FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC

MODEL NUMBER: SM-N9008V

FCC ID: A3LSMN9008V

REPORT NUMBER: 13U16263-4, Revision A

ISSUE DATE: NOVEMBER 21, 2013

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
	10/25/13	Initial Issue	P. Kim
A	11/21/13	Update statement in section 11 for the out of band emission; Update the duty cycle factor calculation in page 13; Update section 13 DFS closing time.	P. Kim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	**SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742 SOUTH KOREA**
EUT DESCRIPTION:	**GSM/WCDMA Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC**
MODEL:	**SM-N9008V**
SERIAL NUMBER:	**FK-314-A, FK-314-C, FK-314-D, FK-314-E, FK-314-F & FK-314-G**
DATE TESTED:	**OCTOBER 21-25, 2013**

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.

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UL Verification Services Inc. By:

PHILIP KIM
WiSE PROGRAM MANAGER
UL Verification Services Inc.

Tested By:

CHARLES VERGONIO
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, 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.

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 EUT is a Dual Band phone that also supports BLUETOOTH, WLAN and NFC.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180-5240	802.11a	11.01	12.62
5260-5320	802.11a	10.43	11.04
5500-5700	802.11a	10.59	11.46
5180-5240	802.11n	10.63	11.56
5260-5320	802.11n	10.28	10.67
5500-5700	802.11n	10.48	11.17

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.3dBi

5.4. SOFTWARE AND FIRMWARE

Software version was 3.4.0-1837616-eng.

The firmware used was N9008VZMEBMJ4.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps
802.11n mode: 6 Mbps

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	EP-TA10CBC	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

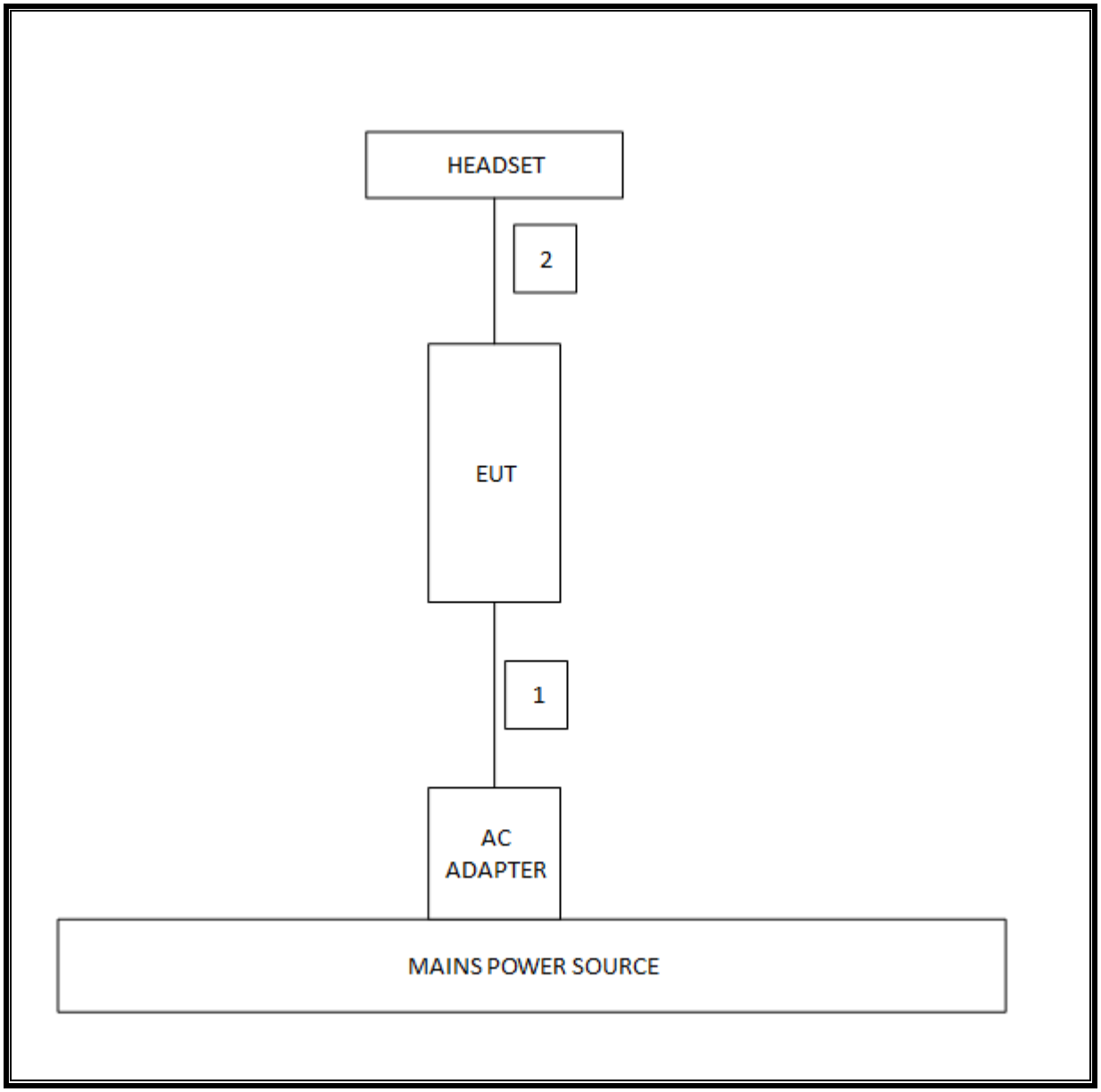
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

TEST SETUP

The EUT is setup as a stand-alone device.

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**	**Asset**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	4/1/2014
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	2/26/2014
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	1/28/2014
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/2014
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	N/A	3/6/2014
Antenna, Horn, 18 GHz	ETS	3117	C01022	2/21/2014
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/2013
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2013
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/2013
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/14
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)	Occupied Band width (26dB)	N/A	Conducted	Pass	21.95MHz
15.407 (a)(1)	TX Cond. Power 5.15-2.25	<17dBm or 4+10Log(OBW)		Pass	11.01dBm
15.407 (a)(2)	TX Cond. Power 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		Pass	10.59dBm
15.407 (a)(5)	PSD	<4dBm		Pass	-0.38dBm
15.407 (a)(6)	Peak Excursion Ratio	13dB		Pass	9.24dB
15.207 (a)	AC Power Line conducted emissions	Section 10	Radiated	Pass	27.99dBuV
15.407 (b) & 15.209	Radiated Spurious Emission / Band edge	< 54dBuV/m		Pass	43.54dBuV/m
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Radiated / Condcuted	Pass	N/A

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

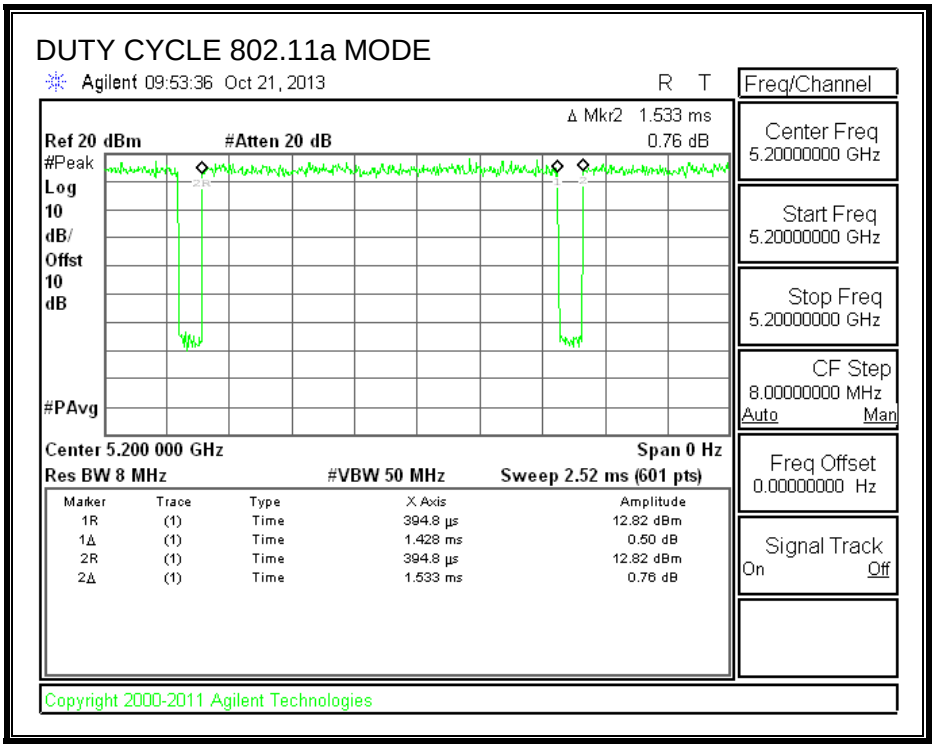
PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

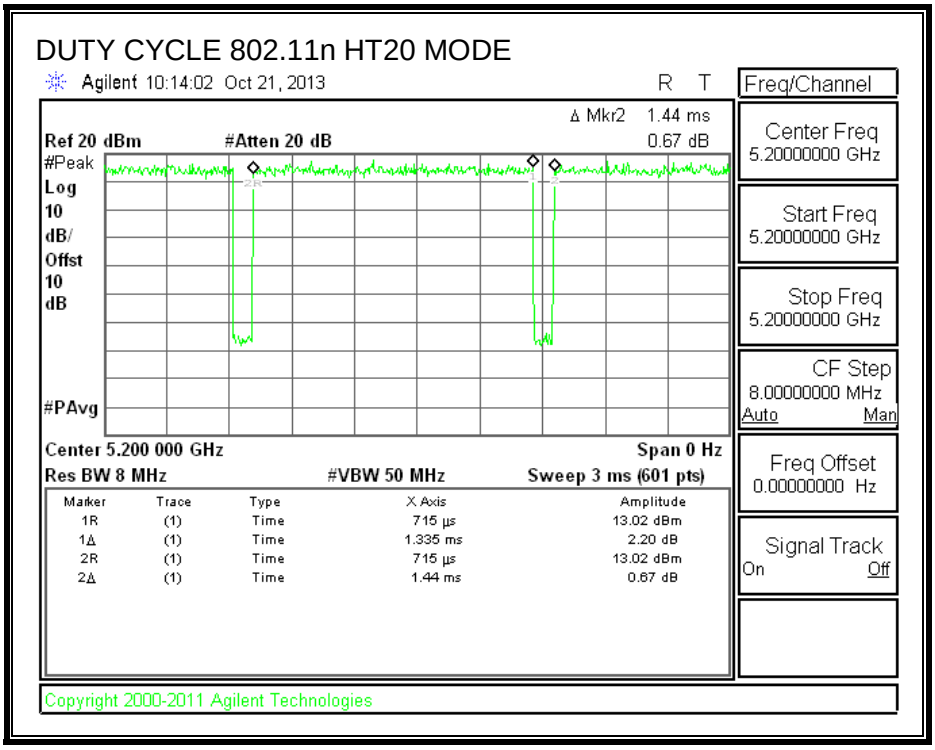
8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11a	1.43	1.53	0.932	93.2%	0.31	0.700
802.11n HT20	1.34	1.44	0.927	92.7%	0.33	0.749

8.2. DUTY CYCLE PLOTS



DUTY CYCLE 802.11n HT20 MODE



9. MEASUREMENT METHOD

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for .power and PPSD

The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.

10. ANTENNA PORT TEST RESULTS

10.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.1.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.60
Mid	5200	21.55
High	5240	21.50
Worst		21.60

10.1.2. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.50
Mid	5300	21.55
High	5320	21.55
Worst		21.55

10.1.3. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.850
Mid	5580	21.950
High	5700	21.850
Worst		21.950

10.1.4. 802.11n MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.95
Mid	5200	21.85
High	5240	21.80
Worst		21.95

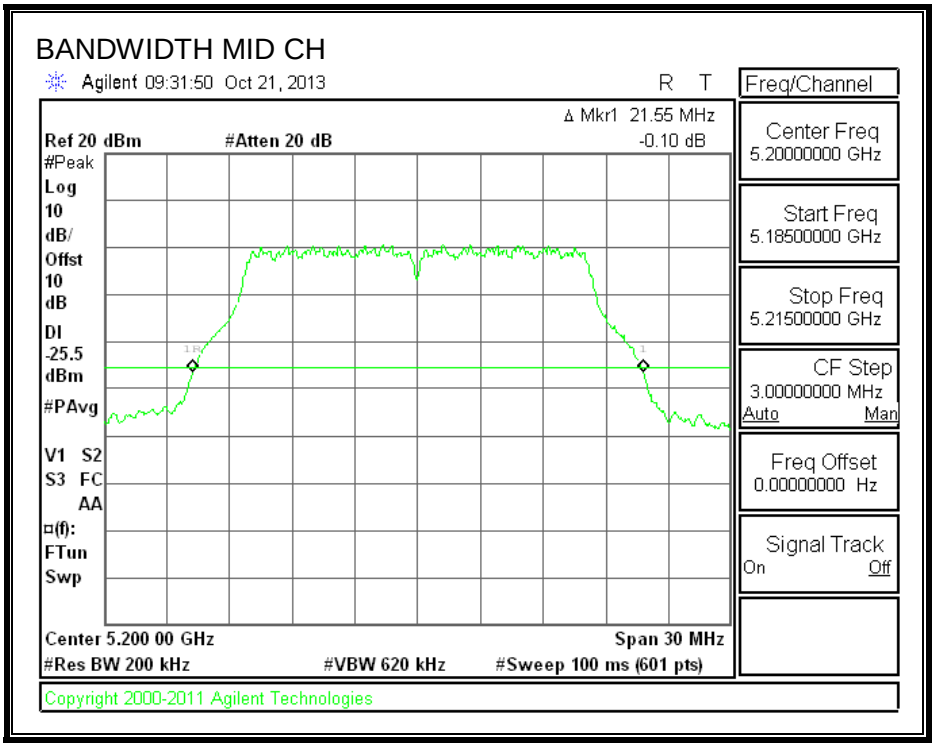
10.1.5. 802.11n MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.00
Mid	5300	21.95
High	5320	21.70
Worst		22.00

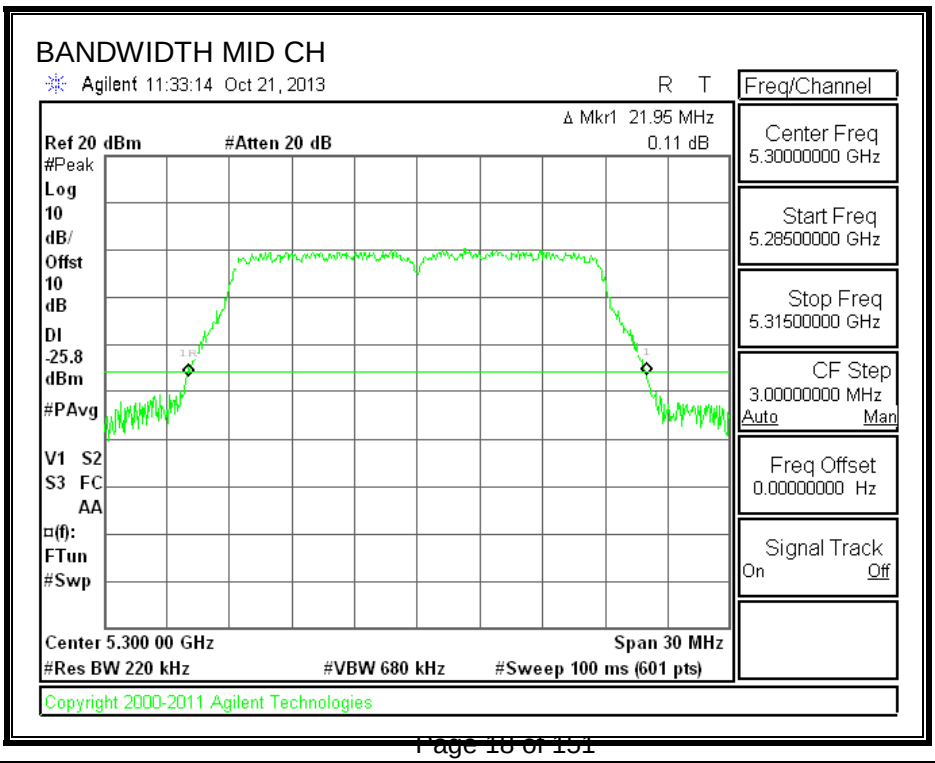
10.1.6. 802.11n MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.850
Mid	5580	21.950
High	5700	21.850
Worst		21.950

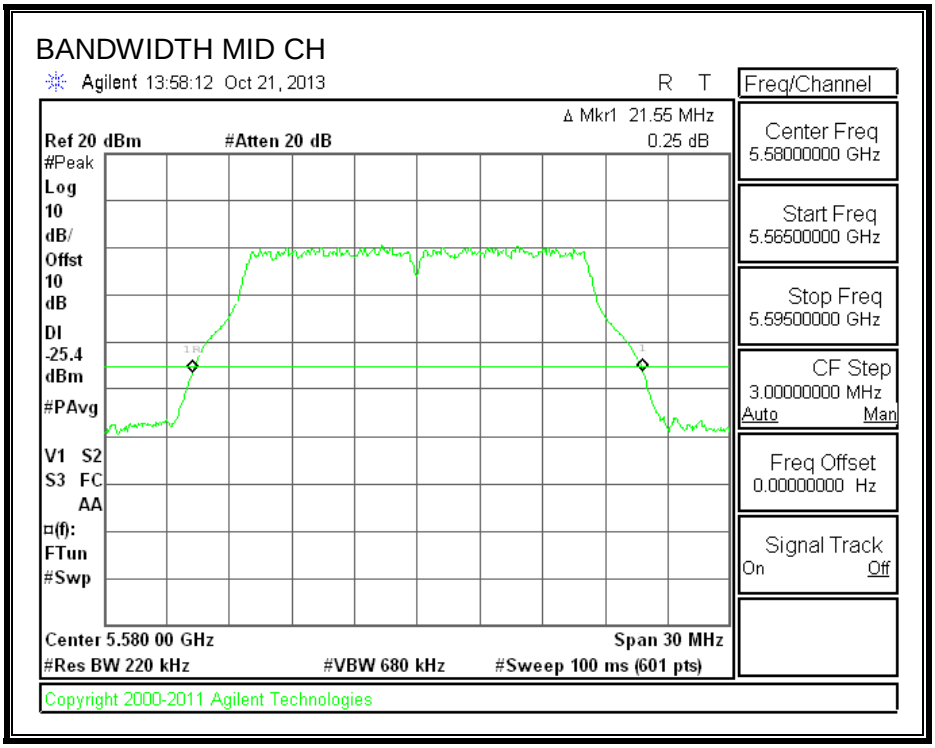
802.11a 5.2G 26 dB BANDWIDTH



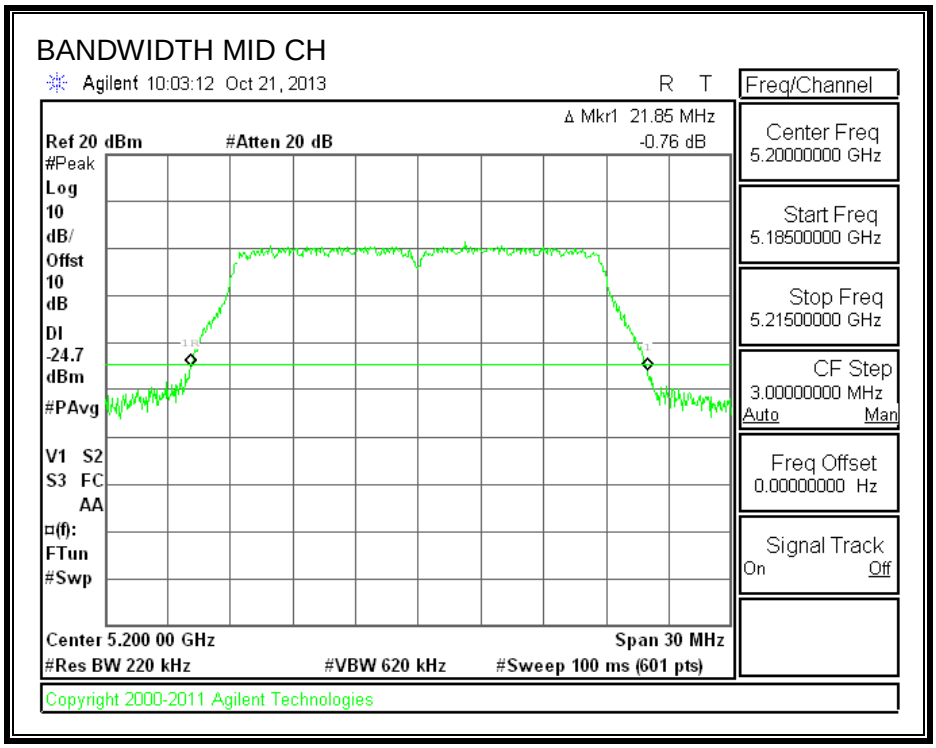
802.11a 5.3G 26 dB BANDWIDTH



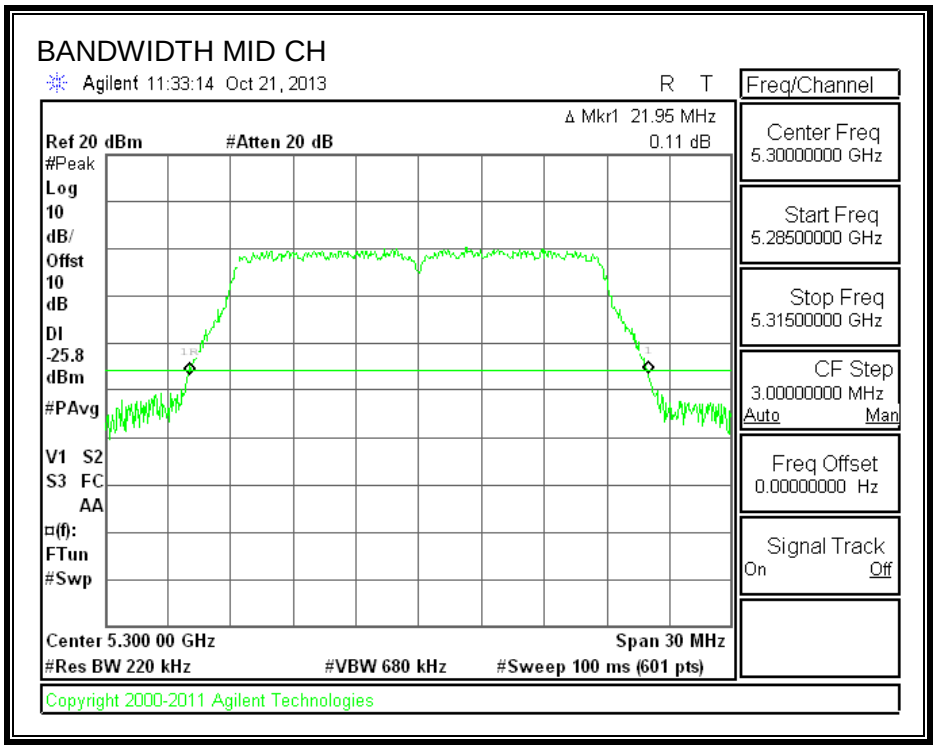
802.11a 5.5G 26 dB BANDWIDTH



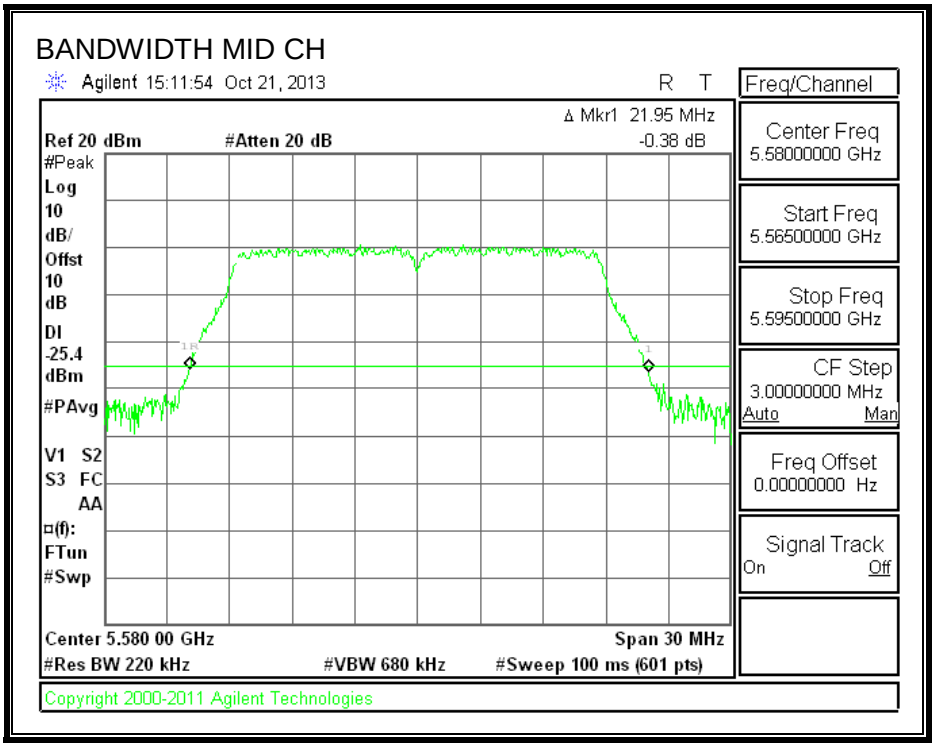
802.11n 5.2G 26 dB BANDWIDTH



802.11n 5.3G 26 dB BANDWIDTH



802.11n 5.5G 26 dB BANDWIDTH



10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.69
Mid	5200	16.68
High	5240	16.68
Worst		16.69

10.2.2. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.10
Mid	5300	17.11
High	5320	17.12
Worst		17.12

10.2.3. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.755
Mid	5580	16.741
High	5700	16.744
Worst		16.755

10.2.1. 802.11n MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.73
Mid	5200	17.72
High	5240	17.72
Worst		17.73

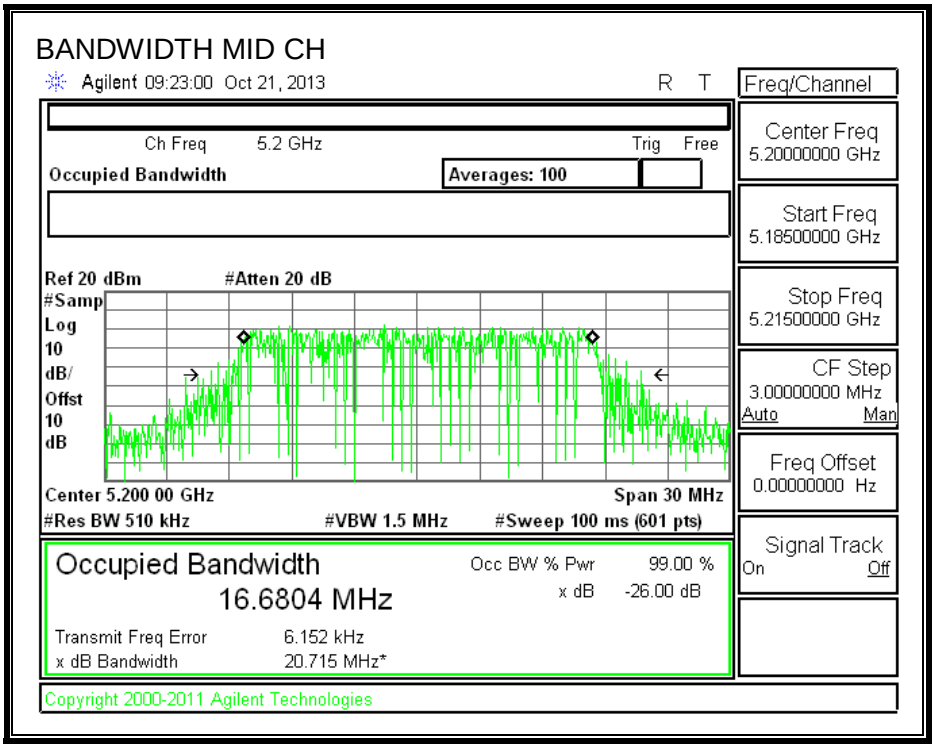
10.2.2. 802.11n MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	18.16
Mid	5300	18.19
High	5320	18.19
Worst		18.19

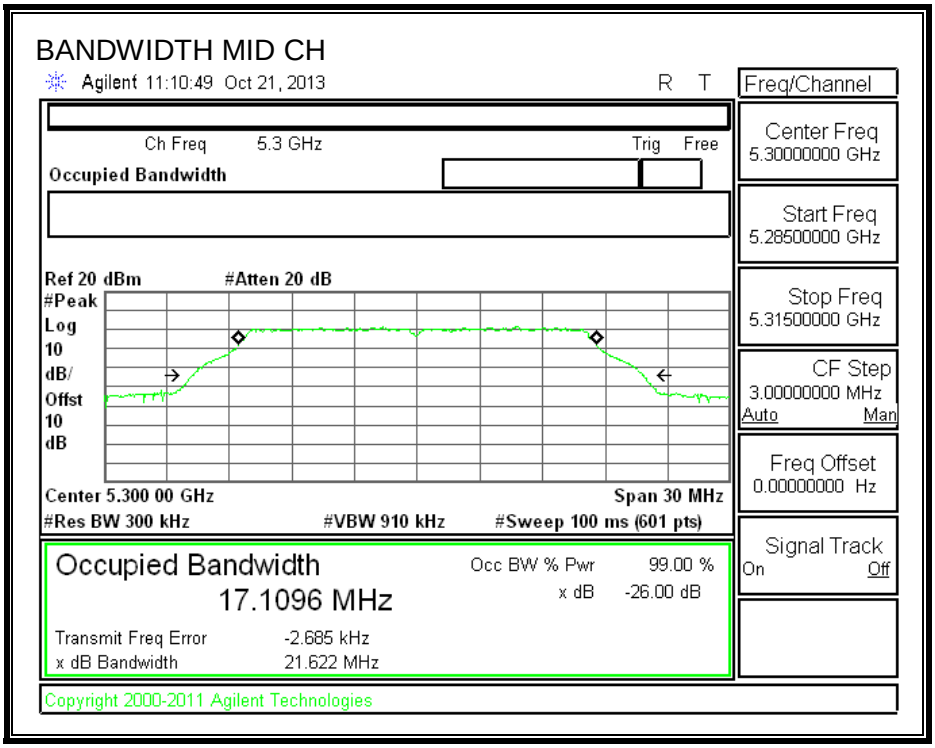
10.2.3. 802.11n MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.890
Mid	5580	17.891
High	5700	17.887
Worst		17.891

