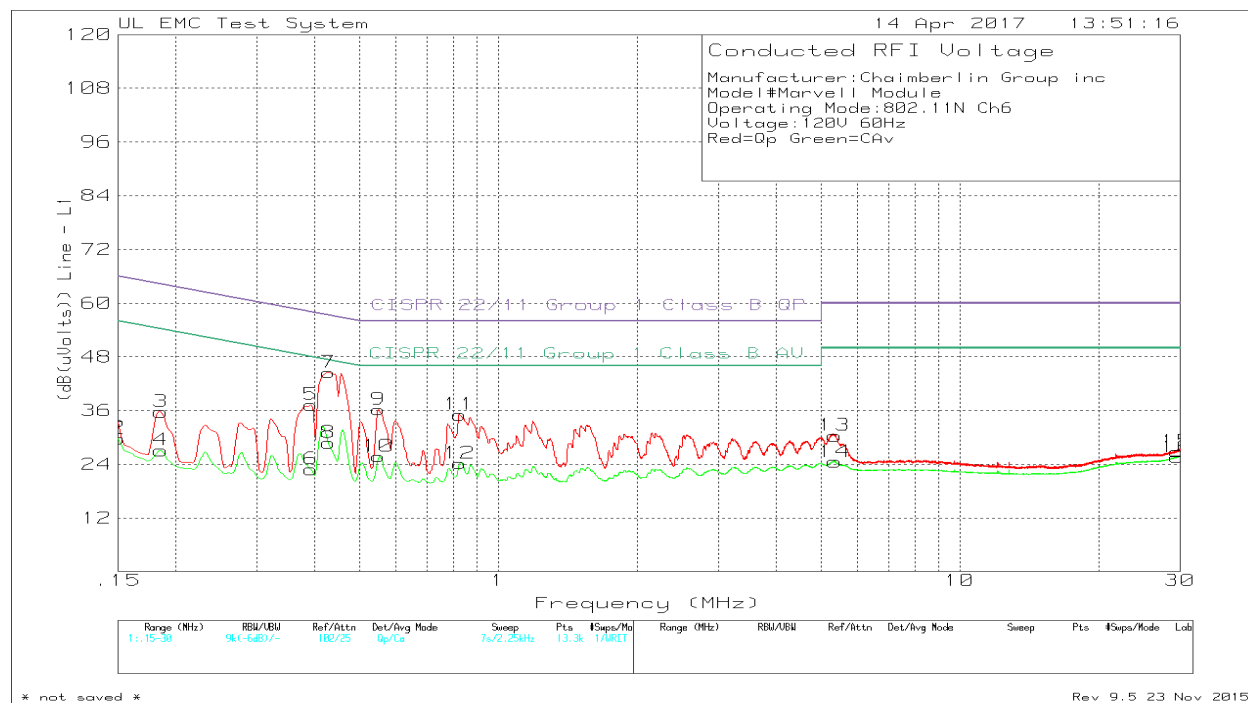
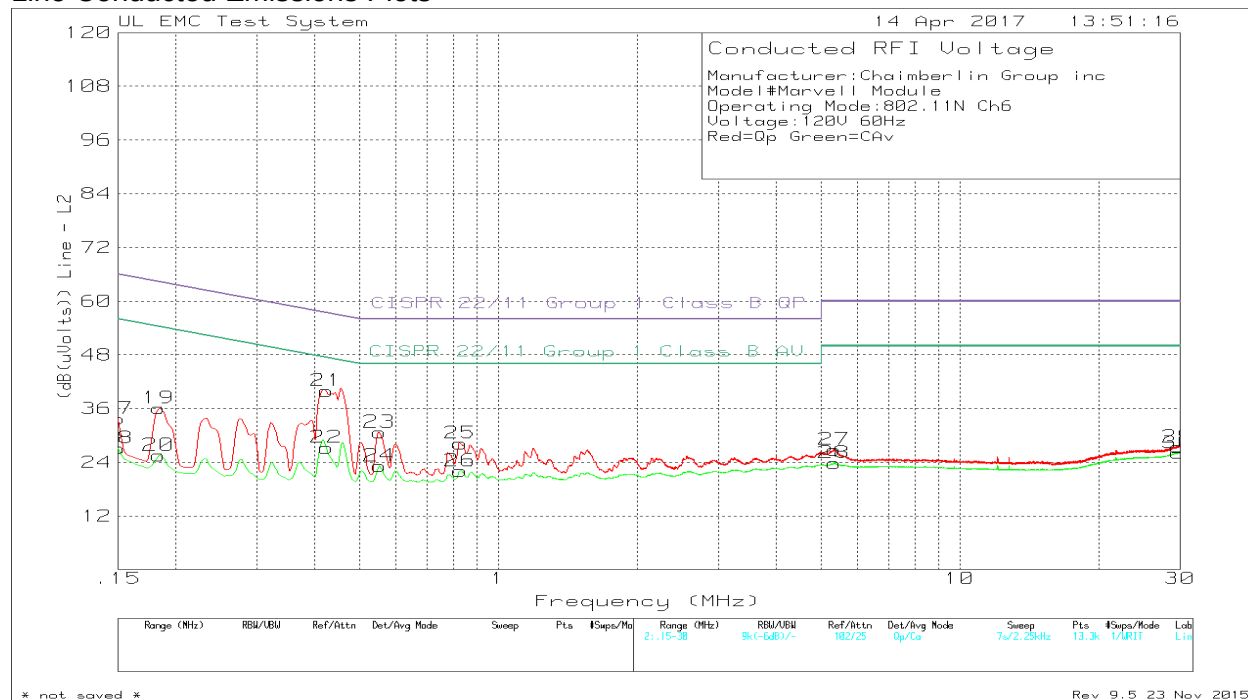
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2
Line							
1	.15	23.5dBuV Qp	.1	14.6	38.2	66	-
					Margin (dB)	-27.8	-
2	.15	15.88dBuV Ca	.1	14.6	30.58	-	56
					Margin (dB)	-	-25.42
3	.18375	21.79dBuV Qp	0	11.7	33.49	64.31	-
					Margin (dB)	-30.82	-
4	.18375	13.89dBuV Ca	0	11.7	25.59	-	54.31
					Margin (dB)	-	-28.72
5	.2985	23.78dBuV Qp	0	10.9	34.68	60.28	-
					Margin (dB)	-25.6	-
6	.2985	13.56dBuV Ca	0	10.9	24.46	-	50.28
					Margin (dB)	-	-25.82
7	.39975	29.5dBuV Qp	0	10.8	40.3	57.86	-
					Margin (dB)	-17.56	-
8	.39975	15.13dBuV Ca	0	10.8	25.93	-	47.86
					Margin (dB)	-	-21.93
9	.447	35.54dBuV Qp	0	10.7	46.24	56.93	-
					Margin (dB)	-10.69	-
10	.447	19.76dBuV Ca	0	10.7	30.46	-	46.93
					Margin (dB)	-	-16.47
11	.555	25.53dBuV Qp	0	10.6	36.13	56	-
					Margin (dB)	-19.87	-
12	.555	13.96dBuV Ca	0	10.6	24.56	-	46
					Margin (dB)	-	-21.44
13	.84975	25.78dBuV Qp	0	10.6	36.38	56	-
					Margin (dB)	-19.62	-
14	.84975	13.16dBuV Ca	0	10.6	23.76	-	46
					Margin (dB)	-	-22.24
