FCC 47 CFR PART 15 SUBPART E
CERTIFICATION TEST REPORT

FOR

TABLET WITH CELLULAR GSM/GPRS/EGPRS/WCDMA/HSPA+/DC- HSDPA/LTE IEEE 802.11A/B/G/N (MIMO 2X2) AND BLUETOOTH RADIO

MODEL NUMBER: A1491

FCC ID: BCGA1491

REPORT NUMBER: 13U16583-4, REVISION A

ISSUE DATE: FEBRUARY 14, 2014

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
UL VERIFICATION SERVICES INC.
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/07/14	Initial Issue	T. Chan
A	02/14/14	Address TCB's Questions	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: Tablet with cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/LTE/IEEE 802.11a/b/g/n (MIMO 2x2) and Bluetooth Radio.

MODEL: A1491

SERIAL NUMBER: 11092

DATE TESTED: NOVEMBER 11 – DECEMBER 17, 2013 and FEBRUARY 14, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

Thu Chan
WiSE Operations Manager
UL Verification Services Inc.

Tested By:

Mona Hua
WiSE Lab Technician
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, and ANSI C63.10-2009.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The device is a Tablet with cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/LTE/IEEE 802.11a/b/g/n (MIMO 2x2) and Bluetooth Radio

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain		Uncorrelated Gain	Correlated Gain
	Tx1	Tx2		
5.2	-0.02	**3.06**	**1.79**	**4.67**
5.3	0.75	**3.25**	**2.18**	**5.10**
5.5	2.43	**4.29**	**3.46**	**6.42**

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was Broadcom WL Tool Version 6.25.86.

5.4. MAXIMUM OUTPUT POWER

Please refer to 13U15668-6 from Section 5.2

5.5. WORST-CASE CONFIGURATION AND MODE

There are two vendors of the WiFi/Bluetooth radio modules: BOM #1, vender1 and BOM #2, vender 2, and they have the same mechanical outline, same on board antenna, matching circuit, antenna structure and same specification and baseline was performed on both venders to determine the worst case on conducted power and radiated emissions.

For the RF conducted test: Refer to FCC DTS report with the FCC ID BCGA1490 and project number 13U15668-6.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z orientation was worst-case orientation for 5GHz; therefore, all final radiated testing was performed with the EUT in Z orientation for 5GHz.

Worst-Case data rates, as provided by the client, were as follows:

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

For below 1GHz test, the EUT that is connected to the headset and AC charger is activated on the worst-case mode and channel with the highest output power.

For all modes with single chain, the radiated emissions test was based on the port with the higher antenna gain.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC Adapter	Apple	A1357	A/12981EA	DoC
Earphone	Apple	NA	NA	NA

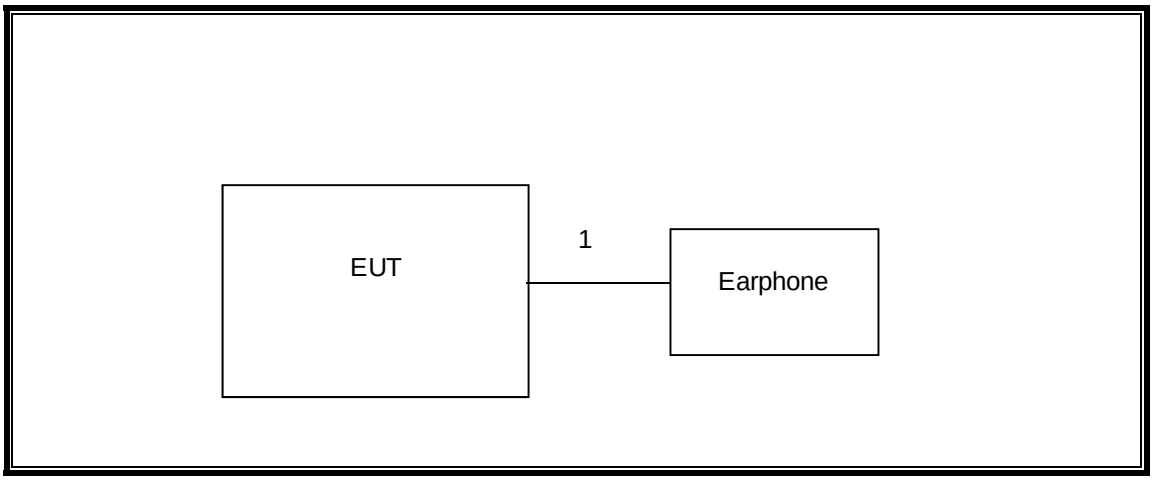
I/O CABLES (RADIATED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Audio	1	Jack	Un-Shielded	0.5m	NA

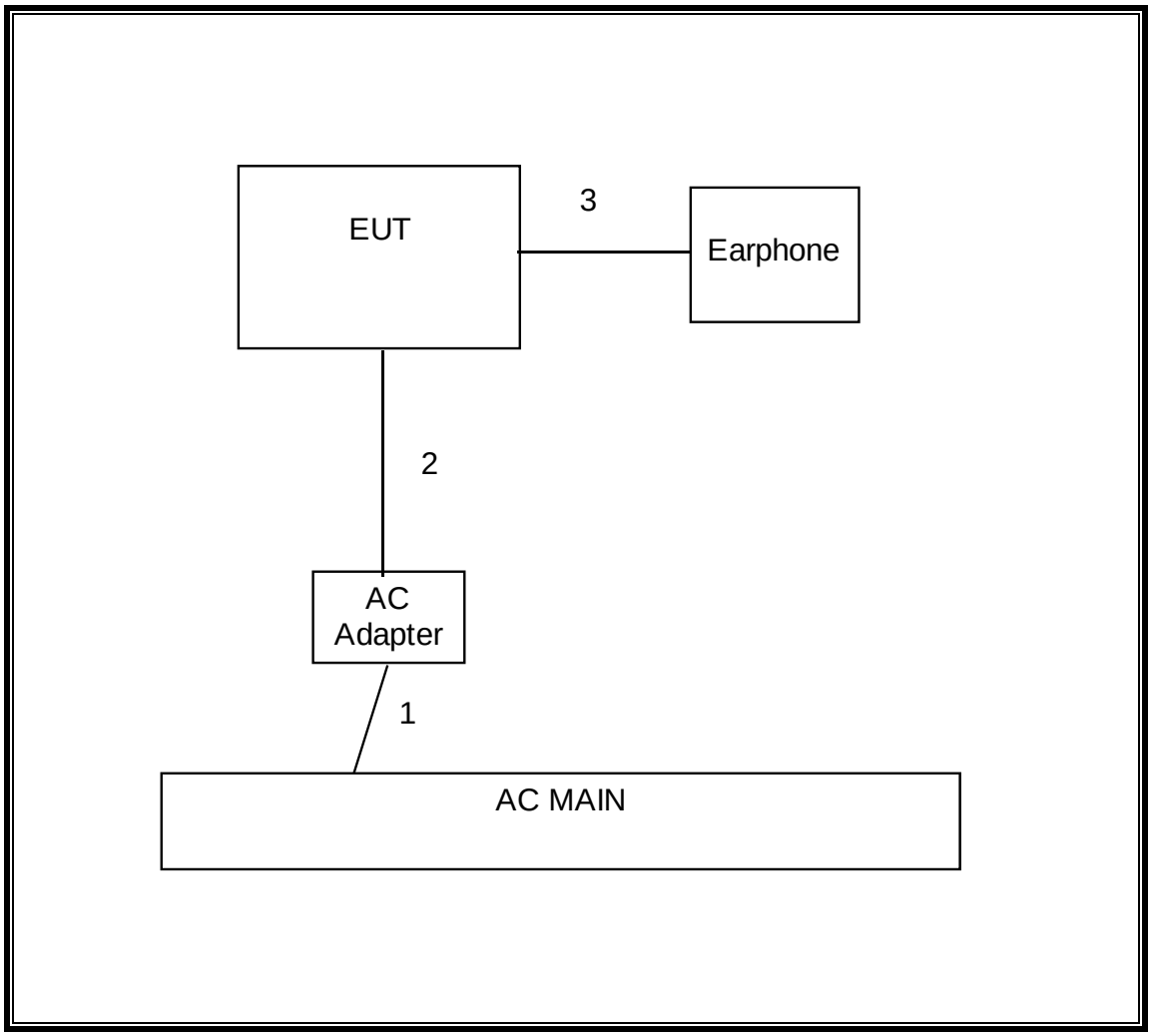
I/O CABLES BELOW 1GHZ TEST

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115	Un-Shielded	2m	NA
2	DC	1	USB	Un-Shielded	2m	NA
3	Audio	1	Jack	Un-Shielded	0.5m	NA

SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR BELOW 1GHZ TEST



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**	**Asset**	**Cal Due**
Horn Antenna 1-18GHz	ETS Lindgren	3117	F00131	02/18/15
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/14
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	05/06/14
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	F00027	03/07/14
Peak / Average Power Sensor	Agilent / HP	E9323A	F00163	04/03/14
P-Series single channel Power Meter	Agilent / HP	N1911A	F00164	04/03/14
Spectrum Analyzer, 3Hz-44GHz	Agilent	N9030A	F00127	02/22/14
PreApmplifier, 1-26.5GHz	Agilent	8449B	C01052	10/22/14
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	F00194	05/14/14
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/20/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Refer the on time and duty cycle data FCC UNII report with the FCC ID BCGA1490 and project number 13U15668-6 at Section 7.1.

7.2. MEASUREMENT METHOD FOR POWER AND PPSD

The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 is used.

The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 Alternative is used.

7.3. MEASUREMENT METHOD FOR AVG. SPURIOUS EMISSIONS ABOVE 1 GHz

The Duty Cycle is greater than or equal to 98%, KDB 789033 Method AD with Power RMS Averaging is used.

8. ANTENNA PORT TEST RESULTS

Note that for all antenna port data refer to the FCC UNII report with the FCC ID BCGA1490 and project number 13U15668-6 from Section 8.1 to 8.12.

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
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. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

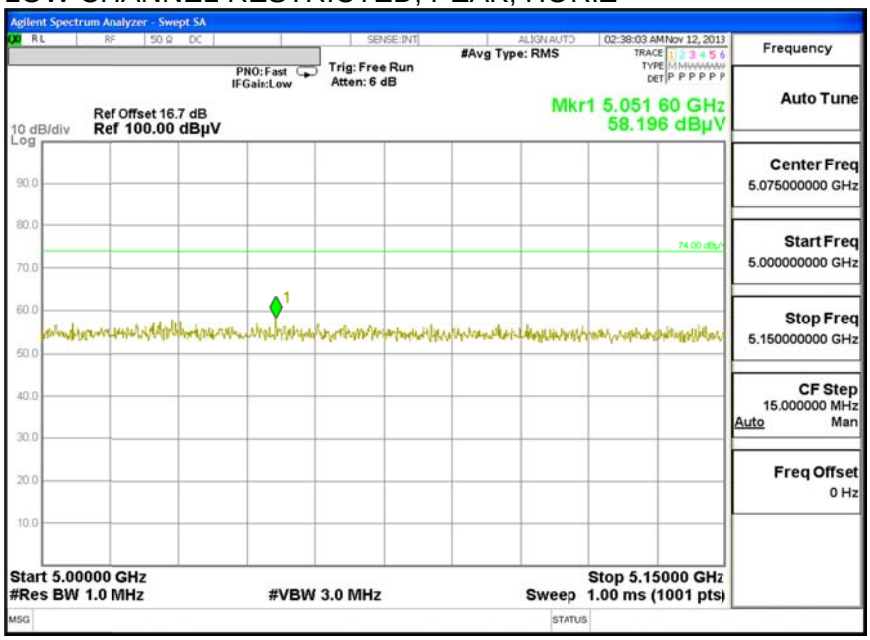
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

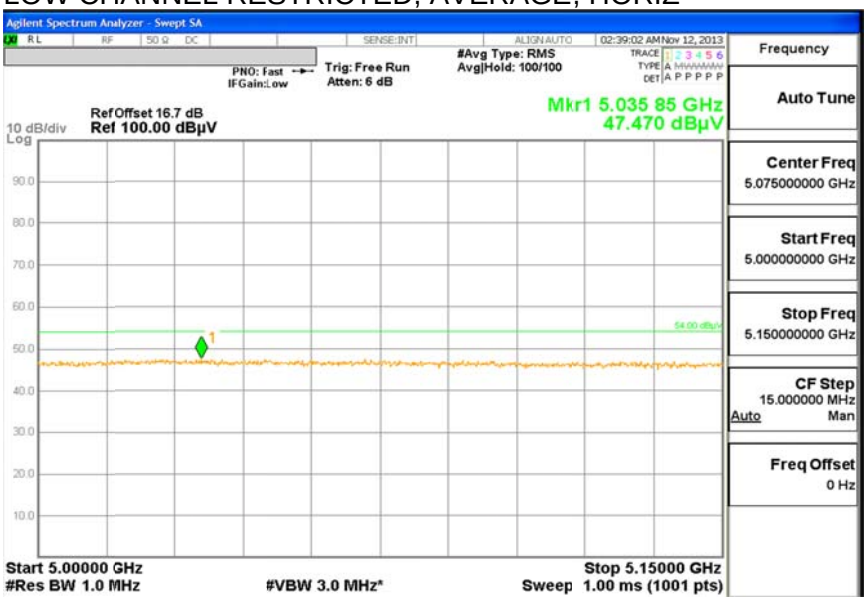
9.2.1. 802.11a SISO MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

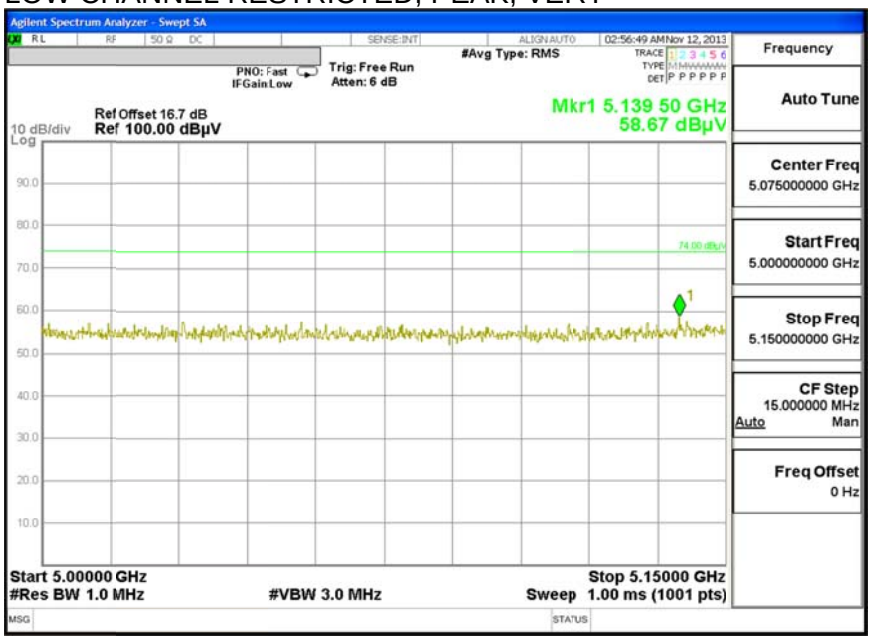
LOW CHANNEL RESTRICTED, PEAK, HORIZ



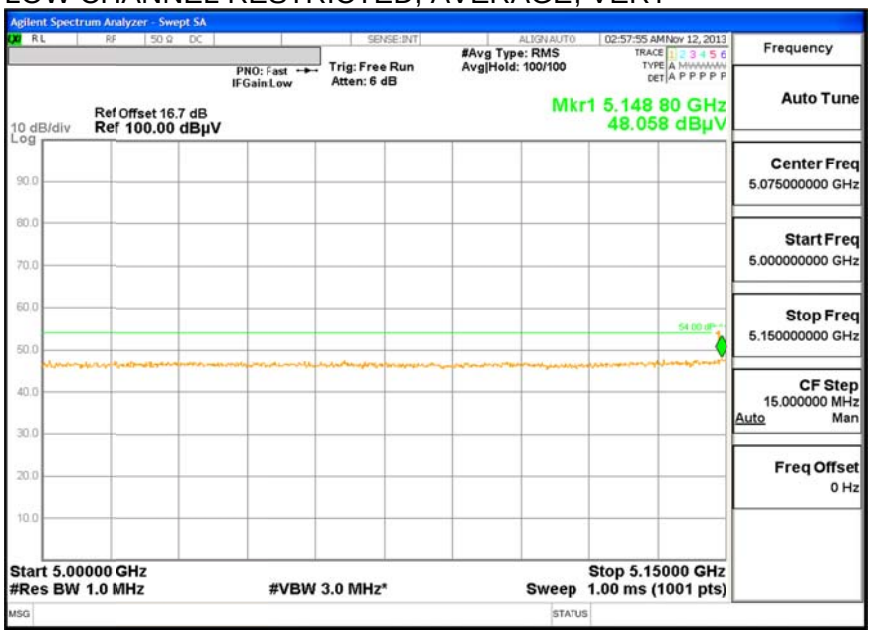
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT