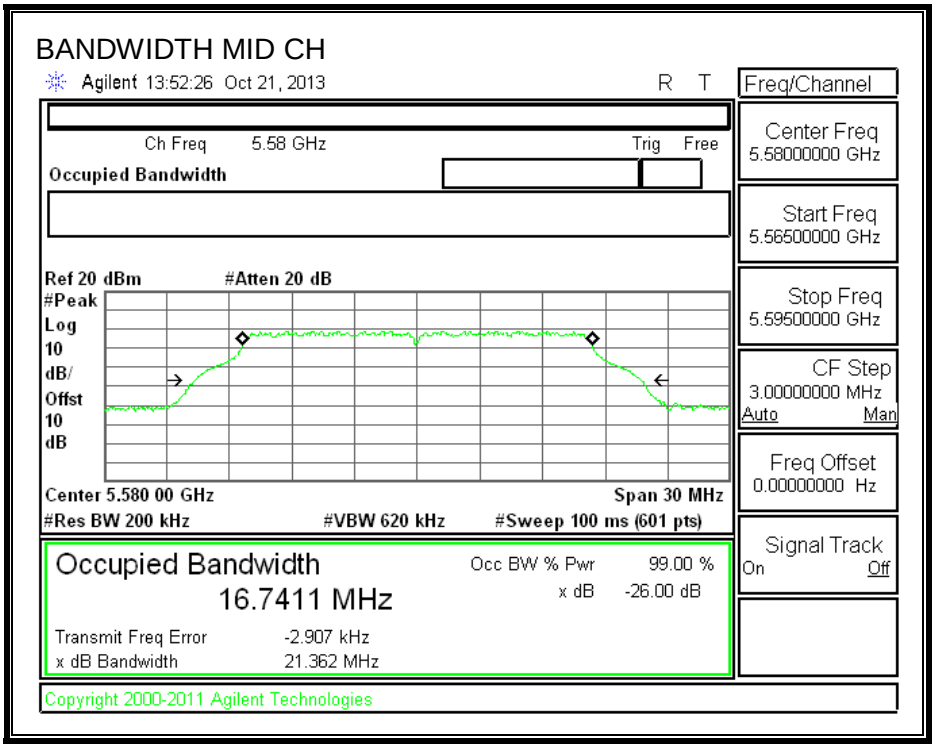
802.11a 5.2G 99% BANDWIDTH



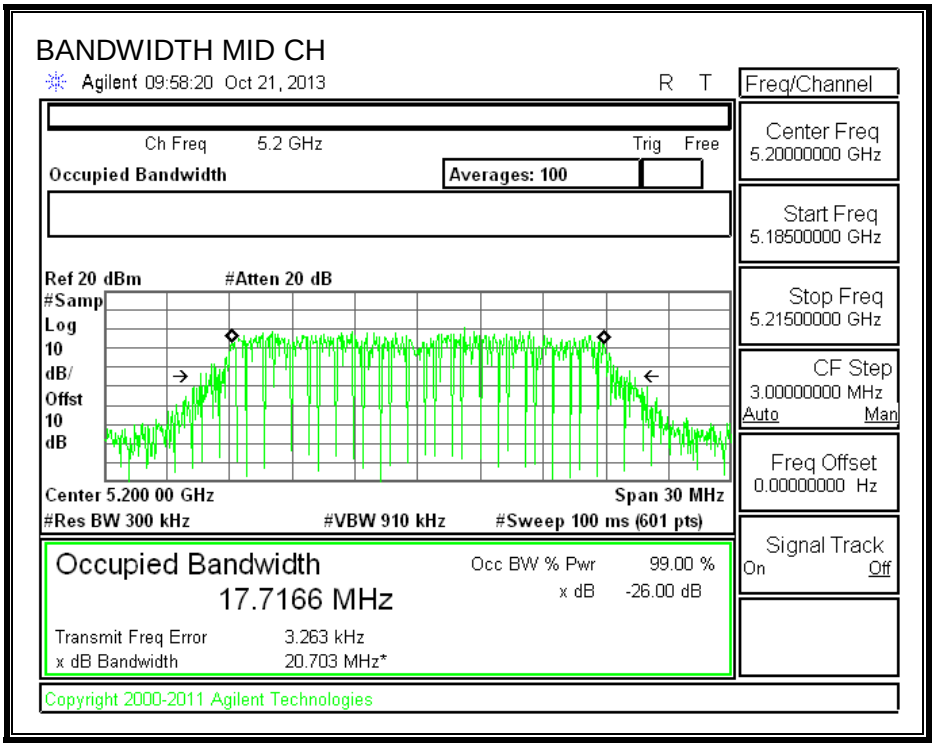
802.11a 5.3G 99% BANDWIDTH



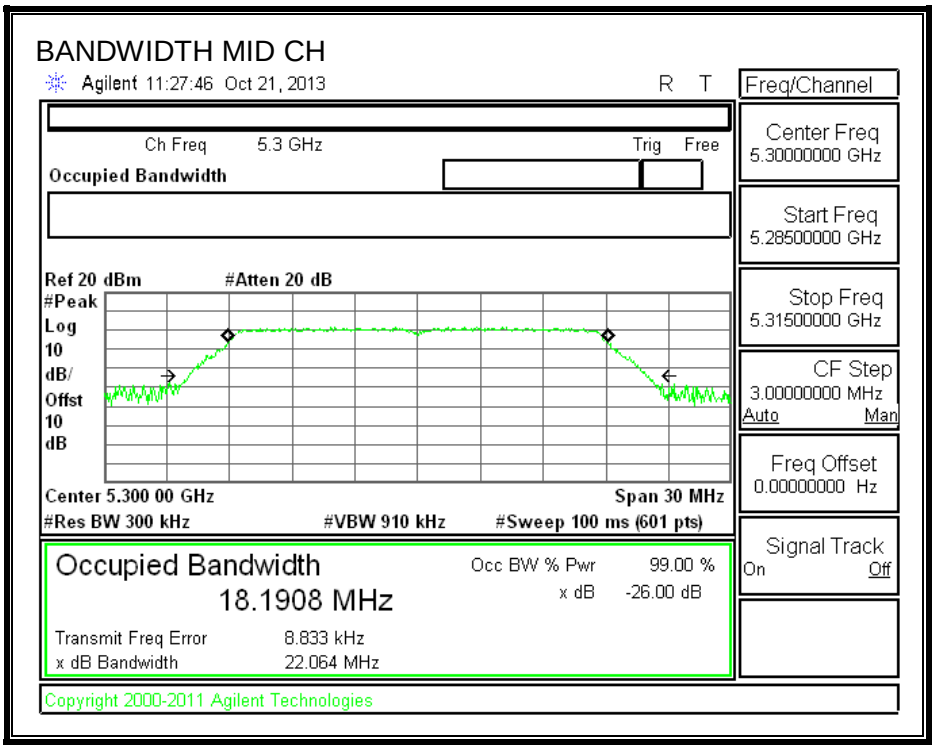
802.11a 5.5G 99% BANDWIDTH



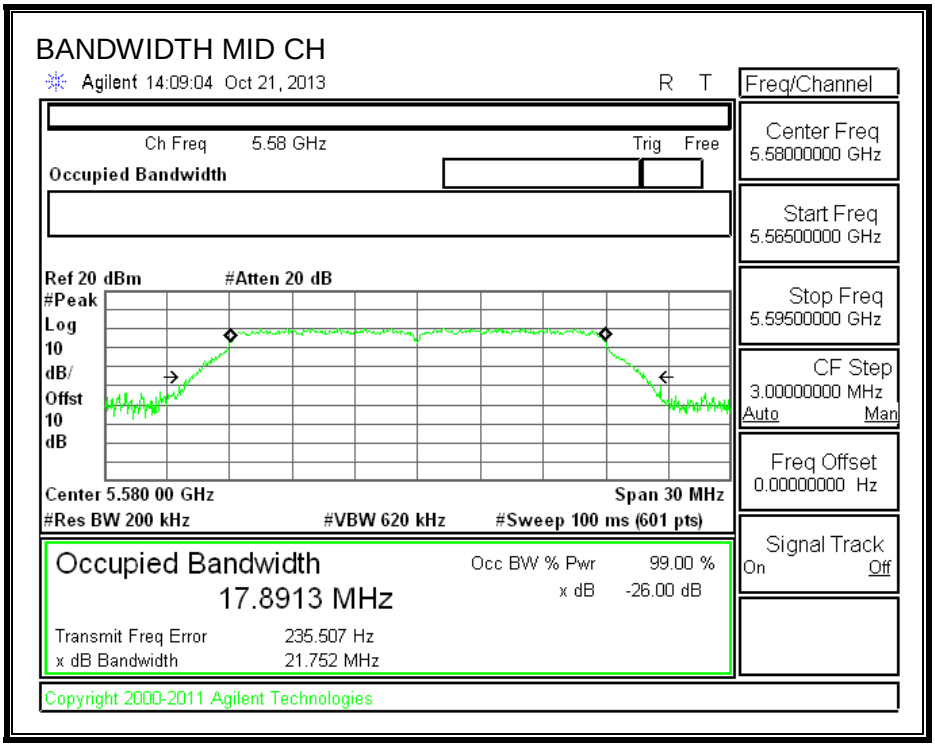
802.11n 5.2G 99% BANDWIDTH



802.11n 5.3G 99% BANDWIDTH



802.11n 5.5G 99% BANDWIDTH



10.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10 dB (including 10 dB pad) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

10.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	10.40
Mid	5200	10.27
High	5240	10.03
Worst		10.40

10.3.2. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	9.80
Mid	5300	9.65
High	5320	9.60
Worst		9.80

10.3.3. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	9.650
Mid	5580	9.450
High	5700	9.200
Worst		9.650

10.3.1. 802.11n MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	9.45
Mid	5200	9.80
High	5240	10.00
Worst		10.00

10.3.2. 802.11n MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	9.75
Mid	5300	9.60
High	5320	9.60
Worst		9.75

10.3.3. 802.11n MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	9.600
Mid	5580	9.800
High	5700	10.000
Worst		10.000

10.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

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

Test Methodology

FCC KDB 644545 D02(Alternative Guidance for 802 11ac V01) was followed to test 5.8GHz DTS band under UNII band.

RESULTS

10.4.1. 802.11a MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.60	16.69	-3.20
Mid	5200	21.55	16.68	-3.20
High	5240	21.50	16.68	-3.20

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	17.00	22.22	25.42	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.22	25.42	17.00	4.00	10.00	4.00
High	5240	17.00	22.22	25.42	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.31	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.697	11.01	17.00	-5.99
Mid	5200	10.498	10.81	17.00	-6.19
High	5240	10.350	10.66	17.00	-6.34

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.690	-0.38	4.00	-4.38
Mid	5200	-0.810	-0.50	4.00	-4.50
High	5240	-1.030	-0.72	4.00	-4.72

10.4.2. 802.11a MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	21.50	17.10	-1.30
Mid	5300	21.55	17.11	-1.30
High	5320	21.55	17.12	-1.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.33	29.33	23.33	11.00	11.00	11.00
Mid	5300	24.00	23.33	29.33	23.33	11.00	11.00	11.00
High	5320	24.00	23.33	29.33	23.33	11.00	11.00	11.00

Duty Cycle CF (dB)	0.31	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	10.118	10.43	23.33	-12.90
Mid	5300	9.898	10.21	23.33	-13.12
High	5320	9.833	10.14	23.33	-13.19

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	-1.140	-0.83	11.00	-11.83
Mid	5300	-1.350	-1.04	11.00	-12.04
High	5320	-1.380	-1.07	11.00	-12.07

10.4.3. 802.11a MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.60	16.76	-1.40
Mid	5580	21.55	16.74	-1.40
High	5700	21.65	16.74	-1.40

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.24	29.24	23.24	11.00	11.00	11.00
Mid	5580	24.00	23.24	29.24	23.24	11.00	11.00	11.00
High	5700	24.00	23.24	29.24	23.24	11.00	11.00	11.00

Duty Cycle CF (dB)	0.31	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	9.904	10.21	23.24	-13.03
Mid	5580	10.099	10.41	23.24	-12.83
High	5700	10.279	10.59	23.24	-12.65

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-1.440	-1.13	11.00	-12.13
Mid	5580	-1.080	-0.77	11.00	-11.77
High	5700	-1.010	-0.70	11.00	-11.70

10.4.4. 802.11n MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	21.95	17.73	-3.20
Mid	5200	21.85	17.72	-3.20
High	5240	21.80	17.72	-3.20

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	17.00	22.49	25.69	17.00	4.00	10.00	4.00
Mid	5200	17.00	22.48	25.68	17.00	4.00	10.00	4.00
High	5240	17.00	22.48	25.68	17.00	4.00	10.00	4.00

Duty Cycle CF (dB)	0.33	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.629	10.96	17.00	-6.04
Mid	5200	10.500	10.83	17.00	-6.17
High	5240	10.367	10.70	17.00	-6.30

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.810	-0.48	4.00	-4.48
Mid	5200	-1.130	-0.80	4.00	-4.80
High	5240	-1.100	-0.77	4.00	-4.77

10.4.5. 802.11n MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	22.00	18.16	-1.30
Mid	5300	21.95	18.19	-1.30
High	5320	21.70	18.18	-1.30

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.59	29.59	23.59	11.00	11.00	11.00
Mid	5300	24.00	23.60	29.60	23.60	11.00	11.00	11.00
High	5320	24.00	23.60	29.60	23.60	11.00	11.00	11.00

Duty Cycle CF (dB)	0.33	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	9.952	10.28	23.59	-13.31
Mid	5300	9.798	10.13	23.60	-13.47
High	5320	9.930	10.26	23.60	-13.34

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	-1.620	-1.29	11.00	-12.29
Mid	5300	-1.850	-1.52	11.00	-12.52
High	5320	-1.530	-1.20	11.00	-12.20

10.4.6. 802.11n MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	21.85	17.89	-1.40
Mid	5580	21.95	17.89	-1.40
High	5700	21.85	17.89	-1.40

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.53	29.53	23.53	11.00	11.00	11.00
Mid	5580	24.00	23.53	29.53	23.53	11.00	11.00	11.00
High	5700	24.00	23.53	29.53	23.53	11.00	11.00	11.00

Duty Cycle CF (dB)	0.33	Included in Calculations of Corr'd Power & PPSD

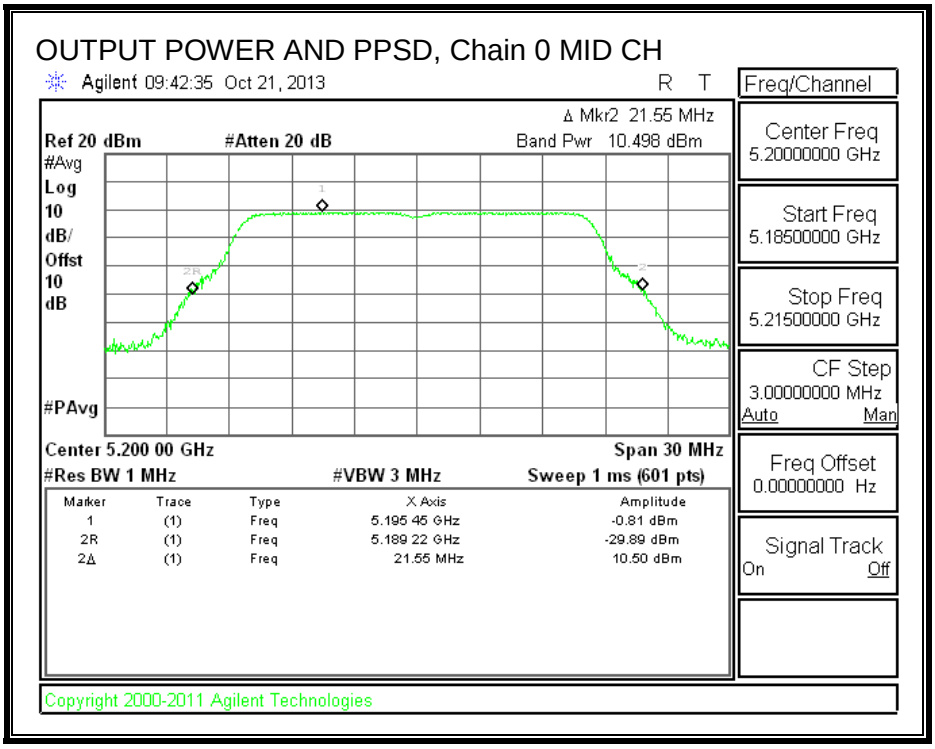
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	9.923	10.25	23.53	-13.27
Mid	5580	10.075	10.41	23.53	-13.12
High	5700	10.151	10.48	23.53	-13.04

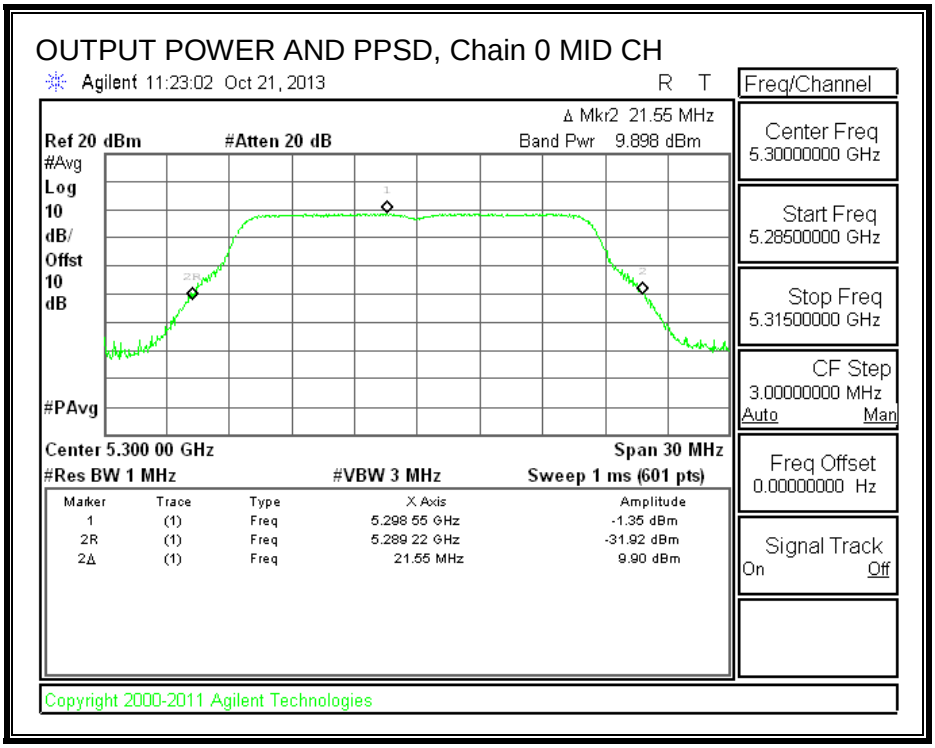
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-1.490	-1.16	11.00	-12.16
Mid	5580	-1.550	-1.22	11.00	-12.22
High	5700	-1.530	-1.20	11.00	-12.20

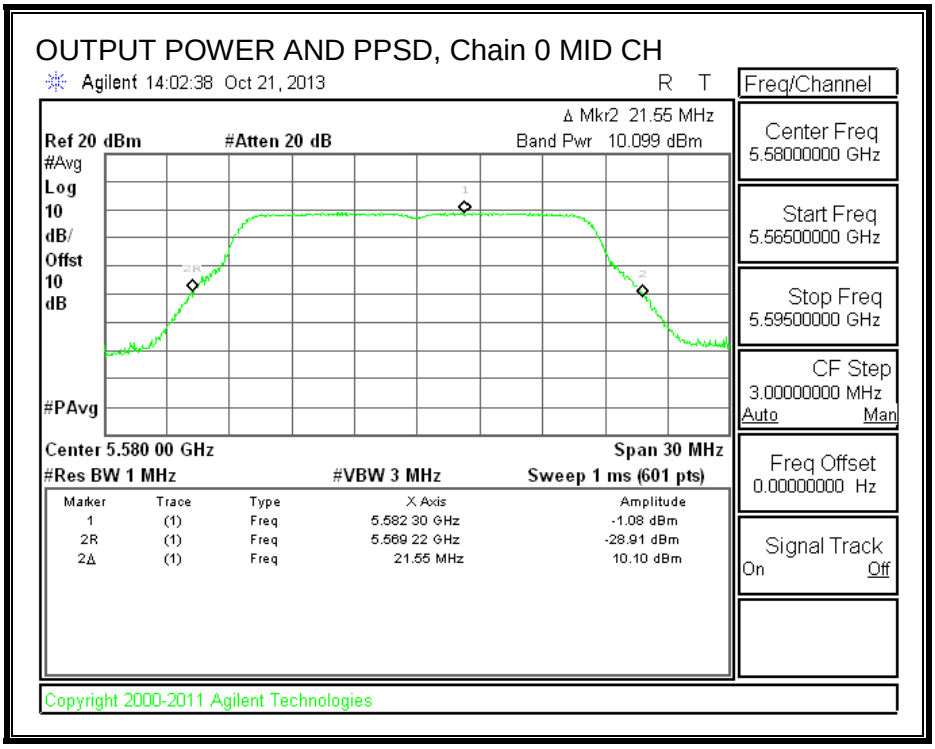
802.11a 5.2G OUTPUT POWER AND PPSD, Chain 0



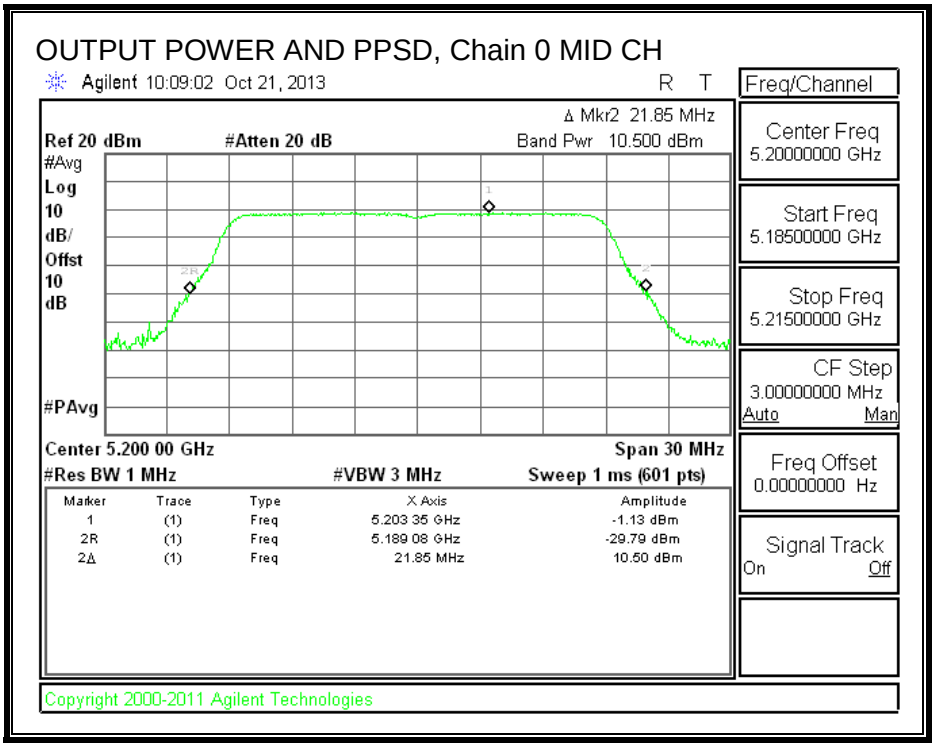
802.11a 5.3G OUTPUT POWER AND PPSD, Chain 0



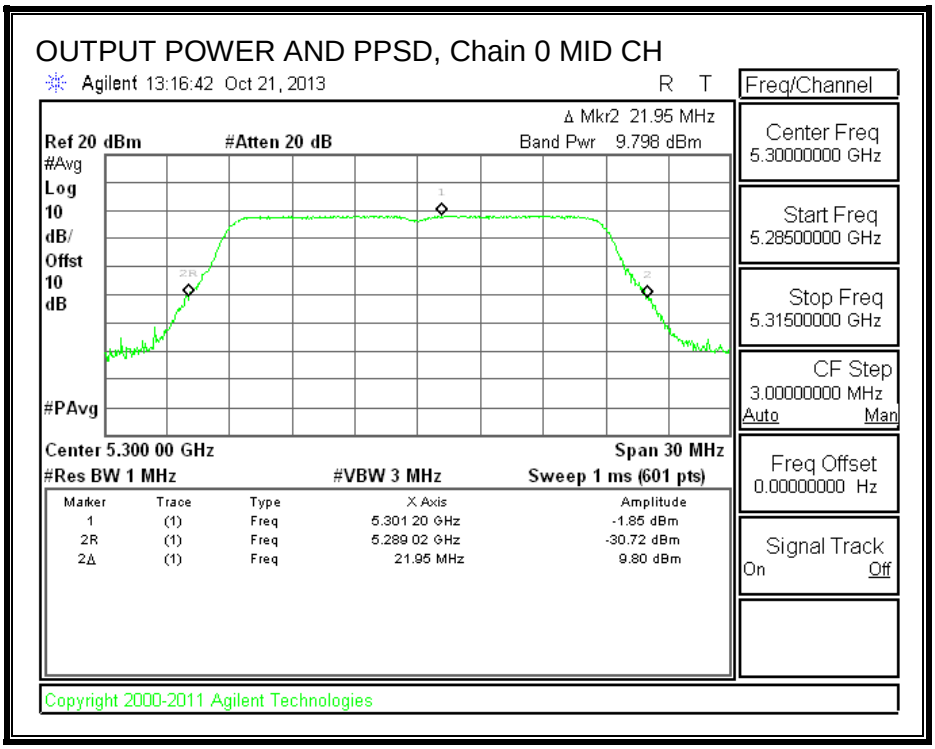
802.11a 5.5G OUTPUT POWER AND PPSD, Chain 0



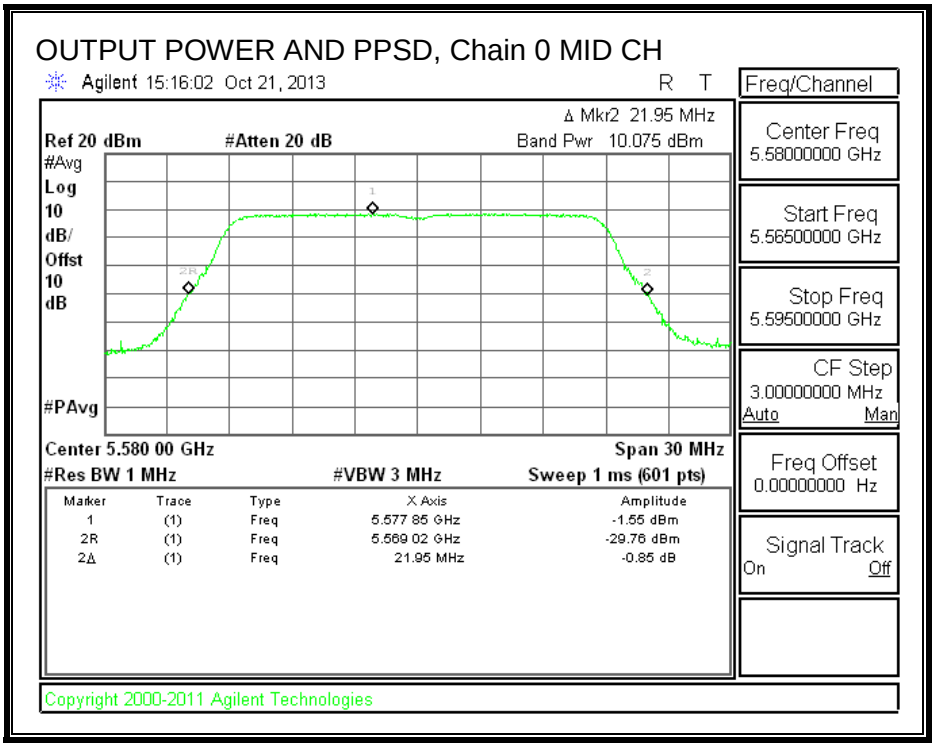
802.11n 5.2G OUTPUT POWER AND PPSD, Chain 0



802.11n 5.3G OUTPUT POWER AND PPSD, Chain 0



802.11n 5.5G OUTPUT POWER AND PPSD, Chain 0



10.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

10.5.1. 802.11a MODE IN THE 5.2 GHz BAND

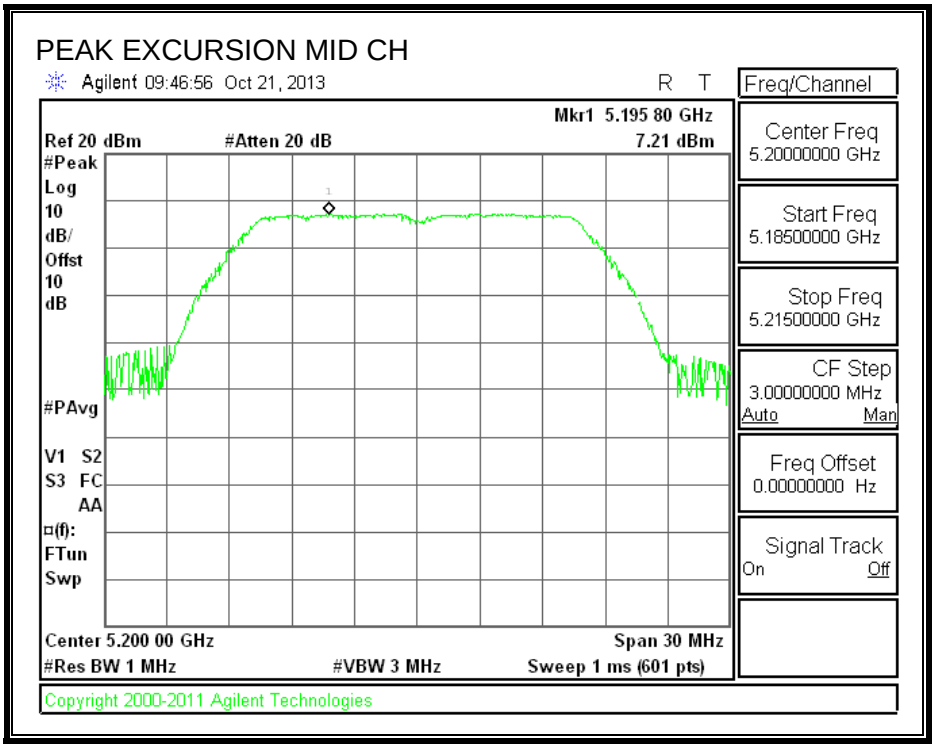
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	7.210	-0.50	0.31	7.40	13	-5.60

10.5.2. 802.11n MODE IN THE 5.2 GHz BAND

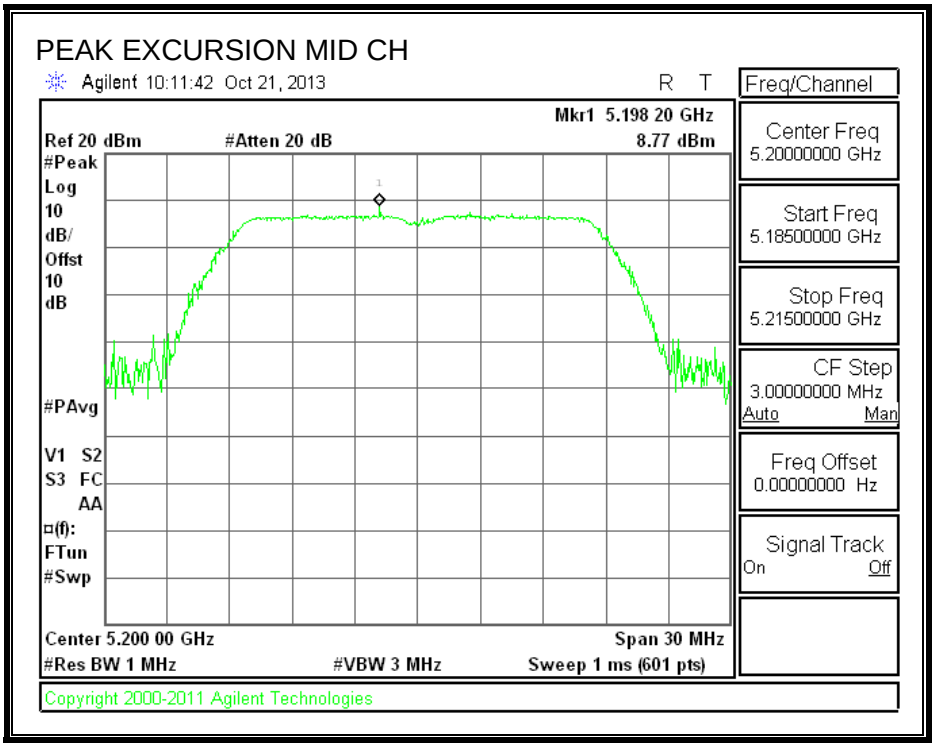
Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5200	8.770	-0.80	0.33	9.24	13	-3.76

PEAK EXCURSION

802.11 a MODE IN THE 5.2 GHz BAND



802.11 n MODE IN THE 5.2 GHz BAND



11. TRANSMITTER ABOVE 1 GHz

11.1. 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.

Reference to KDB 789033 UNII part H) 6) d) Method VB:
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and reduce the VBW to 1/T 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.

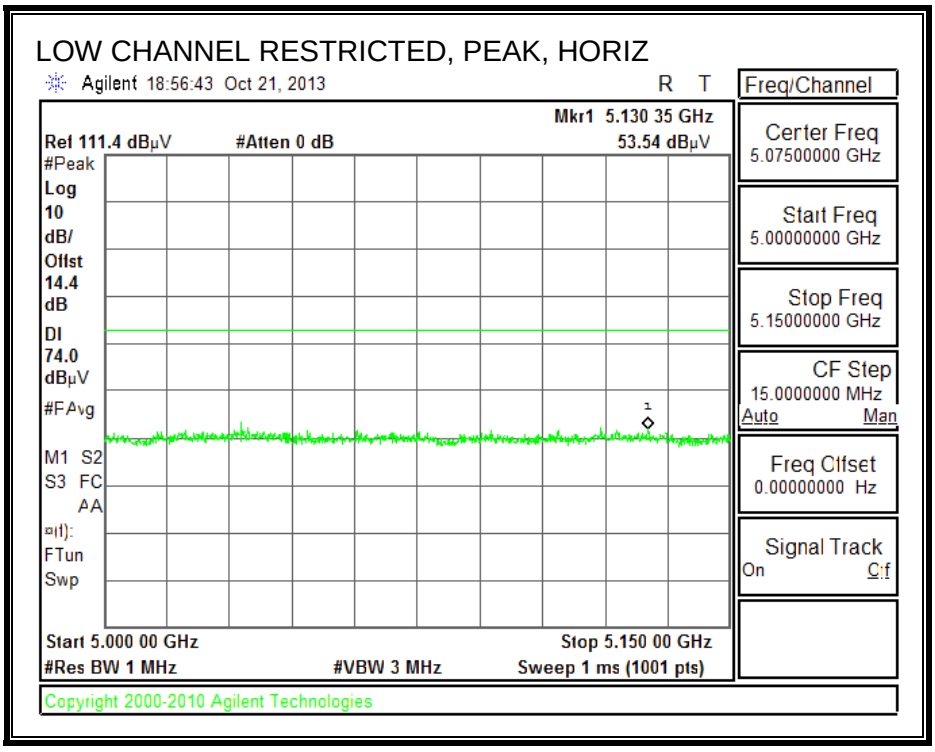
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

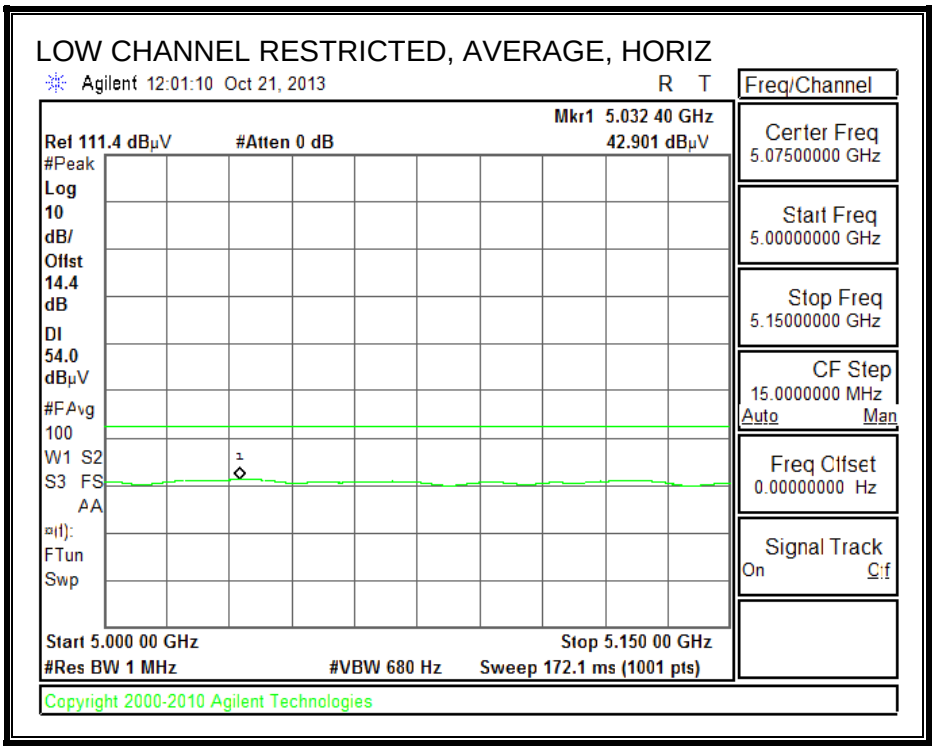
Note: 15.407(b) require the out of band emission EIRP lower than -27dBm/MHz which is 68.23dBuV/meter at 3meter. The following band edge test using the restrict band result showing the peak result all compliance with the -27dBm/MHz requirement.