15	5.37225	19.36dBuV Qp	0	10.9	30.26	60	-
					Margin (dB)	-29.74	-
16	5.37225	13.77dBuV Ca	0	10.9	24.67	-	50
					Margin (dB)	-	-25.33
17	29.14125	13.45dBuV Qp	-.1	13.3	26.65	60	-
					Margin (dB)	-33.35	-
18	29.14125	12.2dBuV Ca	-.1	13.3	25.4	-	50
					Margin (dB)	-	-24.6
Neutral							
19	.15	22.13dBuV Qp	.1	15.2	37.43	66	-
					Margin (dB)	-28.57	-
20	.15	12.71dBuV Ca	.1	15.2	28.01	-	56
					Margin (dB)	-	-27.99
21	.249	20.78dBuV Qp	.1	11.8	32.68	61.79	-
					Margin (dB)	-29.11	-
22	.249	11.08dBuV Ca	.1	11.8	22.98	-	51.79
					Margin (dB)	-	-28.81
23	.44475	29.36dBuV Qp	0	11.2	40.56	56.97	-
					Margin (dB)	-16.41	-
24	.44475	15.68dBuV Ca	0	11.2	26.88	-	46.97
					Margin (dB)	-	-20.09
25	.852	17.77dBuV Qp	0	11.1	28.87	56	-
					Margin (dB)	-27.13	-
26	.852	10.37dBuV Ca	0	11.1	21.47	-	46
					Margin (dB)	-	-24.53
27	5.3565	14.34dBuV Qp	0	11.4	25.74	60	-
					Margin (dB)	-34.26	-
28	5.3565	11.96dBuV Ca	0	11.4	23.36	-	50
					Margin (dB)	-	-26.64
29	29.283	13.67dBuV Qp	-.1	13.6	27.17	60	-
					Margin (dB)	-32.83	-
30	29.283	12.39dBuV Ca	-.1	13.6	25.89	-	50
					Margin (dB)	-	-24.11