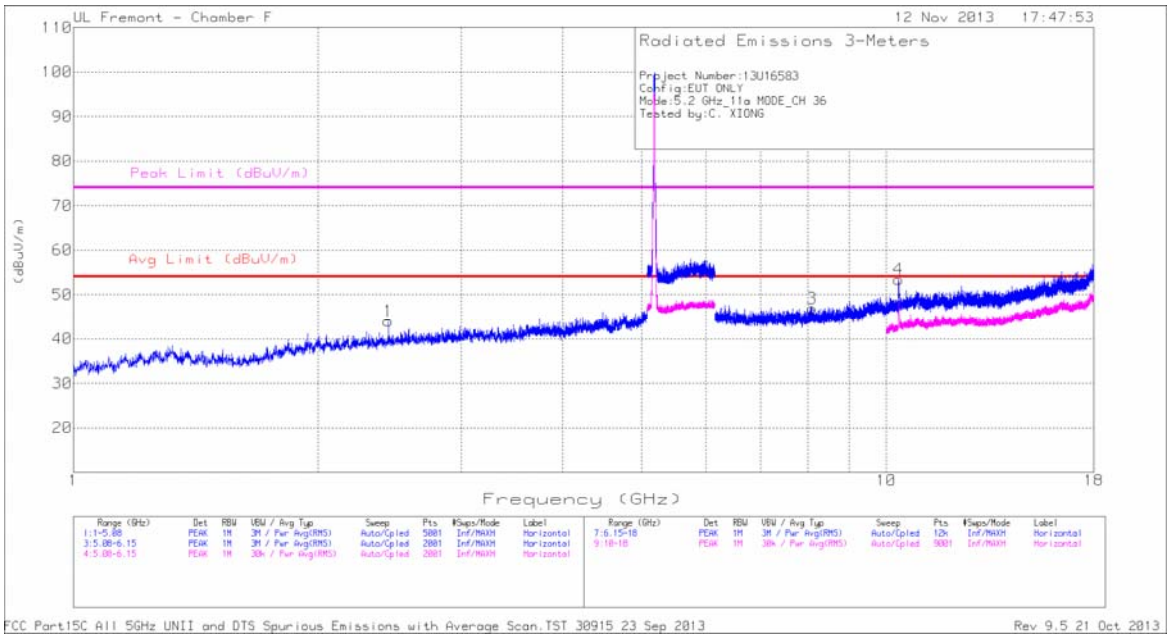


LOW CHANNEL RESTRICTED, AVERAGE, VERT

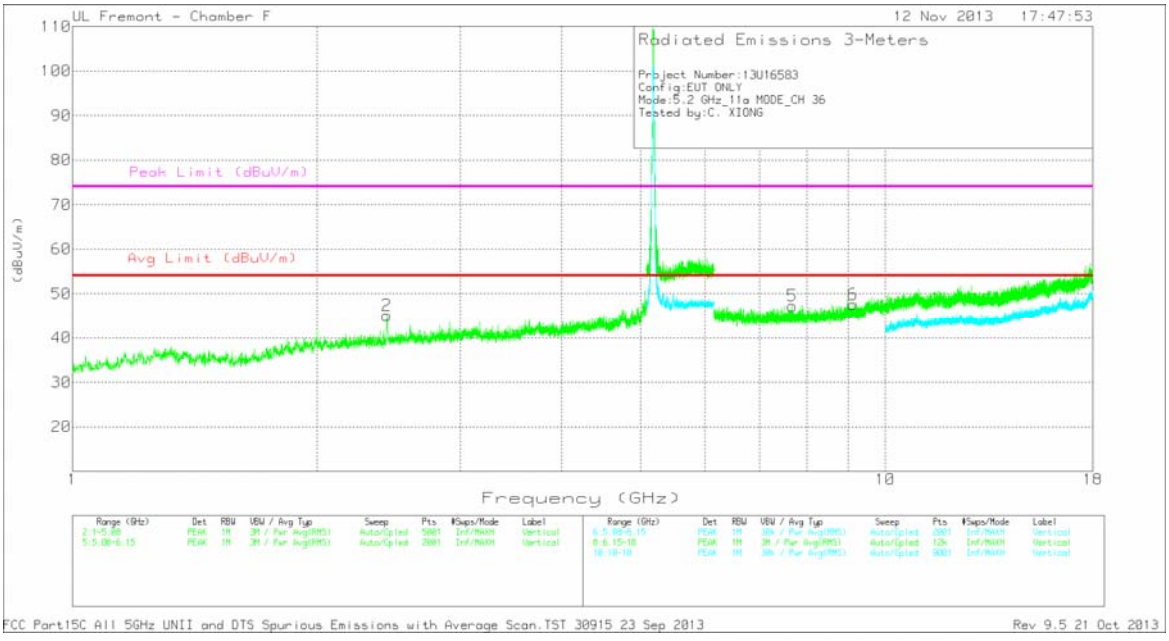


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



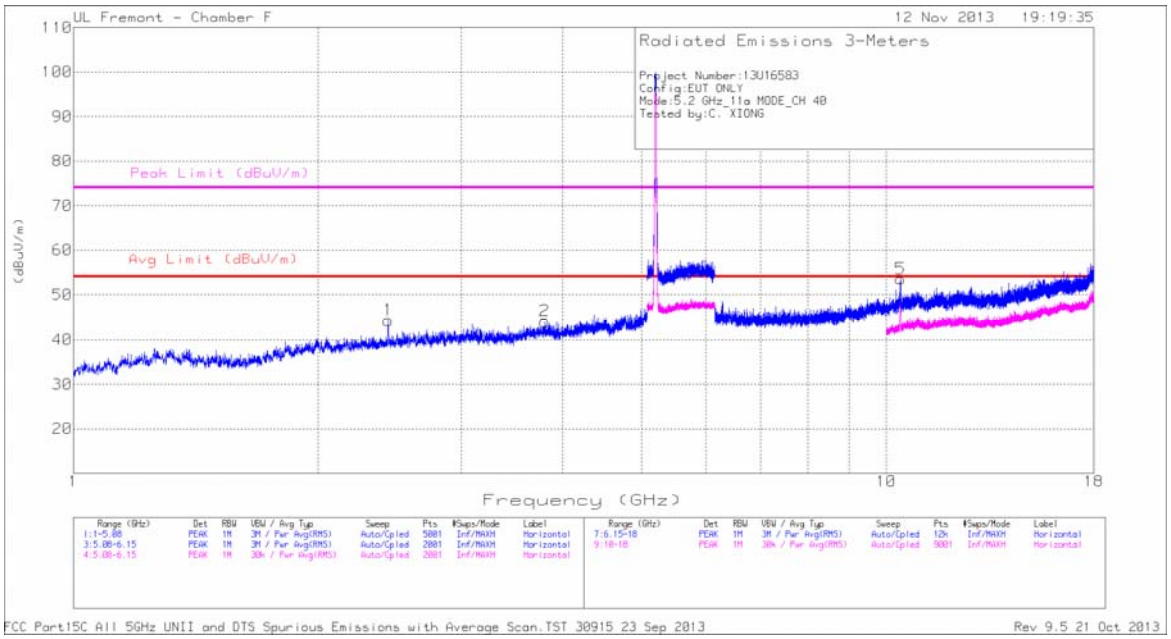
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.439	42.47	PK	32.3	-30.7	44.07	-	-	68.2	-24.13	0-360	199	H
2	2.436	43.49	PK	32.3	-30.7	45.09	-	-	68.2	-23.11	0-360	200	V
3	* 8.102	36.32	PK	36.0	-25.4	46.92	54	-7.08	74.0	-27.08	0-360	100	H
4	10.351	38.05	PK	38.0	-22.6	53.45	-	-	68.2	-14.75	0-360	199	H
5	* 7.684	37.45	PK	35.9	-26.1	47.25	54	-6.75	74.0	-26.75	0-360	201	V
6	* 9.127	34.89	PK	36.5	-23.8	47.59	54	-6.41	74.0	-26.41	0-360	101	V

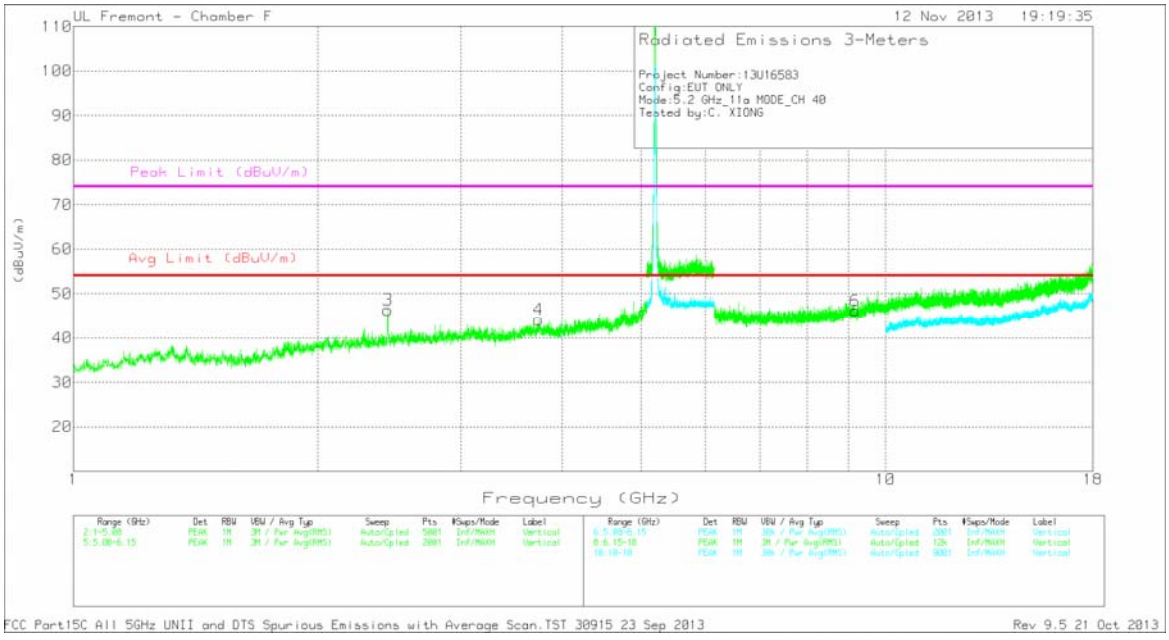
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



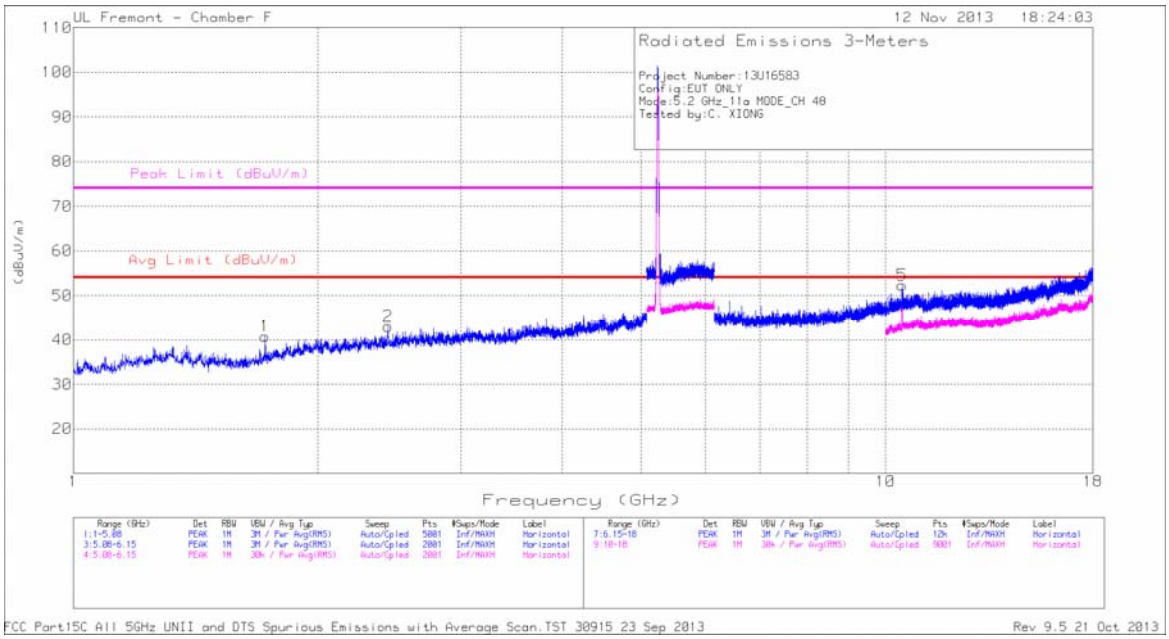
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.439	42.74	PK	32.3	-30.7	44.34	-	-	68.2	-23.86	0-360	199	H
2	* 3.801	39.91	PK	33.6	-29.4	44.11	54	-9.89	74.0	-29.89	0-360	199	H
3	2.439	44.73	PK	32.3	-30.7	46.33	-	-	68.2	-21.87	0-360	200	V
4	* 3.738	40.04	PK	33.5	-29.4	44.14	54	-9.86	74.0	-29.86	0-360	200	V
5	10.408	37.48	PK	38.2	-22.1	53.58	-	-	68.2	-14.62	0-360	100	H
6	* 9.171	33.65	PK	36.5	-24.0	46.15	54	-7.85	74.0	-27.85	0-360	100	V

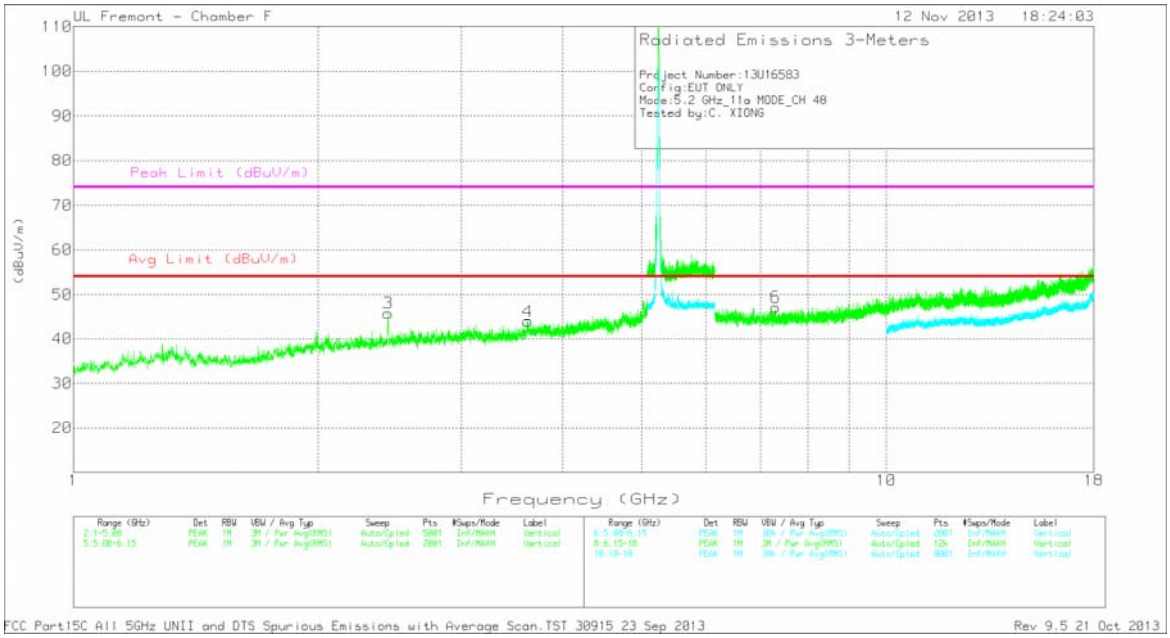
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.722	43.03	PK	29.2	-31.4	40.83	54	-13.17	74.0	-33.17	0-360	100	H
2	2.441	41.46	PK	32.3	-30.7	43.06	-	-	68.2	-25.14	0-360	199	H
3	2.439	44.25	PK	32.3	-30.7	45.85	-	-	68.2	-22.35	0-360	200	V
4	* 3.623	39.67	PK	33.7	-29.4	43.97	54	-10.03	74.0	-30.03	0-360	200	V
5	10.481	36.93	PK	38.3	-22.9	52.33	-	-	68.2	-15.18	0-360	100	H
6	* 7.310	37.27	PK	35.7	-25.8	47.17	54	-6.83	74.0	-26.83	0-360	101	V

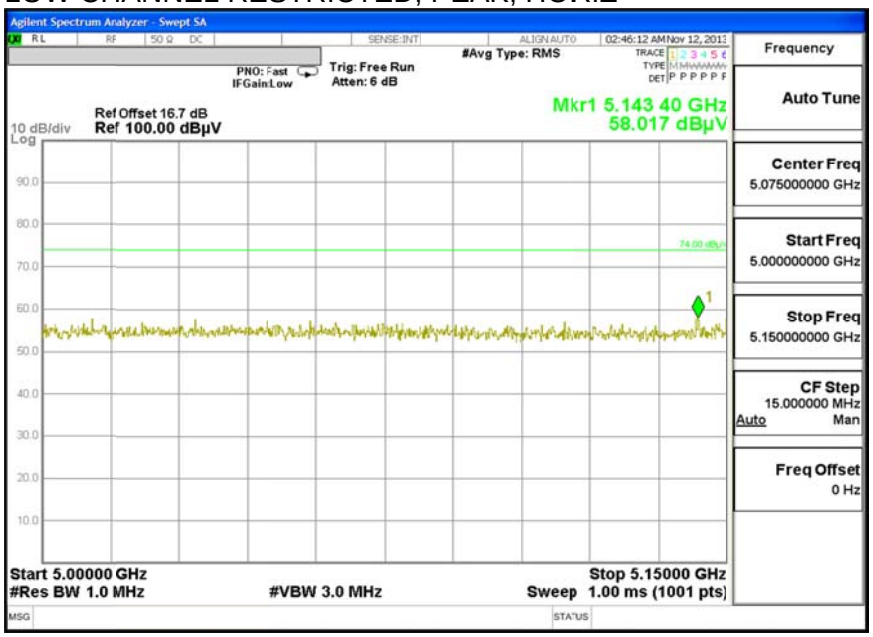
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

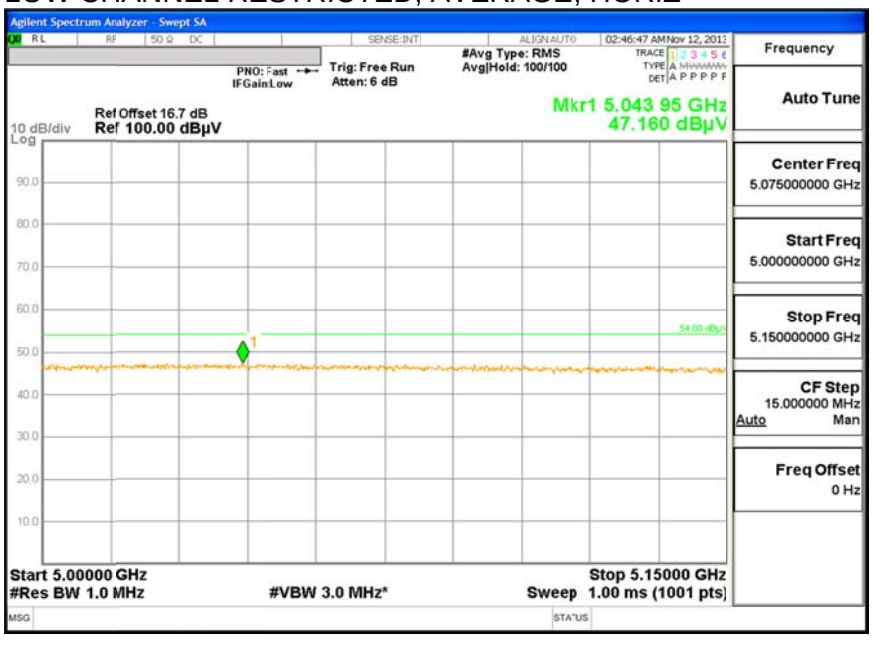
9.2.2. 802.11n HT20 2TX CDD MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