11.2. 5.2 GHz

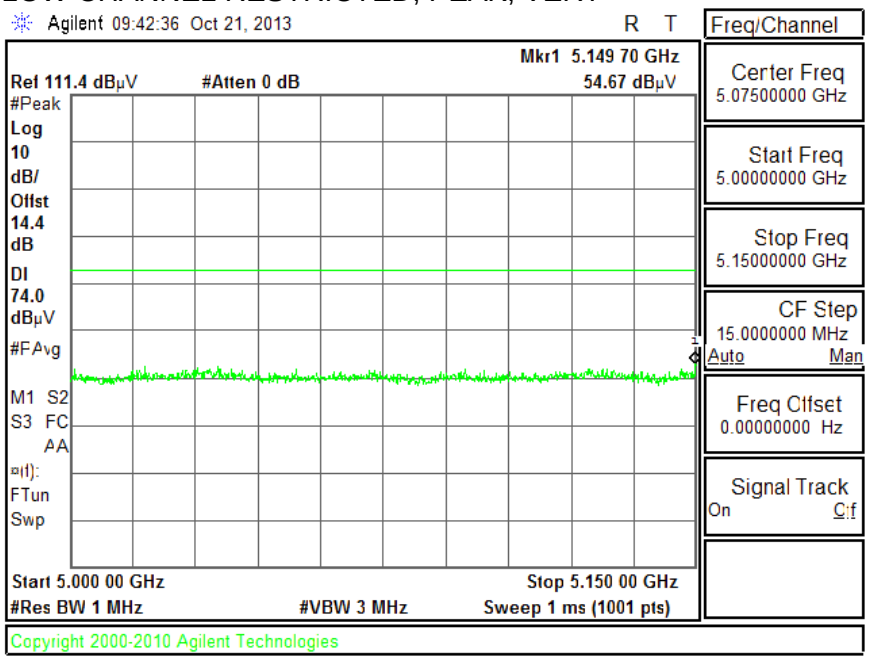
11.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

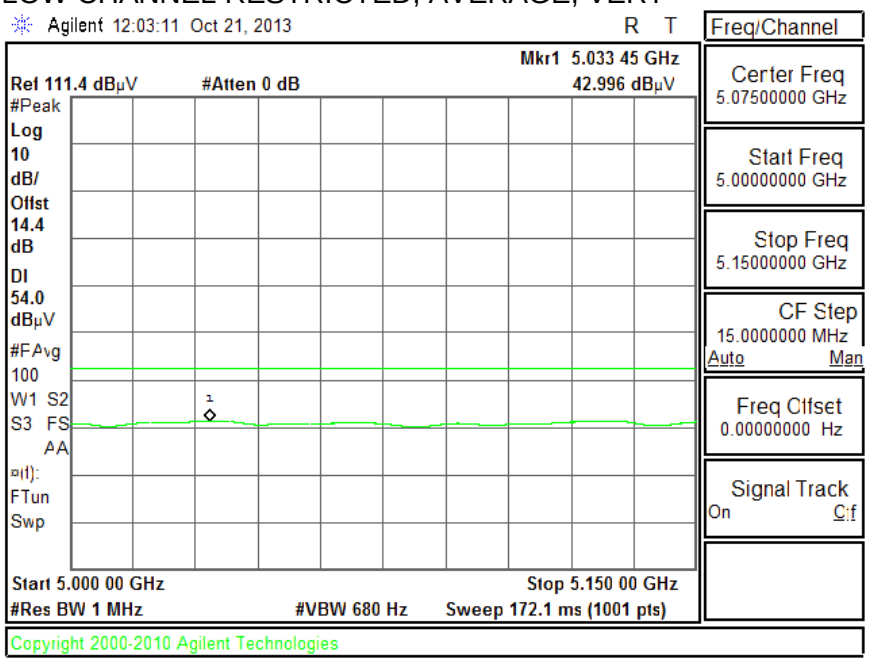




LOW CHANNEL RESTRICTED, PEAK, VERT

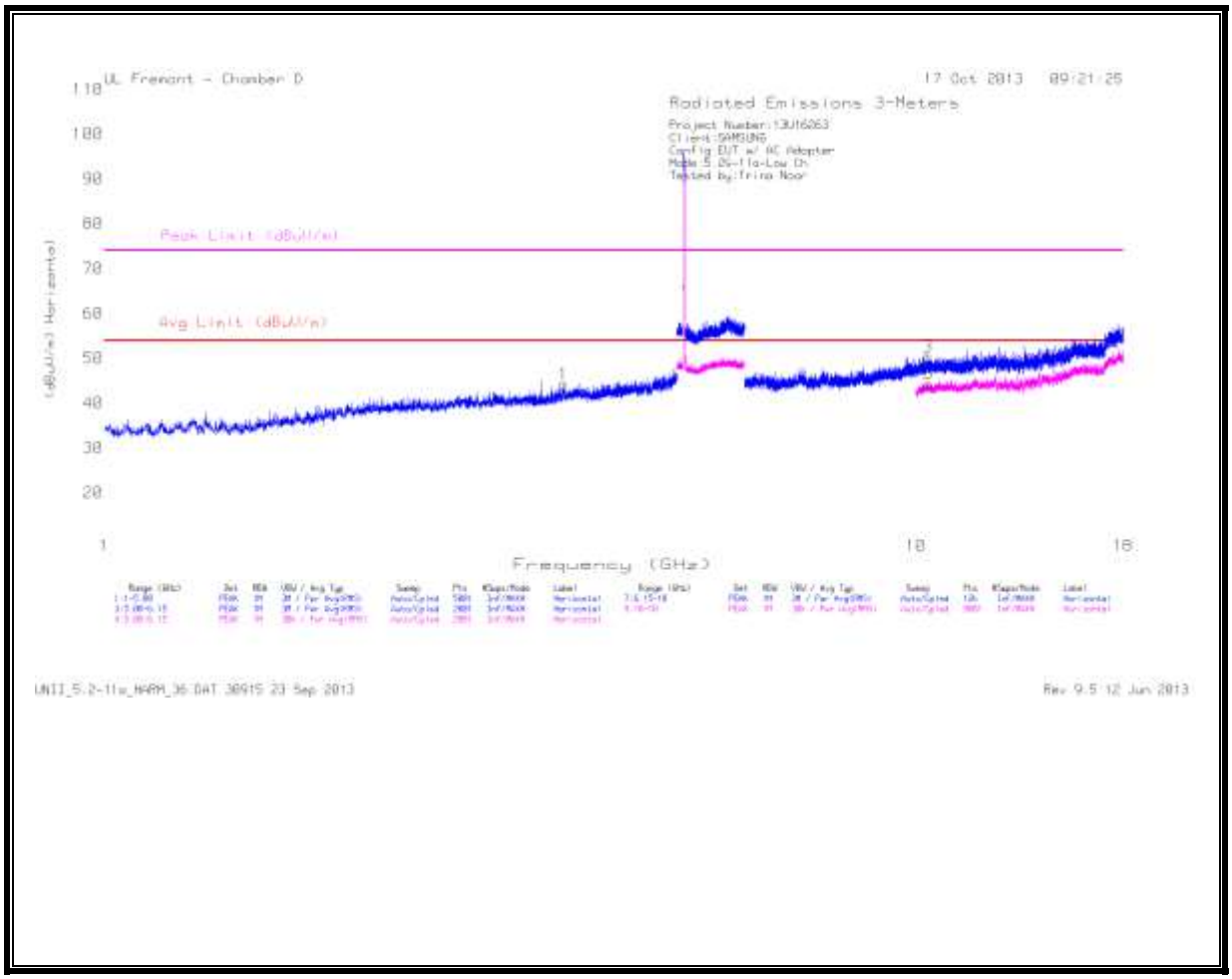


LOW CHANNEL RESTRICTED, AVERAGE, VERT

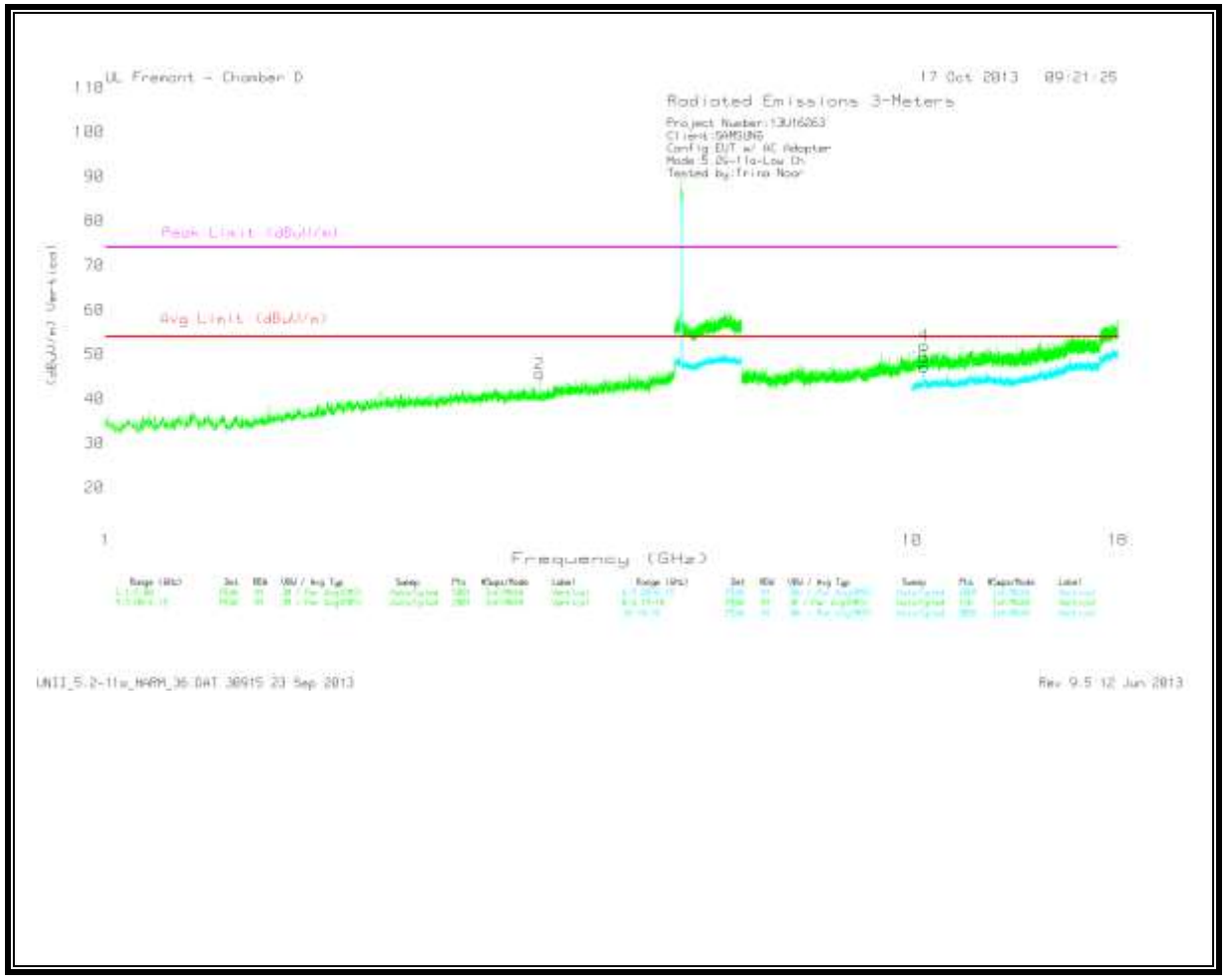


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



VERTICAL

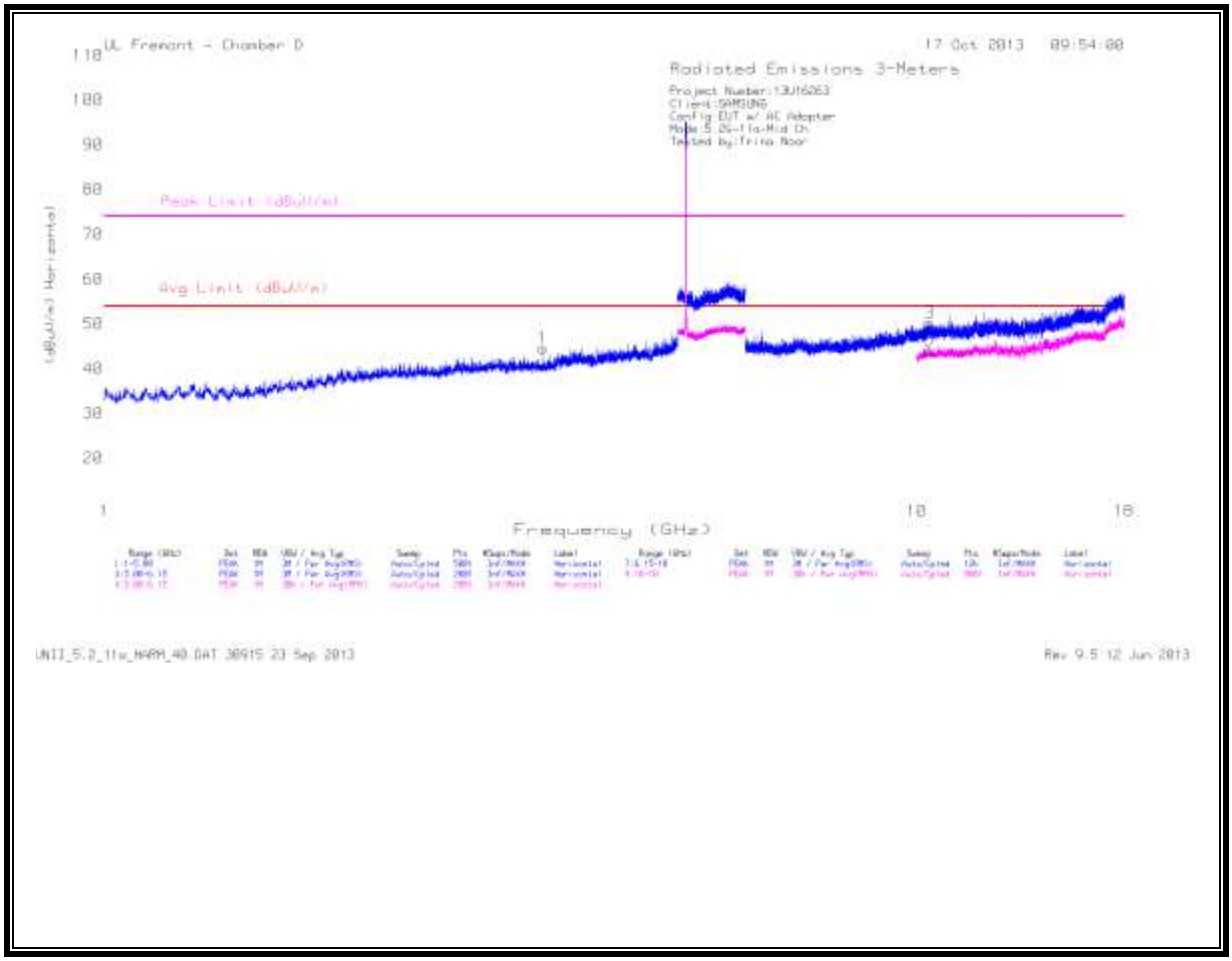


LOW CHANNEL DATA

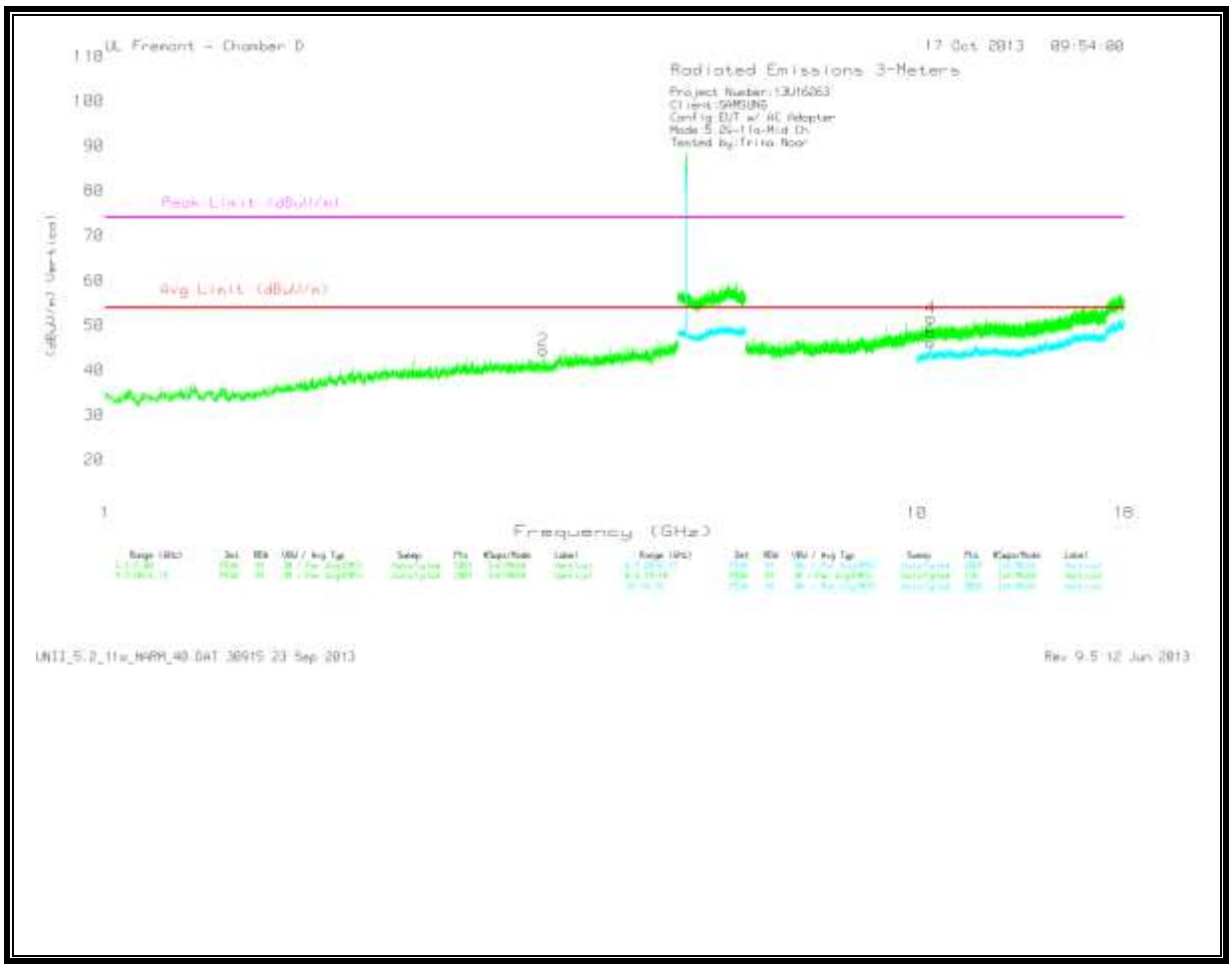
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.681	39.46	PK	33.7	-29	44.16	53.97	-9.81	74	-29.84	0-360	200	H
2	3.454	41.9	PK	33.3	-29.6	45.6	53.97	-8.37	74	-28.4	0-360	200	V
3	10.349	34.07	PK	38.2	-21.9	50.37	53.97	-3.6	74	-23.63	0-360	200	H
4	10.351	35.73	PK	38.2	-22	51.93	53.97	-2.04	74	-22.07	0-360	100	V
5	10.357	28.14	PK	38.2	-22.1	44.24	53.97	-9.73	74	-29.76	0-360	201	H
6	10.354	30.98	PK	38.2	-22	47.18	53.97	-6.79	74	-26.82	0-360	100	V

PK - Peak detector
UNII_5.2-11a_HARM_36.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



VERTICAL

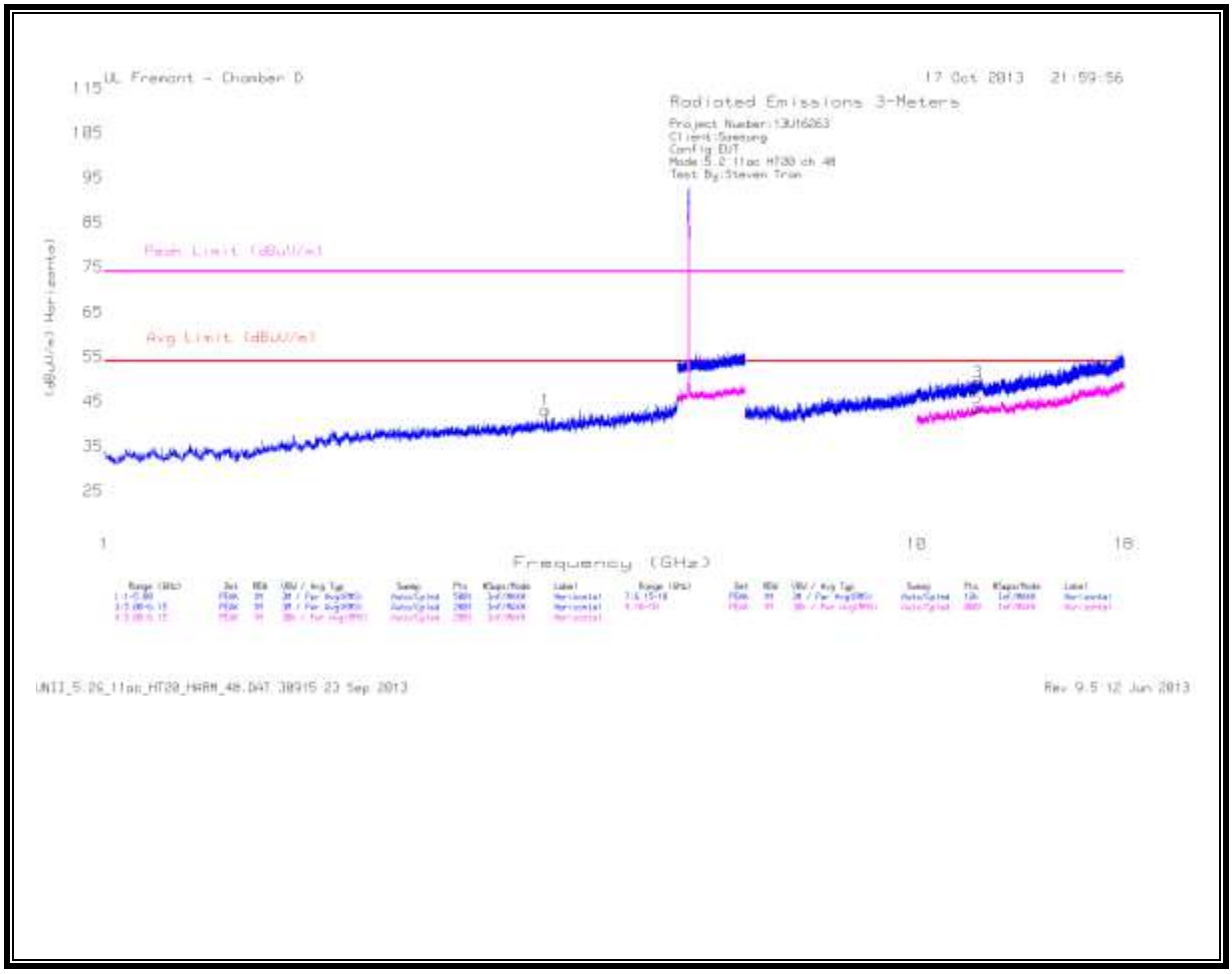


MID CHANNEL DATA

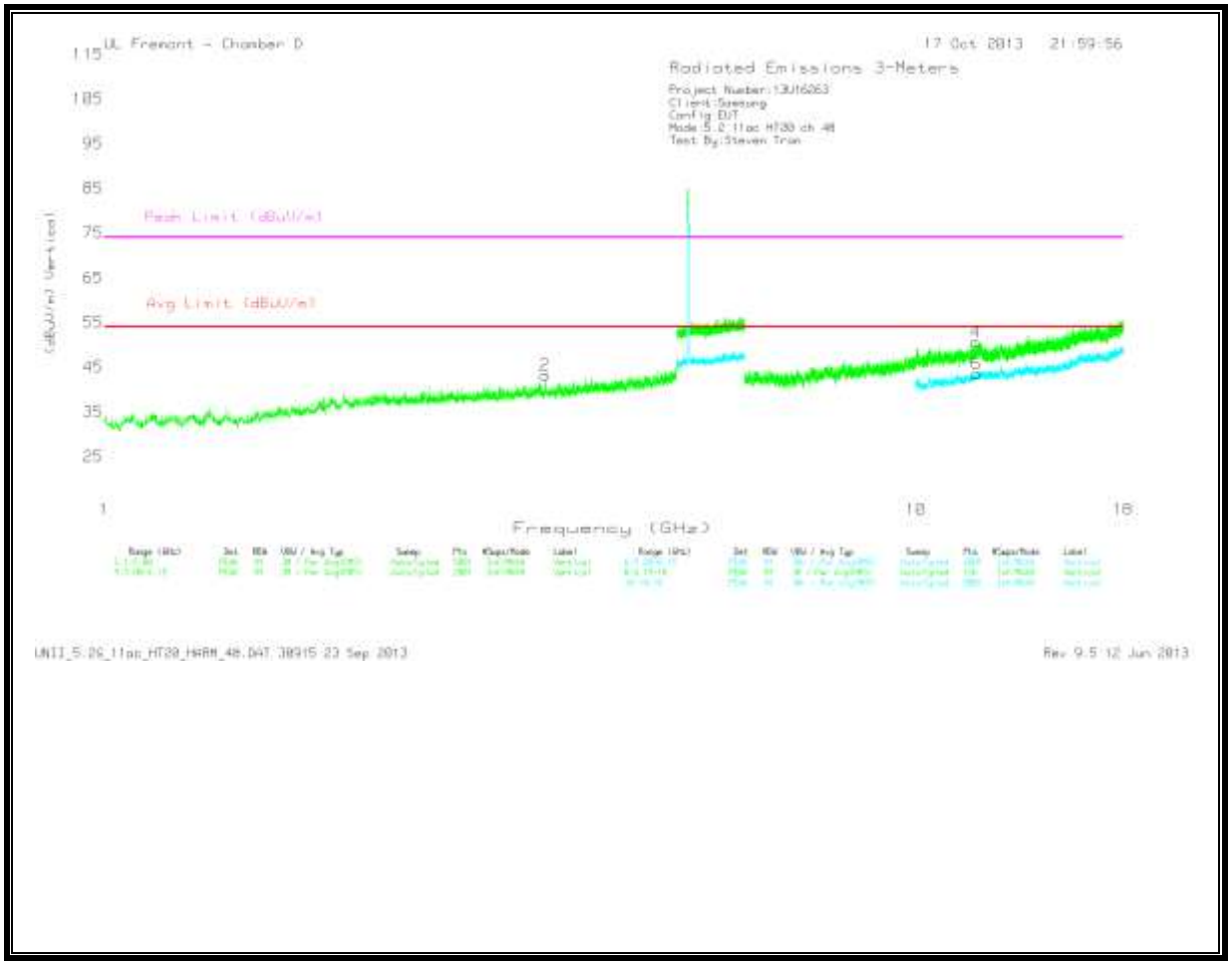
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.468	40.98	PK	33.3	-29.7	44.58	53.97	-9.39	74	-29.42	0-360	100	H
2	3.468	40.83	PK	33.3	-29.7	44.43	53.97	-9.54	74	-29.57	0-360	201	V
3	10.385	33.96	PK	38.3	-22	50.26	53.97	-3.71	74	-23.74	0-360	100	H
4	10.406	35.03	PK	38.3	-21.7	51.63	53.97	-2.34	74	-22.37	0-360	201	V
5	10.377	27.93	PK	38.3	-22.1	44.13	53.97	-9.84	74	-29.87	0-360	100	H
6	10.401	29.64	PK	38.3	-21.7	46.24	53.97	-7.73	74	-27.76	0-360	100	V

PK - Peak detector
UNII_5.2_11a_HARM_40.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

HIGH CHANNEL
HORIZONTAL



VERTICAL



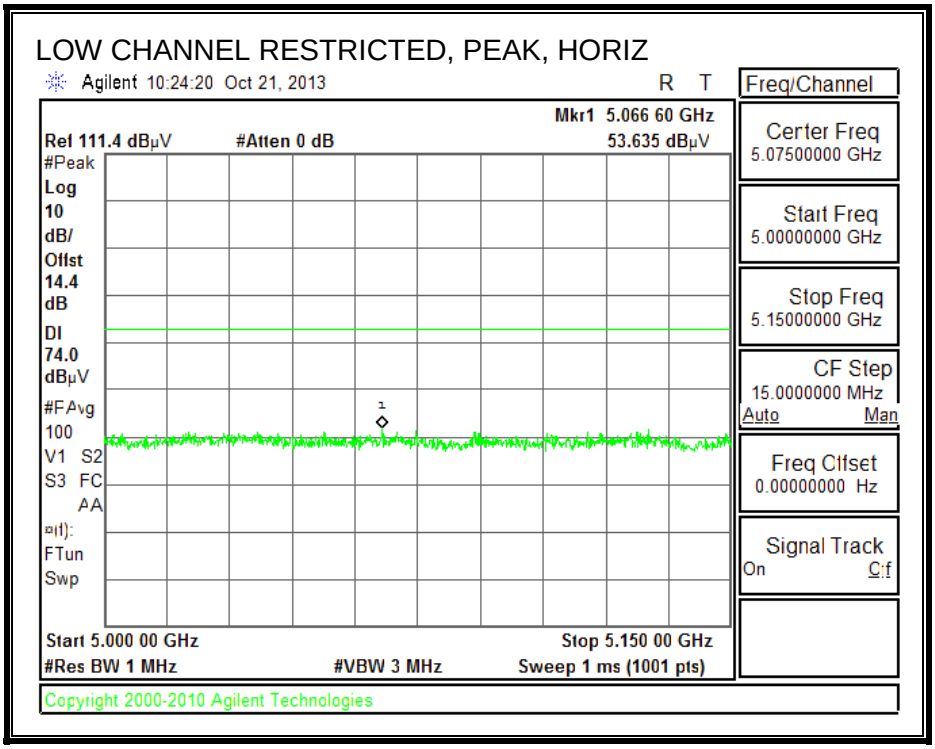
HIGH CHANNEL DATA

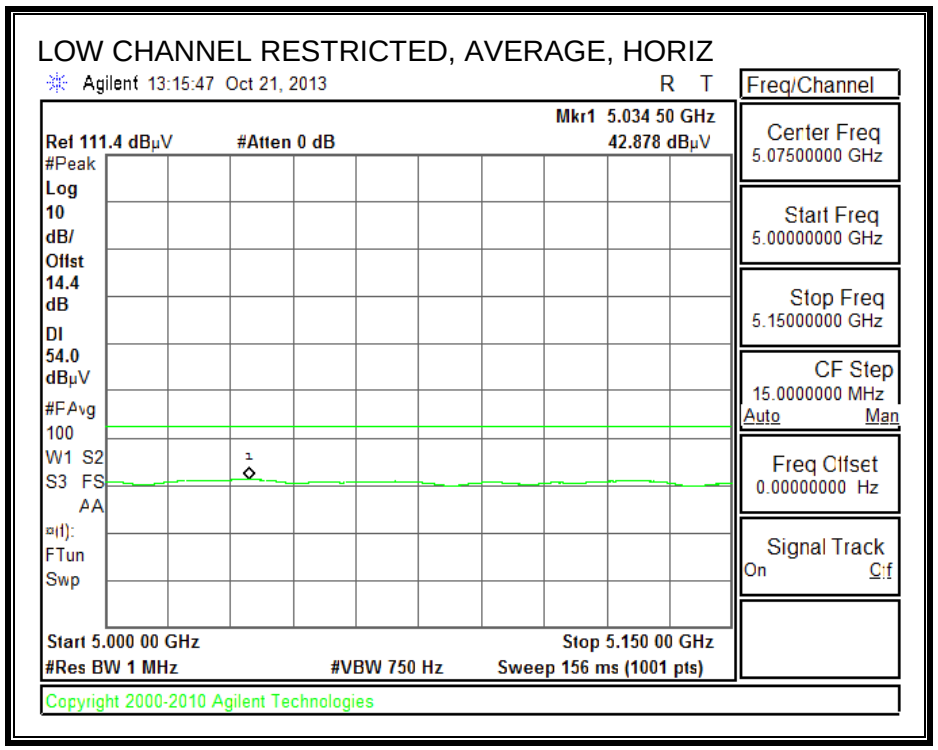
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.494	42.15	PK	33.2	-32.3	43.05	53.97	-10.92	74	-30.95	0-360	100	H
2	3.493	42.34	PK	33.2	-32.3	43.24	53.97	-10.73	74	-30.76	0-360	100	V
3	11.89	32.56	PK	39.1	-22.4	49.26	53.97	-4.71	74	-24.74	0-360	200	H
4	11.859	34.11	PK	39.1	-22.6	50.61	53.97	-3.36	74	-23.39	0-360	100	V
5	11.867	27.01	PK	39.1	-22.6	43.51	53.97	-10.46	74	-30.49	0-360	200	H
6	11.885	26.93	PK	39.1	-22.5	43.53	53.97	-10.44	74	-30.47	0-360	200	V