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

Qp - Quasi-Peak detector
Ca - CISPR Average detection

10.3. 802.11n results

Line Conducted Emissions Plots



Line Conducted Emissions Data

Manufacturer:Chaimberlin Group inc
Model#Marvell Module
Operating Mode:802.11N Ch6
Voltage:120V 60Hz
Red=Qp Green=CAV

Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (dB(uVolts))	Limit:1	2	3	4
=====									
Line									
1	.15	18.87dBuV Qp	.1	14.6	33.57	66	-		
					Margin (dB)	-32.43	-		
2	.15	15dBuV Ca	.1	14.6	29.7	-	56		
					Margin (dB)	-	-26.3		
3	.186	24.13dBuV Qp	0	11.6	35.73	64.21	-		
					Margin (dB)	-28.48	-		
4	.186	15.53dBuV Ca	0	11.6	27.13	-	54.21		
					Margin (dB)	-	-27.08		
5	.393	26.45dBuV Qp	0	10.8	37.25	58	-		
					Margin (dB)	-20.75	-		
6	.393	12.09dBuV Ca	0	10.8	22.89	-	48		
					Margin (dB)	-	-25.11		
7	.429	33.83dBuV Qp	0	10.7	44.53	57.27	-		
					Margin (dB)	-12.74	-		
8	.429	18.1dBuV Ca	0	10.7	28.8	-	47.27		
					Margin (dB)	-	-18.47		
9	.5505	25.63dBuV Qp	0	10.6	36.23	56	-		
					Margin (dB)	-19.77	-		
10	.5505	15.16dBuV Ca	0	10.6	25.76	-	46		
					Margin (dB)	-	-20.24		
11	.825	24.48dBuV Qp	0	10.6	35.08	56	-		
					Margin (dB)	-20.92	-		
12	.825	13.58dBuV Ca	0	10.6	24.18	-	46		
					Margin (dB)	-	-21.82		
13	5.361	19.52dBuV Qp	0	10.9	30.42	60	-		
					Margin (dB)	-29.58	-		
14	5.361	13.65dBuV Ca	0	10.9	24.55	-	50		
					Margin (dB)	-	-25.45		
15	29.571	13.67dBuV Qp	-.1	13.3	26.87	60	-		
					Margin (dB)	-33.13	-		
16	29.571	12.42dBuV Ca	-.1	13.3	25.62	-	50		
					Margin (dB)	-	-24.38		
Neutral									
17	.15	18.45dBuV Qp	.1	15.2	33.75	66	-		
					Margin (dB)	-32.25	-		
18	.15	11.85dBuV Ca	.1	15.2	27.15	-	56		
					Margin (dB)	-	-28.85		
19	.18375	23.78dBuV Qp	.1	12.2	36.08	64.31	-		
					Margin (dB)	-28.23	-		
20	.18375	13.21dBuV Ca	.1	12.2	25.51	-	54.31		
					Margin (dB)	-	-28.8		
21	.4245	28.62dBuV Qp	0	11.3	39.92	57.36	-		
					Margin (dB)	-17.44	-		
22	.4245	15.95dBuV Ca	0	11.3	27.25	-	47.36		
					Margin (dB)	-	-20.11		
23	.55275	19.56dBuV Qp	0	11.1	30.66	56	-		
					Margin (dB)	-25.34	-		
24	.55275	12.08dBuV Ca	0	11.1	23.18	-	46		
					Margin (dB)	-	-22.82		
25	.82725	17.12dBuV Qp	0	11.1	28.22	56	-		
					Margin (dB)	-27.78	-		
26	.82725	10.97dBuV Ca	0	11.1	22.07	-	46		
					Margin (dB)	-	-23.93		
27	5.34525	15.4dBuV Qp	0	11.4	26.8	60	-		
					Margin (dB)	-33.2	-		
28	5.34525	12.44dBuV Ca	0	11.4	23.84	-	50		
					Margin (dB)	-	-26.16		
29	29.715	13.77dBuV Qp	-.1	13.7	27.37	60	-		
					Margin (dB)	-32.63	-		
30	29.715	12.5dBuV Ca	-.1	13.7	26.1	-	50		
					Margin (dB)	-	-23.9		