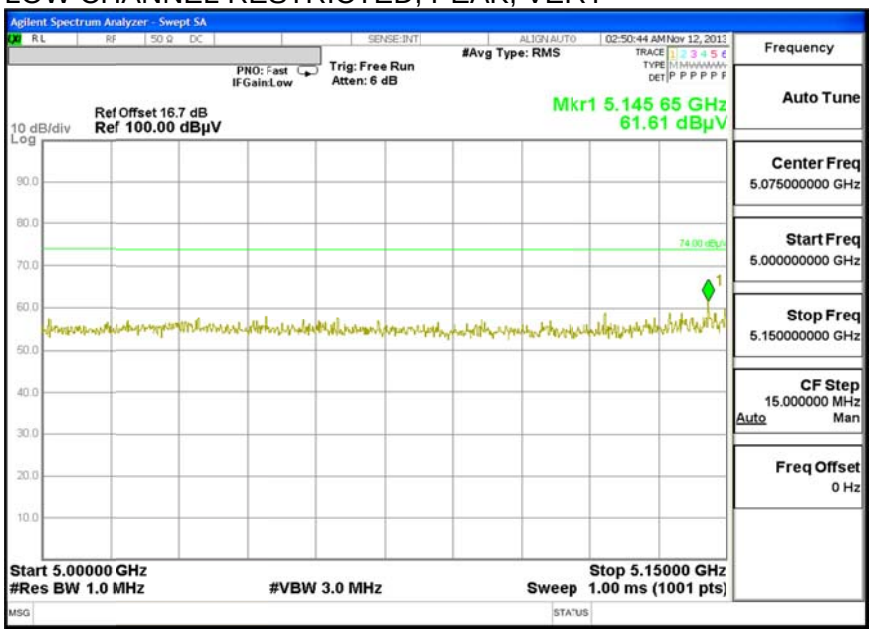
LOW CHANNEL RESTRICTED, PEAK, HORIZ



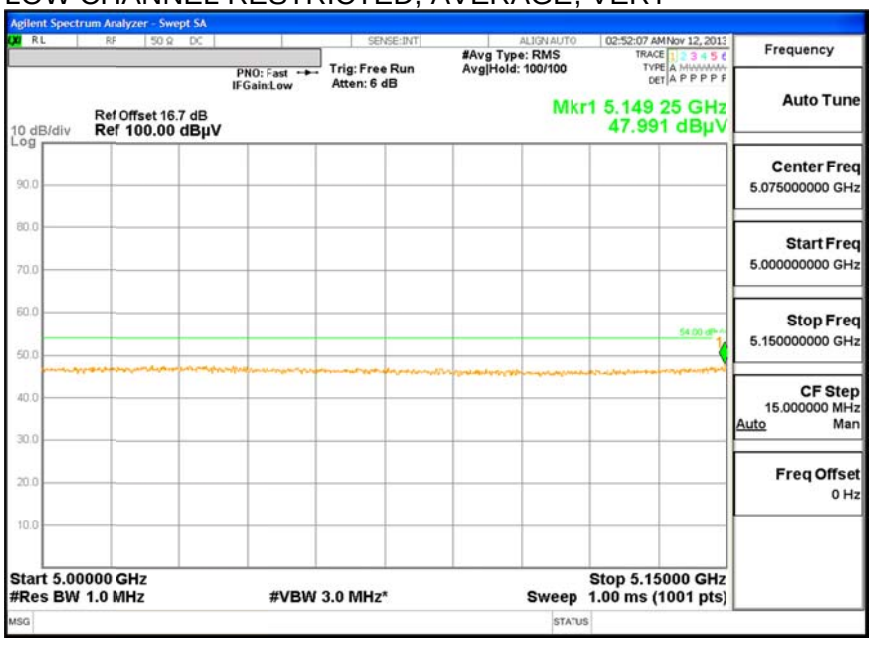
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT

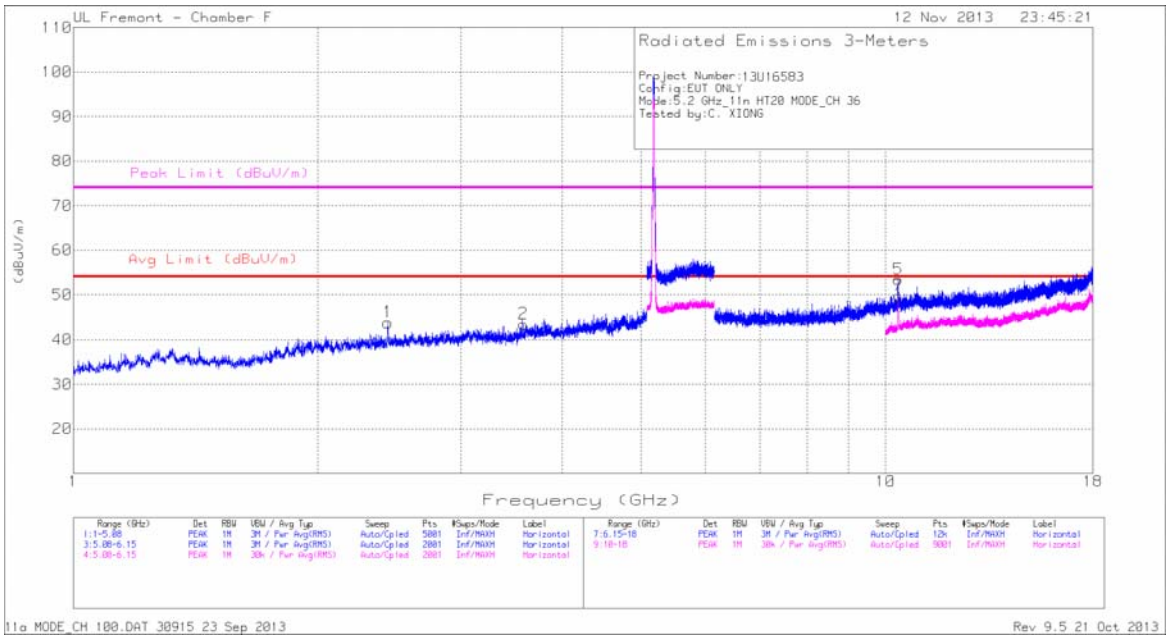


LOW CHANNEL RESTRICTED, AVERAGE, VERT

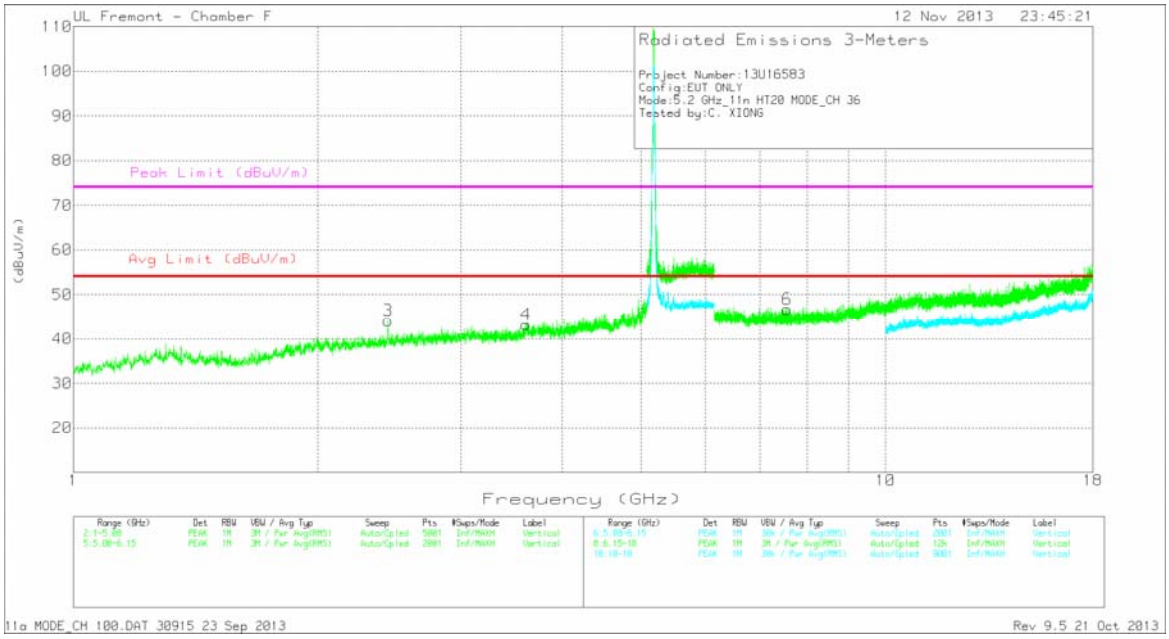


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



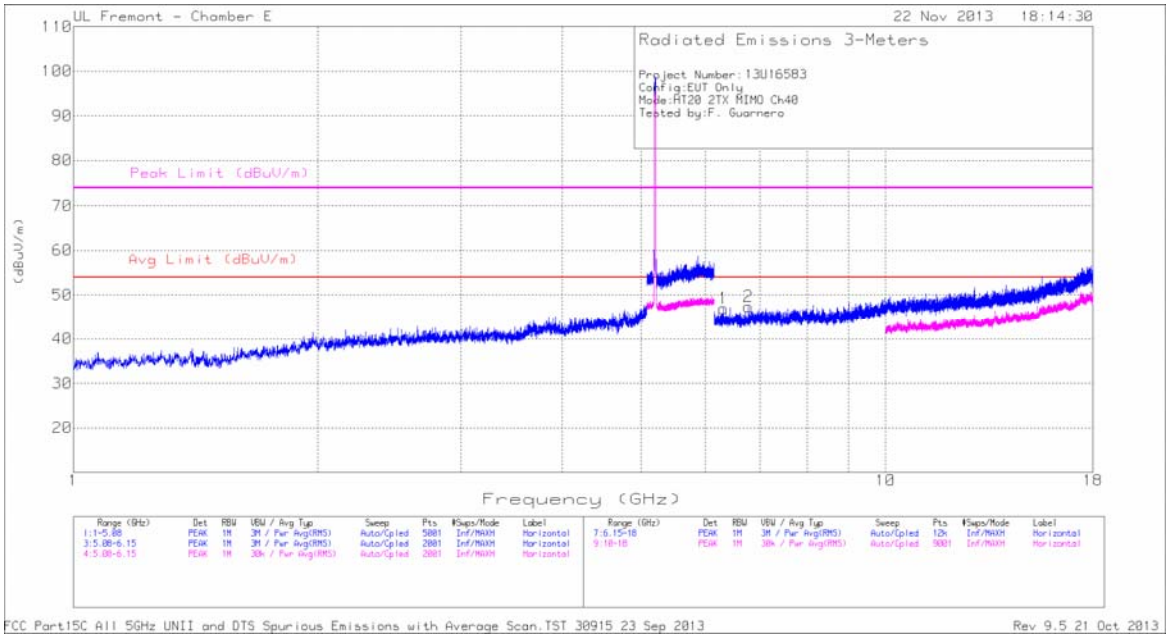
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.439	42.25	PK	32.3	-30.7	43.85	-	-	68.2	-24.35	0-360	199	H
2	* 3.583	39.28	PK	33.7	-29.5	43.48	54	-10.52	74.0	-30.52	0-360	199	H
3	2.440	42.52	PK	32.3	-30.7	44.12	-	-	68.2	-24.08	0-360	201	V
4	* 3.609	38.93	PK	33.7	-29.4	43.23	54	-10.77	74.0	-30.77	0-360	201	V
5	10.360	37.97	PK	38.1	-22.6	53.47	-	-	68.2	-14.73	0-360	199	H
6	* 7.564	36.11	PK	35.8	-25.2	46.71	54	-7.29	74.0	-27.29	0-360	200	V

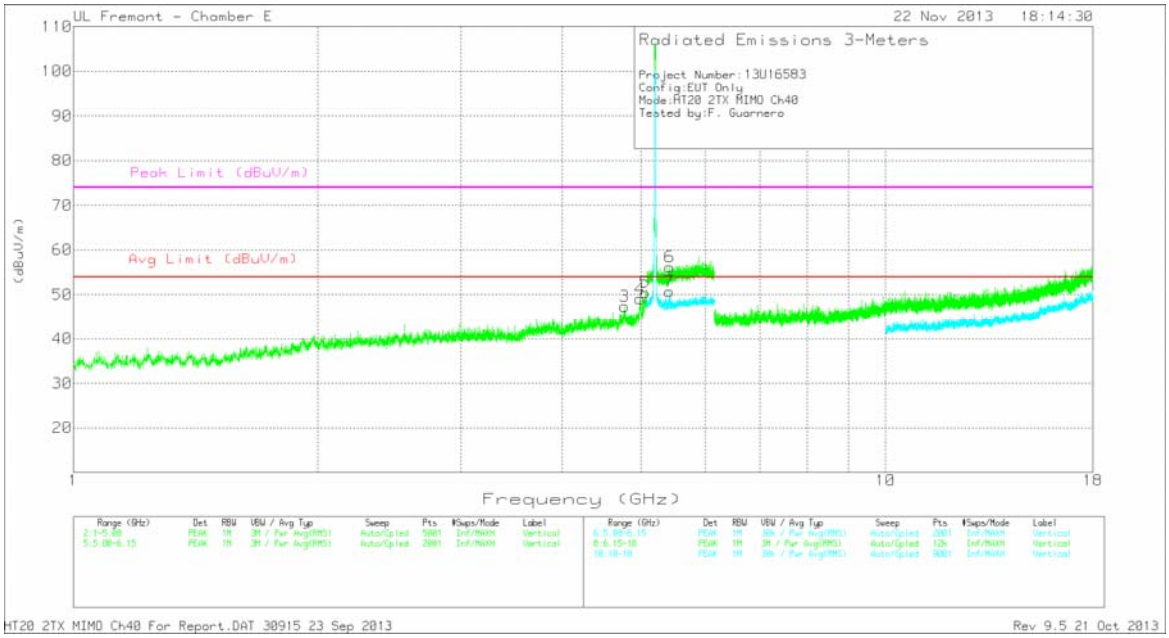
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

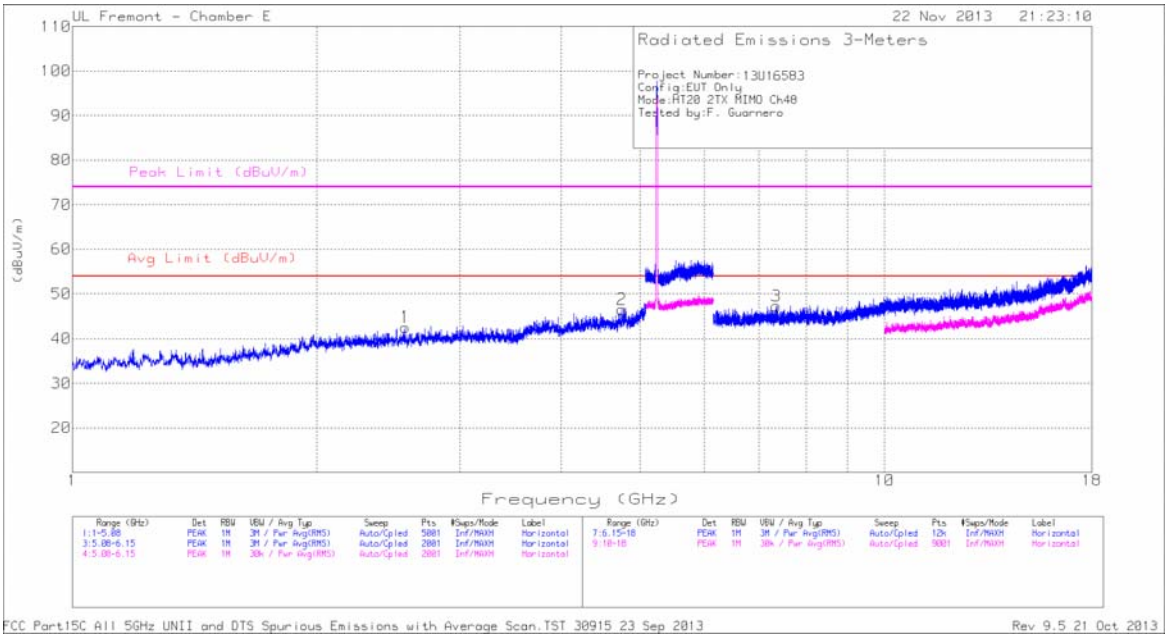
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /6GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.317	39.79	PK	35.9	-28.7	46.99	-	-	68.2	-21.21	0-360	199	H
2	6.777	40.79	PK	35.8	-29.2	47.39	-	-	68.2	-20.81	0-360	199	H
3	* 4.773	42.98	PK	34.4	-30.0	47.38	54	-6.62	74.0	-26.62	0-360	199	V
4	* 4.985	44.16	PK	34.4	-29.5	49.06	-	-	740.0	-24.94	0-360	199	V
	* 4.985	37.01	AD1	34.4	-29.5	41.91	54	-12.09	-	-	220	190	V
5	* 5.058	44.17	PK	34.5	-28.2	50.47	-	-	74.0	-23.53	0-360	199	V
	* 5.048	33.03	AD1	34.5	-28.9	38.63	54	-15.37	-	-	211	227	V
6	* 5.423	42.79	PK	34.8	-21.4	56.19	-	-	74	-17.81	0-360	199	V
7	* 5.423	32.98	AD1	34.8	-21.4	46.38	54	-7.62	-	-	281	117	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