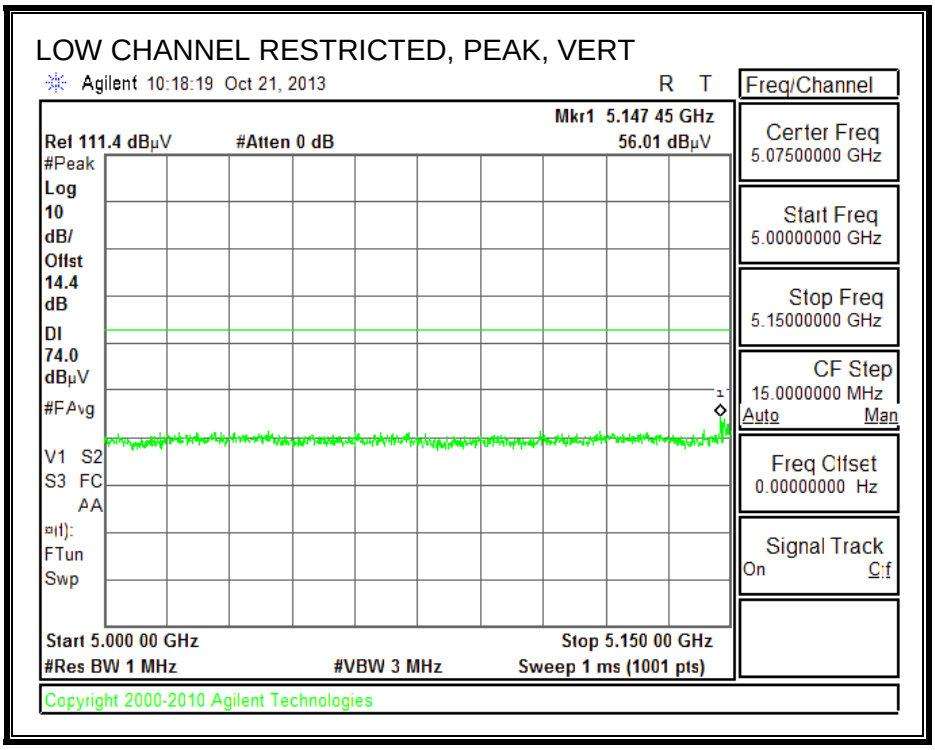
PK - Peak detector
UNII_5.2G_11ac_HT20_HARM_48.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

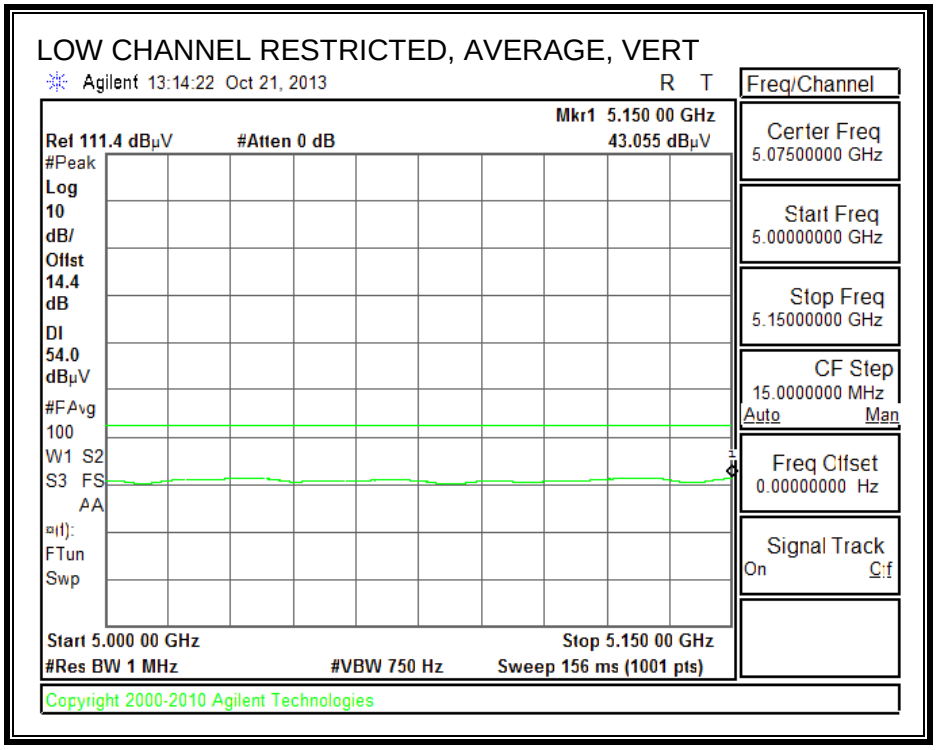
11.2.1. TX ABOVE 1 GHz 802.11n MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



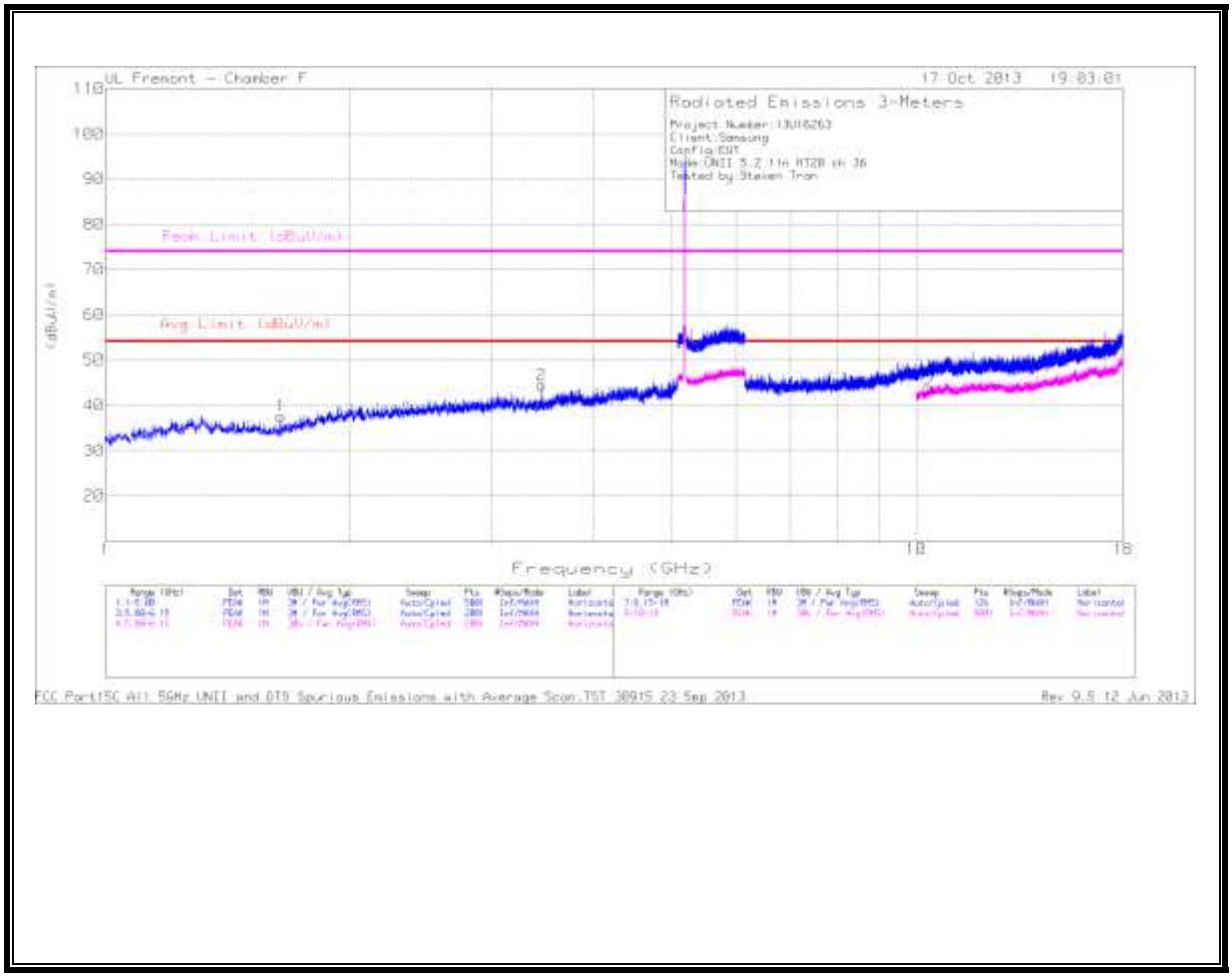




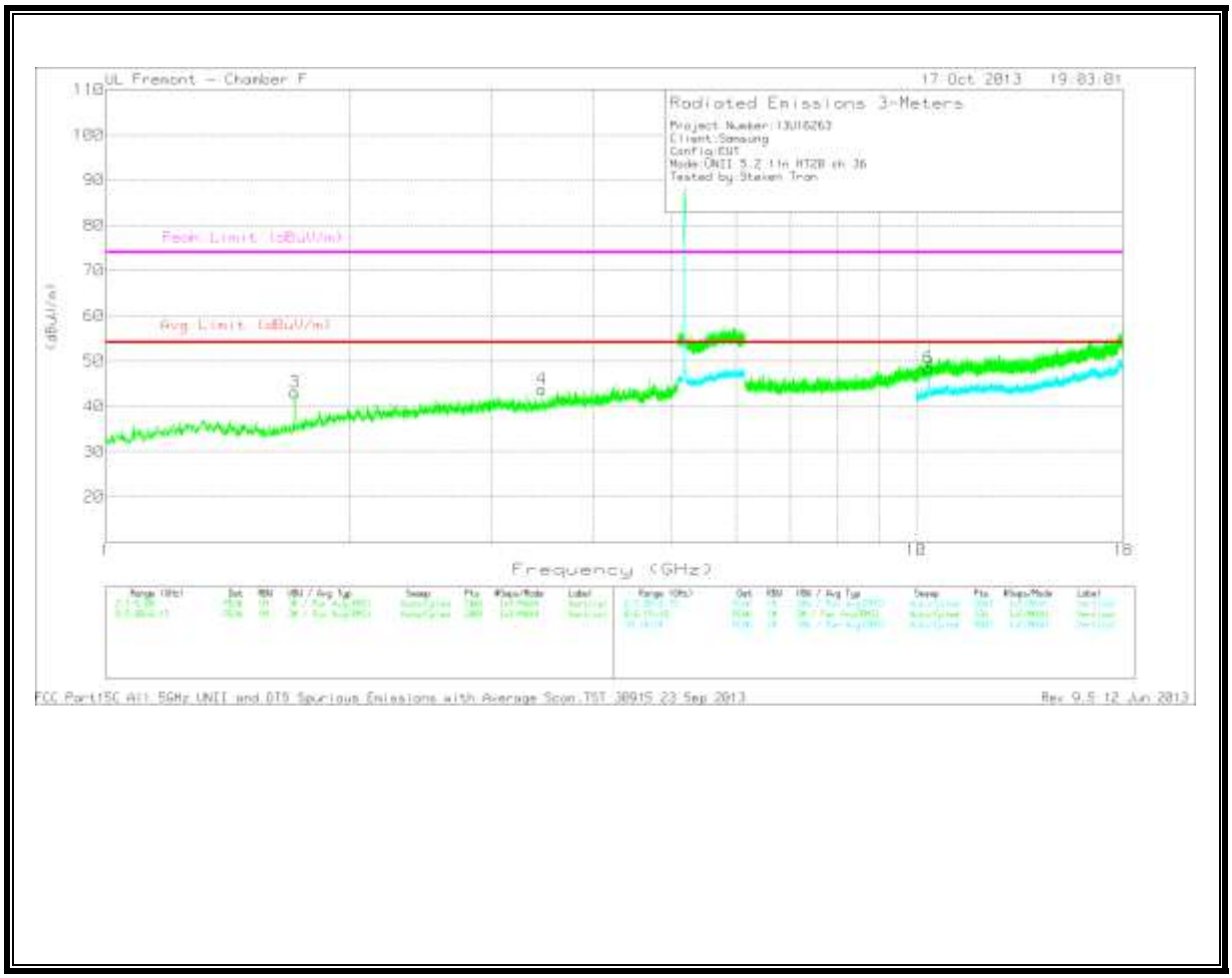


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



LOW CHANNEL
VERTICAL



LOW CHANNEL 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	1.645	40.77	PK	28.4	-31.6	37.57	53.97	-16.4	74	-36.43	0-360	100	H
2	3.454	40.96	PK	33.1	-29.6	44.46	53.97	-9.51	74	-29.54	0-360	100	H
3	1.712	45.52	PK	29.1	-31.5	43.12	53.97	-10.85	74	-30.88	0-360	201	V
4	3.454	40.31	PK	33.1	-29.6	43.81	53.97	-10.16	74	-30.19	0-360	101	V

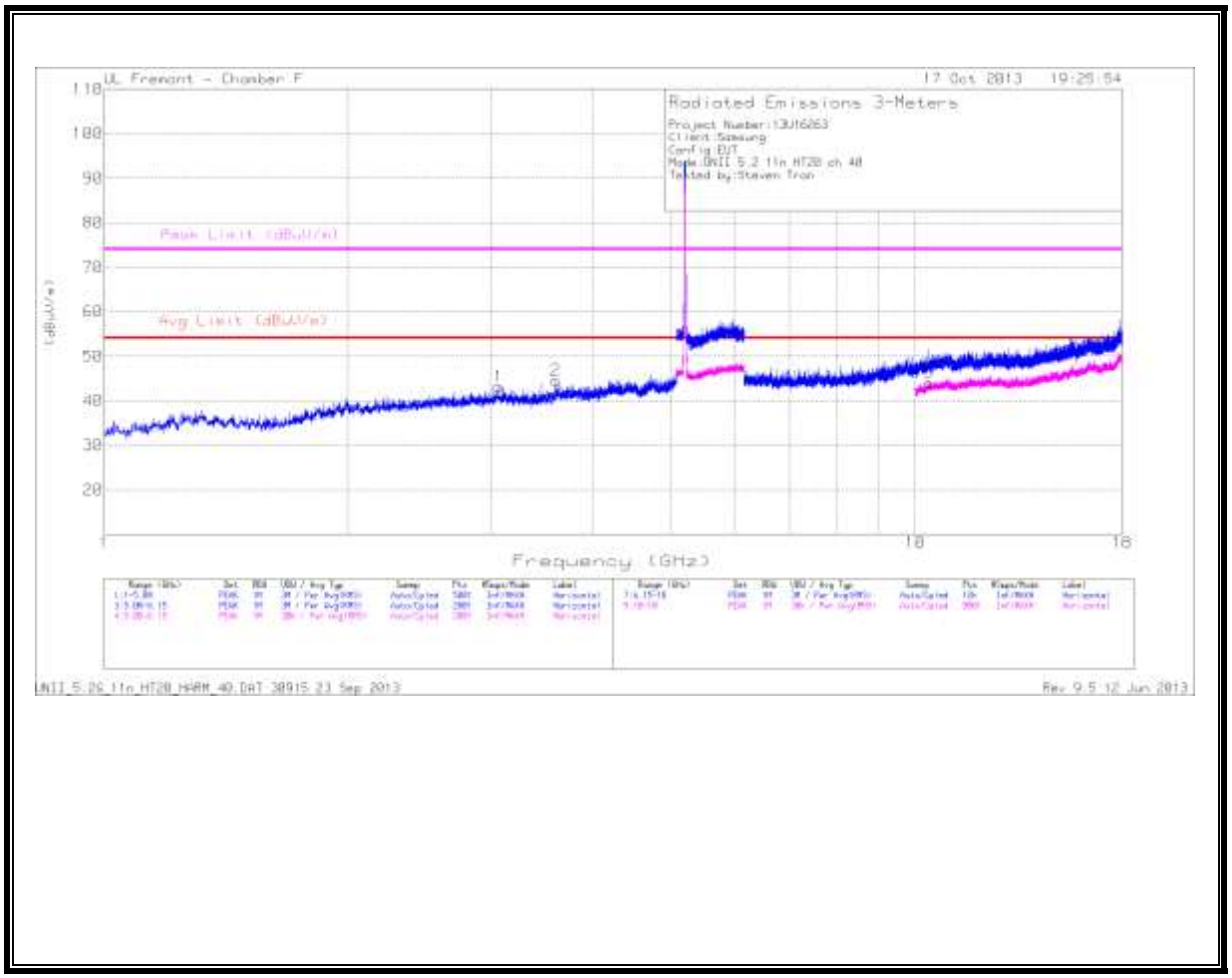
PK - Peak detector

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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
5	10.362	28.32	PK	38.1	-22.5	43.92	53.97	-10.05	74	-30.08	0-360	100	H
6	10.36	33.01	PK	38.1	-22.6	48.51	53.97	-5.46	74	-25.49	0-360	100	V

PK - Peak detector

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



MID CHANNEL
VERTICAL

MID CHANNEL DATA

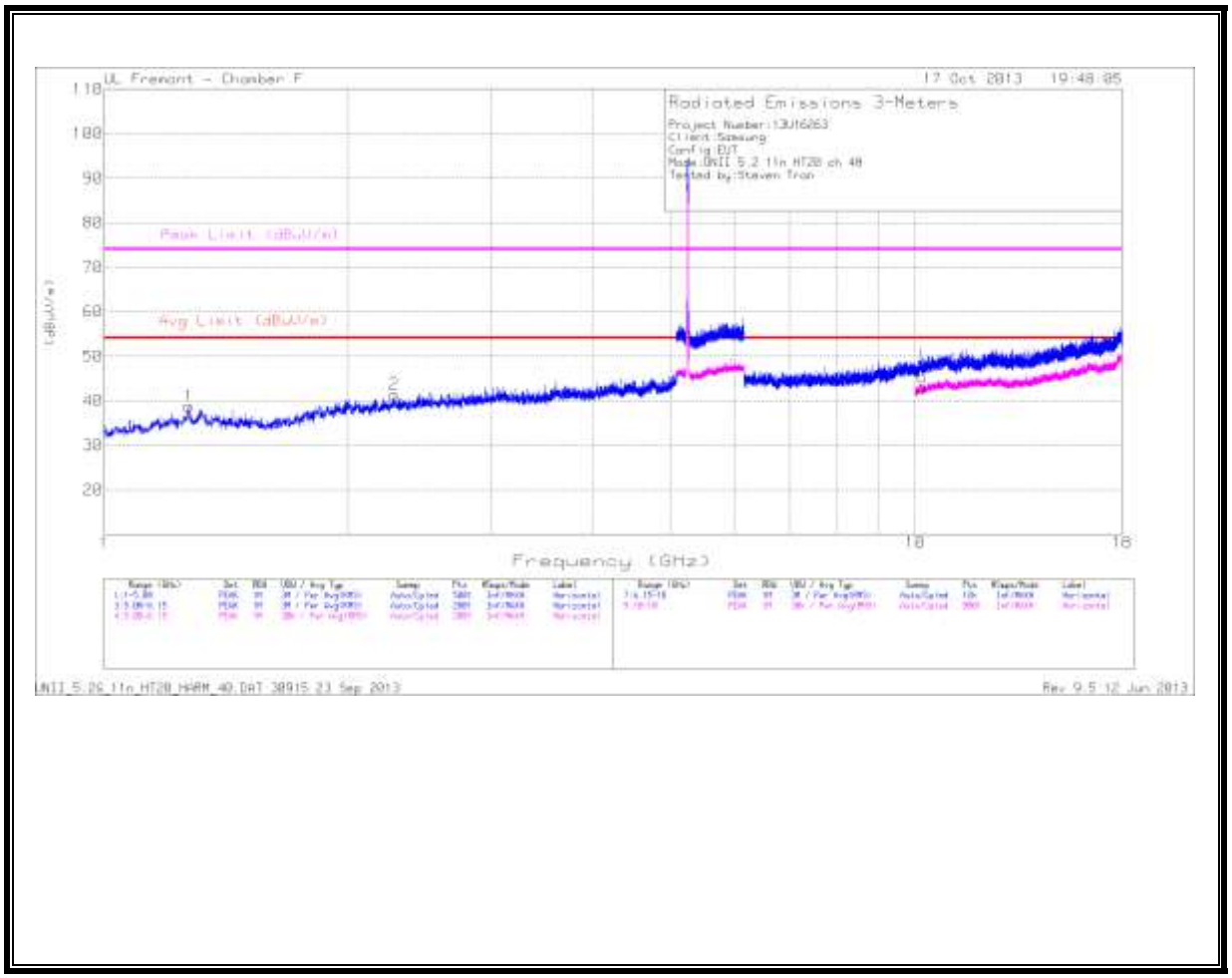
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /5GHz LPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.066	39.29	PK	33.3	-29.4	43.19	53.97	-10.78	74	-30.81	0-360	199	H
2	3.605	40.27	PK	33.7	-29.4	44.57	53.97	-9.4	74	-29.43	0-360	100	H
3	2.273	40.29	PK	31.9	-30.3	41.89	53.97	-12.08	74	-32.11	0-360	201	V
4	3.468	42.09	PK	33.1	-29.5	45.69	53.97	-8.28	74	-28.31	0-360	201	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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
5	10.399	27.9	PK	38.2	-22	44.1	53.97	-9.87	74	-29.9	0-360	100	H
6	10.408	31.14	PK	38.2	-22.1	47.24	53.97	-6.73	74	-26.76	0-360	101	V

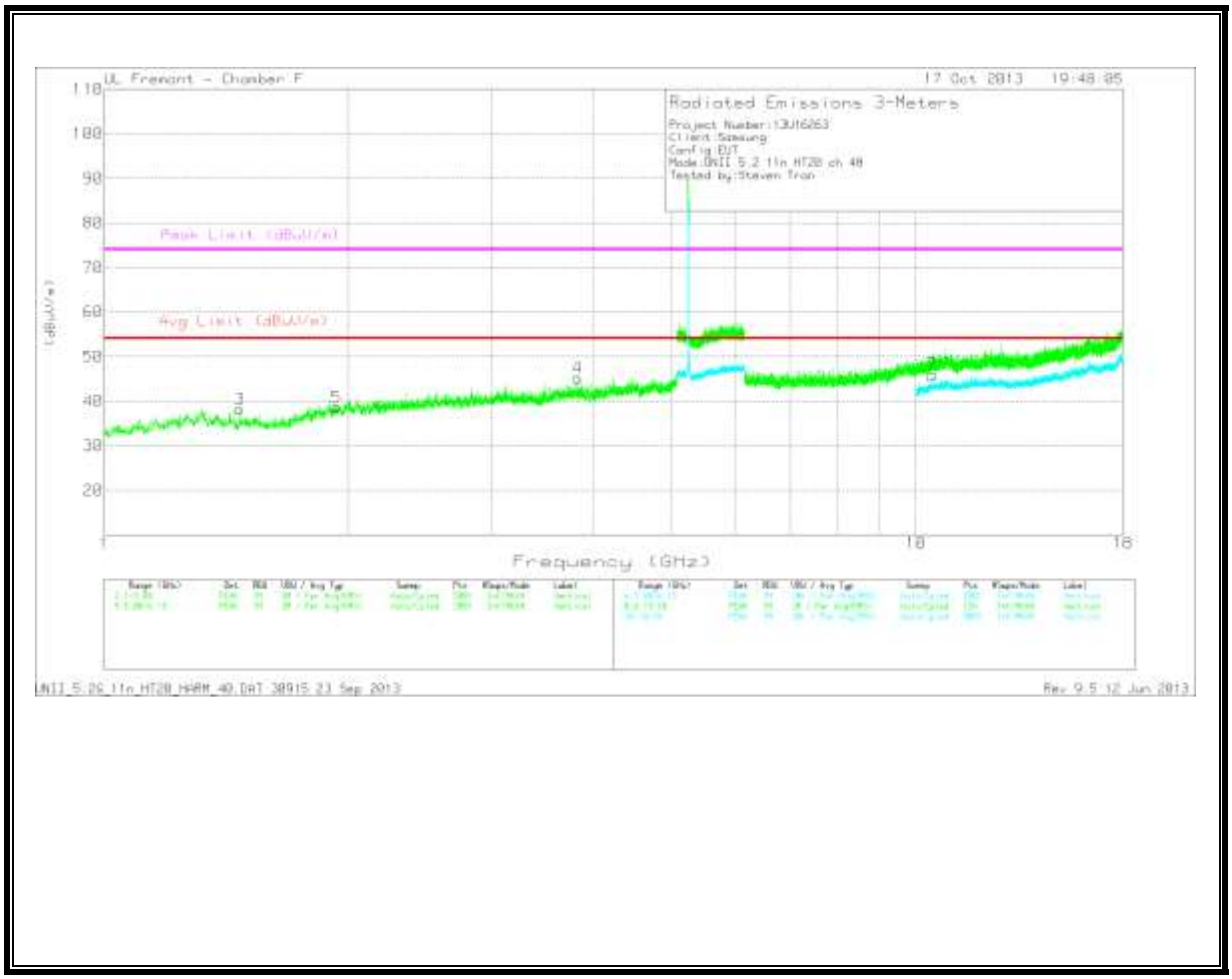
PK - Peak detector

UNII_5.2G_11n_HT20_HARM_40.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

HIGH CHANNEL
HORIZONTAL



HIGH CHANNEL
VERTICAL



HIGH CHANNEL 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	1.273	41.01	PK	29.8	-32	38.81	53.97	-15.16	74	-35.19	0-360	199	H
2	2.279	39.74	PK	32	-30.3	41.44	53.97	-12.53	74	-32.56	0-360	100	H
3	1.47	41.21	PK	28.9	-31.9	38.21	53.97	-15.76	74	-35.79	0-360	200	V
4	3.829	40.72	PK	33.6	-29.1	45.22	53.97	-8.75	74	-28.78	0-360	200	V
5	1.931	38.41	PK	31.3	-31.1	38.61	53.97	-15.36	74	-35.39	0-360	101	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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
6	10.201	28.45	PK	37.7	-23.1	43.05	53.97	-10.92	74	-30.95	0-360	199	H
7	10.478	30.52	PK	38.3	-22.9	45.92	53.97	-8.05	74	-28.08	0-360	101	V

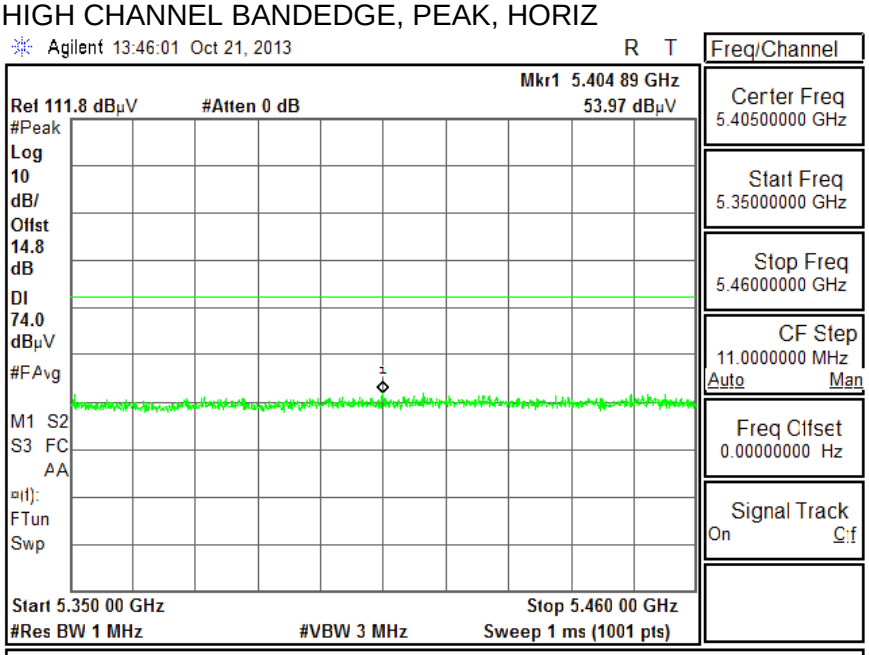
PK - Peak detector
UNII_5.2G_11n_HT20_HARM_40.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

11.3. 5.3 GHz

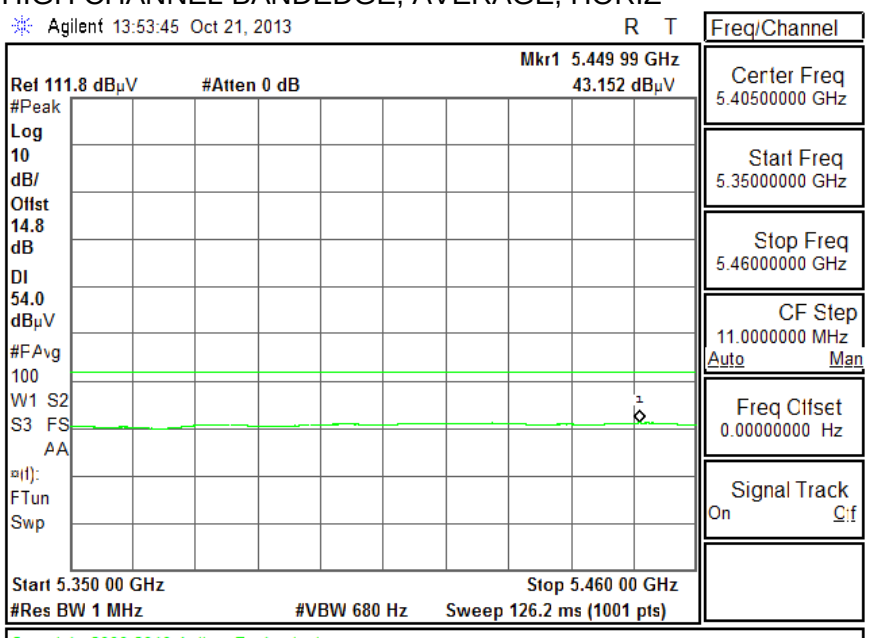
11.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

AUTHORIZED BANDEDGE (HIGH CHANNEL)