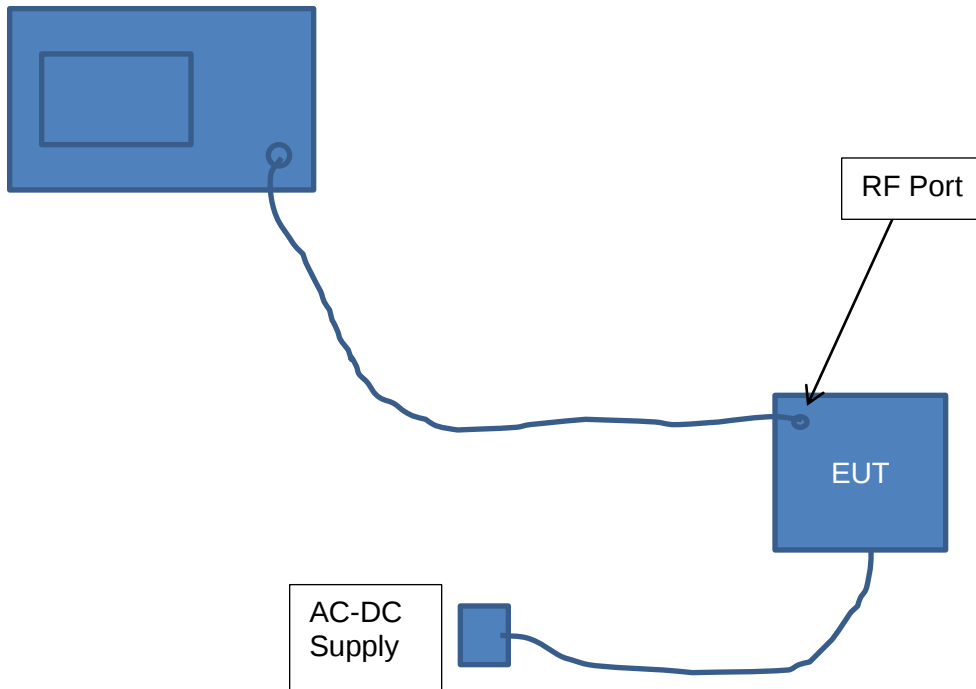
LIMIT 1: CISPR 22/11 Group 1 Class B QP
LIMIT 2: CISPR 22/11 Group 1 Class B AV