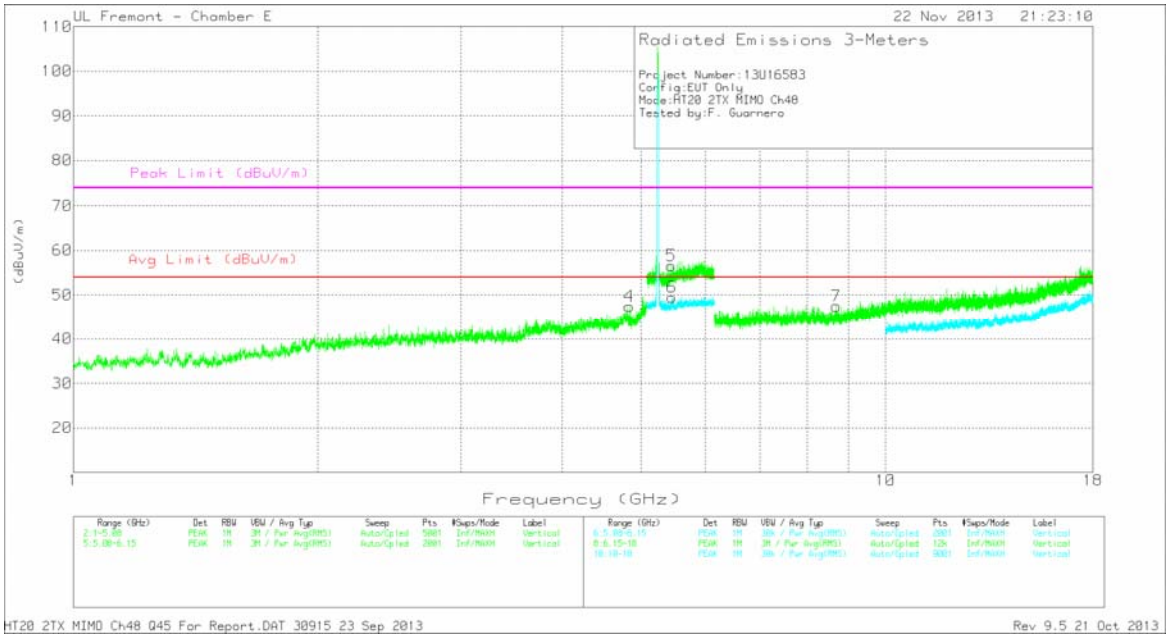
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.570	42.67	PK	32.8	-32.9	42.57	-	-	68.2	-25.63	0-360	100	H
2	* 4.749	42.35	PK	34.4	-30.3	46.45	54	-7.55	74.0	-27.55	0-360	100	H
3	* 7.357	38.94	PK	36	-27.7	47.24	54	-6.76	74.0	-26.76	0-360	199	H
4	* 4.836	43.35	PK	34.4	-30.3	47.45	54	-6.55	74.0	-26.55	0-360	100	V
5	* 5.448	43.06	PK	34.8	-21.3	56.56	-	-	74.0	-17.44	0-360	100	V
6	* 5.448	33.19	AD1	34.8	-21.2	46.79	54	-7.21	-	-	241	392	V
7	8.697	37.72	PK	36.5	-26.7	47.52	-	-	68.2	-20.68	0-360	199	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

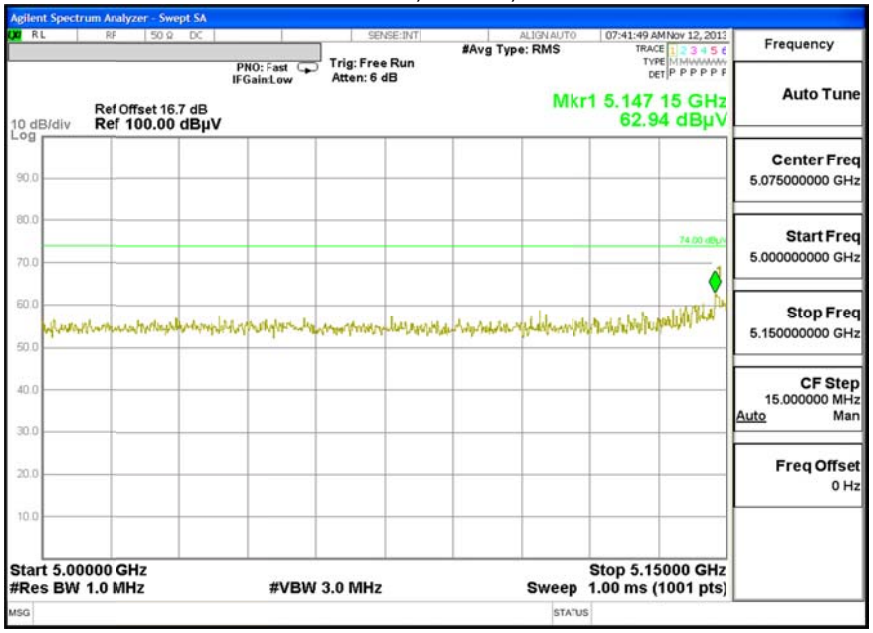
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

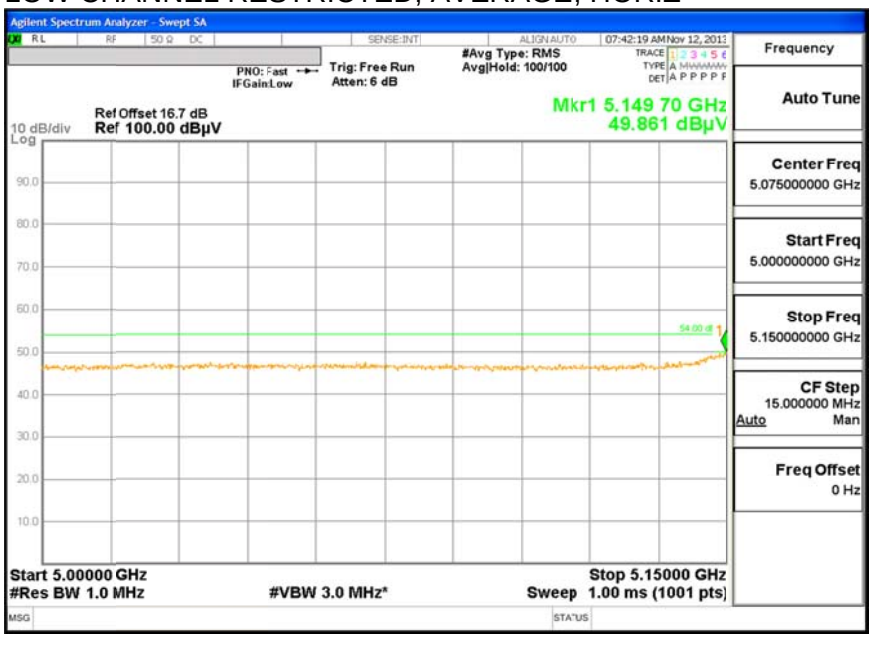
9.2.3. 802.11n HT40 SISO MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

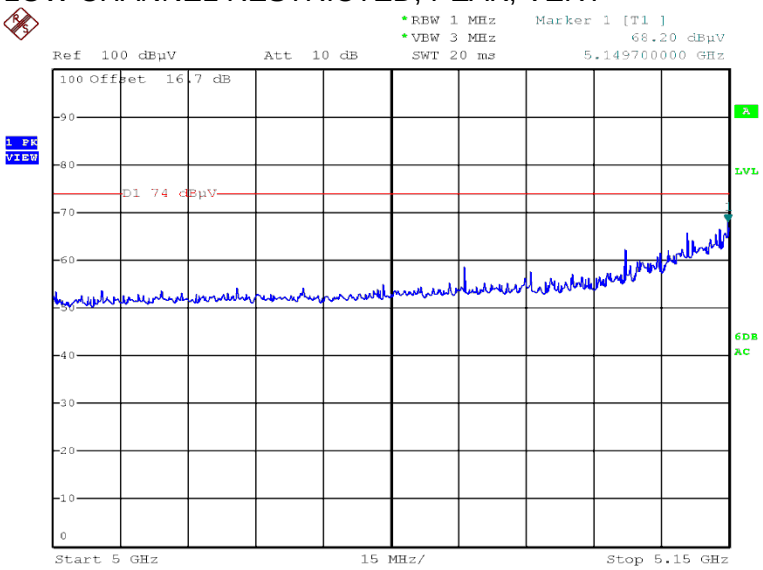
LOW CHANNEL RESTRICTED, PEAK, HORIZ



LOW CHANNEL RESTRICTED, AVERAGE, HORIZ

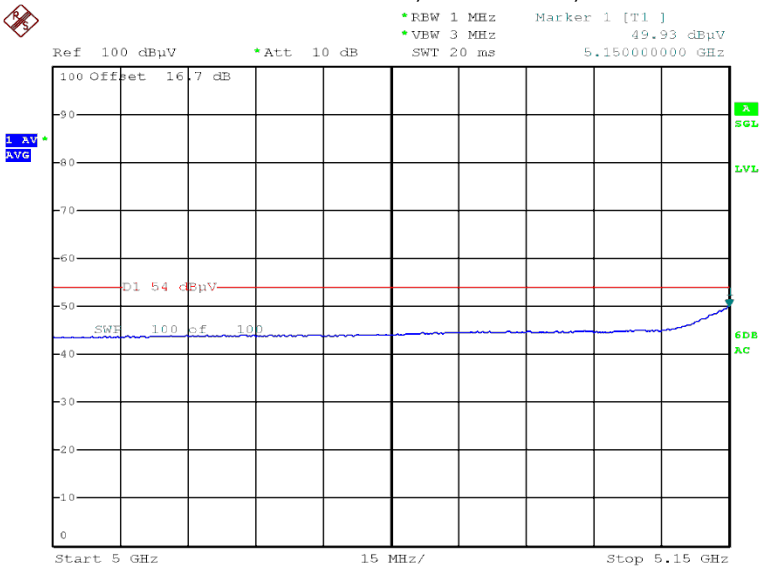


LOW CHANNEL RESTRICTED, PEAK, VERT



Date: 17.DEC.2013 01:13:58

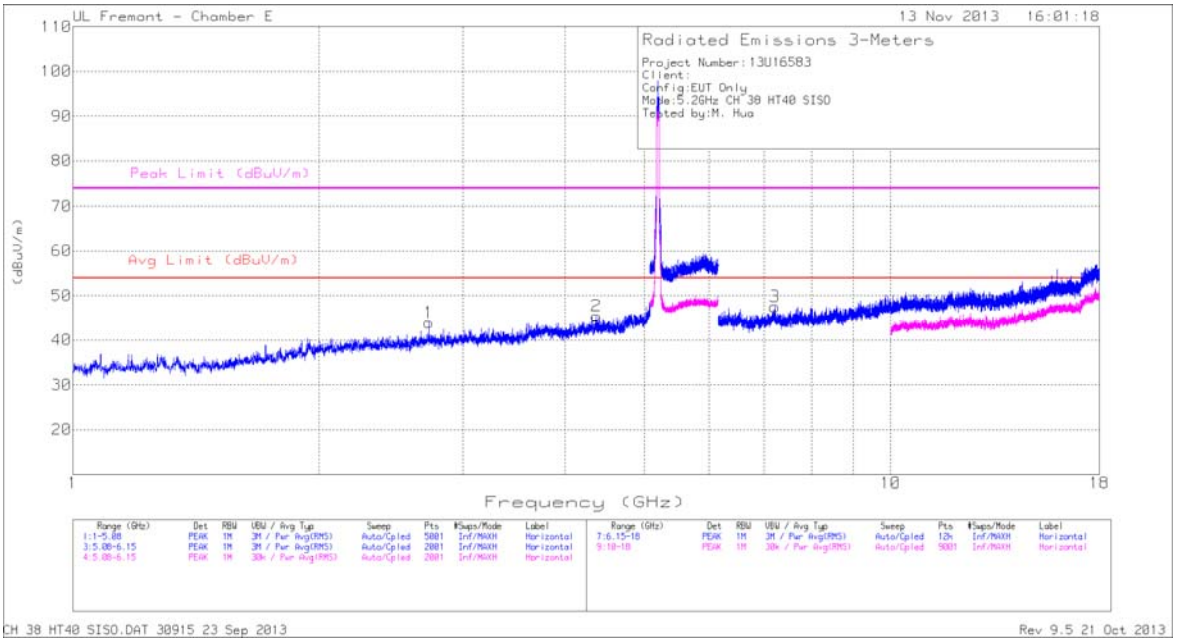
LOW CHANNEL RESTRICTED, AVERAGE, VERT



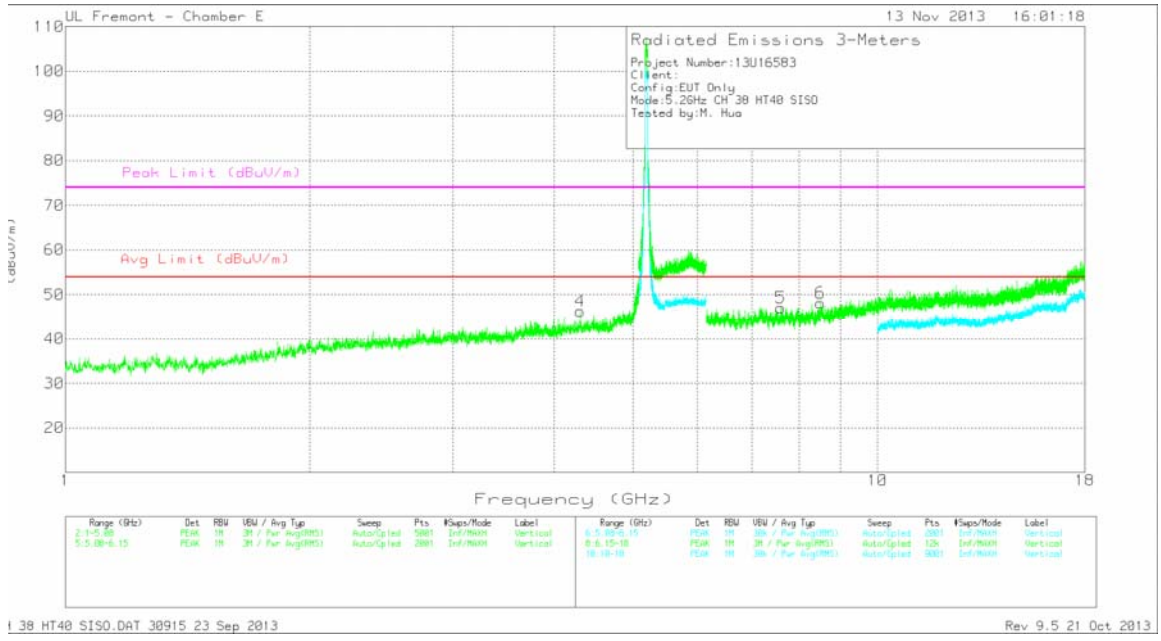
Date: 17.DEC.2013 01:15:04

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



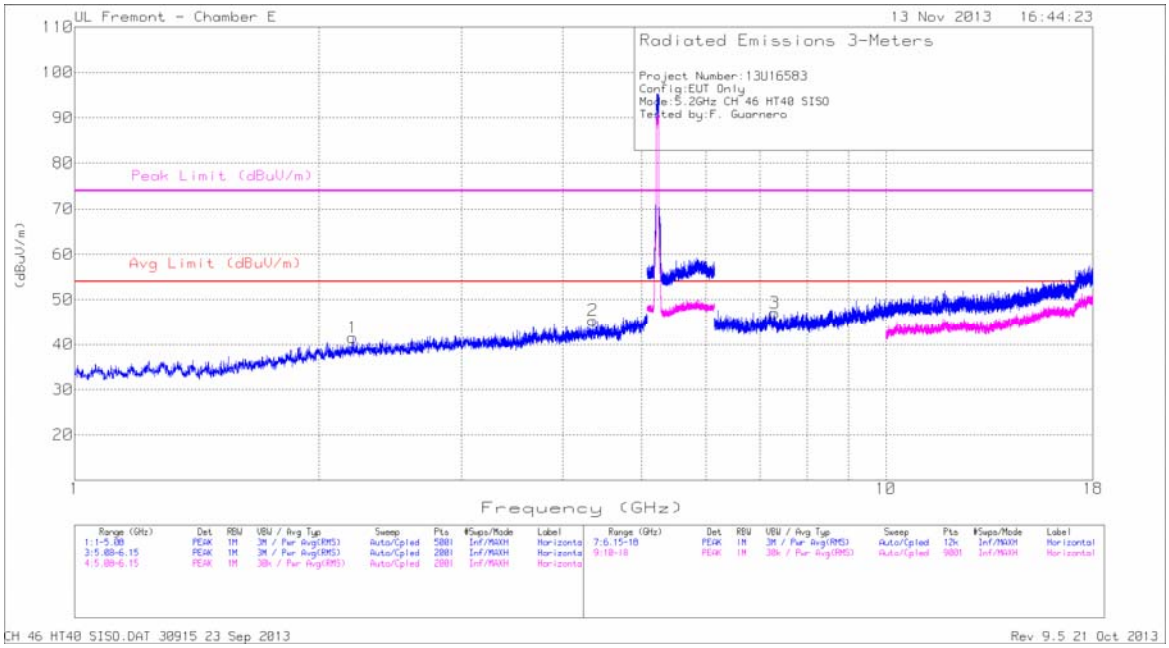
DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.724	40.82	PK	32.8	-29.7	43.92	54	-10.08	74.0	-30.08	0-360	100	H
2	* 4.367	40.14	PK	34.0	-28.7	45.44	54	-8.56	74.0	-28.56	0-360	100	H
3	7.218	35.63	PK	35.9	-24.0	47.53	-	-	68.2	-20.67	0-360	200	H
4	* 4.306	40.29	PK	34.0	-28.0	46.29	54	-7.71	74.0	-27.71	0-360	100	V
5	* 7.600	36.86	PK	36.0	-25.8	47.06	54	-6.94	74.0	-26.94	0-360	100	V
6	8.506	35.33	PK	36.2	-23.4	48.13	-	-	68.2	-20.07	0-360	100	V