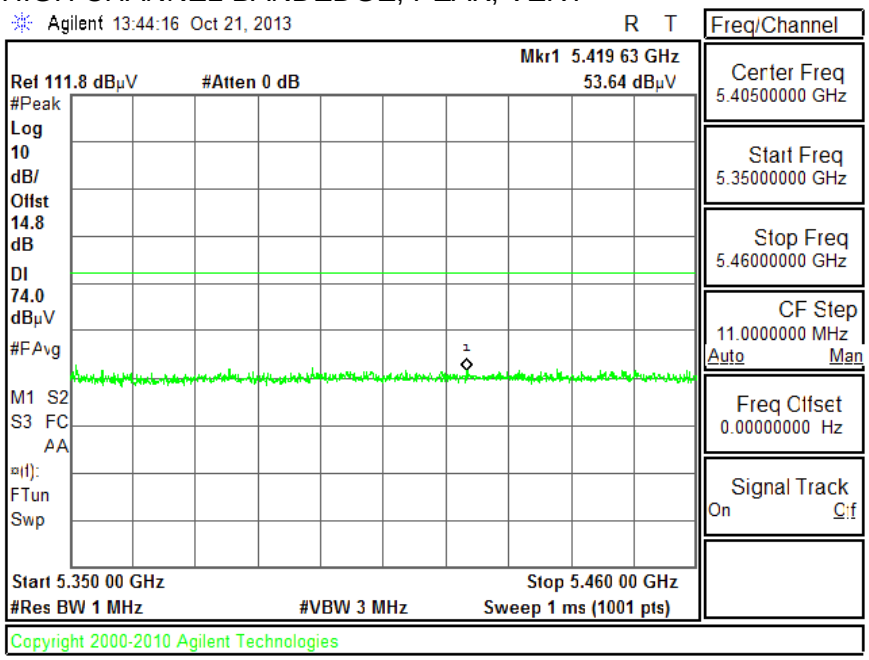
HIGH CHANNEL BANDEDGE, PEAK, HORIZ



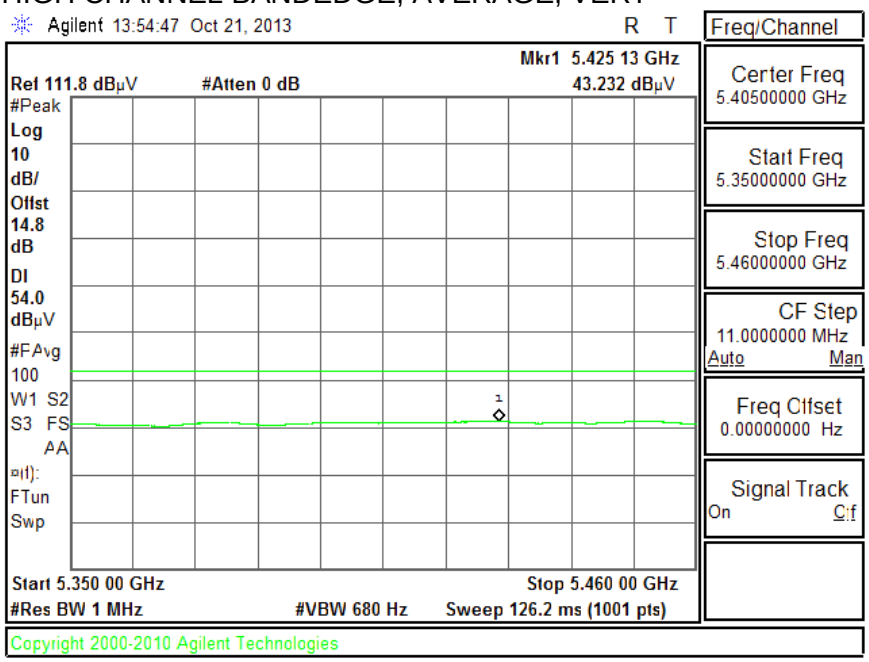
HIGH CHANNEL BANDEDGE, AVERAGE, HORIZ



HIGH CHANNEL BANDEDGE, PEAK, VERT

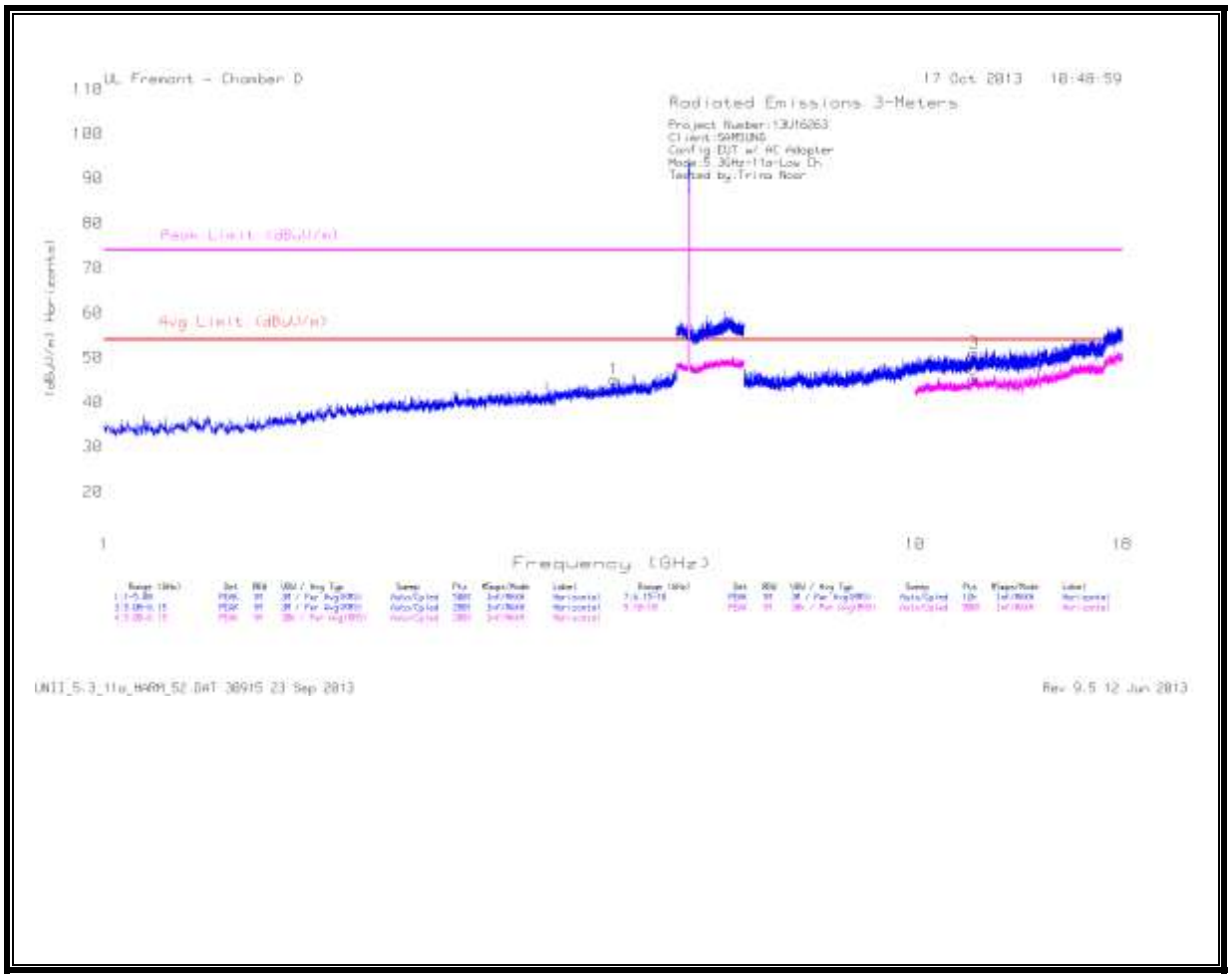


HIGH CHANNEL BANDEDGE, AVERAGE, VERT

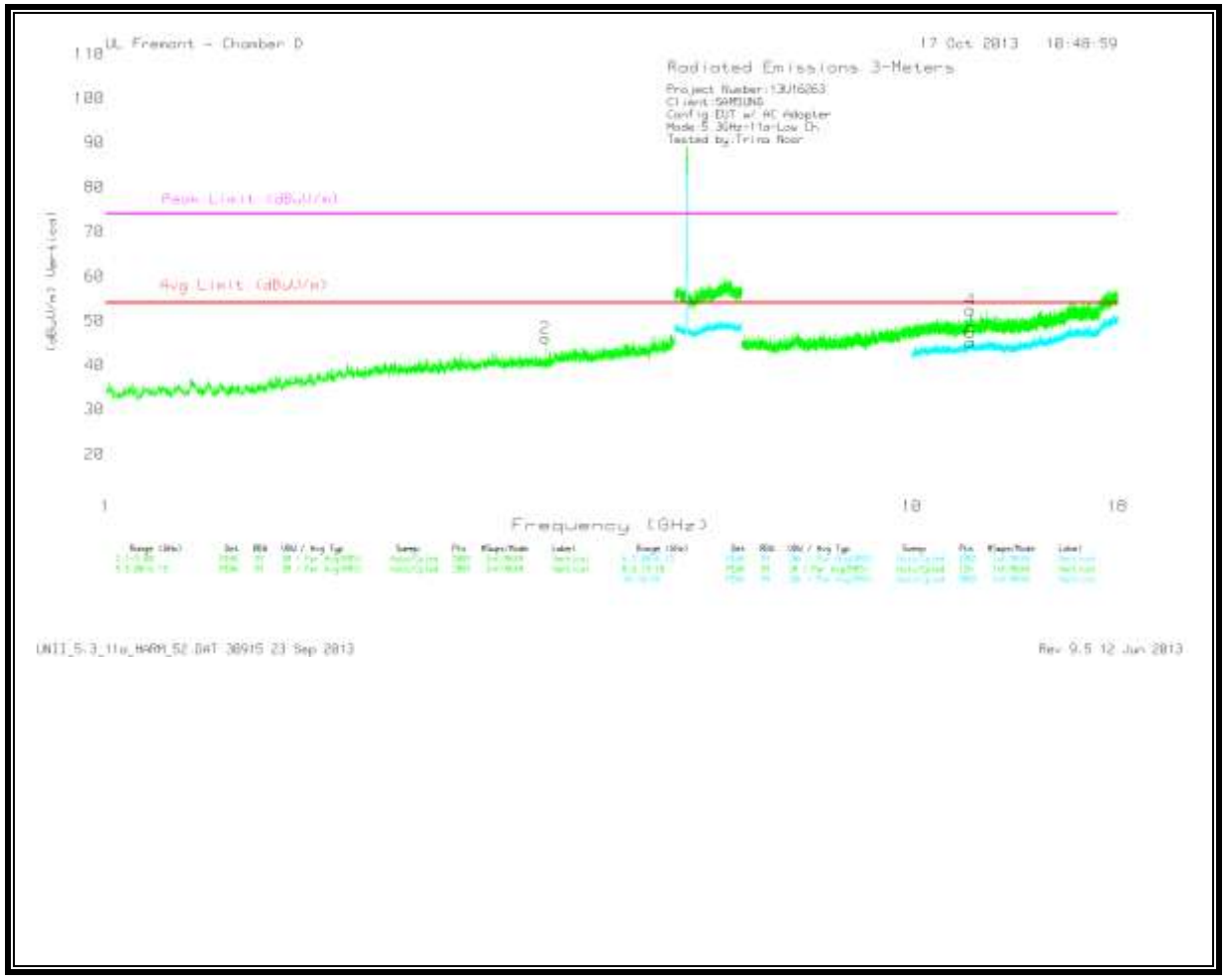


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



VERTICAL

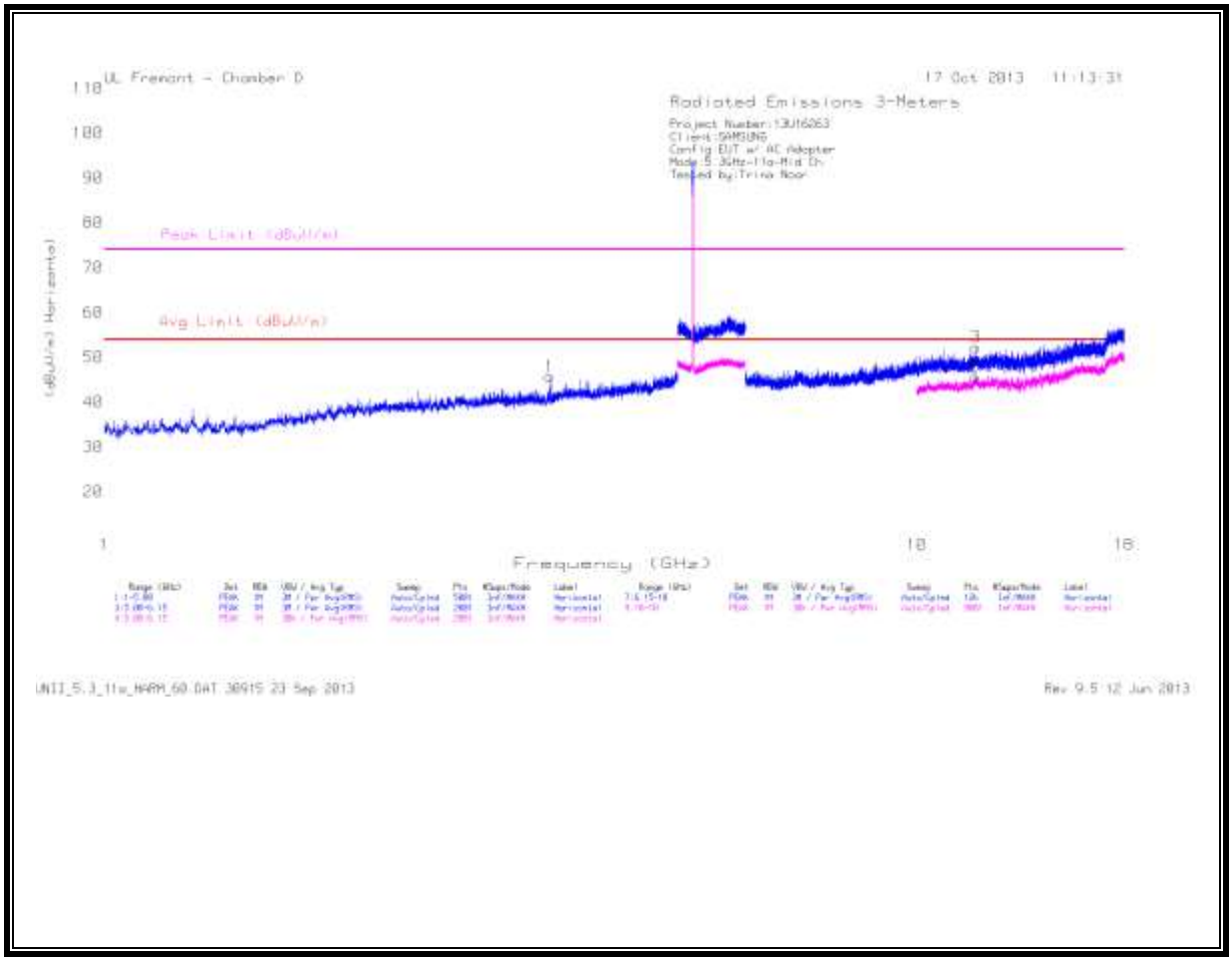


LOW CHANNEL DATA

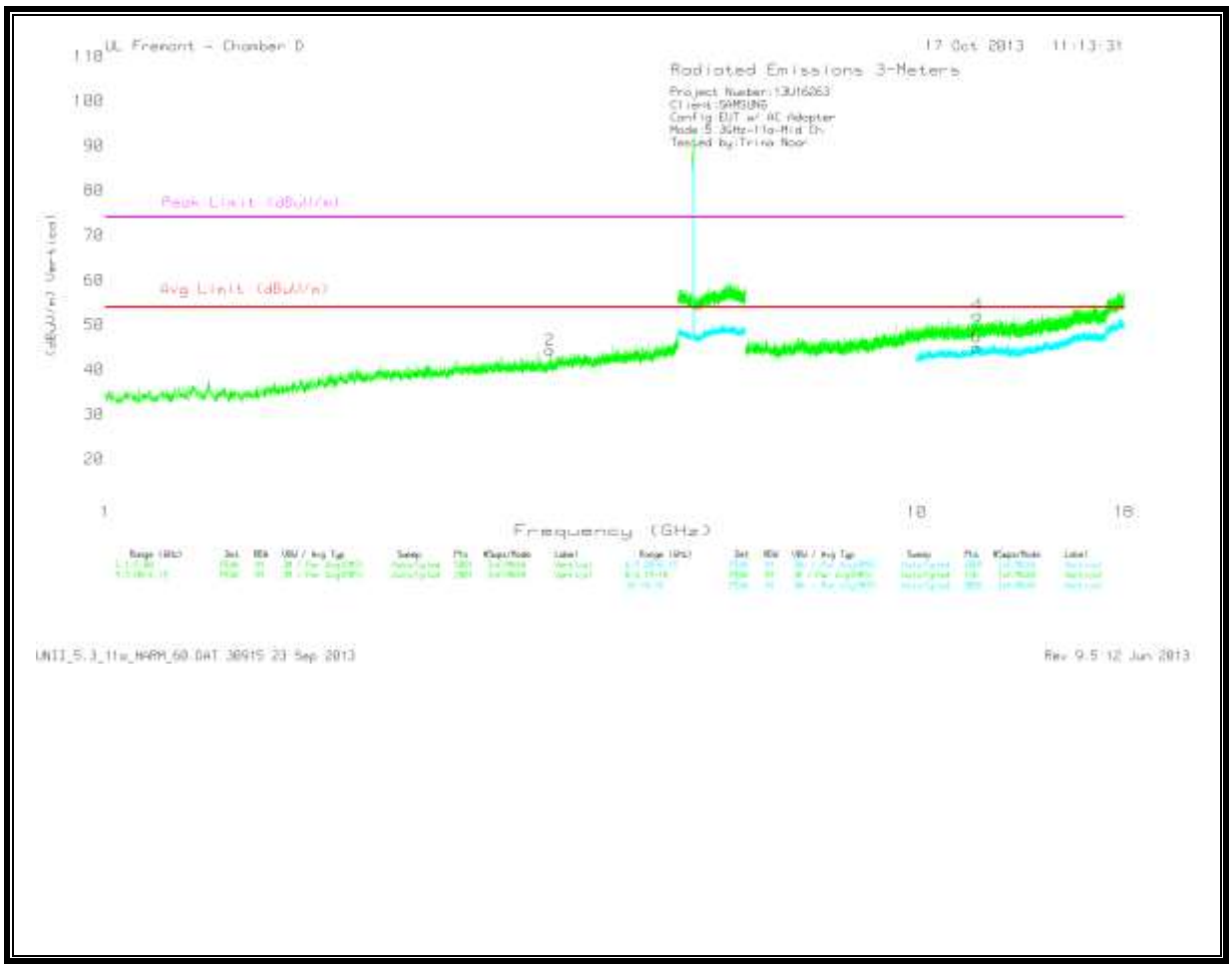
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.253	39.76	PK	33.9	-28.5	45.16	53.97	-8.81	74	-28.84	0-360	201	H
2	3.508	42.63	PK	33.3	-29.8	46.13	53.97	-7.84	74	-27.87	0-360	201	V
3	11.817	33.25	PK	39	-21.3	50.95	53.97	-3.02	74	-23.05	0-360	100	H
4	11.822	34.61	PK	39	-21.2	52.41	53.97	-1.56	74	-21.59	0-360	201	V
5	11.821	27.46	PK	39	-21.2	45.26	53.97	-8.71	74	-28.74	0-360	200	H
6	11.82	27.28	PK	39	-21.2	45.08	53.97	-8.89	74	-28.92	0-360	100	V

PK - Peak detector
UNII_5.3_11a_HARM_52.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



VERTICAL



MID CHANNEL 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	3.534	41.57	PK	33.4	-29.3	45.67	53.97	-8.3	74	-28.33	0-360	201	H
2	3.534	40.26	PK	33.4	-29.3	44.36	53.97	-9.61	74	-29.64	0-360	100	V
3	11.822	34.42	PK	39	-21.2	52.22	53.97	-1.75	74	-21.78	0-360	201	H
4	11.886	35.11	PK	39.1	-22	52.21	53.97	-1.76	74	-21.79	0-360	100	V
5	11.814	27.96	PK	39	-21.4	45.56	53.97	-8.41	74	-28.44	0-360	100	H
6	11.847	27.54	PK	39	-21.5	45.04	53.97	-8.93	74	-28.96	0-360	201	V

PK - Peak detector

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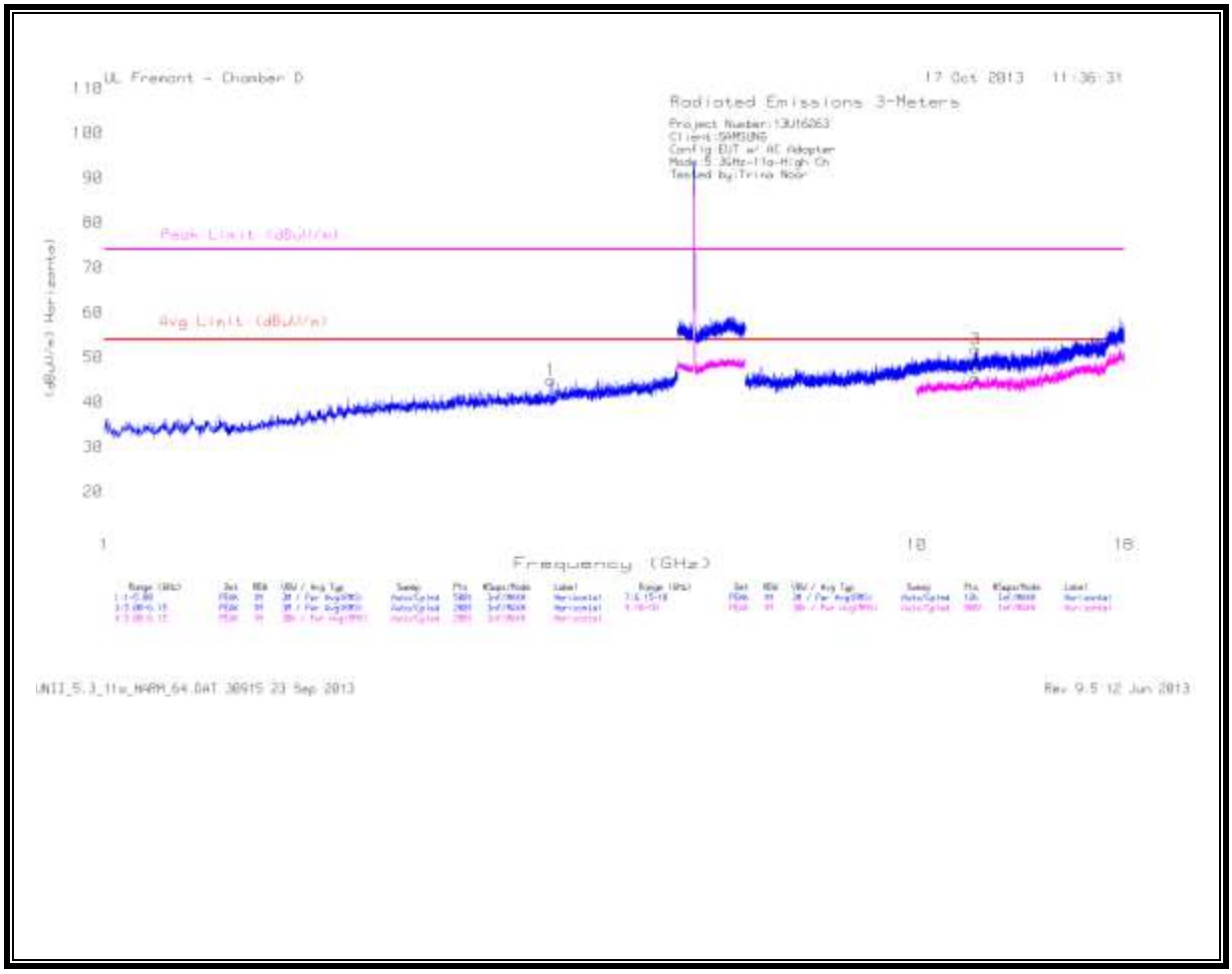
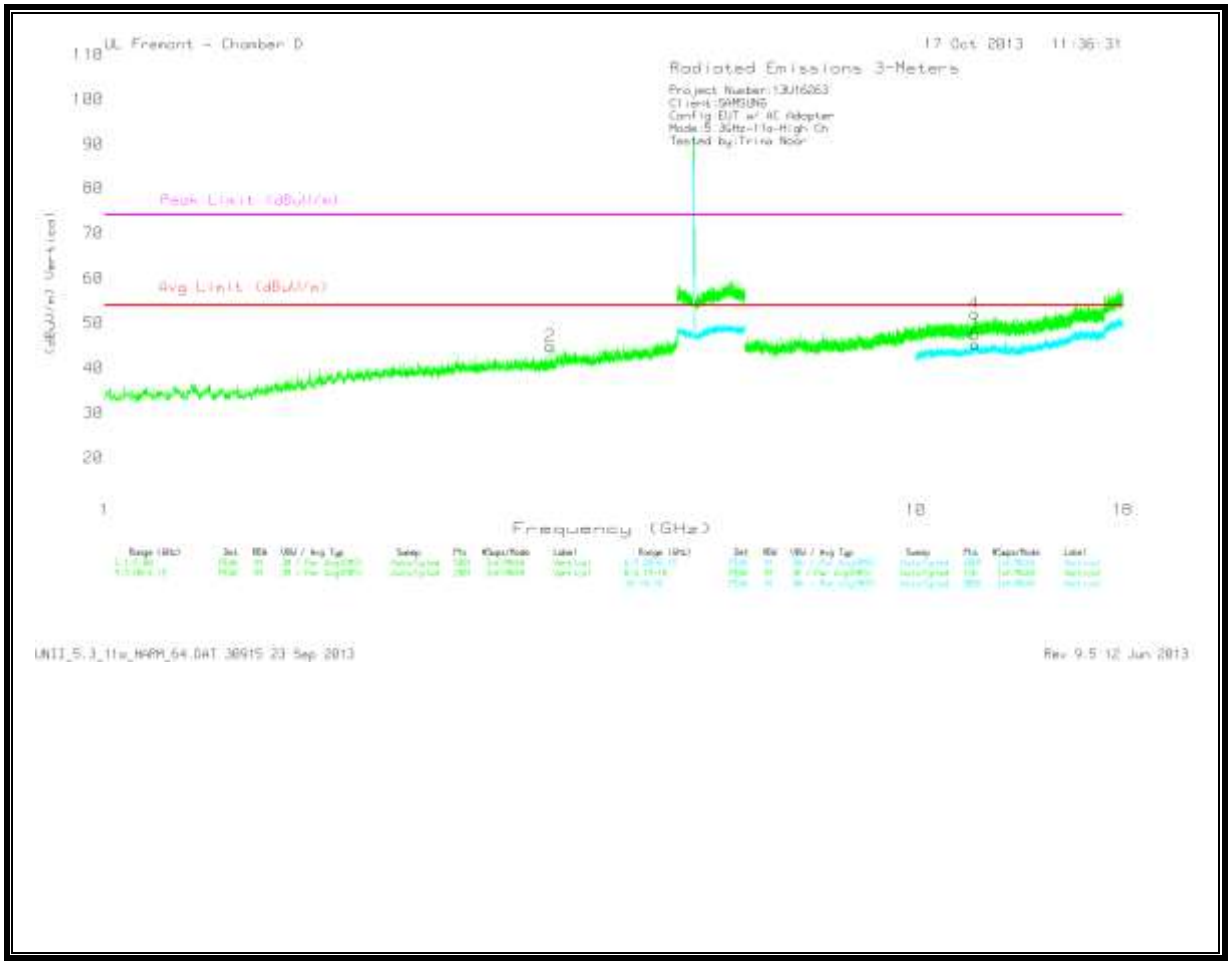
HIGH CHANNEL
HORIZONTAL



VERTICAL



HIGH CHANNEL 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	3.548	40.75	PK	33.4	-29.3	44.85	53.97	-9.12	74	-29.15	0-360	201	H
2	3.548	40.72	PK	33.4	-29.3	44.82	53.97	-9.15	74	-29.18	0-360	201	V
3	11.819	34.12	PK	39	-21.3	51.82	53.97	-2.15	74	-22.18	0-360	100	H
4	11.808	34.79	PK	39	-21.7	52.09	53.97	-1.88	74	-21.91	0-360	100	V
5	11.809	27.99	PK	39	-21.6	45.39	53.97	-8.58	74	-28.61	0-360	100	H
6	11.827	27.28	PK	39	-21.1	45.18	53.97	-8.79	74	-28.82	0-360	201	V

PK - Peak detector

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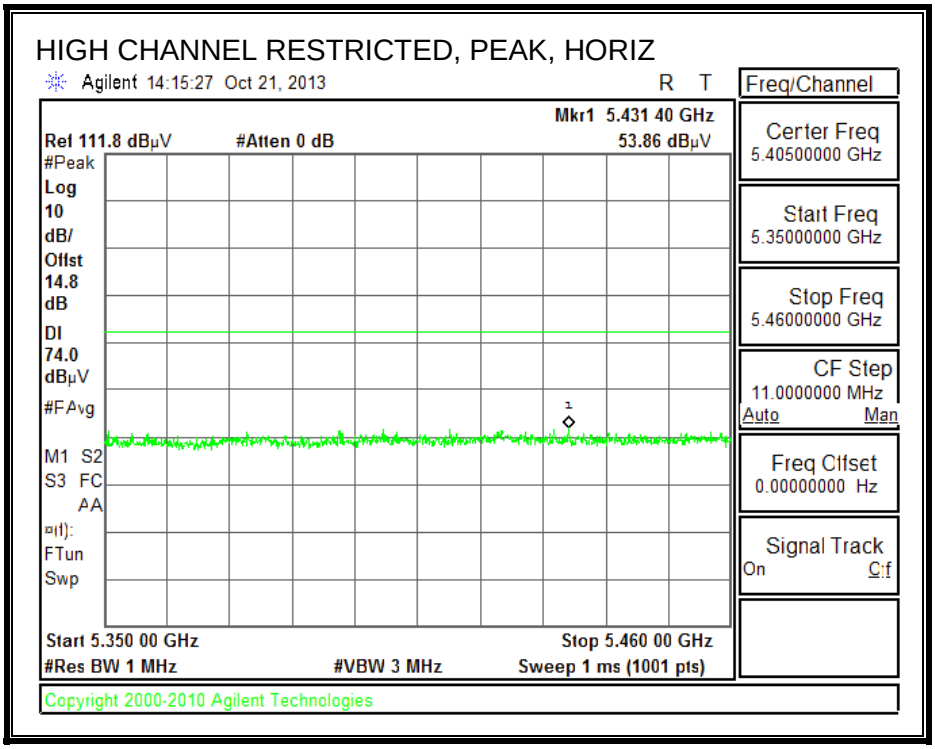
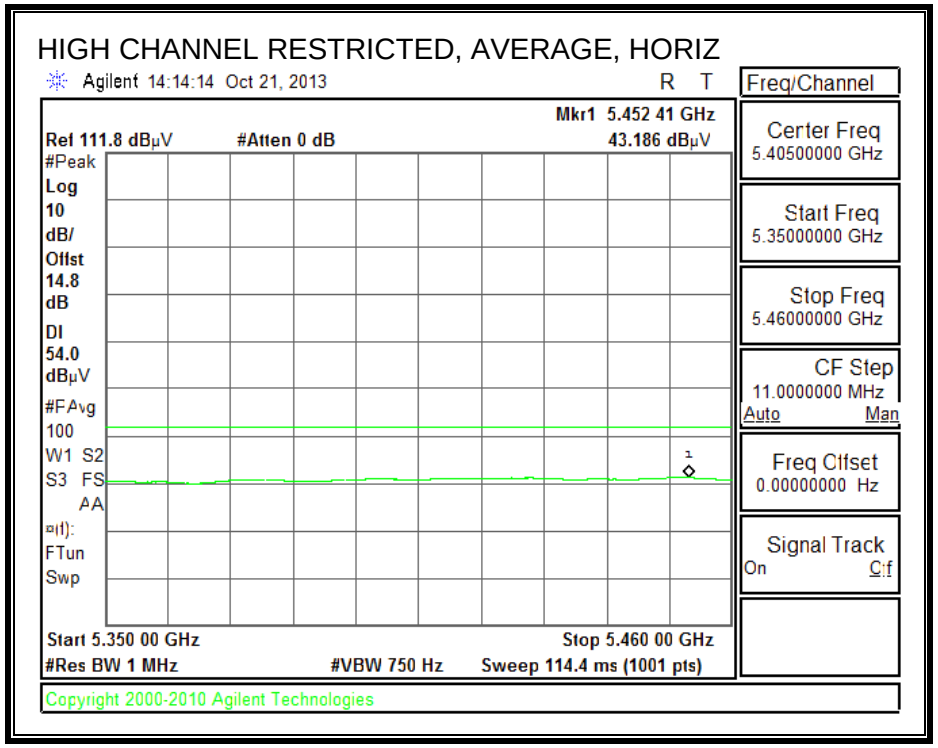
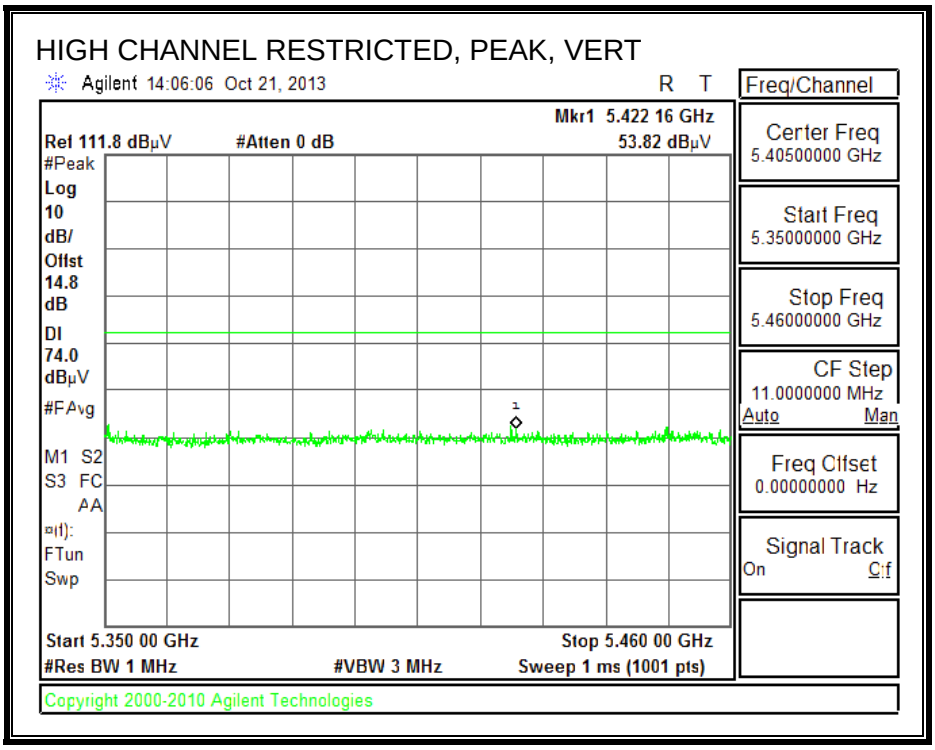
11.3.1. TX ABOVE 1 GHz 802.11n MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