Qp - Quasi-Peak detector
Ca - CISPR Average detection

11. SETUP PHOTOS

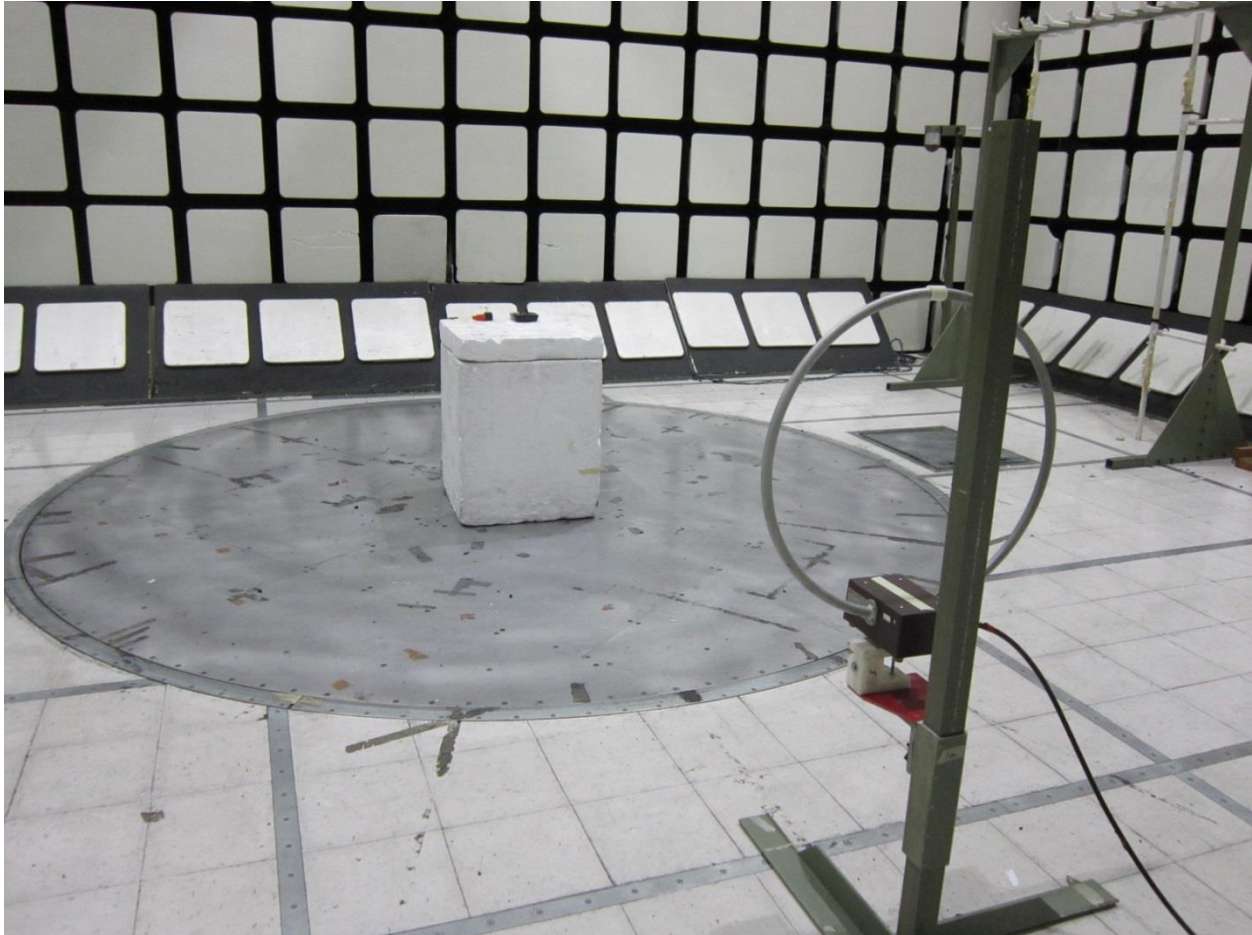
ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP – Actual photo not available.