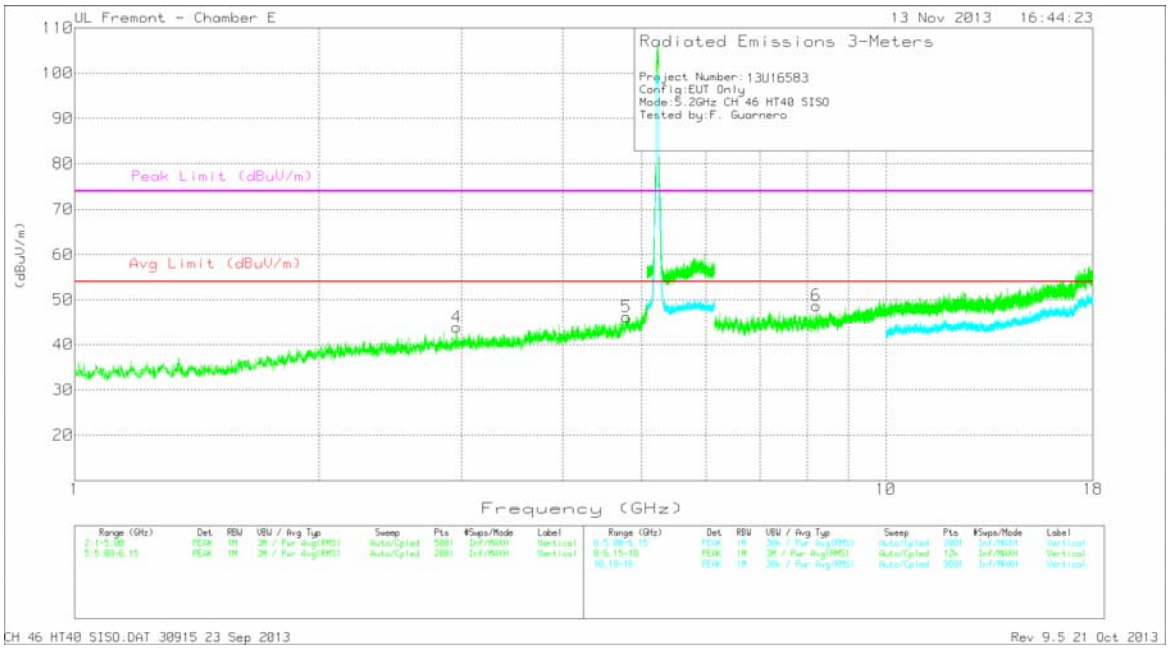
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*2.203	40.25	PK	32.3	-31.0	41.55	54	-12.45	74.0	-32.45	0-360	201	H
2	*4.356	39.96	PK	34	-28.6	45.36	54	-8.64	74.0	-28.64	0-360	100	H
3	*7.296	37.03	PK	35.9	-25.9	47.03	54	-6.97	74.0	-26.97	0-360	100	H
4	2.958	40.66	PK	33.1	-29.9	43.86	-	-	68.2	-24.34	0-360	201	V
5	*4.790	38.98	PK	34.4	-27.2	46.18	54	-7.82	74.0	-27.82	0-360	100	V
6	*8.211	37.78	PK	36	-25.1	48.68	-	-	74.0	-25.32	0-360	100	V
	*8.211	28.37	AD1	36	-24.9	39.47	54	-14.53	-	-	0-360	331	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

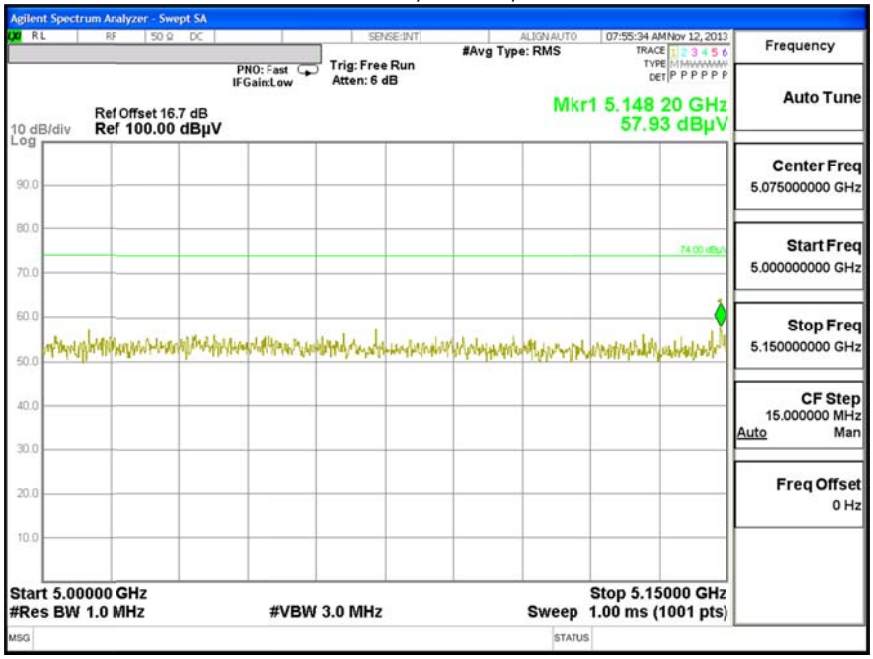
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

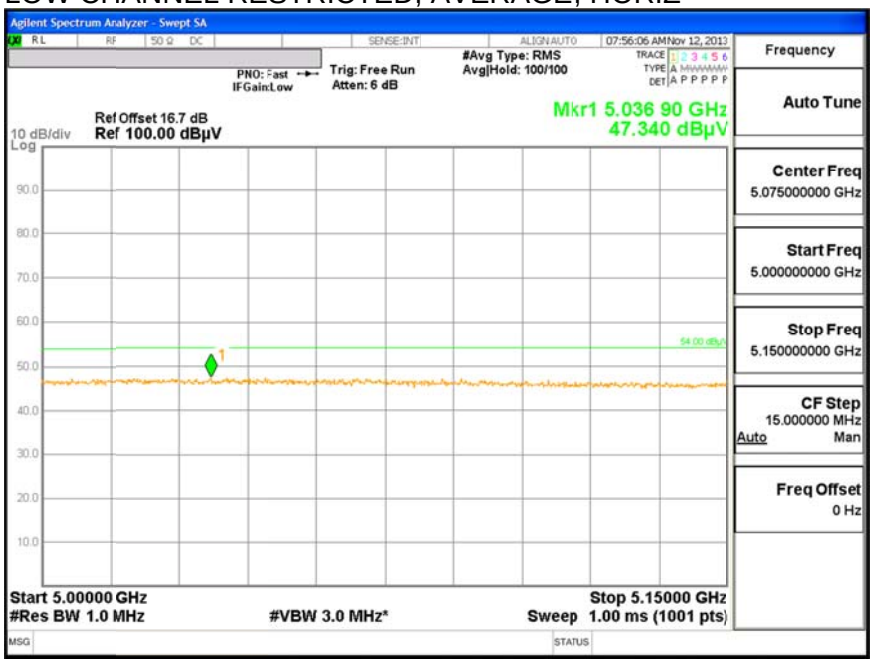
9.2.4. 802.11n HT40 2TX CDD MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

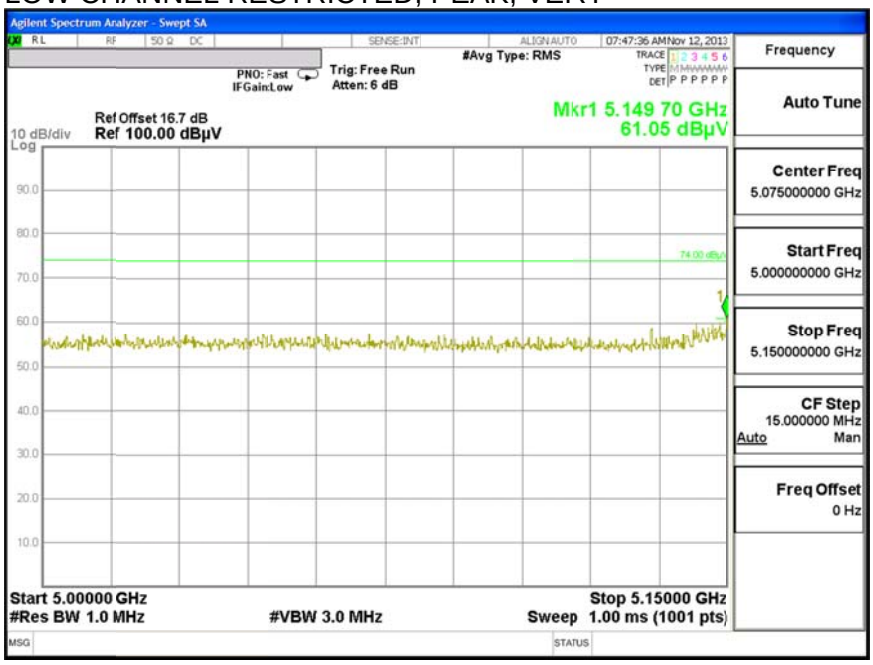
LOW CHANNEL RESTRICTED, PEAK, HORIZ



LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



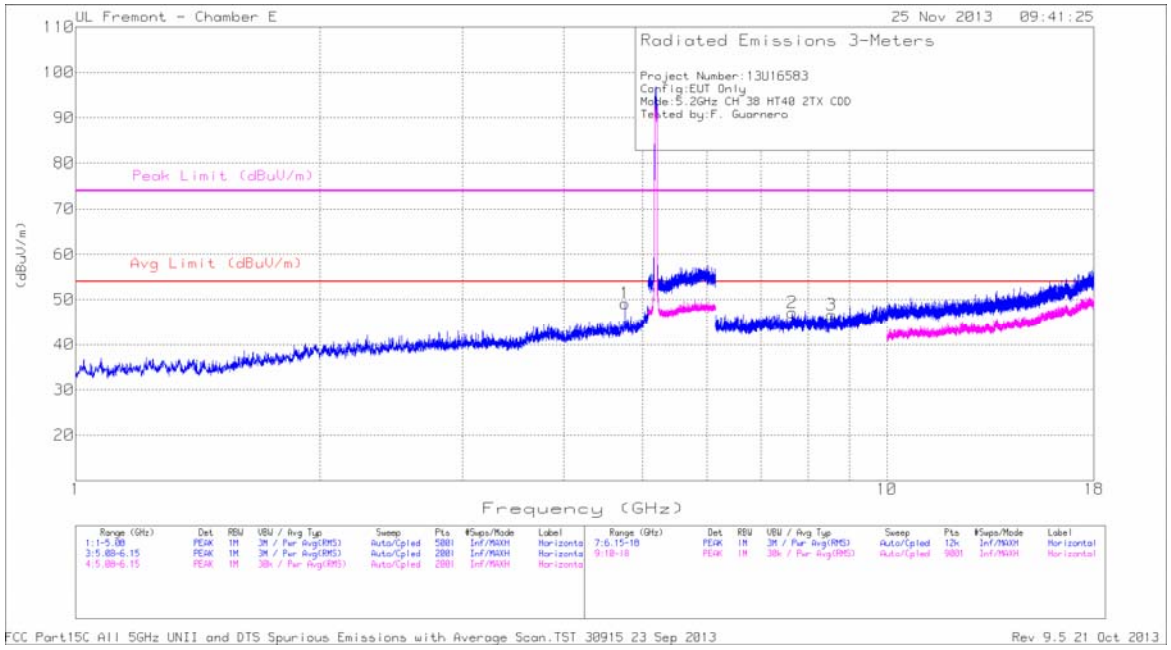
LOW CHANNEL RESTRICTED, PEAK, VERT



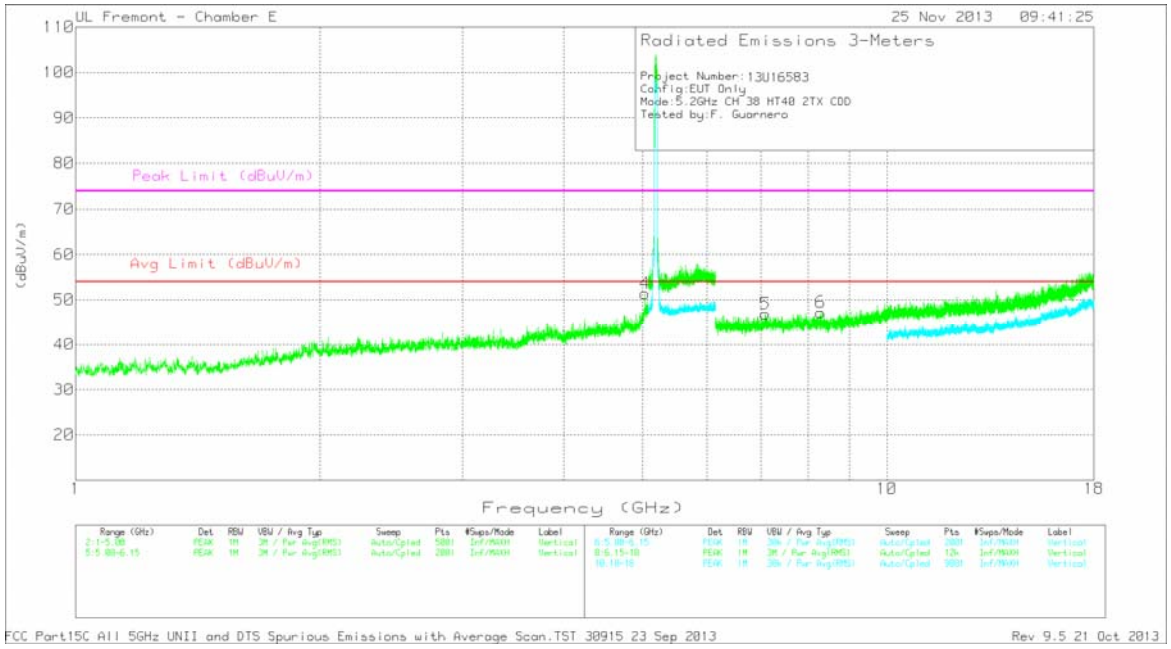
LOW CHANNEL RESTRICTED, AVERAGE, VERT

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

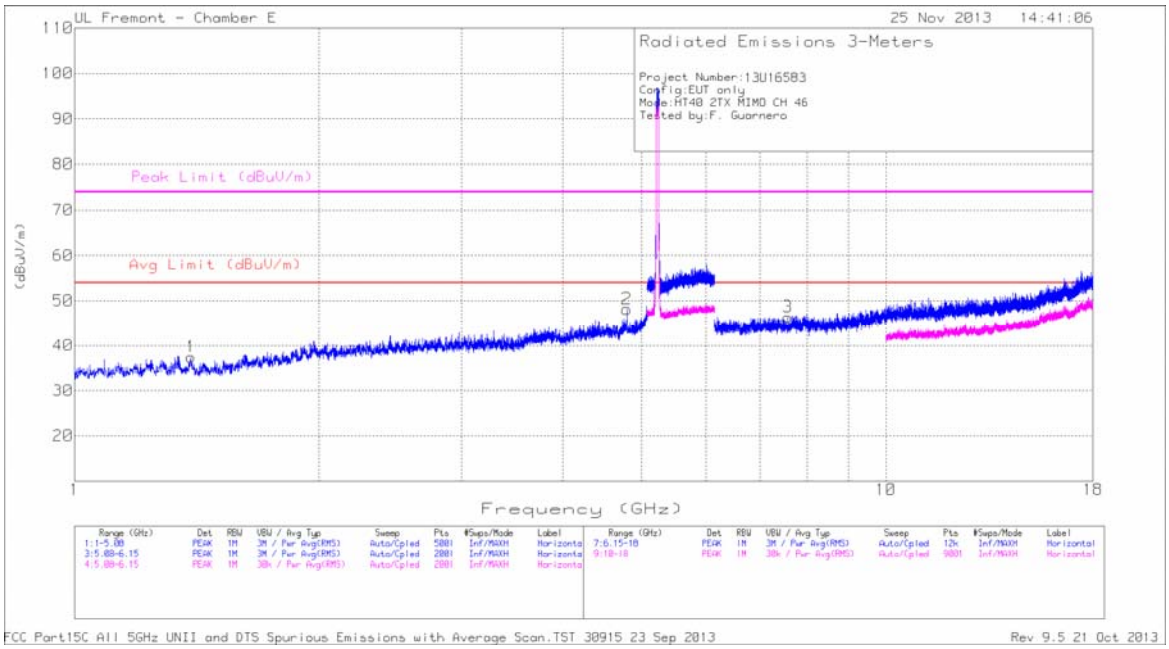
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.758	44.88	PK	34.4	-30.1	49.18	-	-	74.0	-24.82	0-360	199	H
	* 4.758	38.52	AD1	34.4	-30.1	42.82	54	-11.18	-	-	0-360	147	H
2	* 7.648	38.92	PK	36.2	-28.0	47.12	54	-6.88	74.0	-26.88	0-360	199	H
3	8.546	36.96	PK	36.3	-26.6	46.66	-	-	68.2	-21.54	0-360	199	H
4	* 5.037	46.01	PK	34.4	-29.0	51.41	-	-	-	-22.59	0-360	199	V
	* 5.037	35.64	AD1	34.4	-29.0	41.04	54	-12.96	-	-	0-360	102	V
5	7.084	39.31	PK	36	-28.4	46.91	-	-	68.2	-21.29	0-360	200	V
6	* 8.292	38.52	PK	36.2	-27.5	47.22	54	-6.78	74.0	-26.78	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