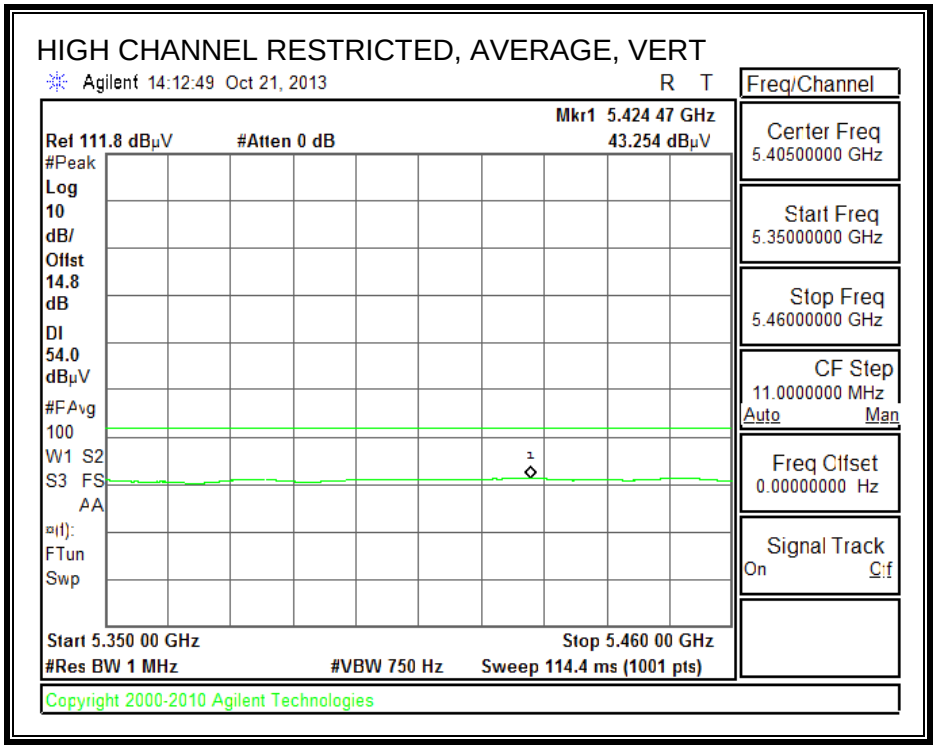




HIGH CHANNEL RESTRICTED, PEAK, VERT

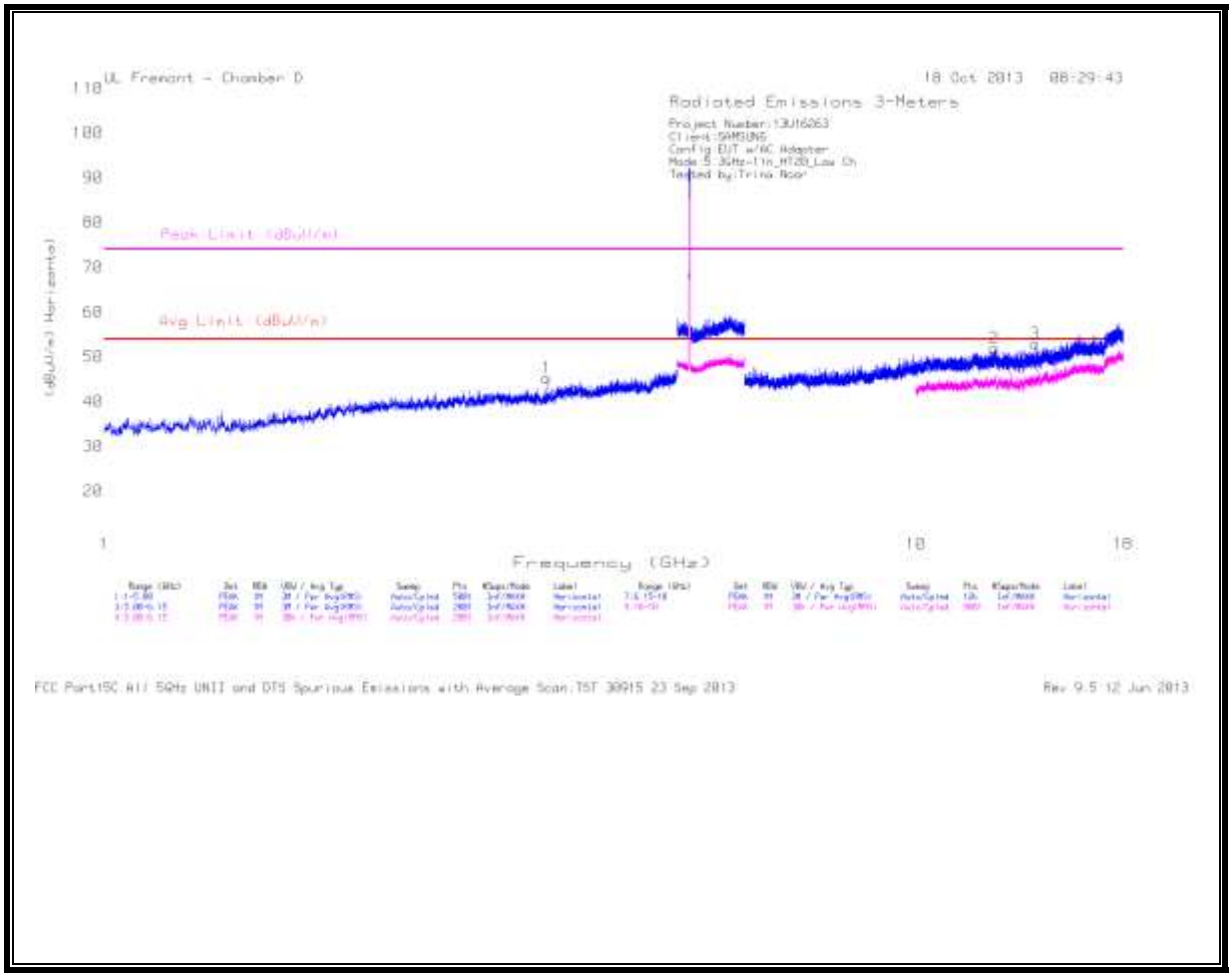


HIGH CHANNEL RESTRICTED, AVERAGE, VERT

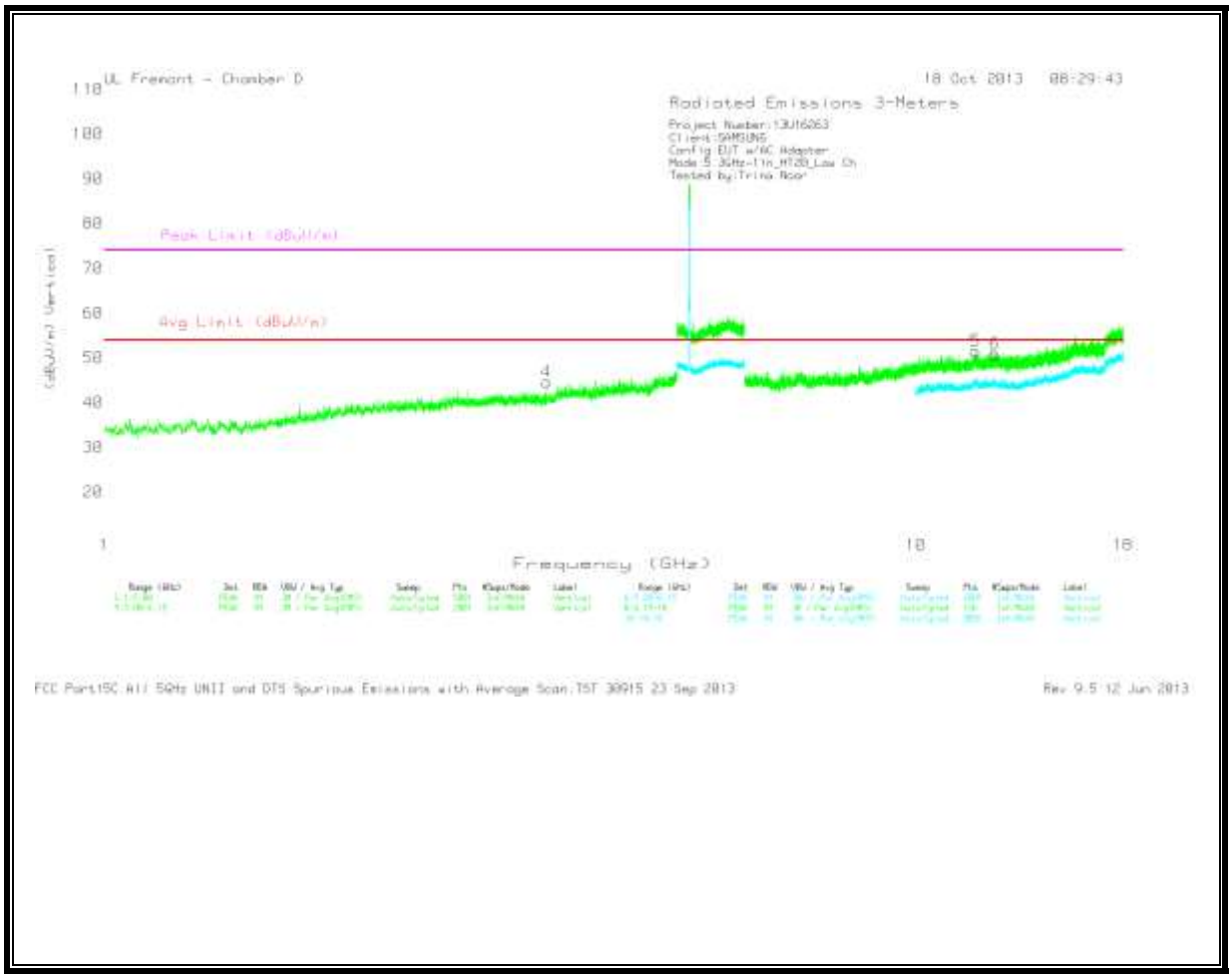


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



LOW CHANNEL
VERTICAL



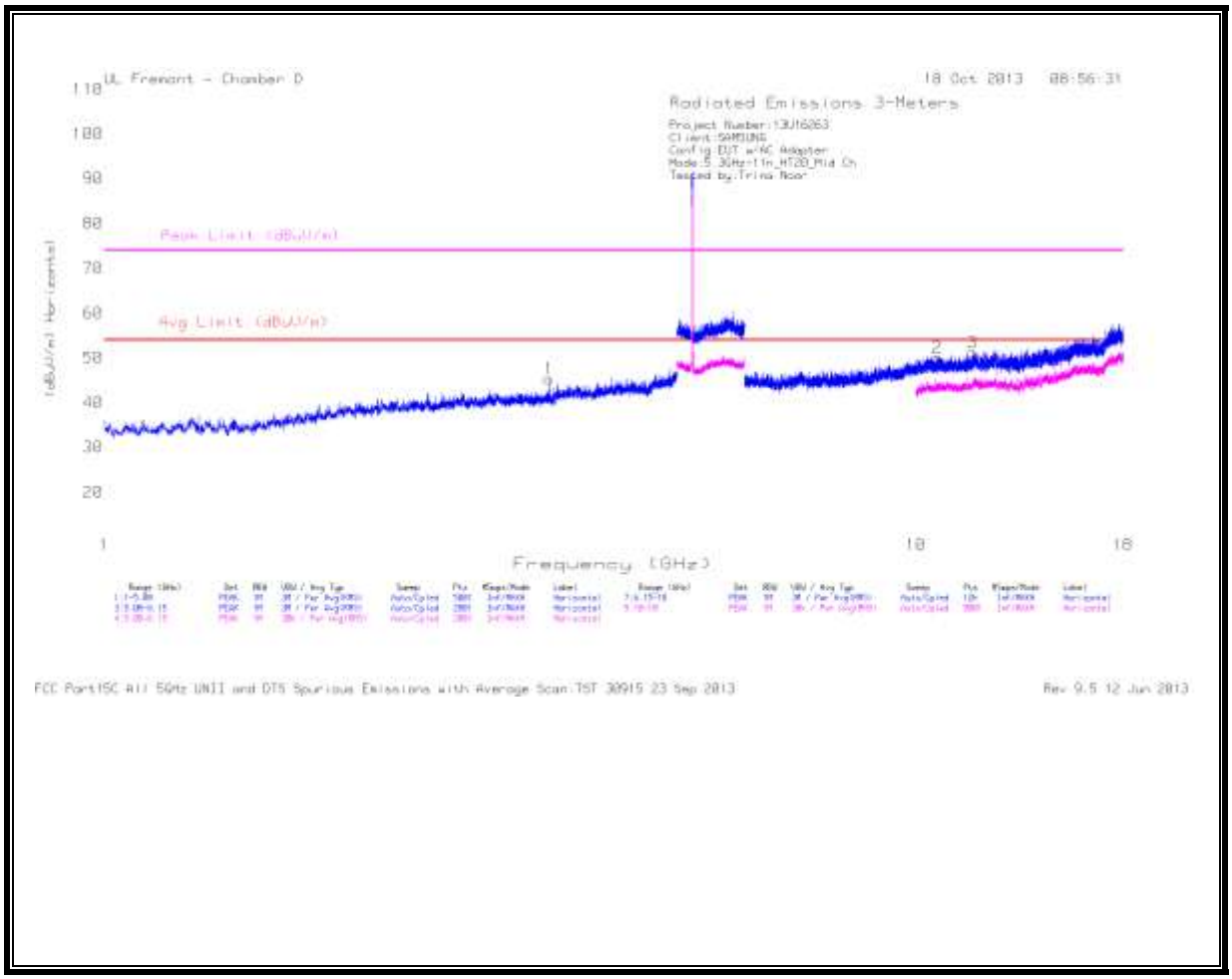
LOW CHANNEL DATA

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	3.508	41.75	PK	33.3	-29.8	45.25	53.97	-8.72	74	-28.75	0-360	201	H
4	3.508	41.15	PK	33.3	-29.8	44.65	53.97	-9.32	74	-29.35	0-360	201	V
2	12.502	34.76	PK	39.2	-22	51.96	53.97	-2.01	74	-22.04	0-360	100	H
3	14.031	37.78	PK	39.4	-24.3	52.88	53.97	-1.09	74	-21.12	0-360	201	H
5	11.84	33.77	PK	39	-21.3	51.47	53.97	-2.5	74	-22.53	0-360	201	V
6	12.524	33.59	PK	39.2	-21.9	50.89	53.97	-3.08	74	-23.11	0-360	201	V

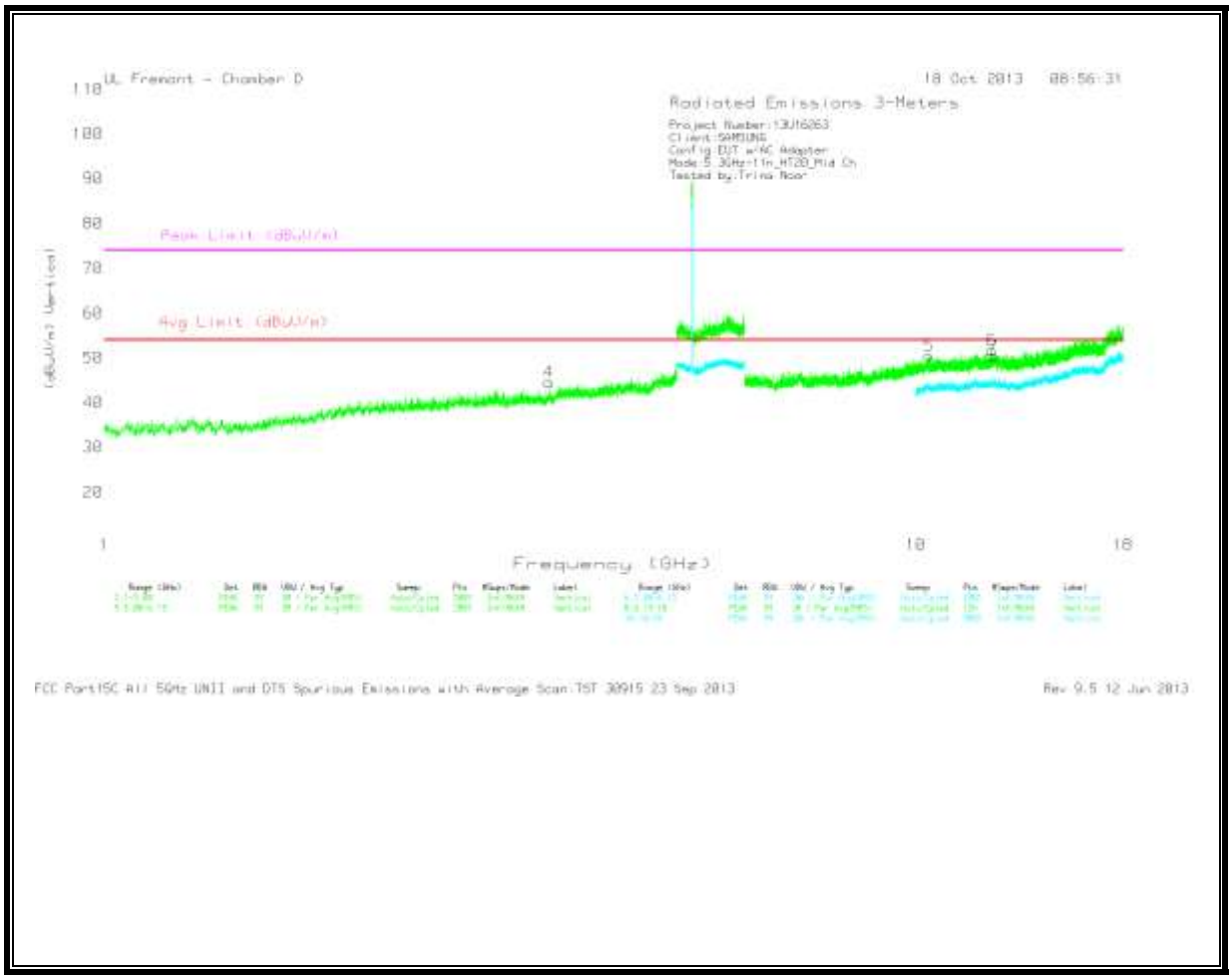
PK - Peak detector

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



MID CHANNEL
VERTICAL



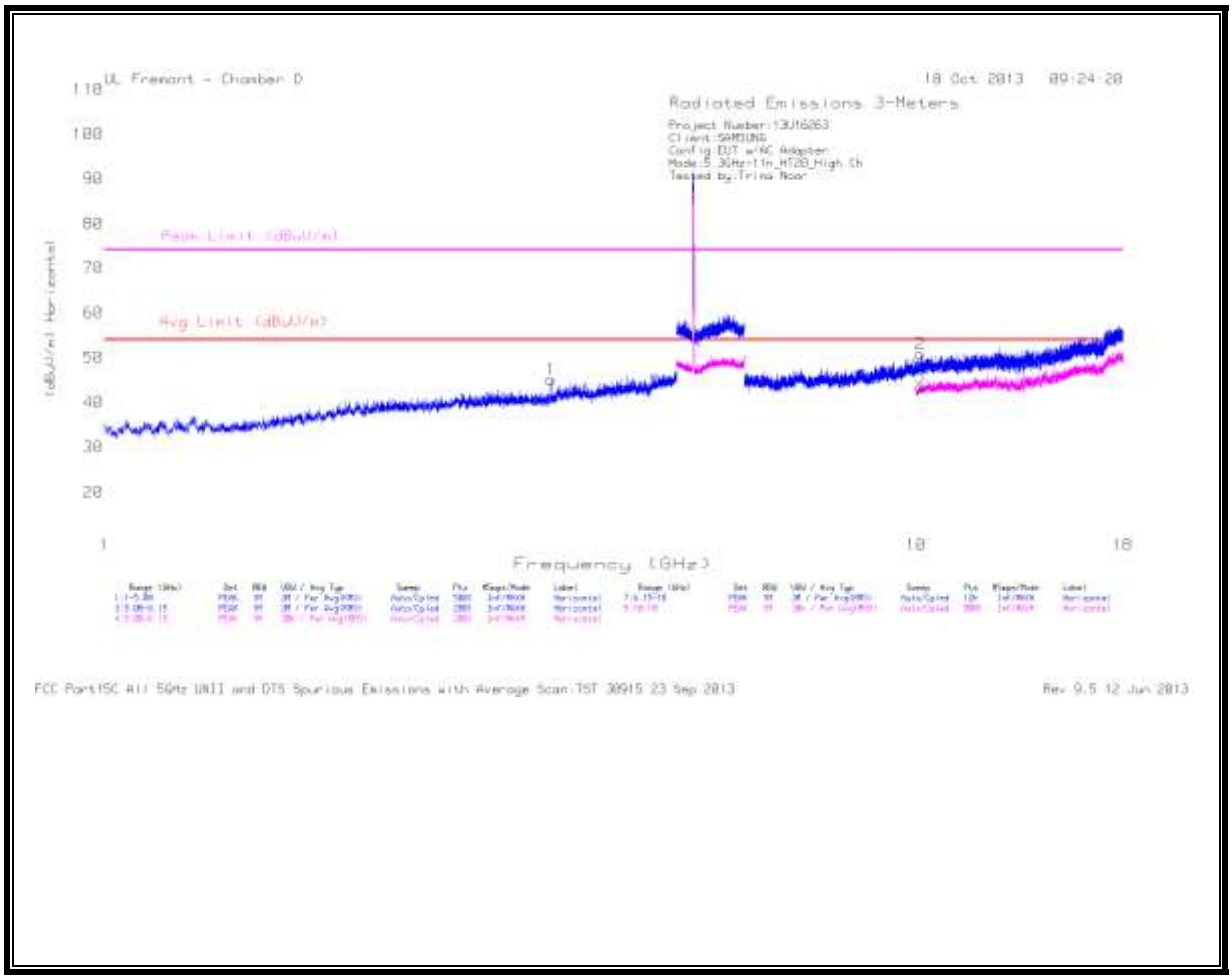
MID CHANNEL DATA

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	3.534	41.15	PK	33.4	-29.3	45.25	53.97	-8.72	74	-28.75	0-360	201	H
4	3.534	40.44	PK	33.4	-29.3	44.54	53.97	-9.43	74	-29.46	0-360	201	V
2	10.622	33.36	PK	38.4	-21.8	49.96	53.97	-4.01	74	-24.04	0-360	100	H
3	11.753	34.75	PK	38.9	-22.4	51.25	53.97	-2.72	74	-22.75	0-360	201	H
5	10.386	34.01	PK	38.3	-21.9	50.41	53.97	-3.56	74	-23.59	0-360	100	V
6	12.405	34.69	PK	39.2	-22.2	51.69	53.97	-2.28	74	-22.31	0-360	201	V
7	12.467	33.15	PK	39.2	-22	50.35	53.97	-3.62	74	-23.65	0-360	201	V

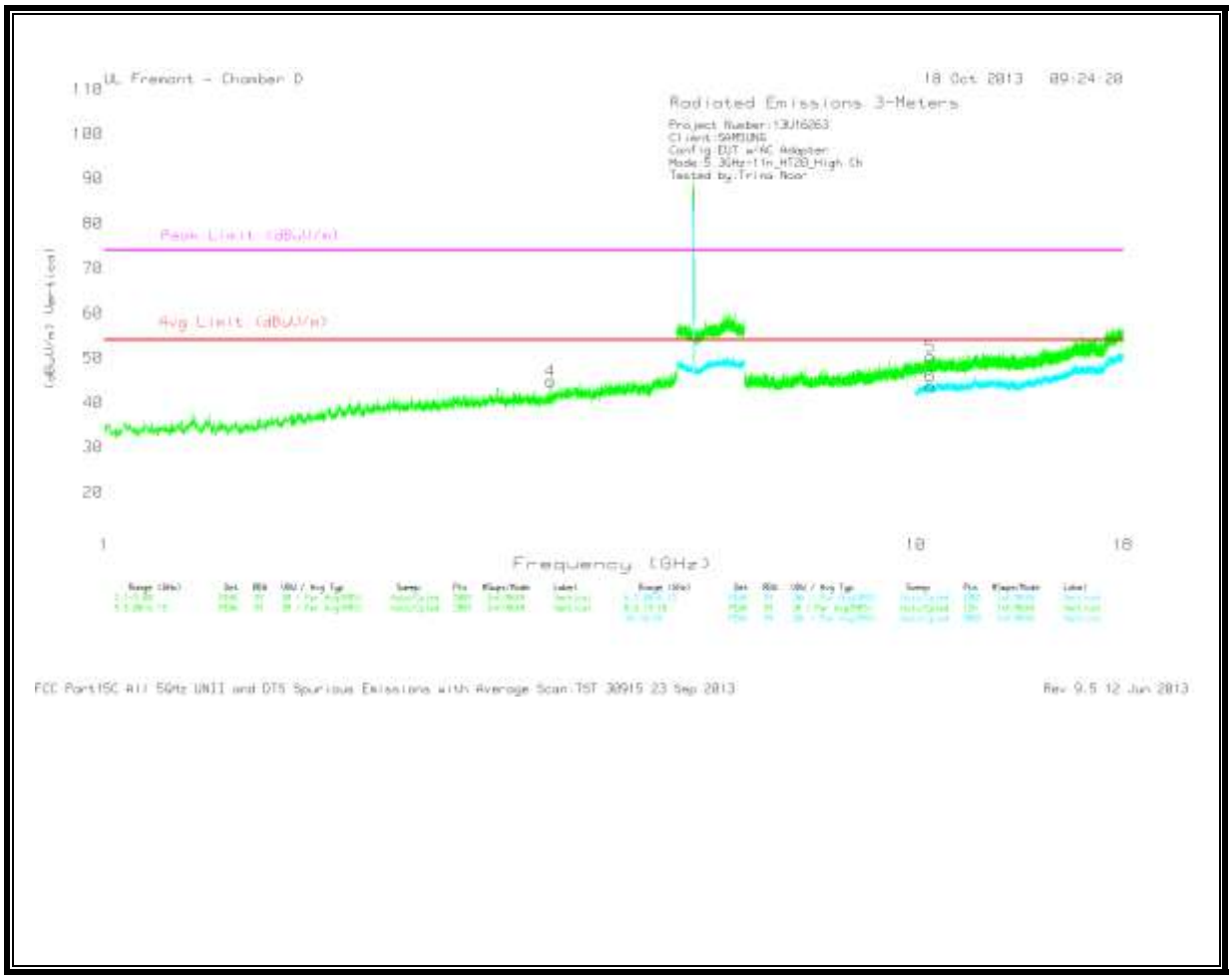
PK - Peak detector

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

HIGH CHANNEL
HORIZONTAL



HIGH CHANNEL
VERTICAL



HIGH CHANNEL 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	3.548	41.05	PK	33.4	-29.3	45.15	53.97	-8.82	74	-28.85	0-360	201	H
4	3.547	40.69	PK	33.4	-29.3	44.79	53.97	-9.18	74	-29.21	0-360	100	V
2	10.126	34.97	PK	38.1	-22.2	50.87	53.97	-3.1	74	-23.13	0-360	200	H
5	10.426	34.16	PK	38.3	-22.2	50.26	53.97	-3.71	74	-23.74	0-360	200	V
3	10.122	27.59	PK	38	-22.1	43.49	53.97	-10.48	74	-30.51	0-360	100	H
6	10.422	27.39	PK	38.3	-22.1	43.59	53.97	-10.38	74	-30.41	0-360	100	V

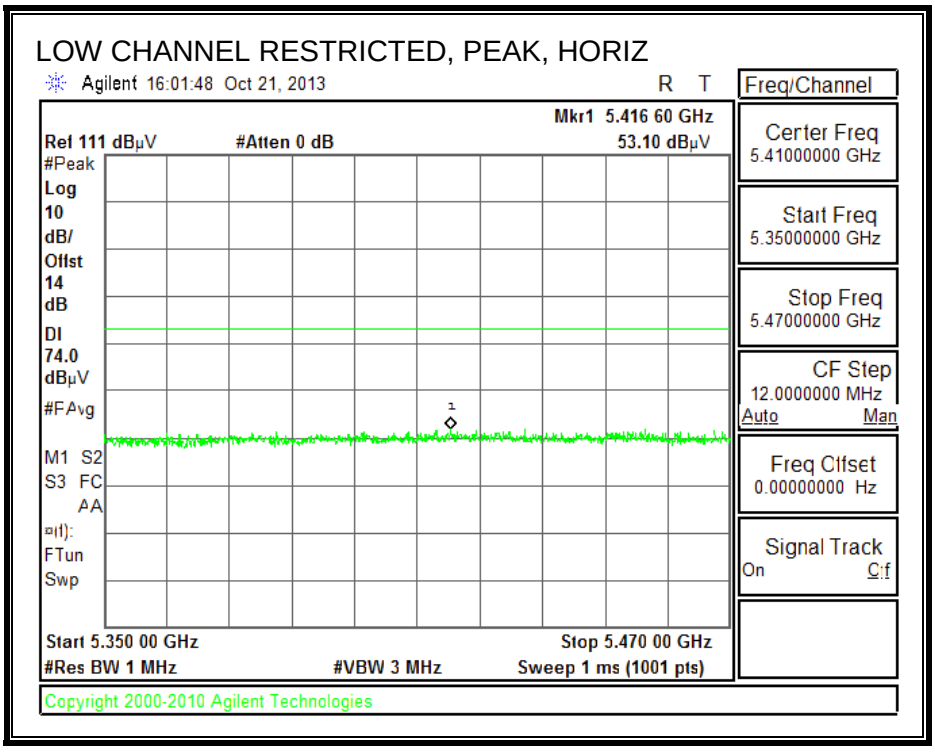
PK - Peak detector

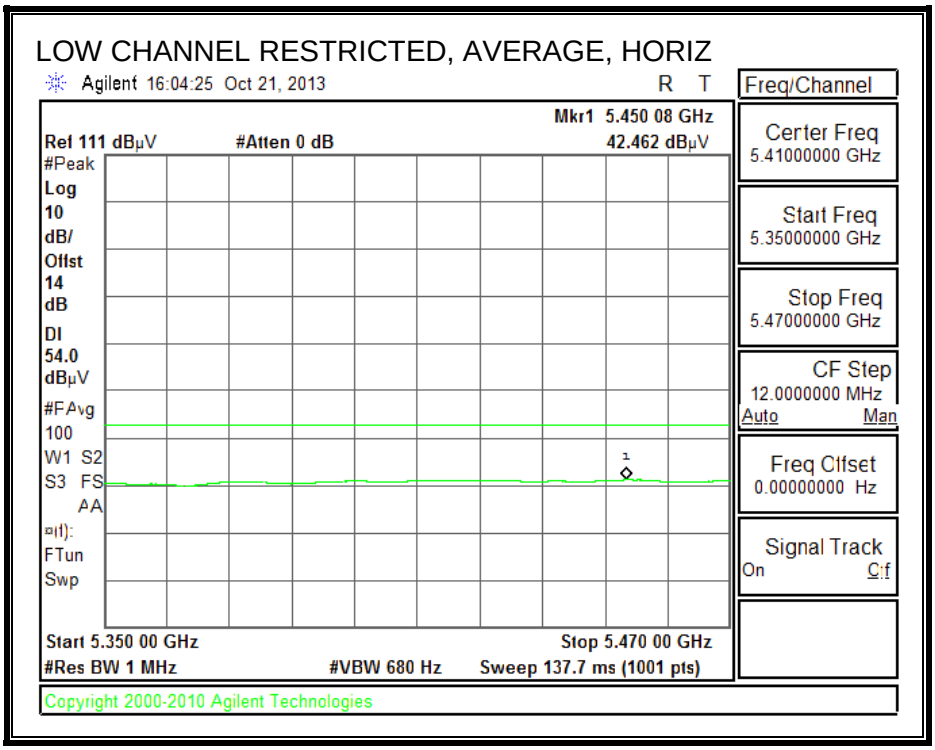
FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

11.4. 5.5-5.6 GHz

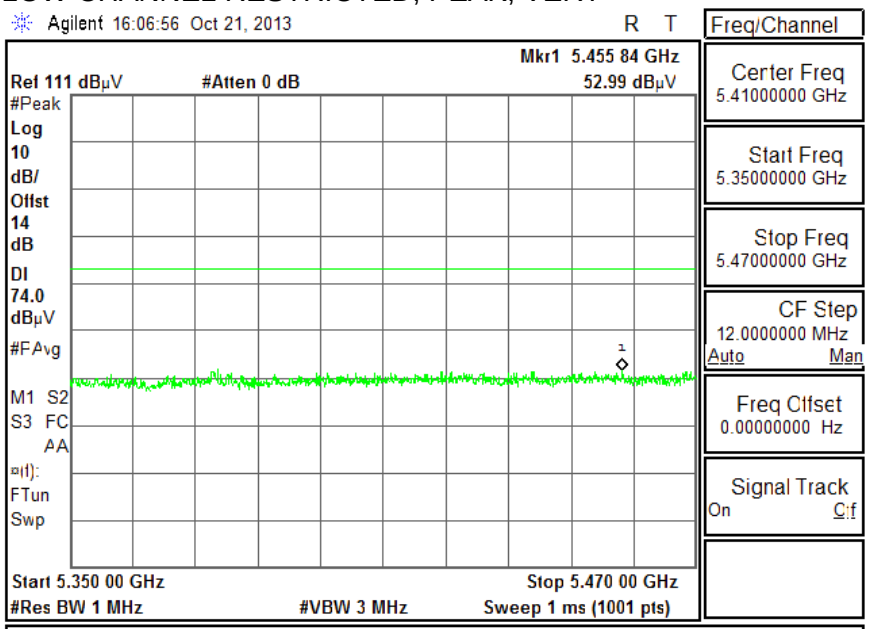
11.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

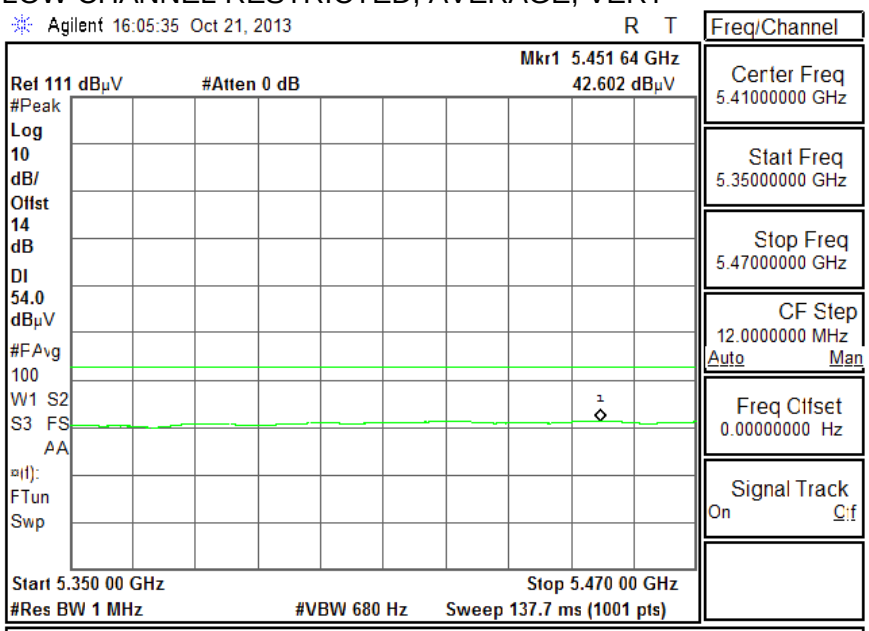




LOW CHANNEL RESTRICTED, PEAK, VERT

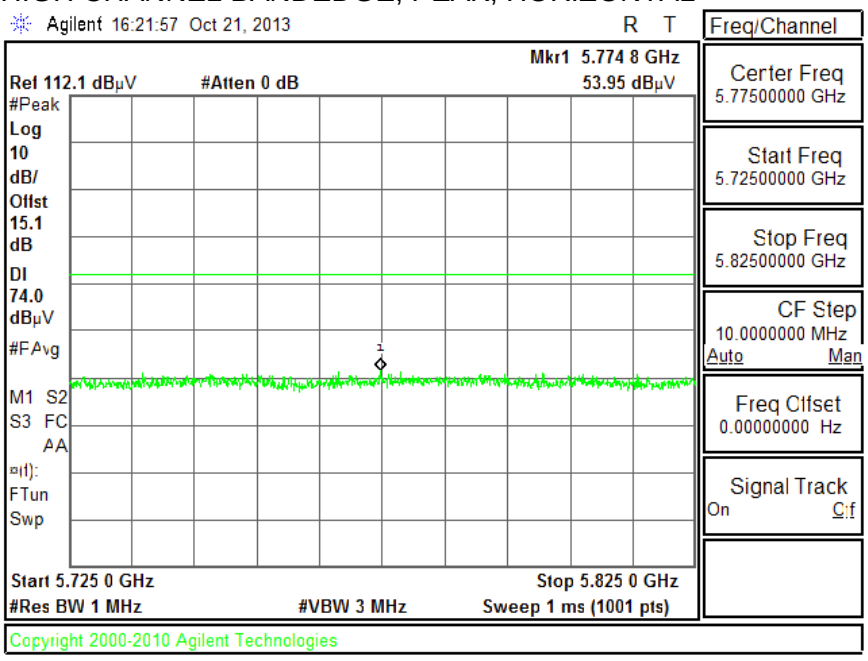


LOW CHANNEL RESTRICTED, AVERAGE, VERT

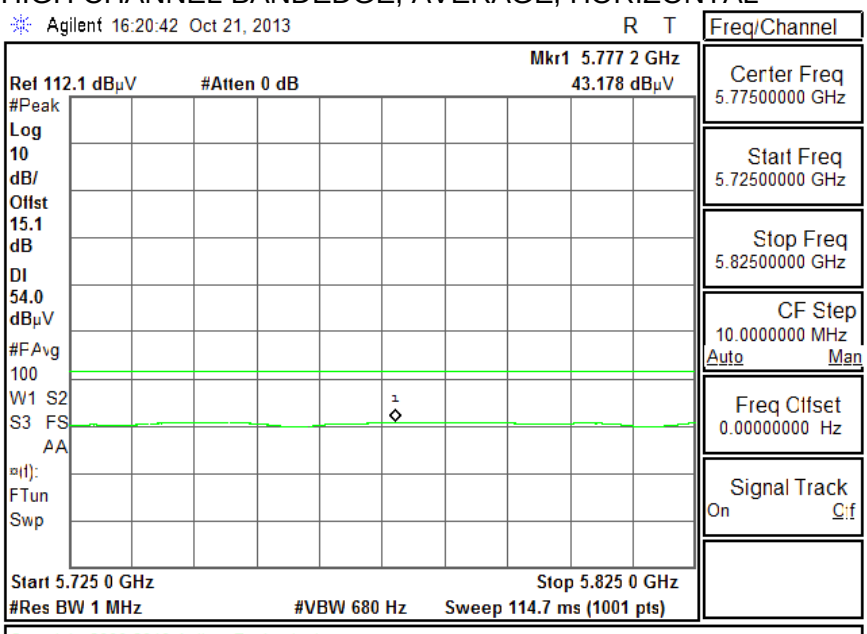


AUTHORIZED BANDEDGE (HIGH CHANNEL)