Emissions 1GHz – 25GHz

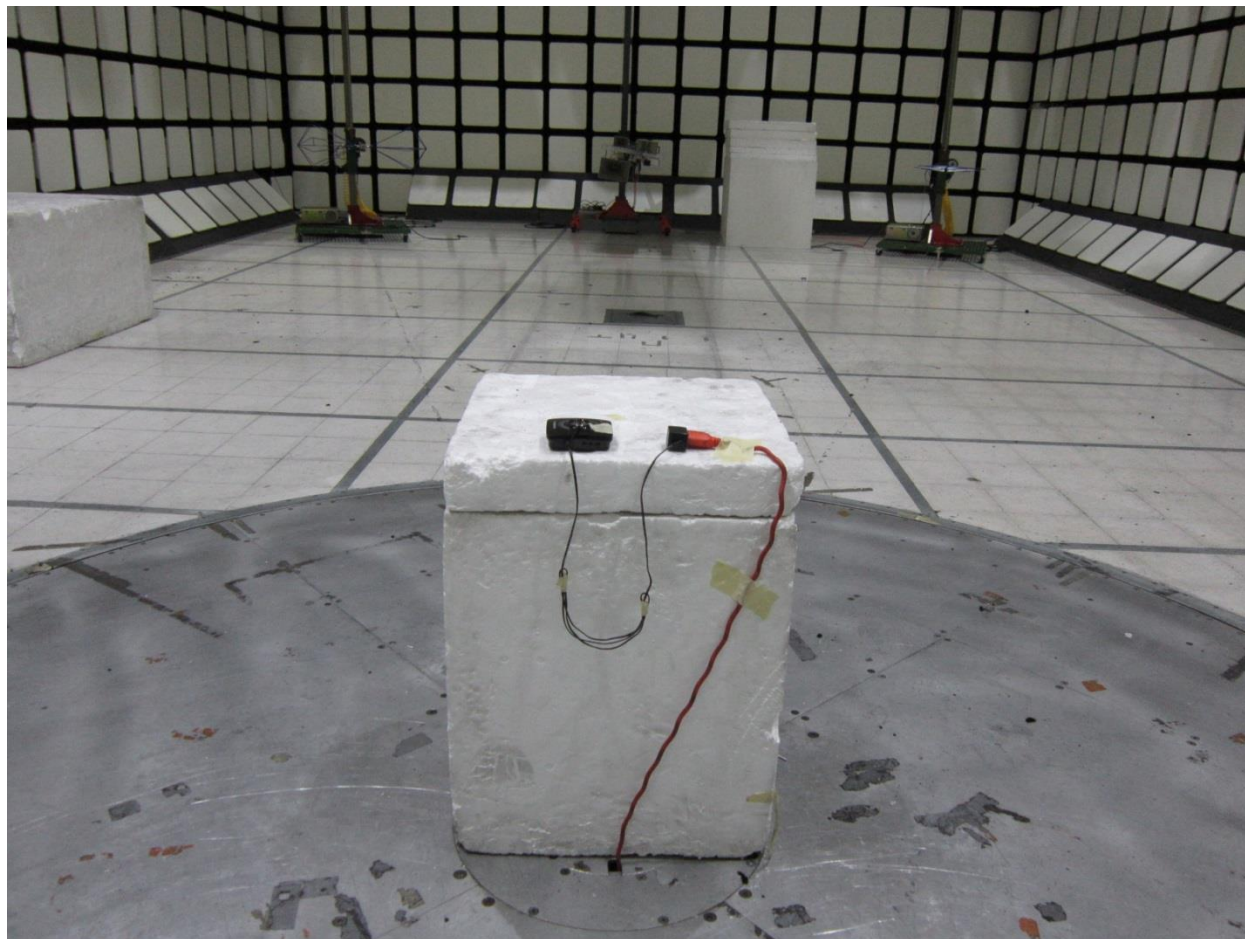


RADIATED RF MEASUREMENT SETUP