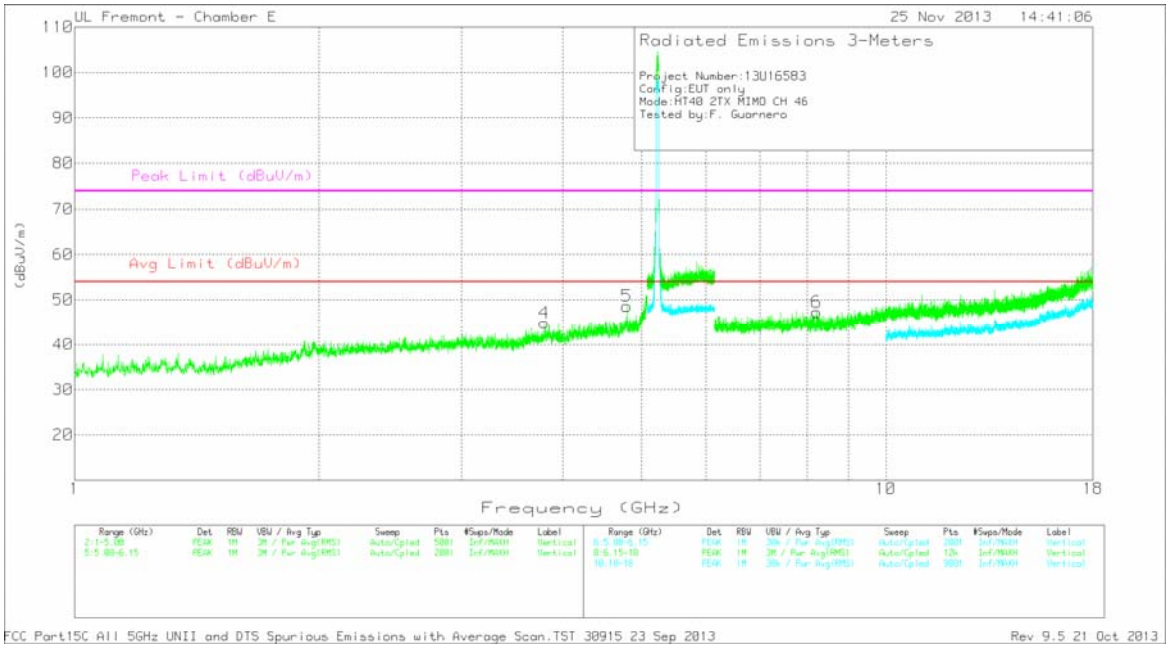
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.392	42.64	PK	29	-34.2	37.44	54	-16.56	74.0	-36.56	0-360	199	H
2	* 4.795	44.08	PK	34.4	-30.3	48.18	-	-	74.0	-25.82	0-360	101	H
	* 4.795	38.29	AD1	34.4	-30.3	42.39	54	-11.61	-	-	64	191	H
3	* 7.575	39.01	PK	36.1	-28.7	46.41	54	-7.59	74.0	-27.59	0-360	199	H
4	* 3.796	43.20	PK	33.7	-32.0	44.90	54	-9.10	74.0	-29.10	0-360	100	V
5	* 4.795	44.52	PK	34.4	-30.3	48.62	-	-	74.0	-25.38	0-360	199	V
	* 4.795	40.87	AD1	34.4	-30.3	44.97	54	-9.03	-	-	103	183	V
6	* 8.222	39.01	PK	36.2	-27.9	47.31	54	-6.69	74.0	-26.69	0-360	199	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

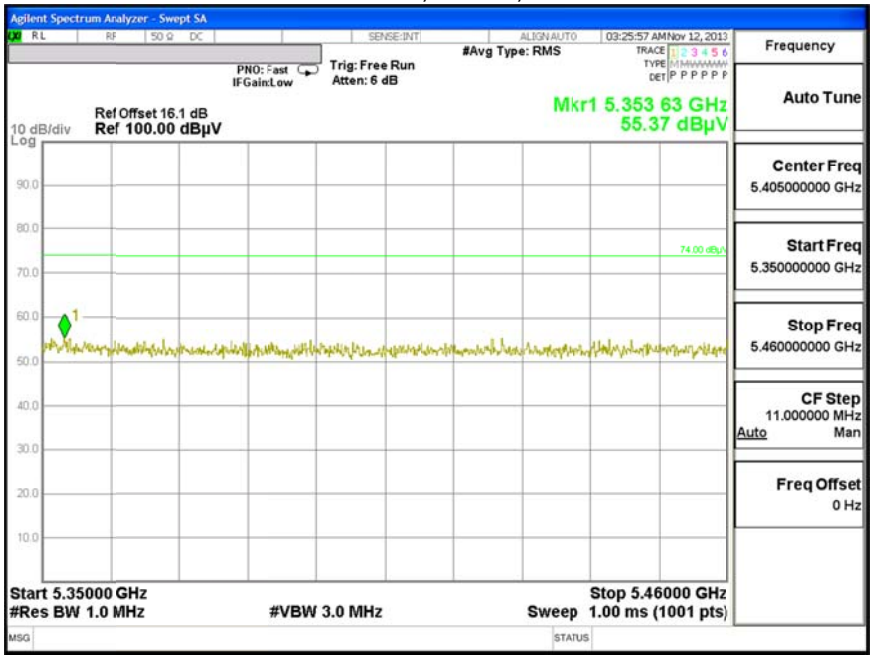
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

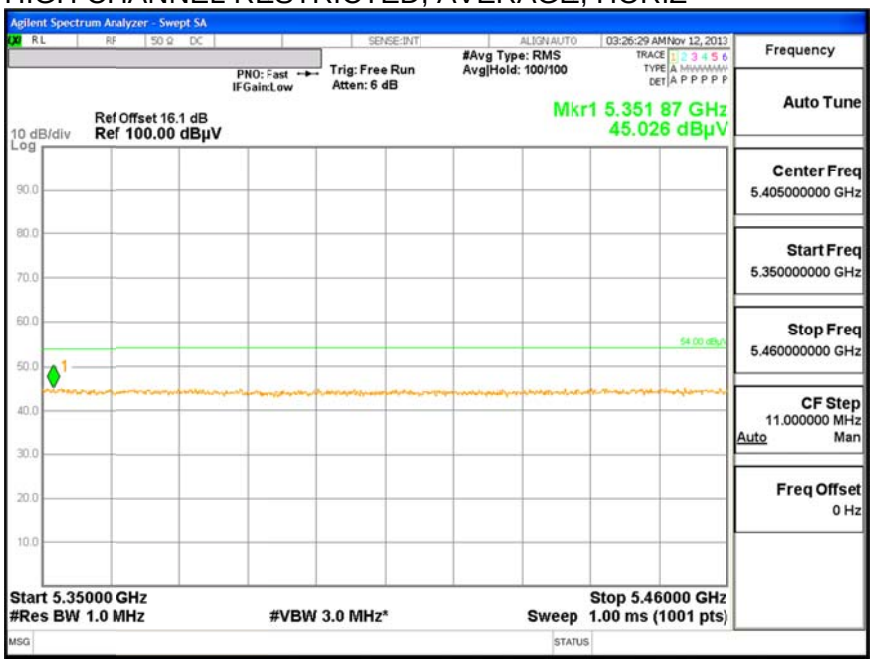
9.2.5. 802.11a SISO MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

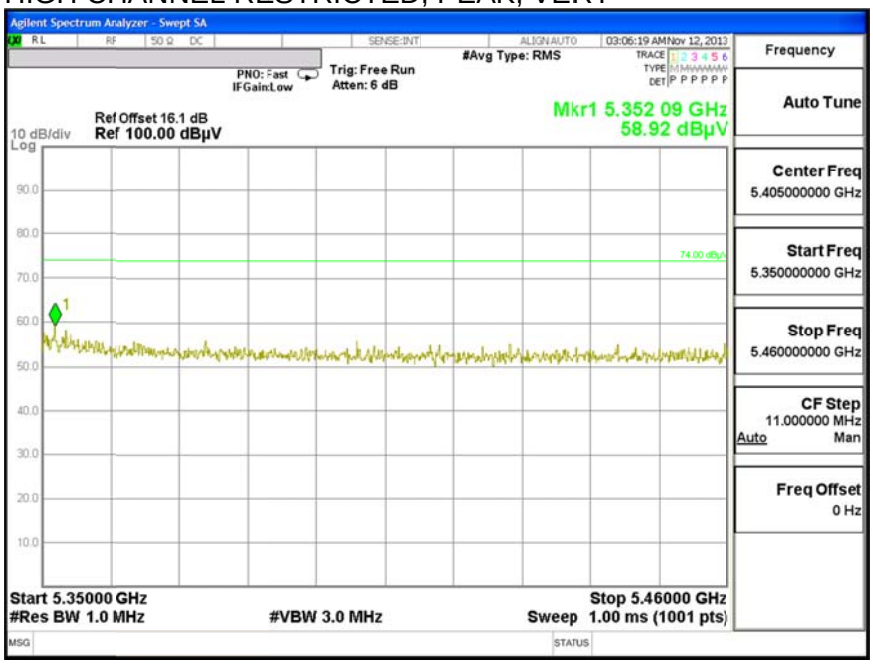
HIGH CHANNEL RESTRICTED, PEAK, HORIZ



HIGH CHANNEL RESTRICTED, AVERAGE, HORIZ



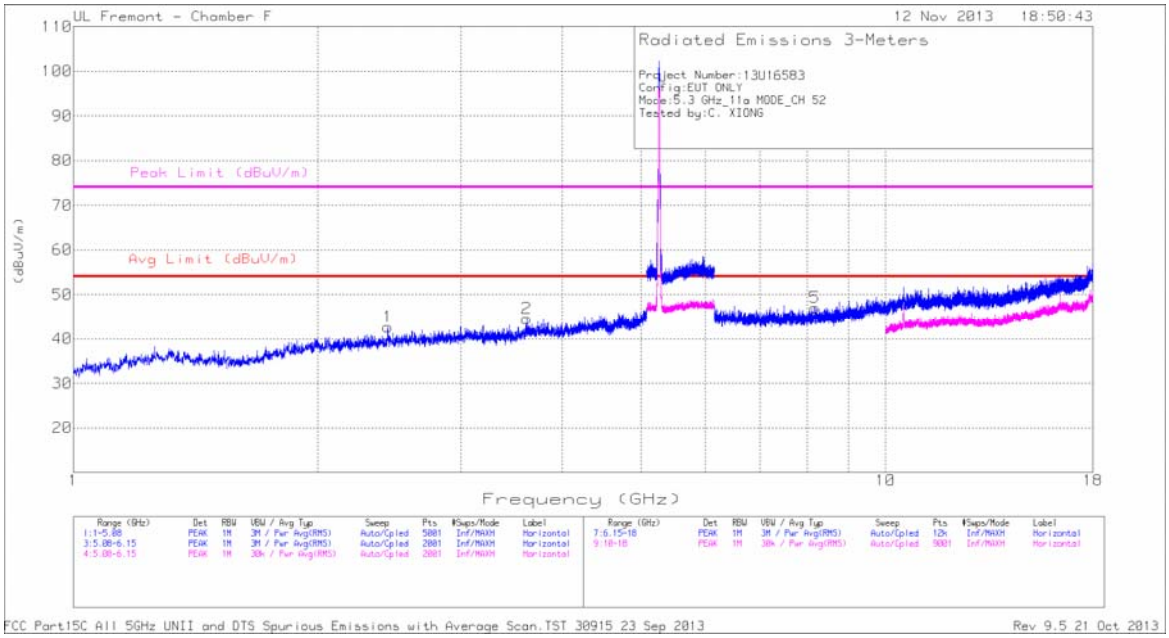
HIGH CHANNEL RESTRICTED, PEAK, VERT



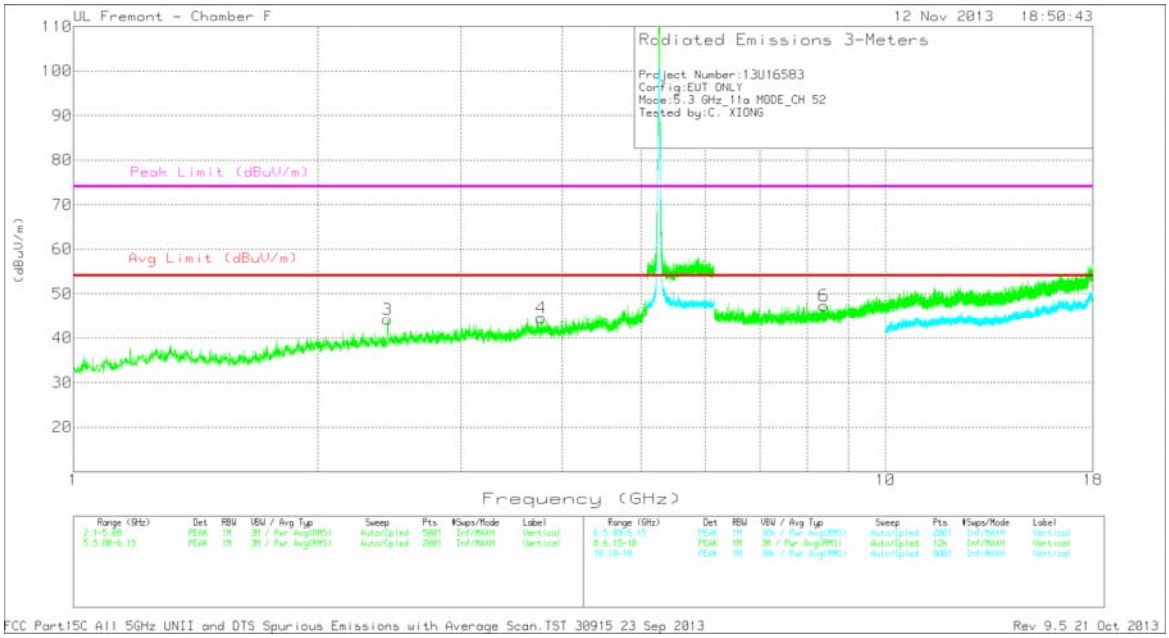
HIGH CHANNEL RESTRICTED, AVERAGE, VERT

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

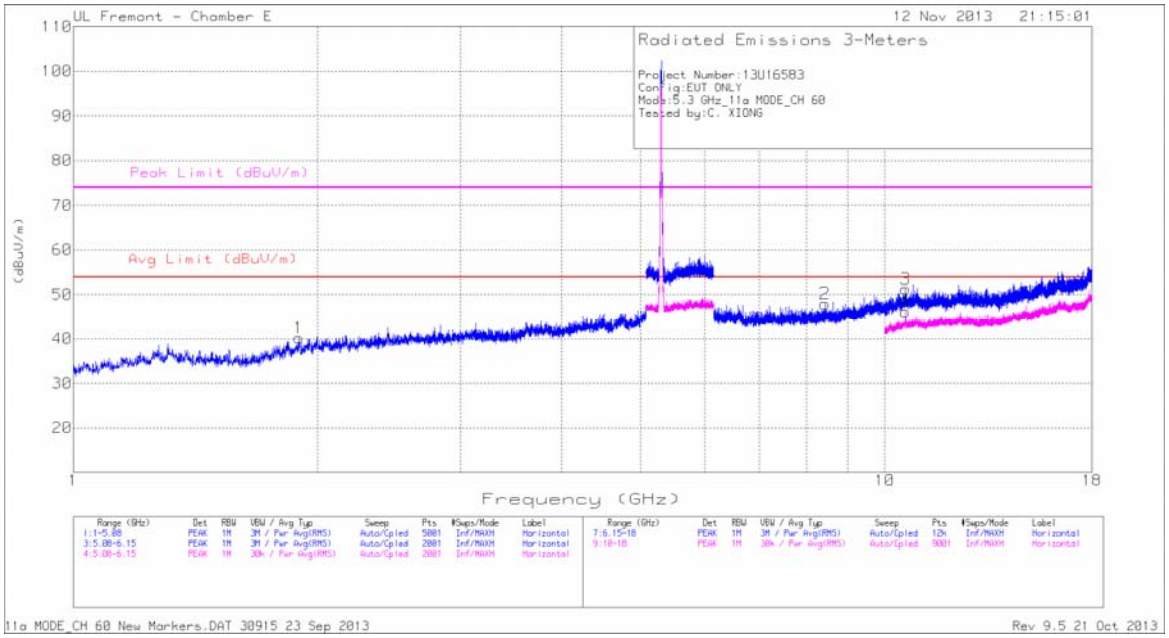
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.439	41.14	PK	32.3	-30.7	42.74	-	-	68.2	-25.46	0-360	199	H
2	* 3.615	40.22	PK	33.7	-29.3	44.62	54	-9.38	74.0	-29.38	0-360	199	H
3	2.436	42.64	PK	32.3	-30.7	44.24	-	-	68.2	-23.95	0-360	201	V
4	* 3.769	40.54	PK	33.6	-29.6	44.54	54	-9.46	74.0	-29.46	0-360	201	V
5	* 8.184	36.27	PK	36.0	-25.2	47.07	54	-6.93	74.0	-26.93	0-360	100	H
6	* 8.398	36.30	PK	36.0	-25.0	47.30	54	-6.70	74.0	-26.70	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

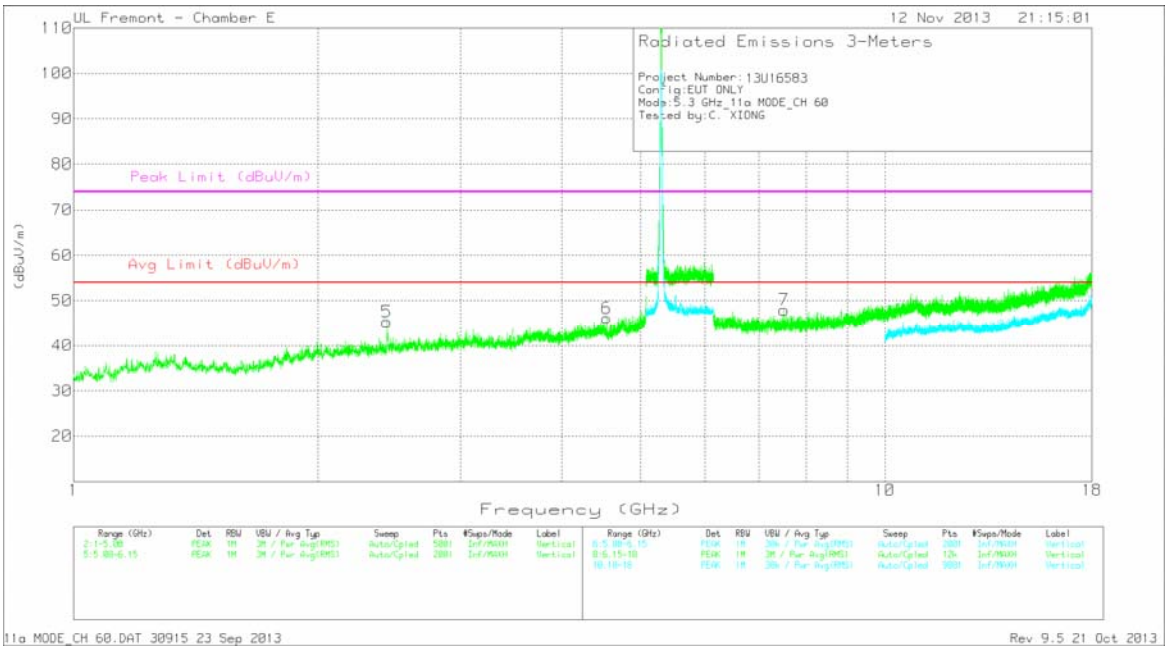
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