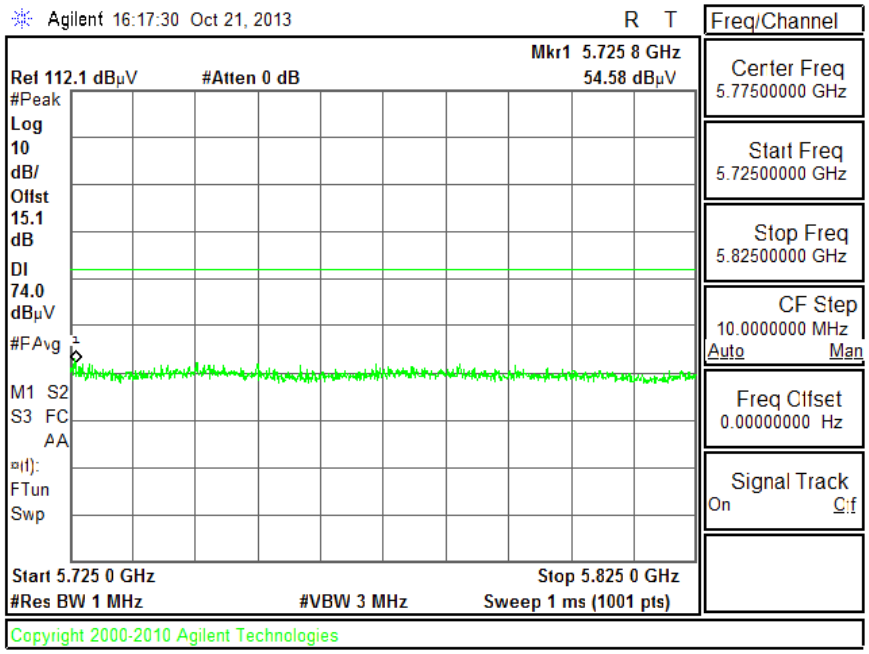
HIGH CHANNEL BANDEDGE, PEAK, HORIZONTAL



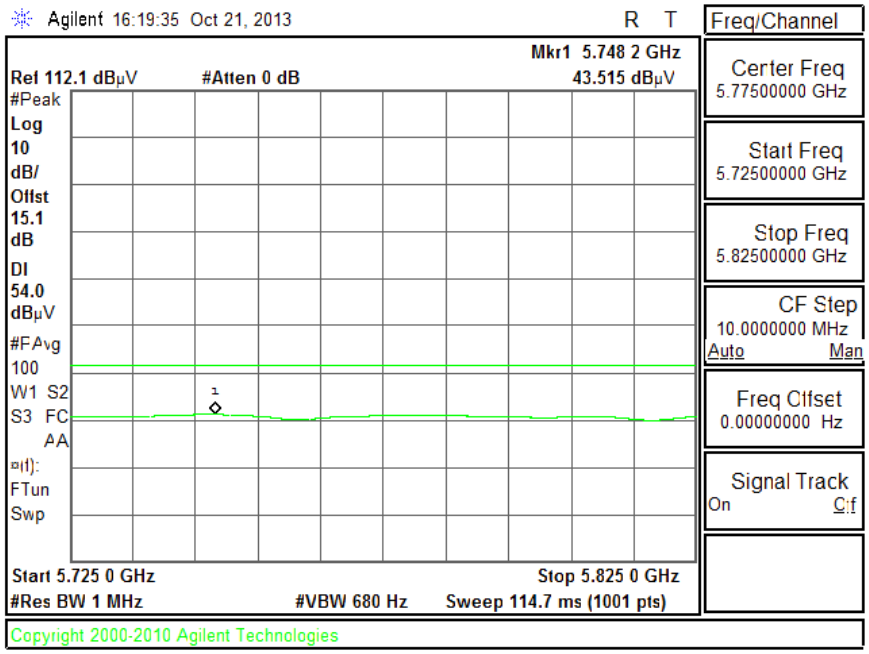
HIGH CHANNEL BANDEDGE, AVERAGE, HORIZONTAL



HIGH CHANNEL BANDEDGE, PEAK, VERTICAL

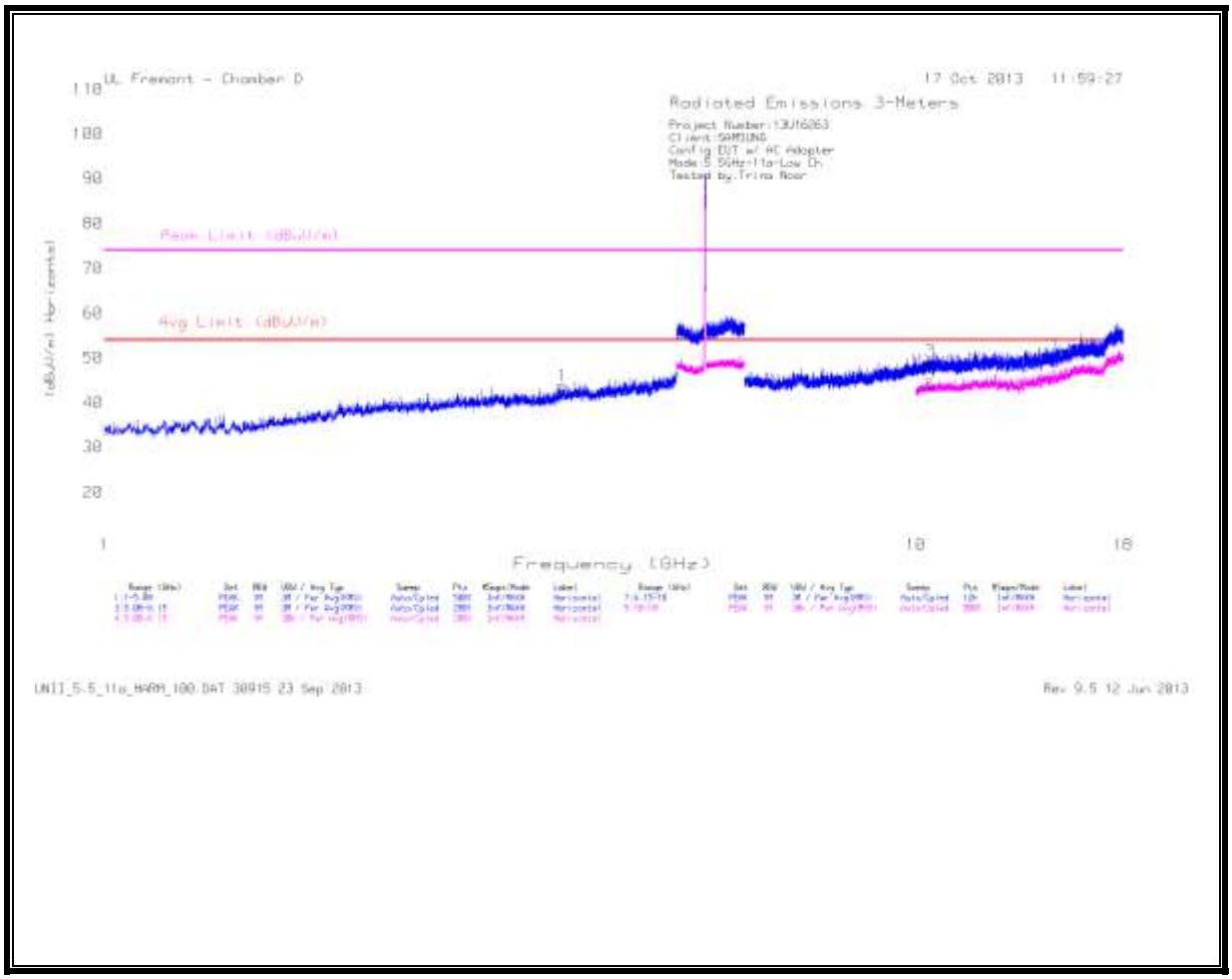


HIGH CHANNEL BANDEDGE, AVERAGE, VERTICAL

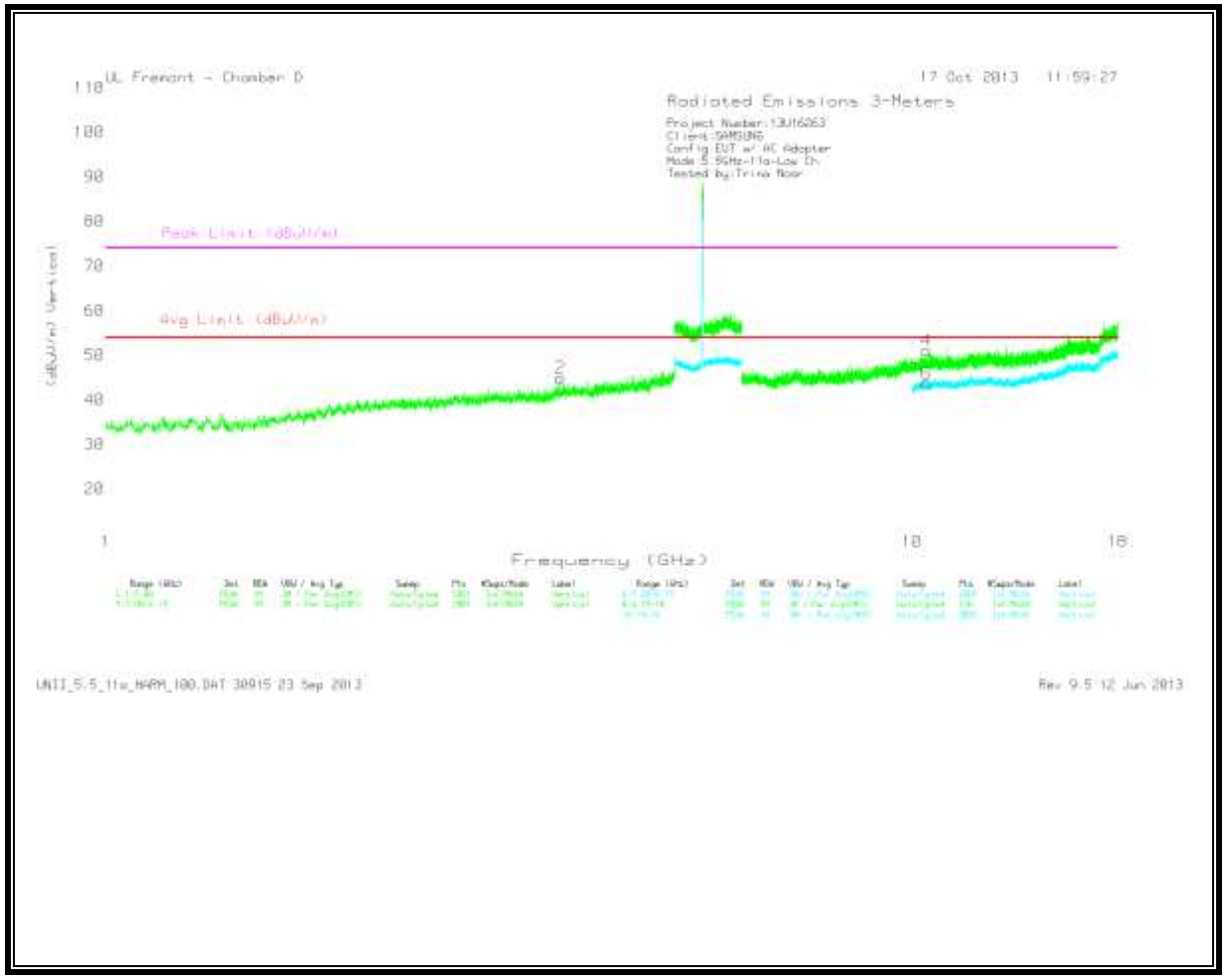


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



VERTICAL



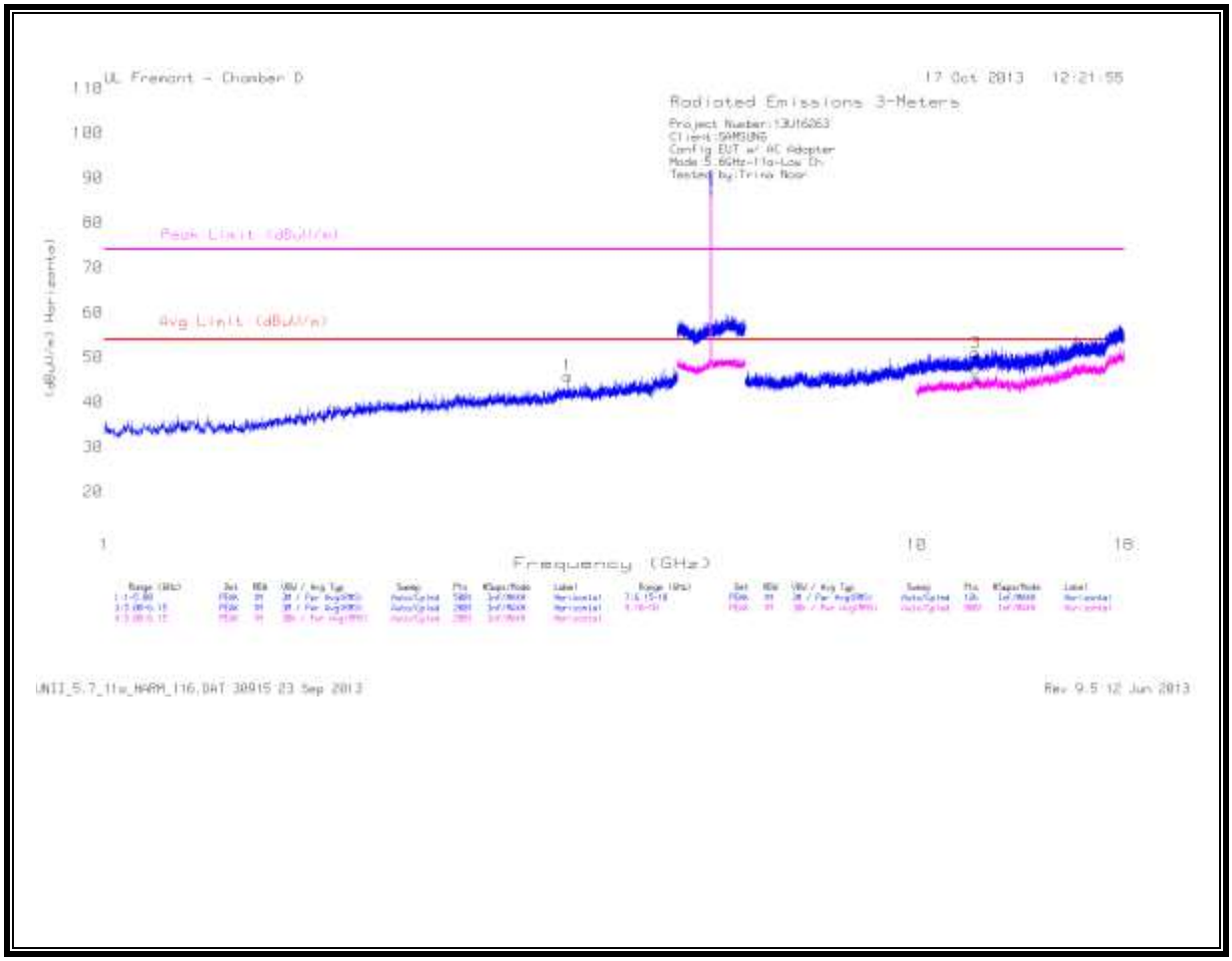
LOW CHANNEL DATA

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	3.668	39.16	PK	33.6	-29	43.76	53.97	-10.21	74	-30.24	0-360	100	H
2	3.668	40.36	PK	33.6	-29	44.96	53.97	-9.01	74	-29.04	0-360	100	V
3	10.425	33.26	PK	38.3	-22.2	49.36	53.97	-4.61	74	-24.64	0-360	100	H
4	10.424	34.93	PK	38.3	-22.2	51.03	53.97	-2.94	74	-22.97	0-360	201	V
5	10.415	27.64	PK	38.3	-21.9	44.04	53.97	-9.93	74	-29.96	0-360	100	H
6	10.424	27.64	PK	38.3	-22.2	43.74	53.97	-10.23	74	-30.26	0-360	200	V

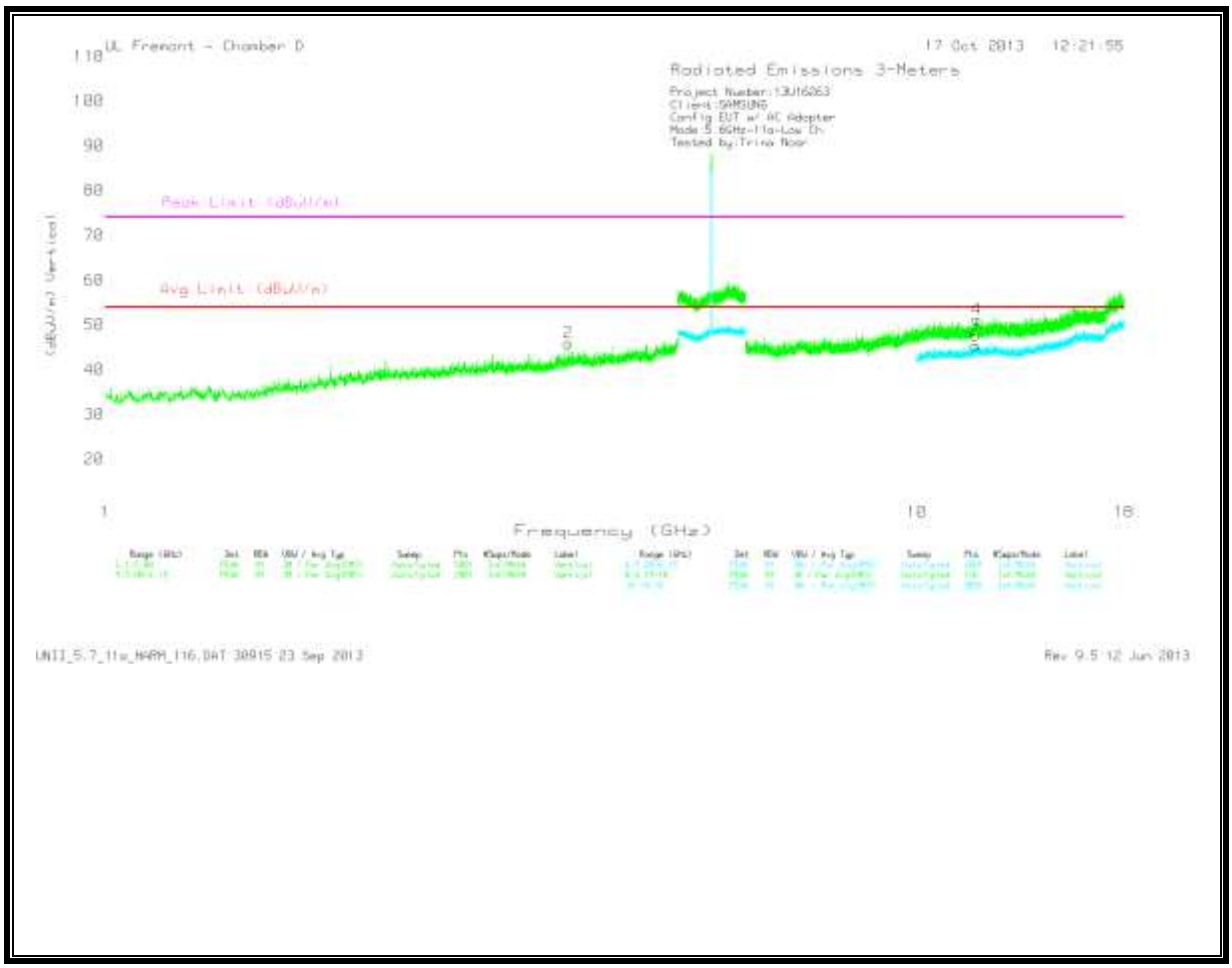
PK - Peak detector

UNII_5.5_11a_HARM_100.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



VERTICAL



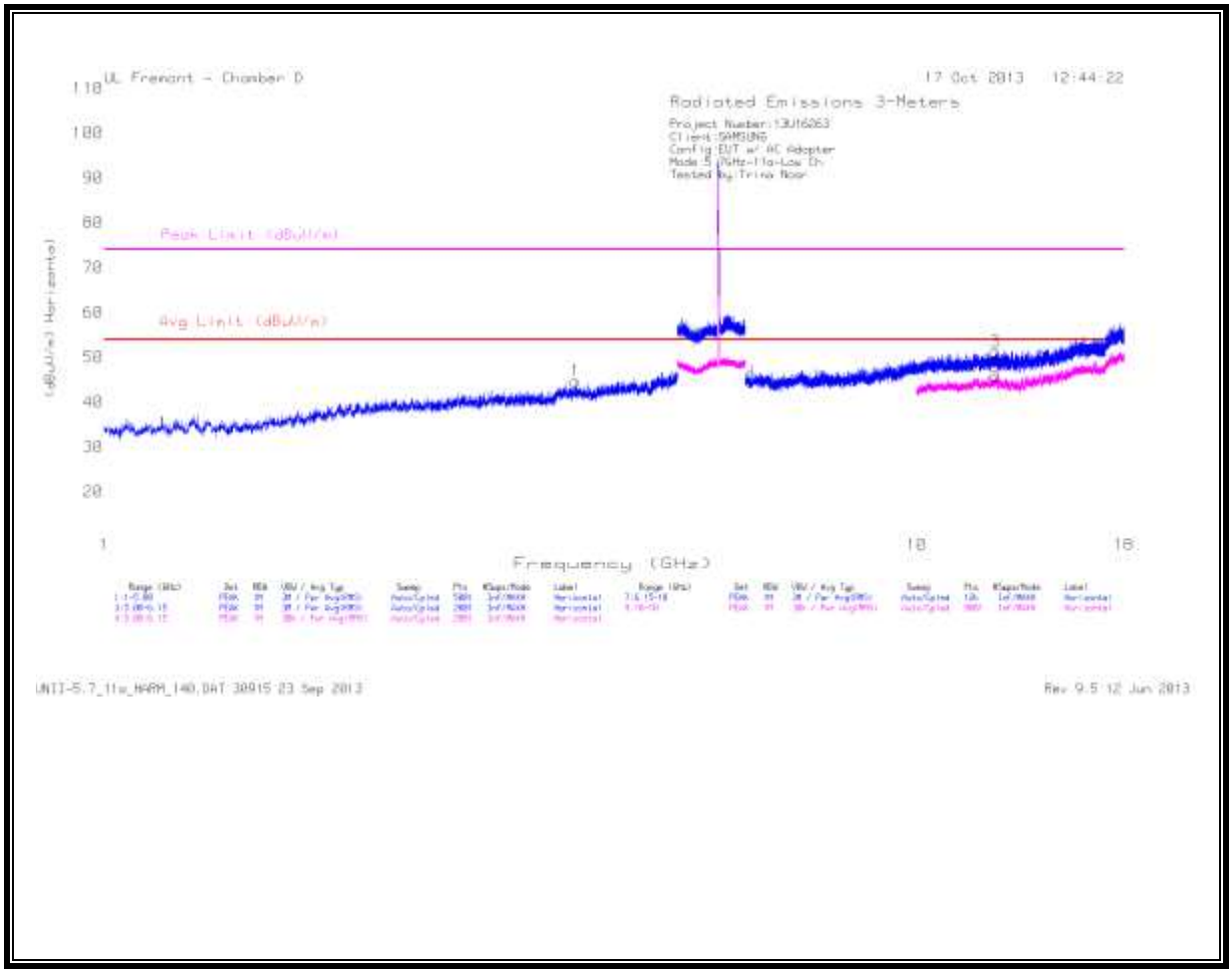
MID CHANNEL DATA

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	3.721	41.35	PK	33.7	-29.2	45.85	53.97	-8.12	74	-28.15	0-360	100	H
2	3.721	41.49	PK	33.7	-29.2	45.99	53.97	-7.98	74	-28.01	0-360	100	V
3	11.816	33.32	PK	39	-21.3	51.02	53.97	-2.95	74	-22.98	0-360	100	H
4	11.847	33.77	PK	39	-21.5	51.27	53.97	-2.7	74	-22.73	0-360	200	V
5	11.842	27.46	PK	39	-21.3	45.16	53.97	-8.81	74	-28.84	0-360	100	H
6	11.807	28.03	PK	39	-21.7	45.33	53.97	-8.64	74	-28.67	0-360	200	V

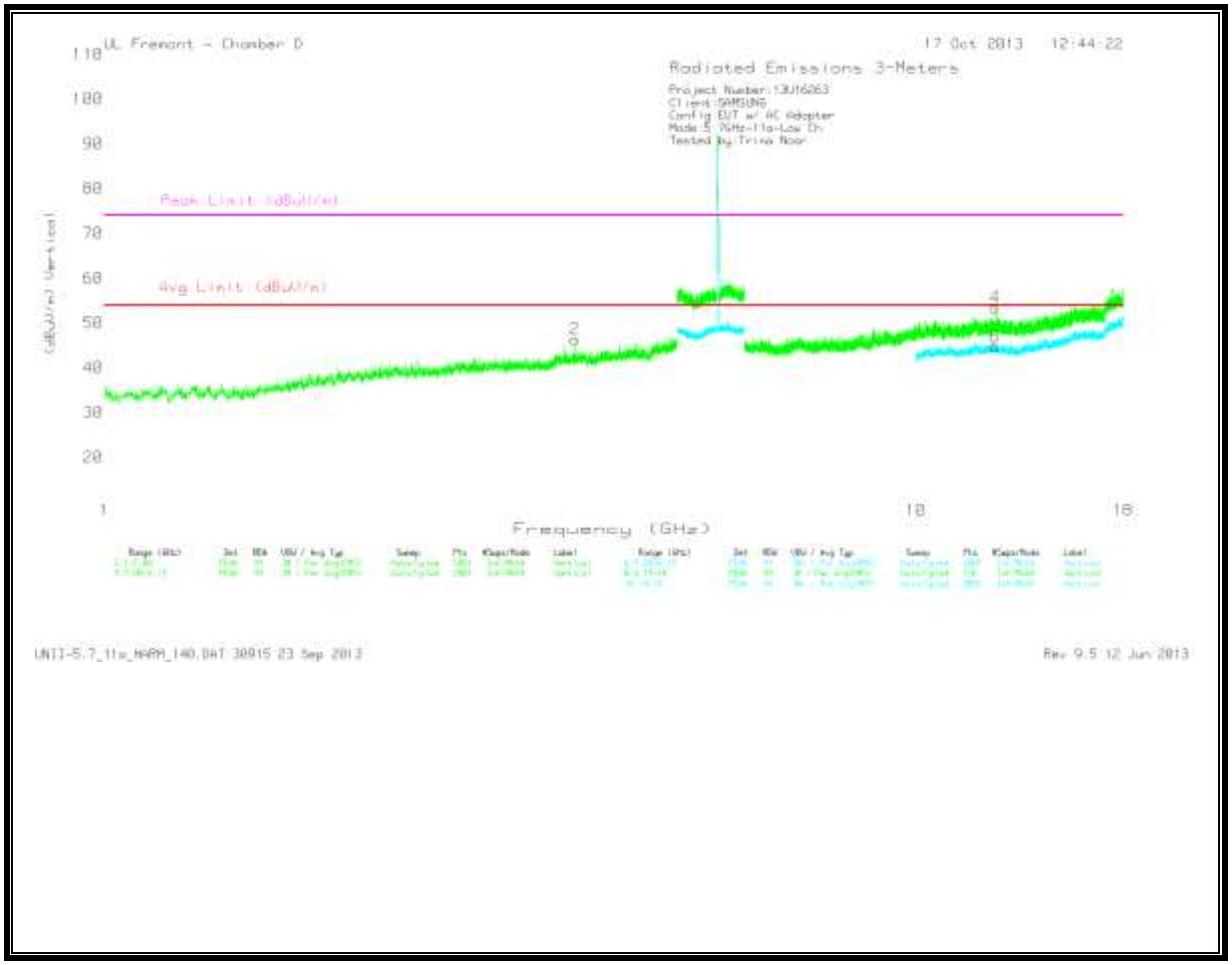
PK - Peak detector

UNII_5.7_11a_HARM_116.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

HIGH CHANNEL
HORIZONTAL



VERTICAL



HIGH CHANNEL DATA

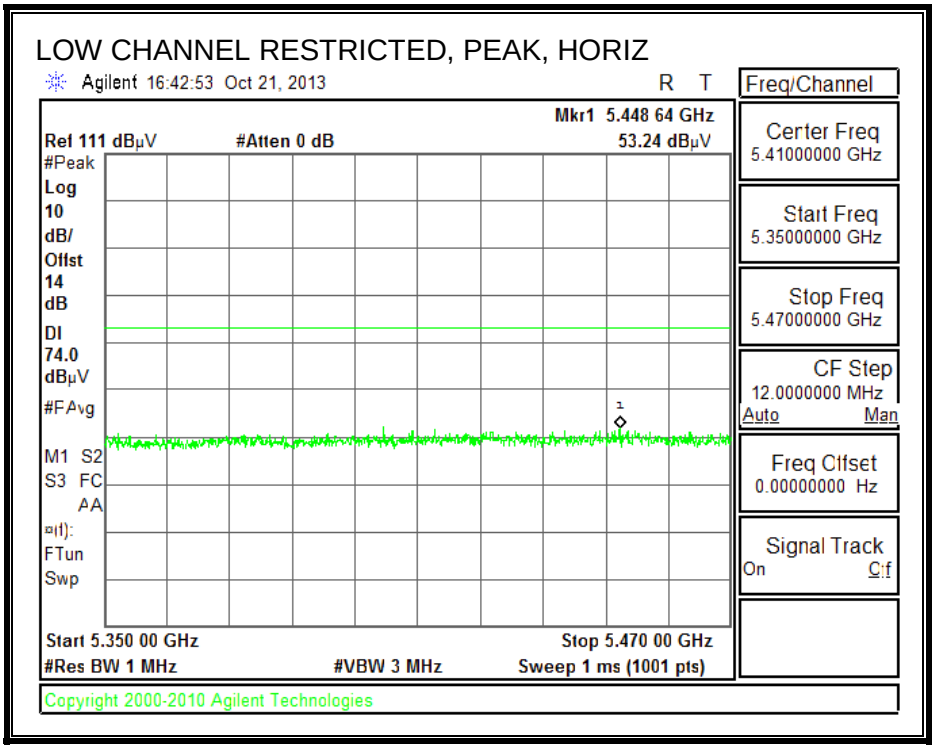
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.801	40.08	PK	33.8	-29.2	44.68	53.97	-9.29	74	-29.32	0-360	201	H
2	3.801	41.79	PK	33.8	-29.2	46.39	53.97	-7.58	74	-27.61	0-360	100	V
3	12.51	33.99	PK	39.2	-21.9	51.29	53.97	-2.68	74	-22.71	0-360	200	H
4	12.516	36.09	PK	39.2	-21.8	53.49	53.97	-.48	74	-20.51	0-360	200	V
5	12.51	28.57	PK	39.2	-21.9	45.87	53.97	-8.1	74	-28.13	0-360	201	H
6	12.52	27.31	PK	39.2	-21.8	44.71	53.97	-9.26	74	-29.29	0-360	201	V