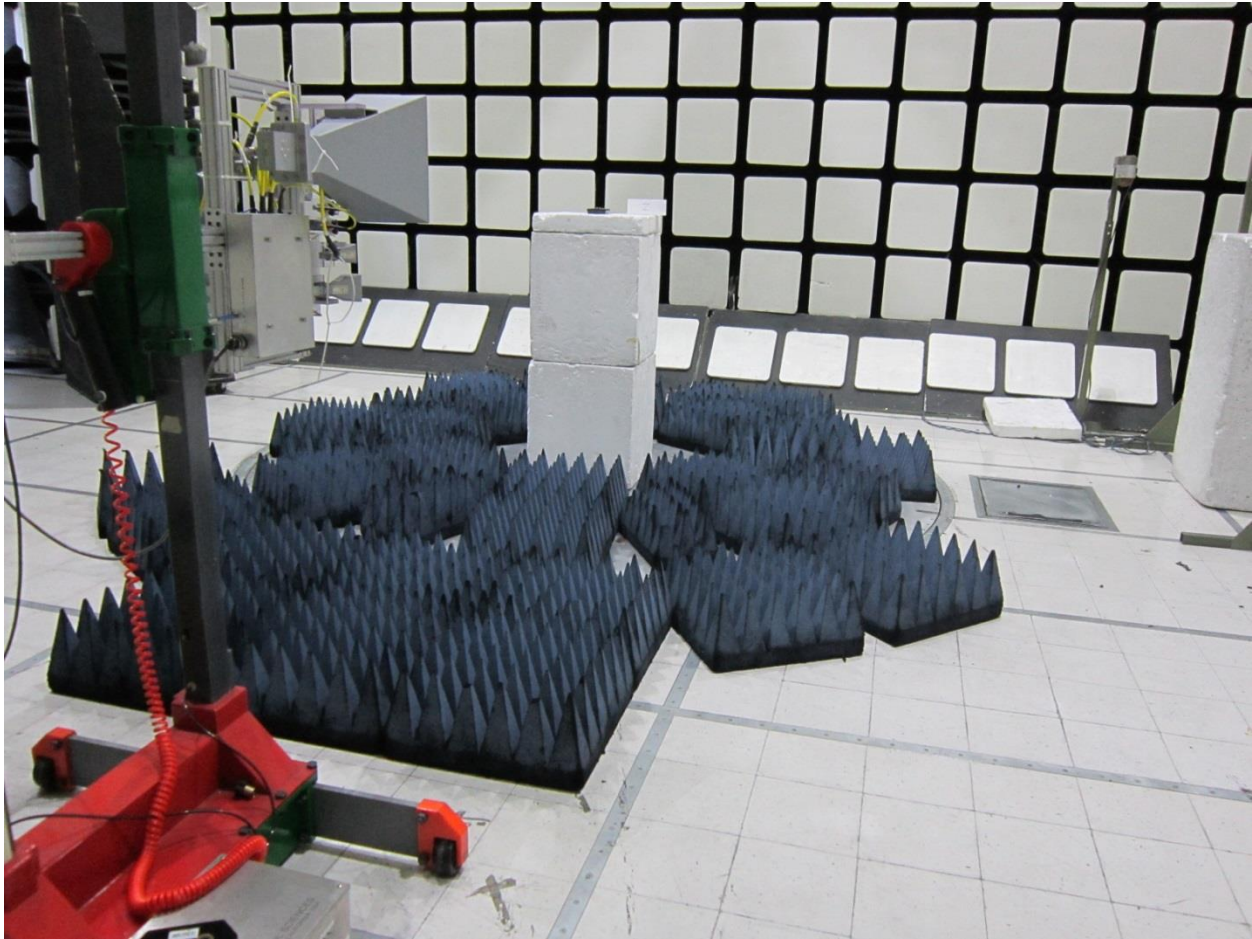
Emissions 9kHz – 30MHz



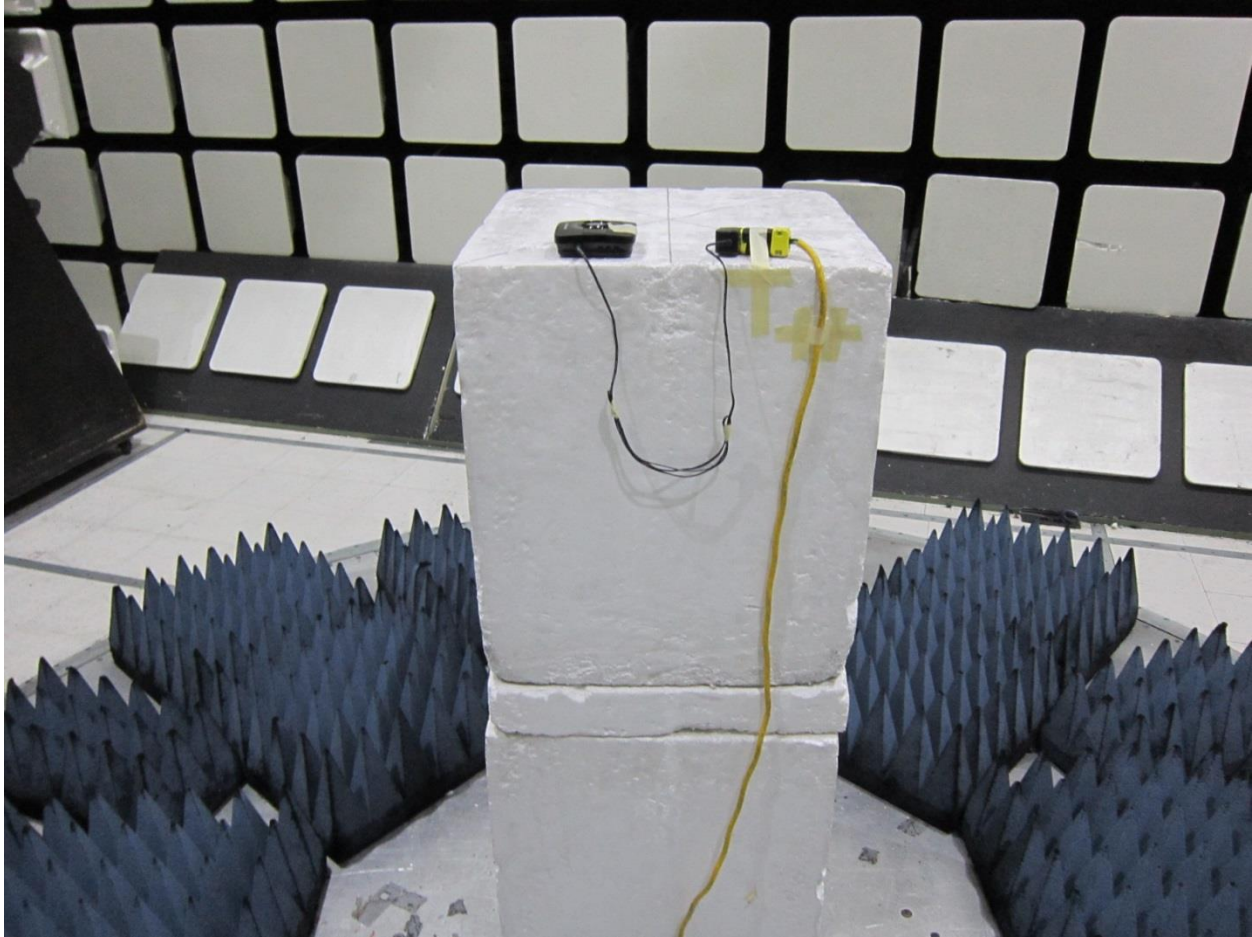
Emissions 30MHz - 1GHz



Emissions 1GHz – 25GHz



Emissions 1GHz – 25GHz (close up)



END OF REPORT