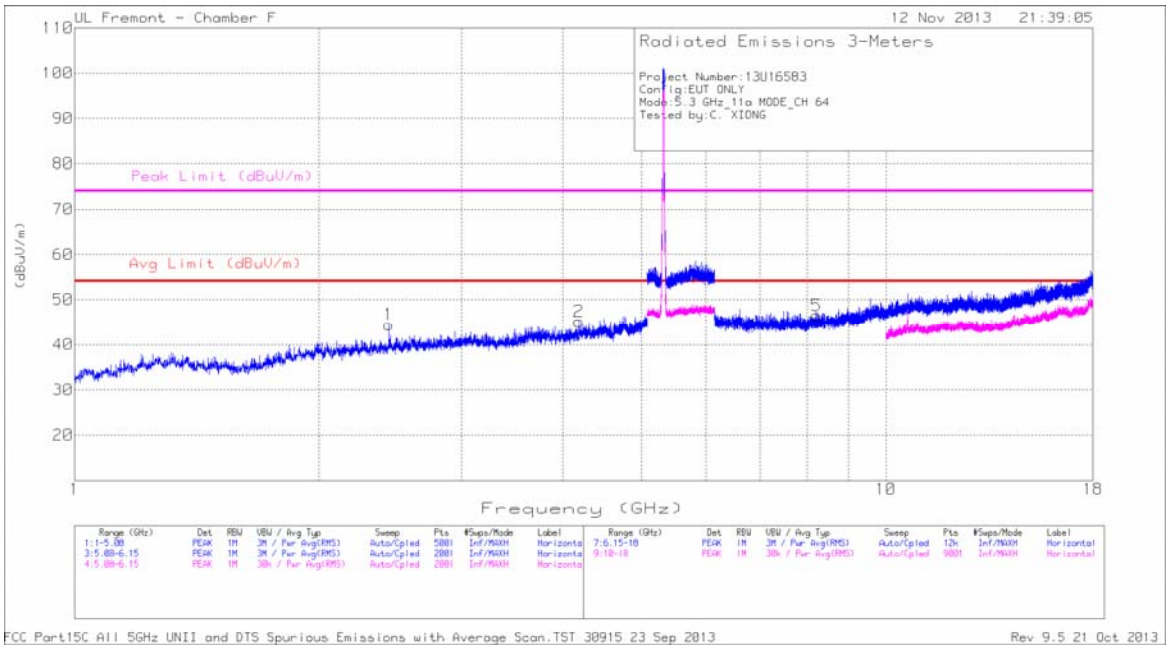
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.895	40.45	PK	31.1	-31.3	40.25	-	-	68.2	-27.95	0-360	100	H
2	*8.438	37.14	PK	36	-25.2	47.94	54	-6.06	74.0	-26.06	0-360	199	H
3	*10.604	35.58	PK	38.6	-22.9	51.28	-	-	74.0	-22.72	0-360	199	H
4	*10.604	30.27	Avg	38.6	-22.7	46.17	54	-7.11	-	-	0-360	100	H
5	2.435	43.66	PK	32.3	-30.7	45.26	-	-	68.2	-22.94	0-360	200	V
6	*4.541	40.71	PK	34	-28.6	46.11	54	-7.89	74.0	-27.89	0-360	200	V
7	*7.512	37.85	PK	35.8	-25.7	47.95	54	-6.05	74.0	-26.05	0-360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

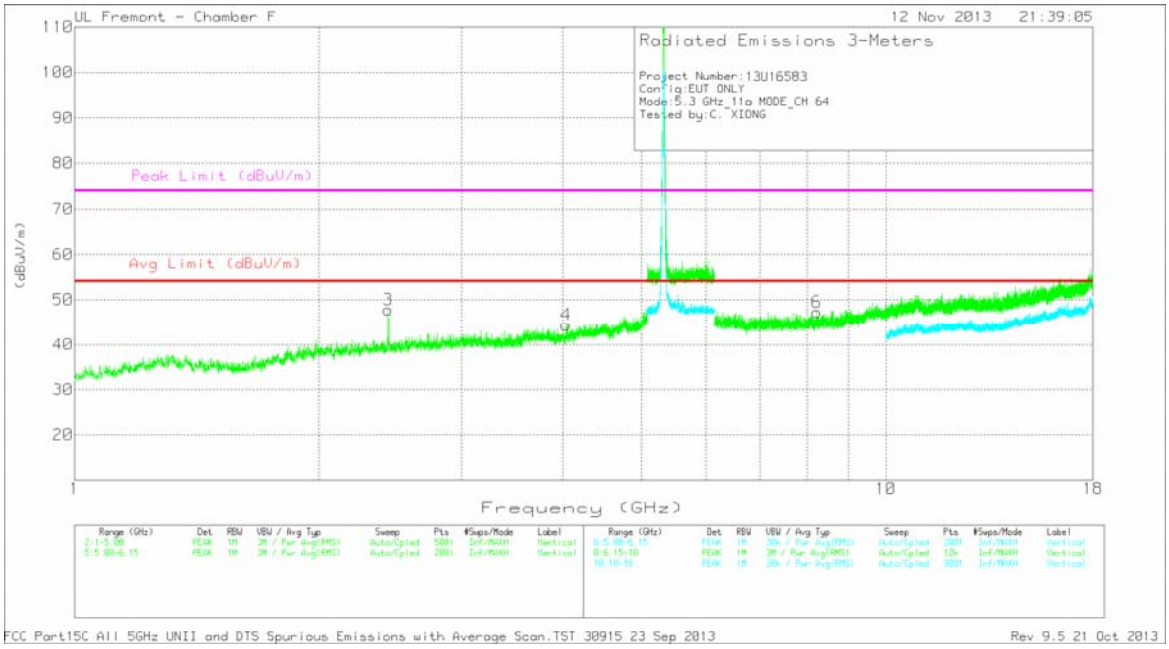
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.439	42.83	PK	32.3	-30.7	44.43	-	-	68.2	-23.77	0-360	199	H
2	* 4.185	40.47	PK	33.4	-28.7	45.17	54	-8.83	74.0	-28.83	0-360	100	H
3	2.436	46.24	PK	32.3	-30.7	47.84	-	-	68.2	-20.36	0-360	201	V
4	* 4.038	39.12	PK	33.4	-28.1	44.42	54	-9.58	74.0	-29.58	0-360	201	V
5	* 8.221	35.76	PK	36.0	-25.3	46.46	54	-7.54	74.0	-27.54	0-360	199	H
6	* 8.226	36.66	PK	36.0	-25.4	47.26	54	-6.74	74.0	-26.74	0-360	101	V

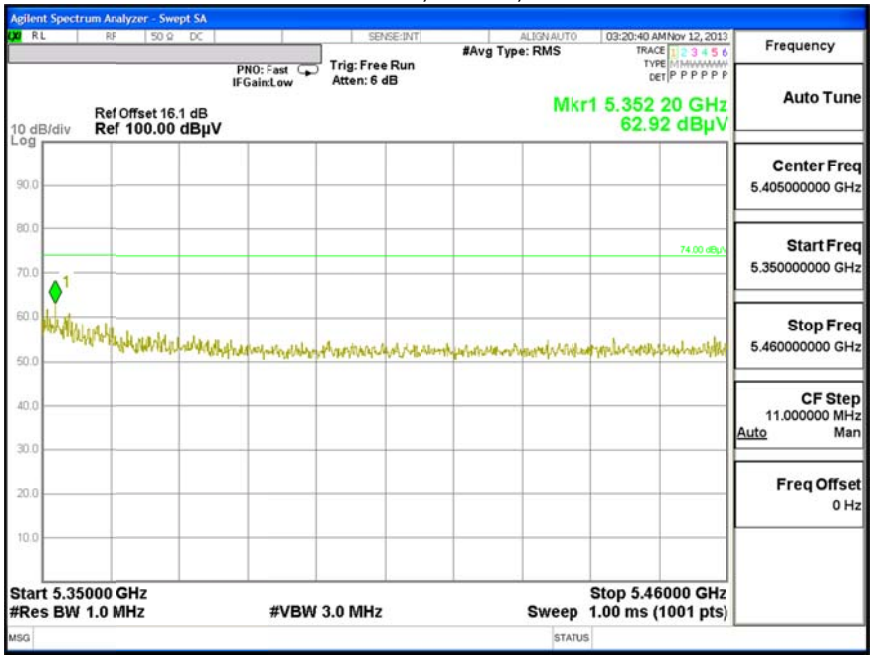
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

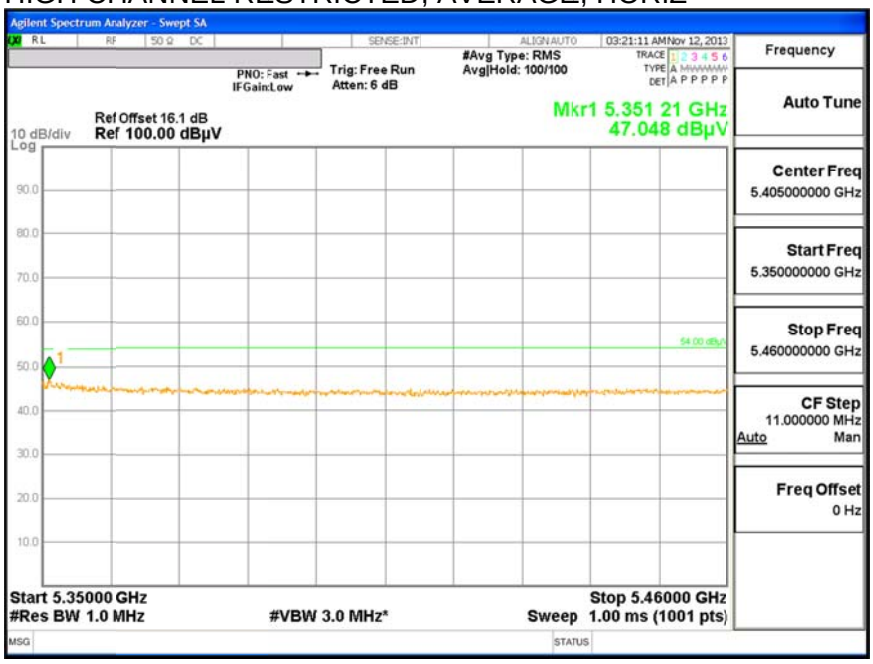
9.2.6. 802.11n HT20 2TX CDD MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

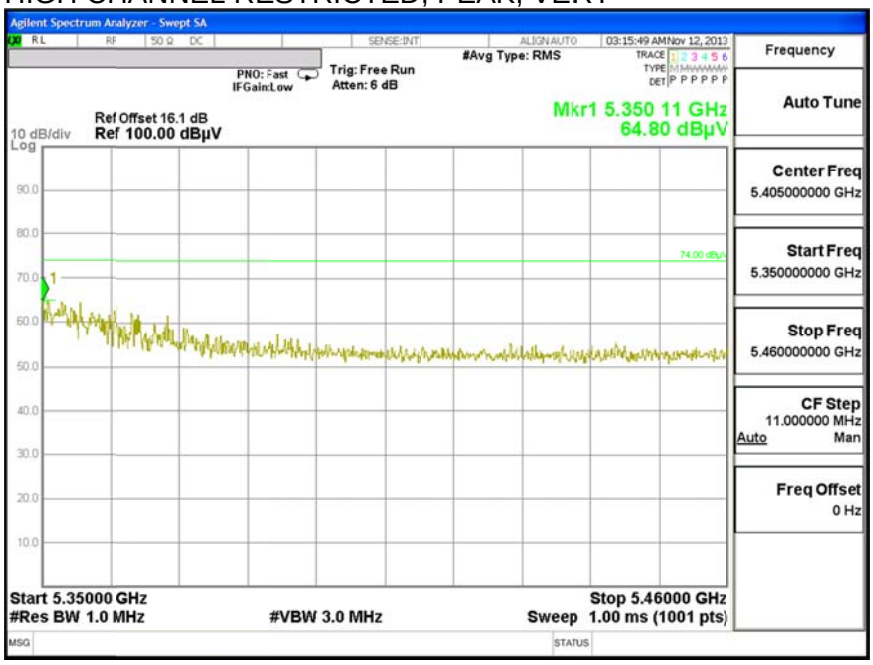
HIGH CHANNEL RESTRICTED, PEAK, HORIZ



HIGH CHANNEL RESTRICTED, AVERAGE, HORIZ



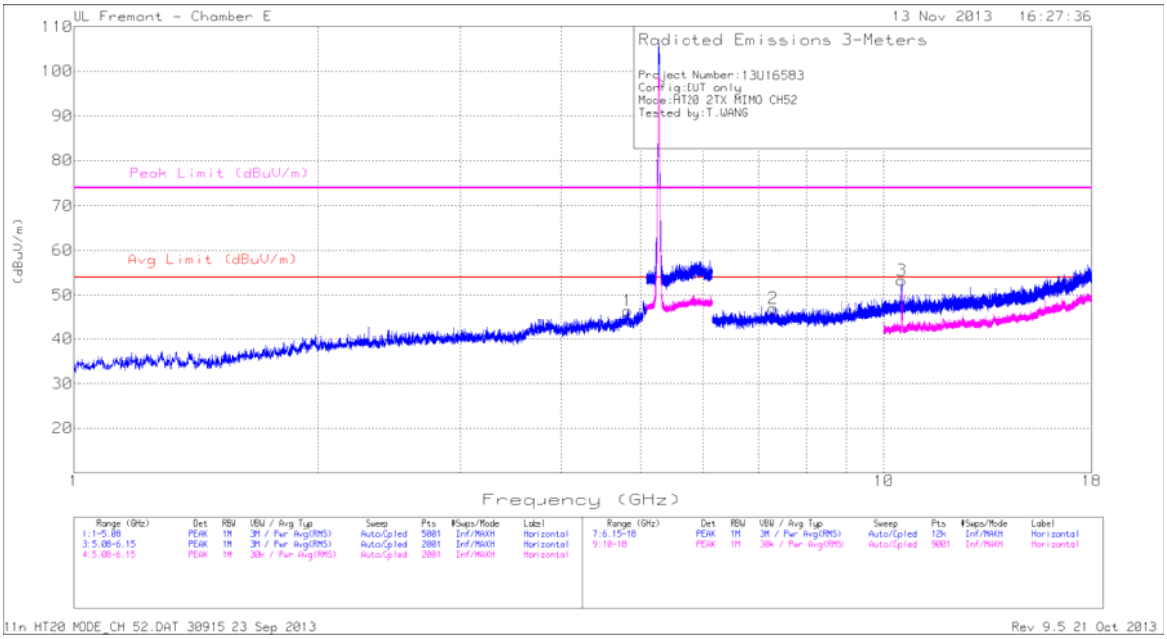
HIGH CHANNEL RESTRICTED, PEAK, VERT



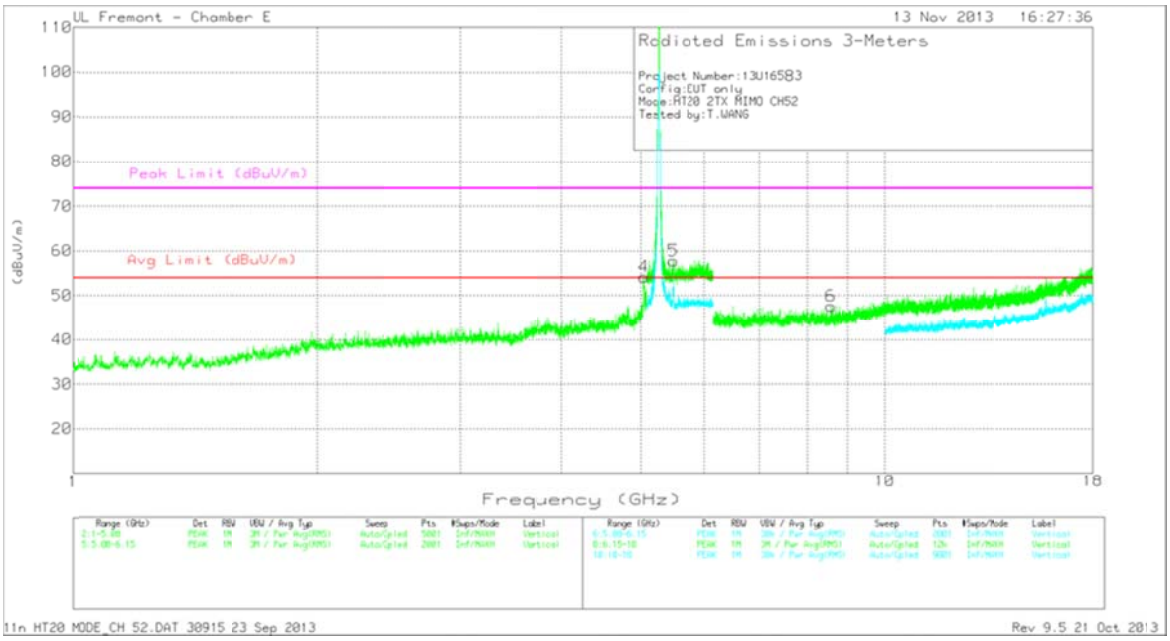
HIGH CHANNEL RESTRICTED, AVERAGE, VERT

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

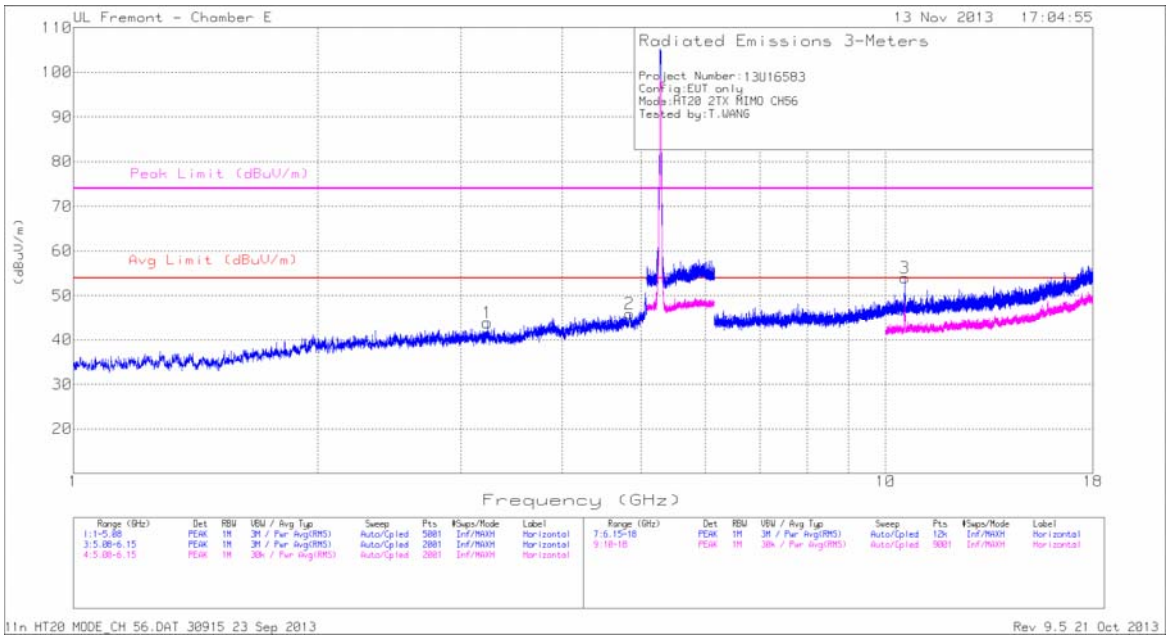
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.821	42.59	PK	34.4	-30.5	46.49	54	-7.51	74.0	-27.51	0-360	199	H
2	* 7.299	39.41	PK	36.0	-28.4	47.01	54	-6.99	74.0	-26.99	0-360	101	H
3	10.519	39.80	PK	38.4	-24.9	53.30	-	-	68.2	-14.90	0-360	101	H
4	* 5.040	48.80	PK	34.4	-29.0	54.20	-	-	74.0	-19.80	0-360	101	V
	* 5.040	42.80	AD1	34.4	-29.0	48.20	54	-5.80	-	-	56	309	V
5	5.480	44.20	PK	34.8	-21.2	57.80	-	-	68.2	-10.40	0-360	199	V
6	8.552	38.03	PK	36.3	-26.7	47.63	-	-	68.2	-20.57	0-360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

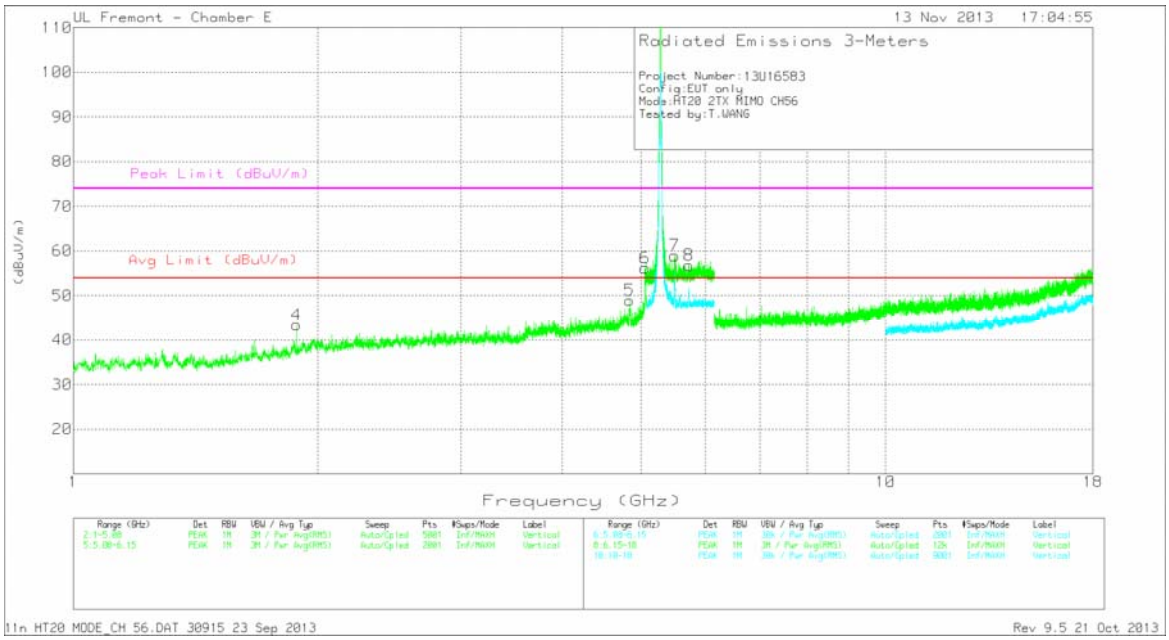
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

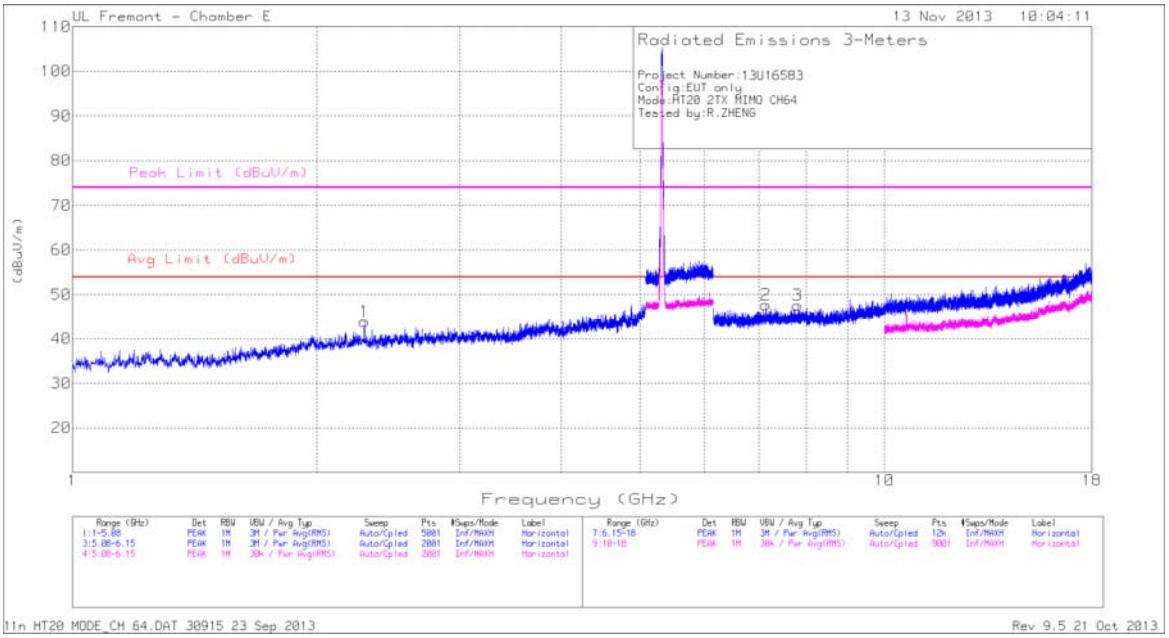
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.233	42.58	PK	33.4	-32.1	43.88	-	-	68.2	-24.32	0-360	199	H
2	* 4.839	41.87	PK	34.4	-30.3	45.97	54	-8.03	74.0	-28.03	0-360	199	H
3	10.562	40.26	PK	38.4	-24.7	53.96	-	-	68.2	-14.24	0-360	100	H
4	1.883	45.73	PK	31.4	-33.7	43.43	-	-	68.2	-24.77	0-360	100	V
5	* 4.838	44.87	PK	34.4	-30.3	48.97	-	-	74.0	-25.03	0-360	100	V
	* 4.838	37.73	AD1	34.4	-30.3	41.19	54	-12.20	-	-	31.8	265.4	V
6	* 5.057	49.92	PK	34.5	-28.2	56.22	-	-	74	-17.78	0-360	100	V
	* 5.057	42.80	AD1	34.4	-29.0	48.2	54	-5.80	-	-	56	309	V
7	5.499	45.28	PK	34.8	-21.1	58.98	-	-	68.2	-9.22	0-360	199	V
8	5.725	42.99	PK	35.3	-21.5	56.79	-	-	68.2	-11.41	0-360	199	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

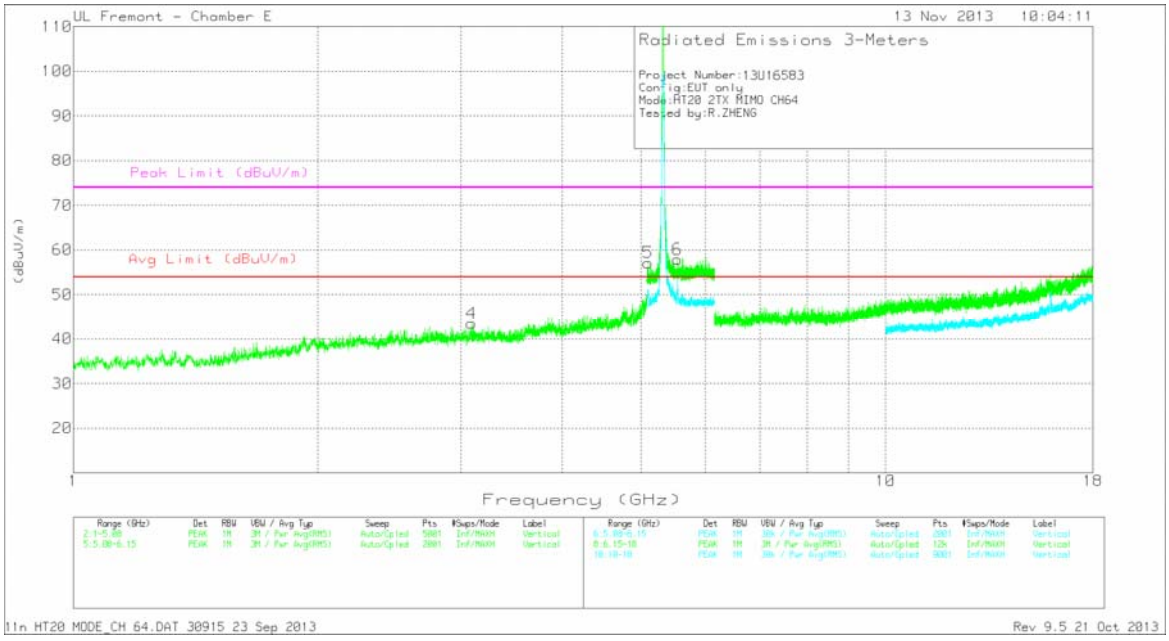
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.288	44.50	PK	32.4	-33.0	43.90	54	-10.10	74.0	-30.10	0-360	199	H
2	7.142	40.90	PK	36	-29.2	47.70	-	-	68.2	-20.50	0-360	100	H
3	7.811	39.44	PK	36.2	-28.0	47.64	-	-	68.2	-20.56	0-360	199	H
4	3.092	42.5	PK	33.3	-32.3	43.50	-	-	68.2	-24.70	0-360	199	V
5	* 5.100	44.25	PK	34.5	-21.6	57.15	-	-	74.0	-16.85	0-360	199	V
	* 5.100	35.38	AD1	34.5	-21.7	48.18	54	-5.82	-	-	103	238	V
6	5.543	43.90	PK	34.9	-20.9	57.90	-	-	68.2	-10.30	0-360	199	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

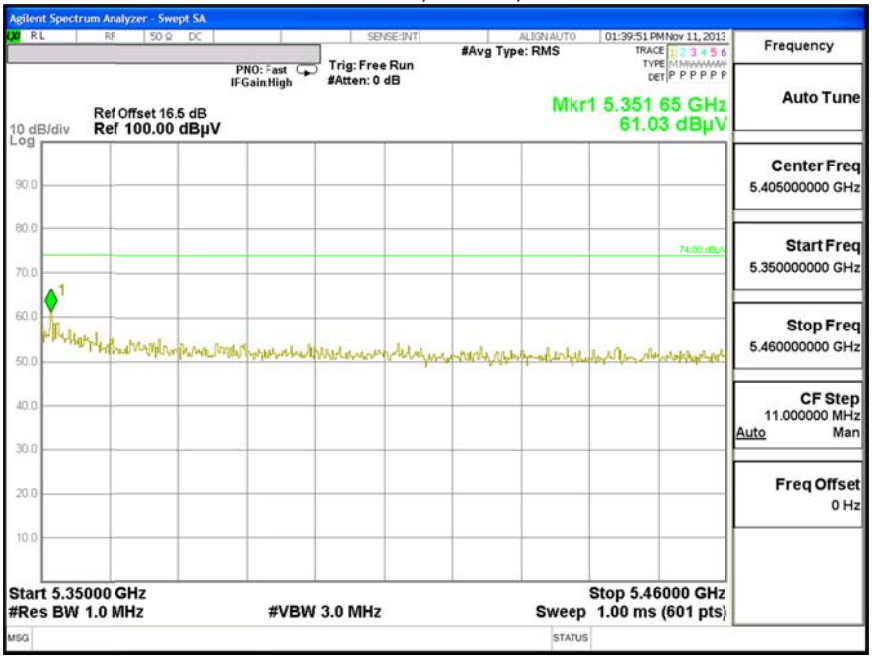
PK - Peak detector

AD1 - KDB 789033 Method: AD Primary Power Average

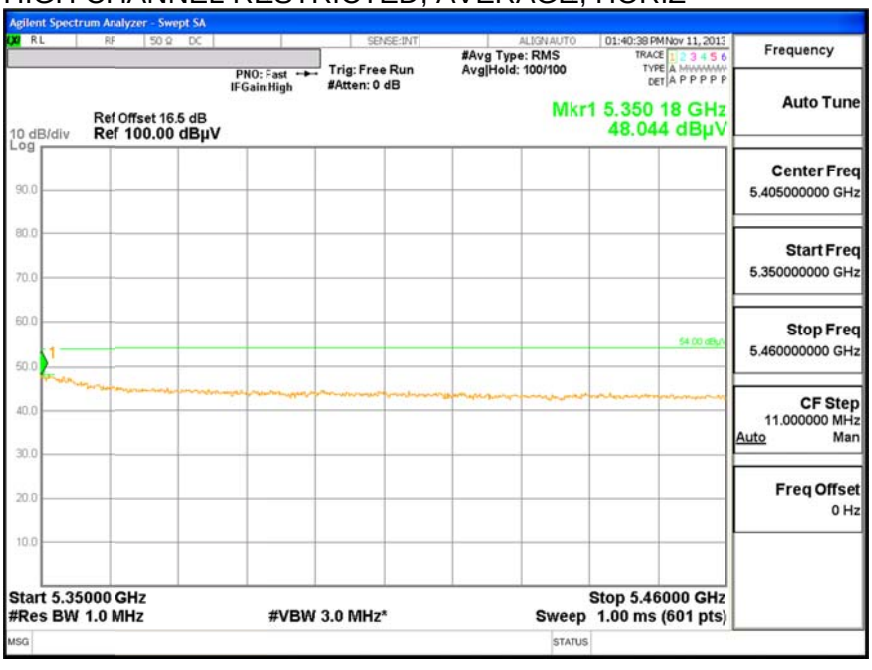
9.2.7. 802.11n HT40 SISO MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

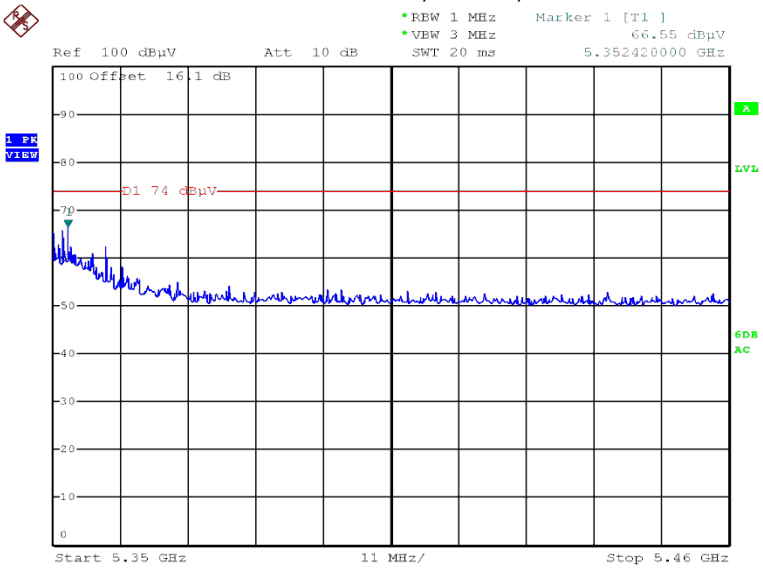
HIGH CHANNEL RESTRICTED, PEAK, HORIZ



HIGH CHANNEL RESTRICTED, AVERAGE, HORIZ



HIGH CHANNEL RESTRICTED, PEAK, VERT



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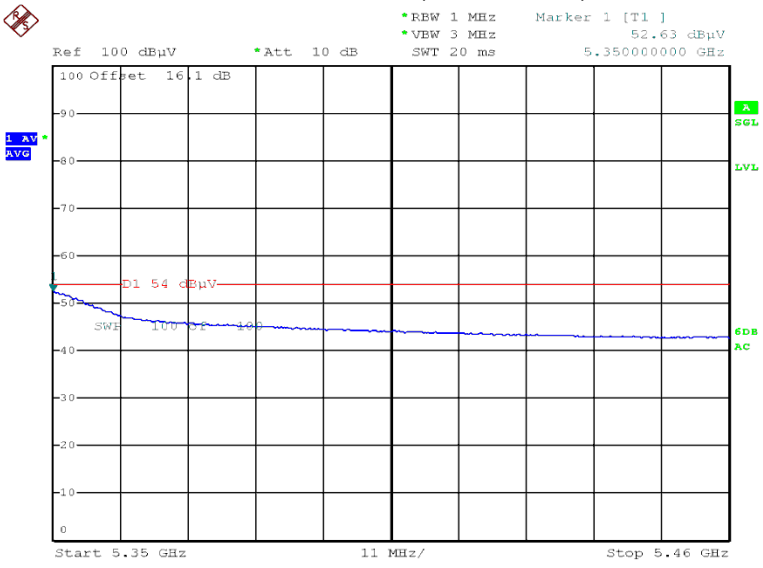
HIGH CHANNEL RESTRICTED, AVERAGE, VERT



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