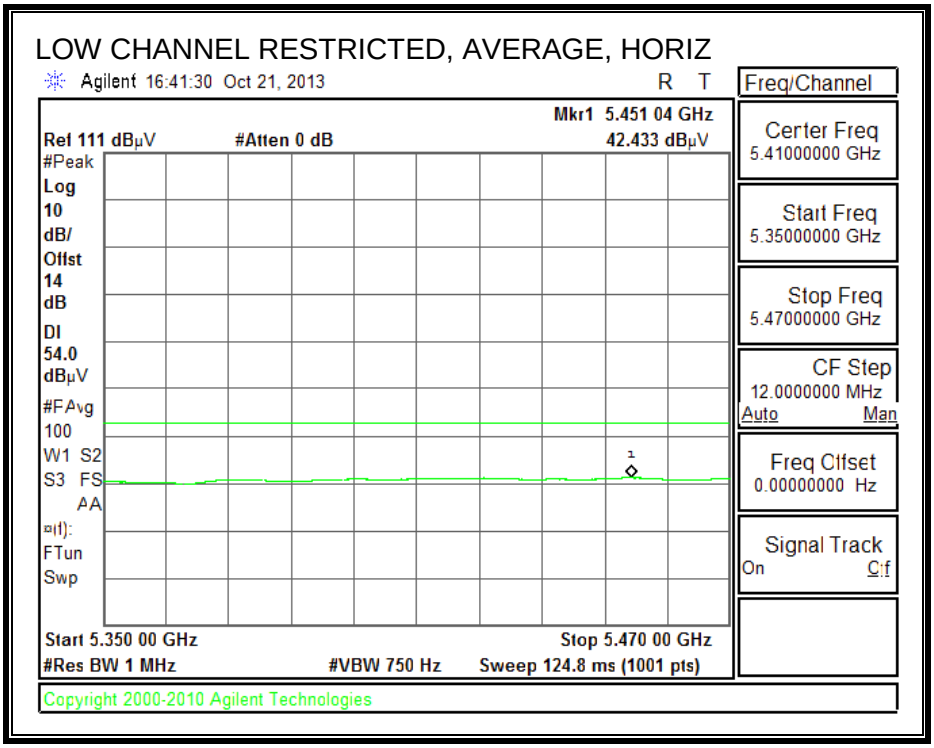
PK - Peak detector

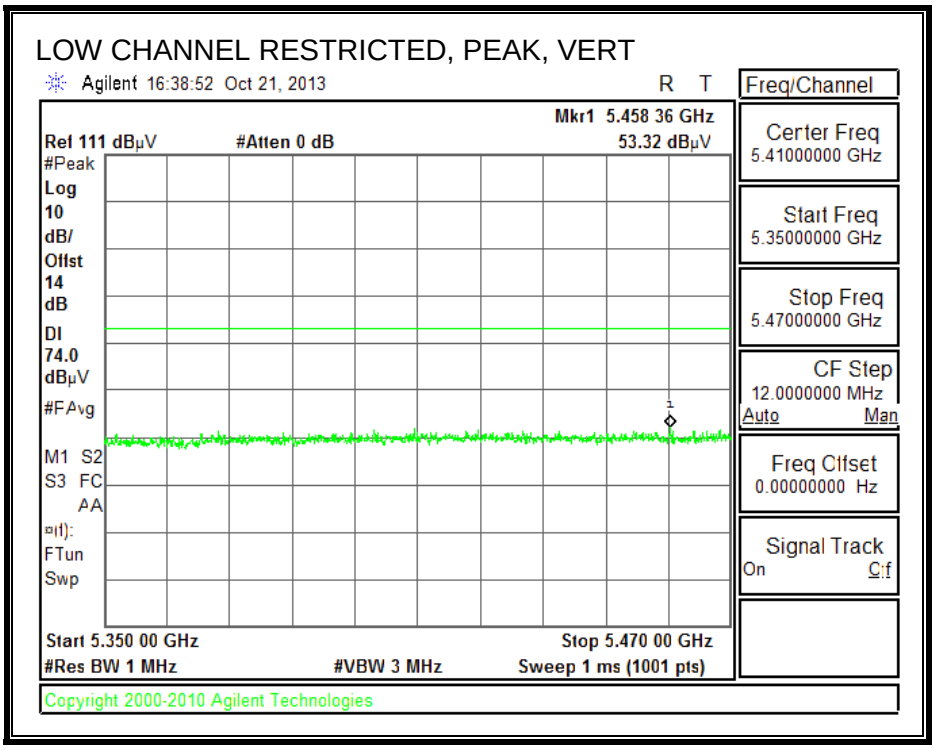
UNII-5.7_11a_HARM_140.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

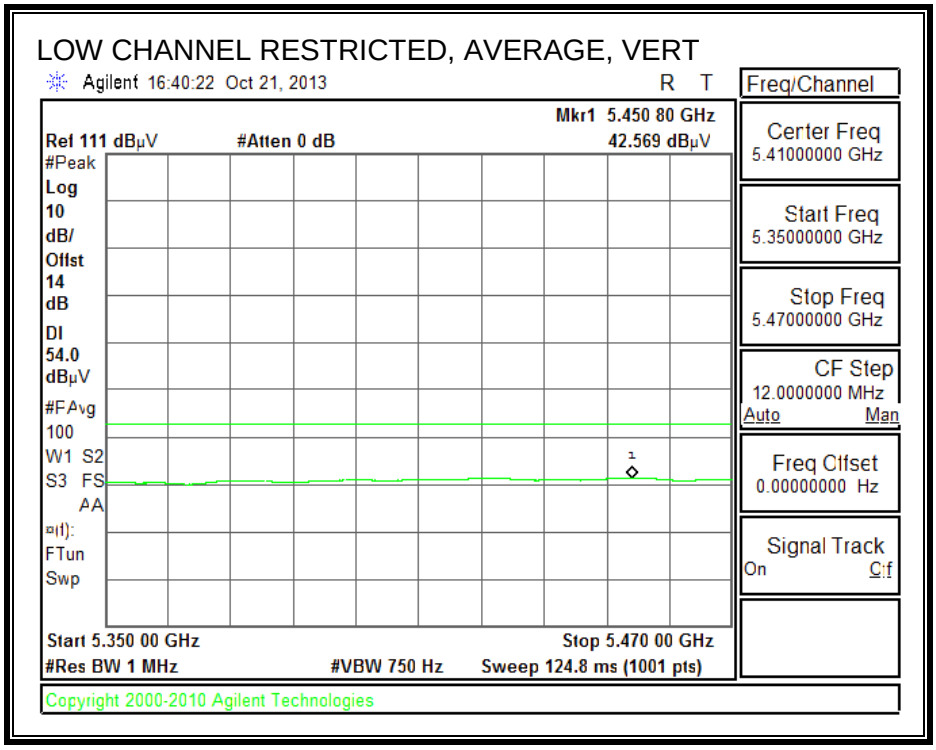
11.4.1. TX ABOVE 1 GHz 802.11n MODE IN THE 5.5 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

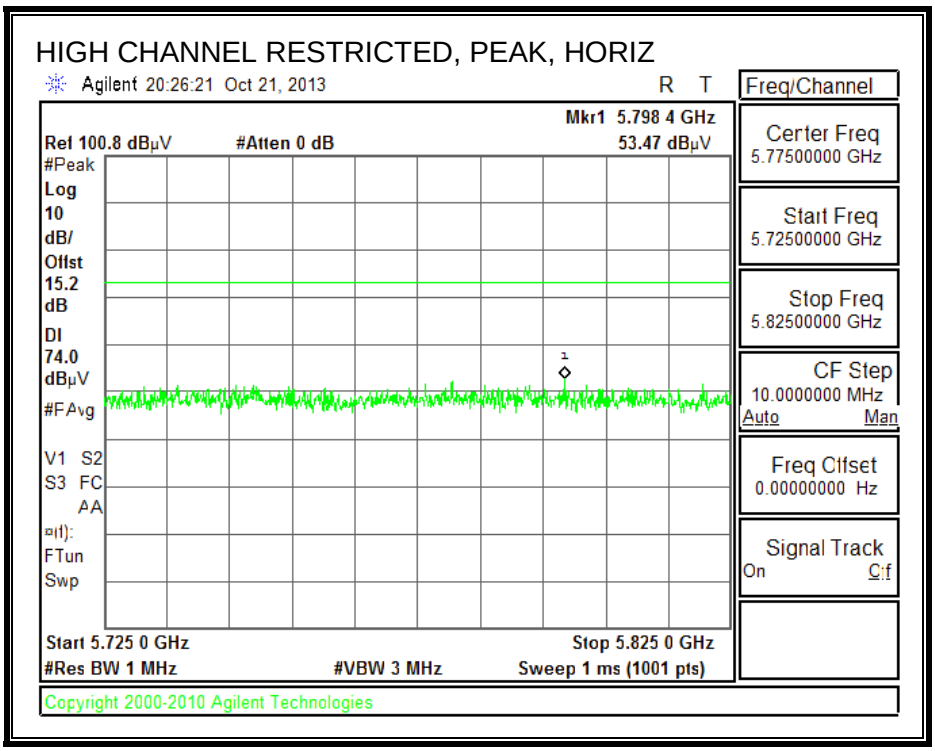


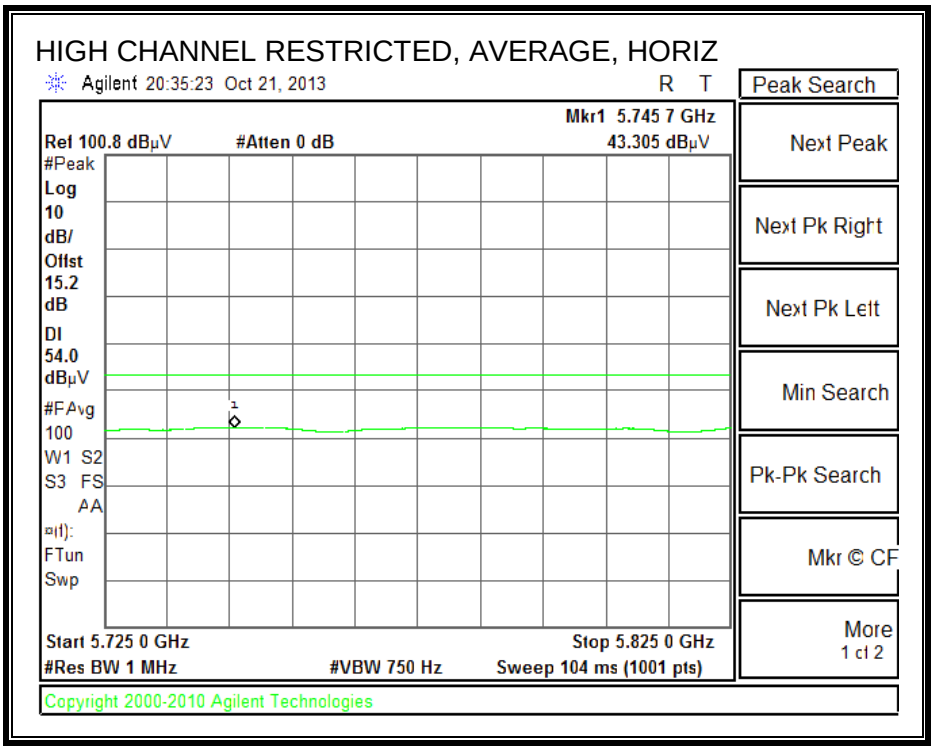




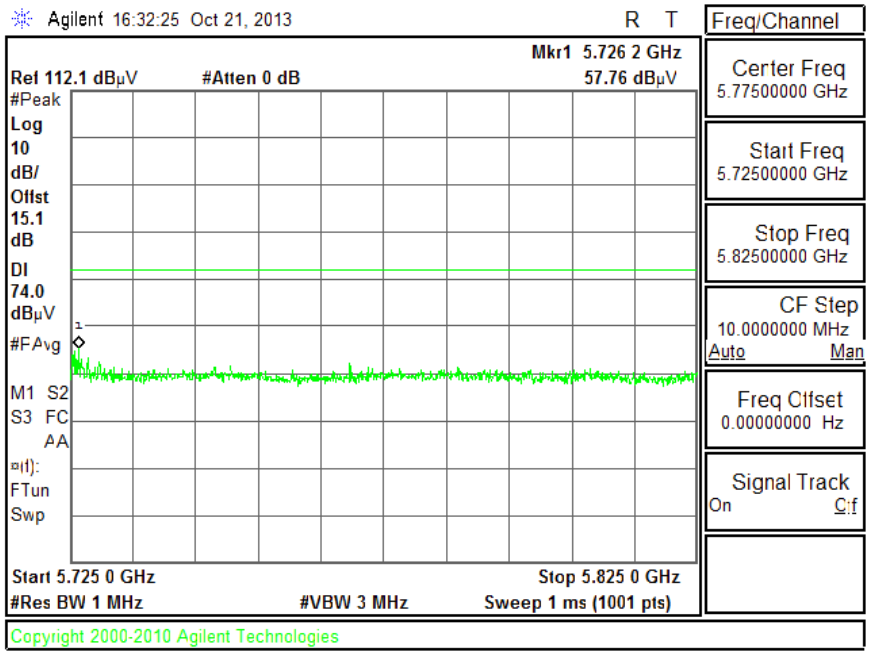


RESTRICTED BANDEDGE (HIGH CHANNEL)

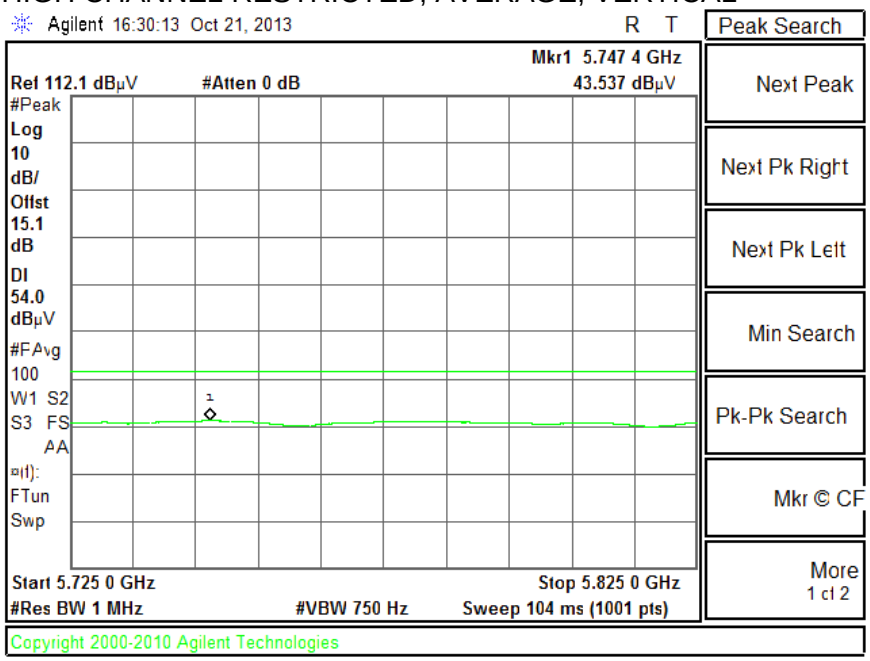




HIGH CHANNEL RESTRICTED, PEAK, VERTICAL

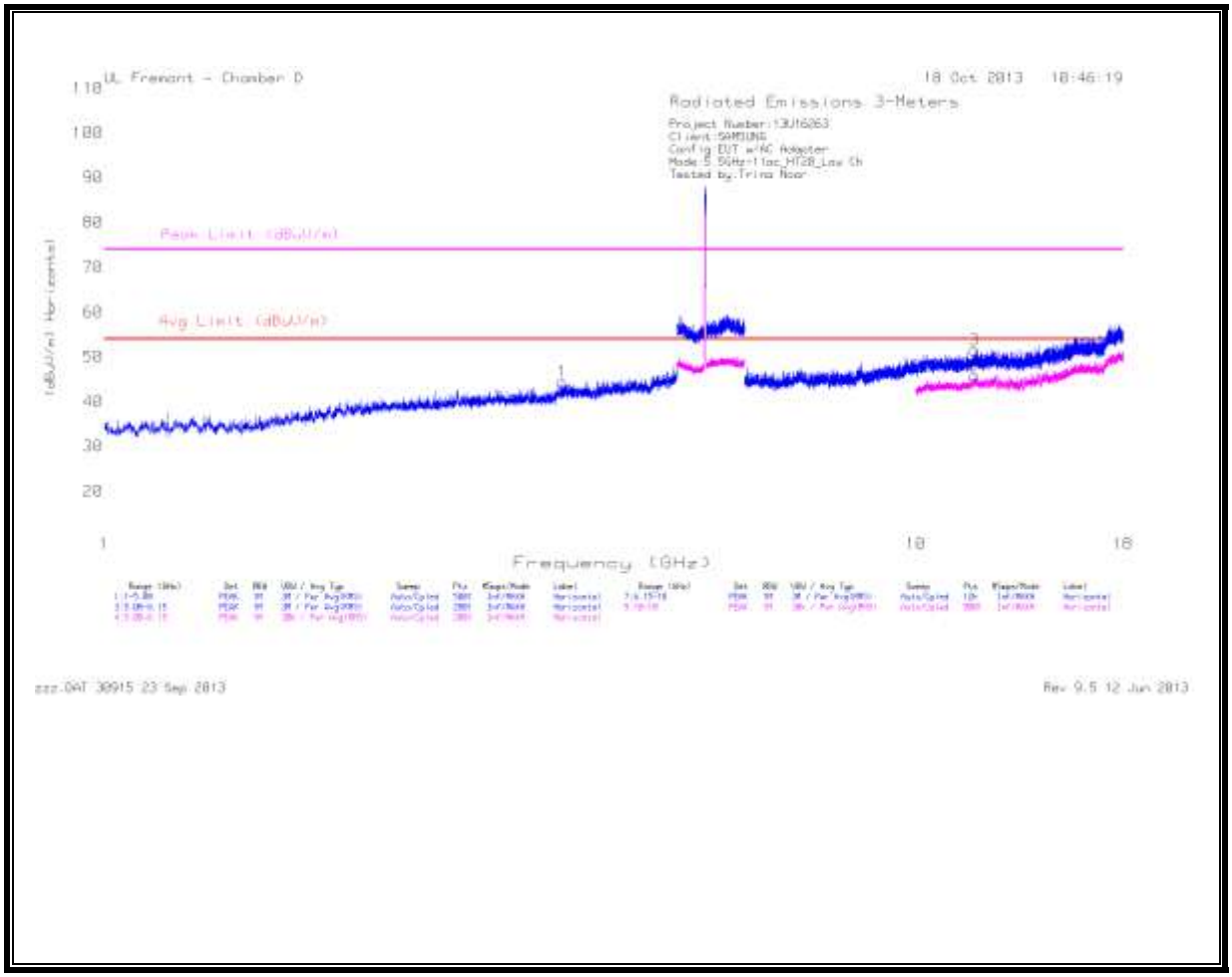


HIGH CHANNEL RESTRICTED, AVERAGE, VERTICAL

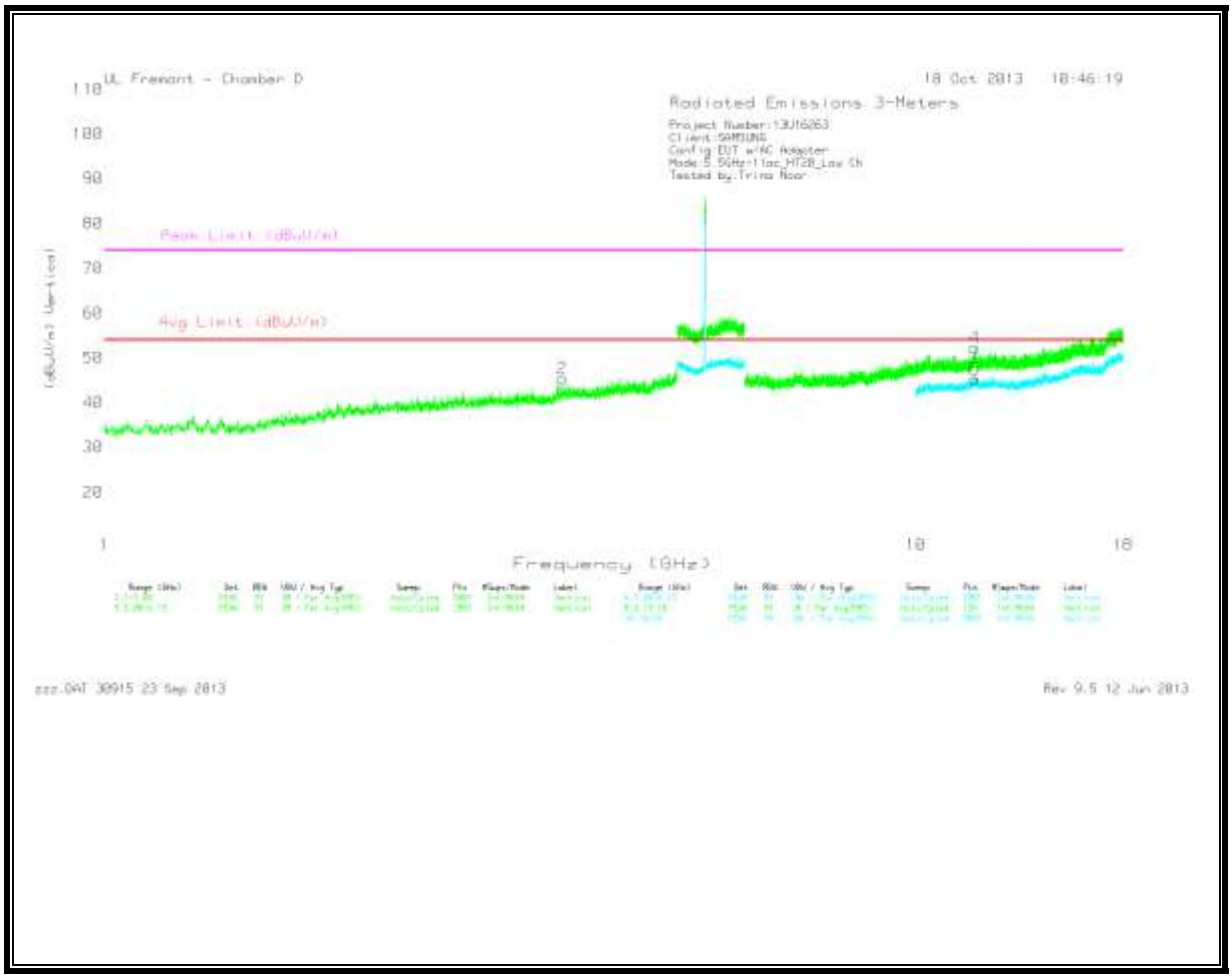


HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



LOW CHANNEL
VERTICAL

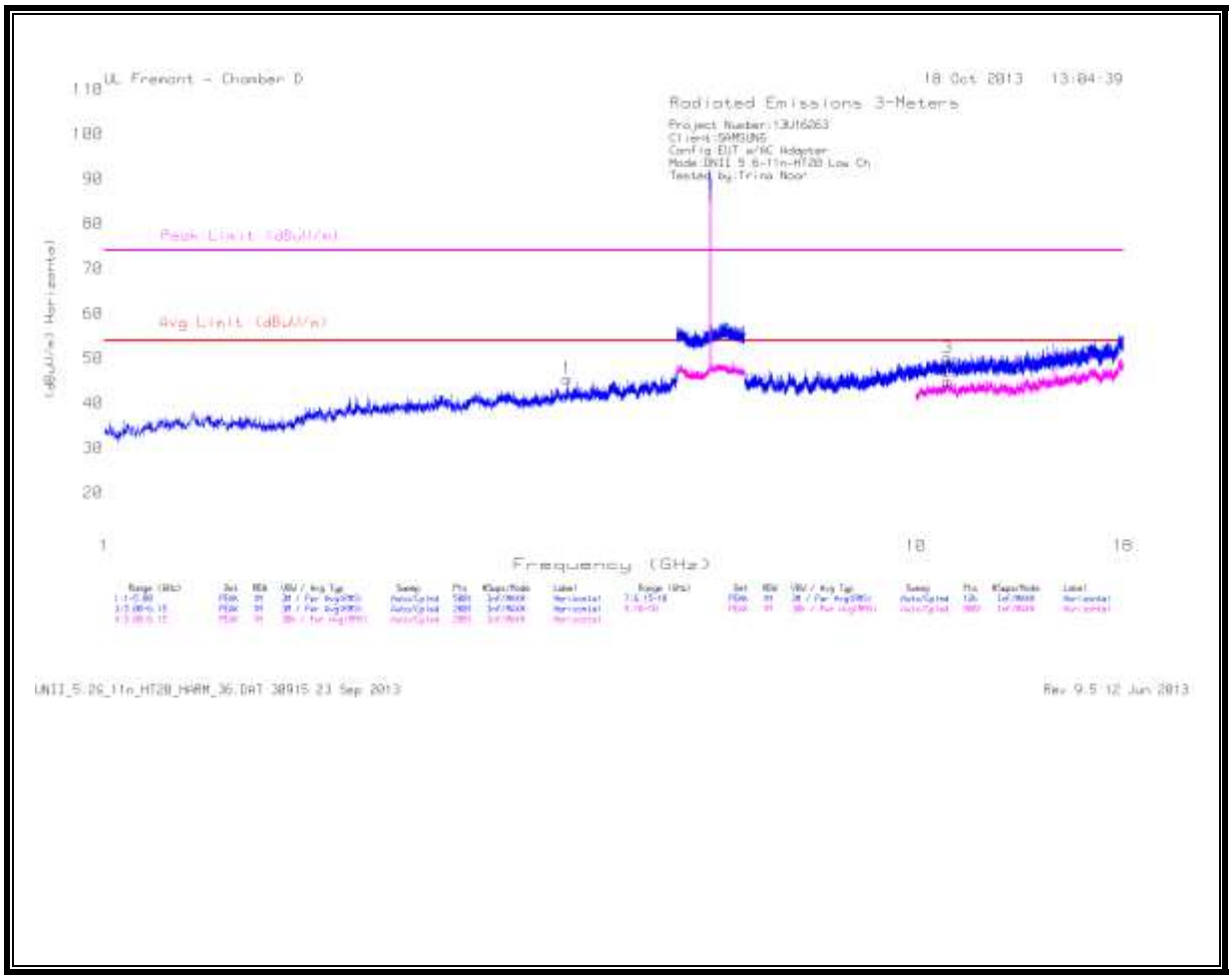


LOW CHANNEL DATA

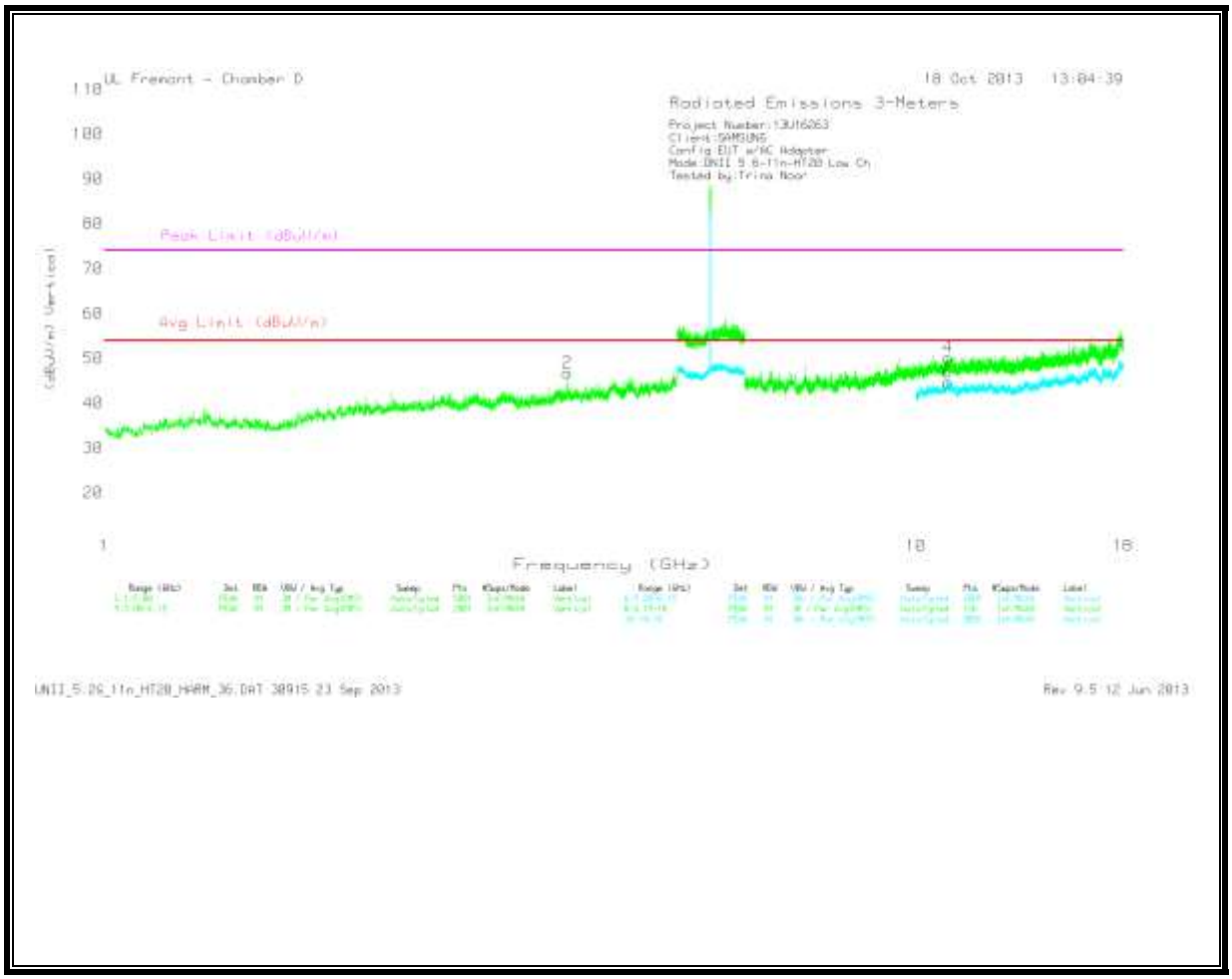
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (db/m)	Amp/Cbl /Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.668	39.8	PK	33.6	-29	44.4	53.97	-9.57	74	-29.6	0-360	100	H
2	3.668	40.75	PK	33.6	-29	45.35	53.97	-8.62	74	-28.65	0-360	100	V
3	11.814	33.97	PK	39	-21.4	51.57	53.97	-2.4	74	-22.43	0-360	100	H
4	11.82	34.47	PK	39	-21.2	52.27	53.97	-1.7	74	-21.73	0-360	100	V
5	11.818	28.12	PK	39	-21.3	45.82	53.97	-8.15	74	-28.18	0-360	201	H
6	11.818	27.58	PK	39	-21.3	45.28	53.97	-8.69	74	-28.72	0-360	201	V

PK - Peak detector
zzz.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

MID CHANNEL
HORIZONTAL



MID CHANNEL
VERTICAL



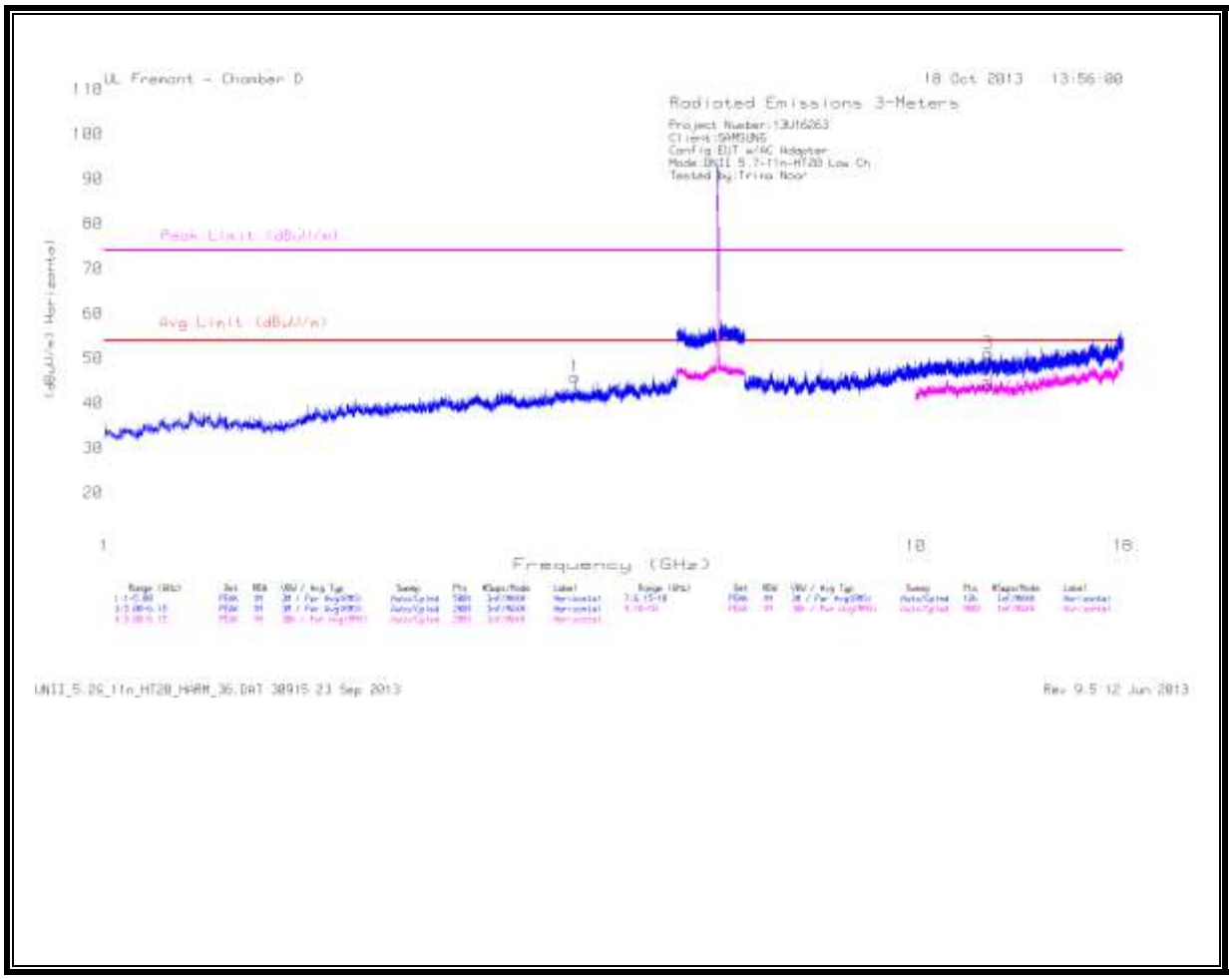
MID CHANNEL DATA

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	3.721	41.14	PK	33.5	-29.2	45.44	53.97	-8.53	74	-28.56	0-360	100	H
2	3.721	42.46	PK	33.5	-29.2	46.76	53.97	-7.21	74	-27.24	0-360	100	V

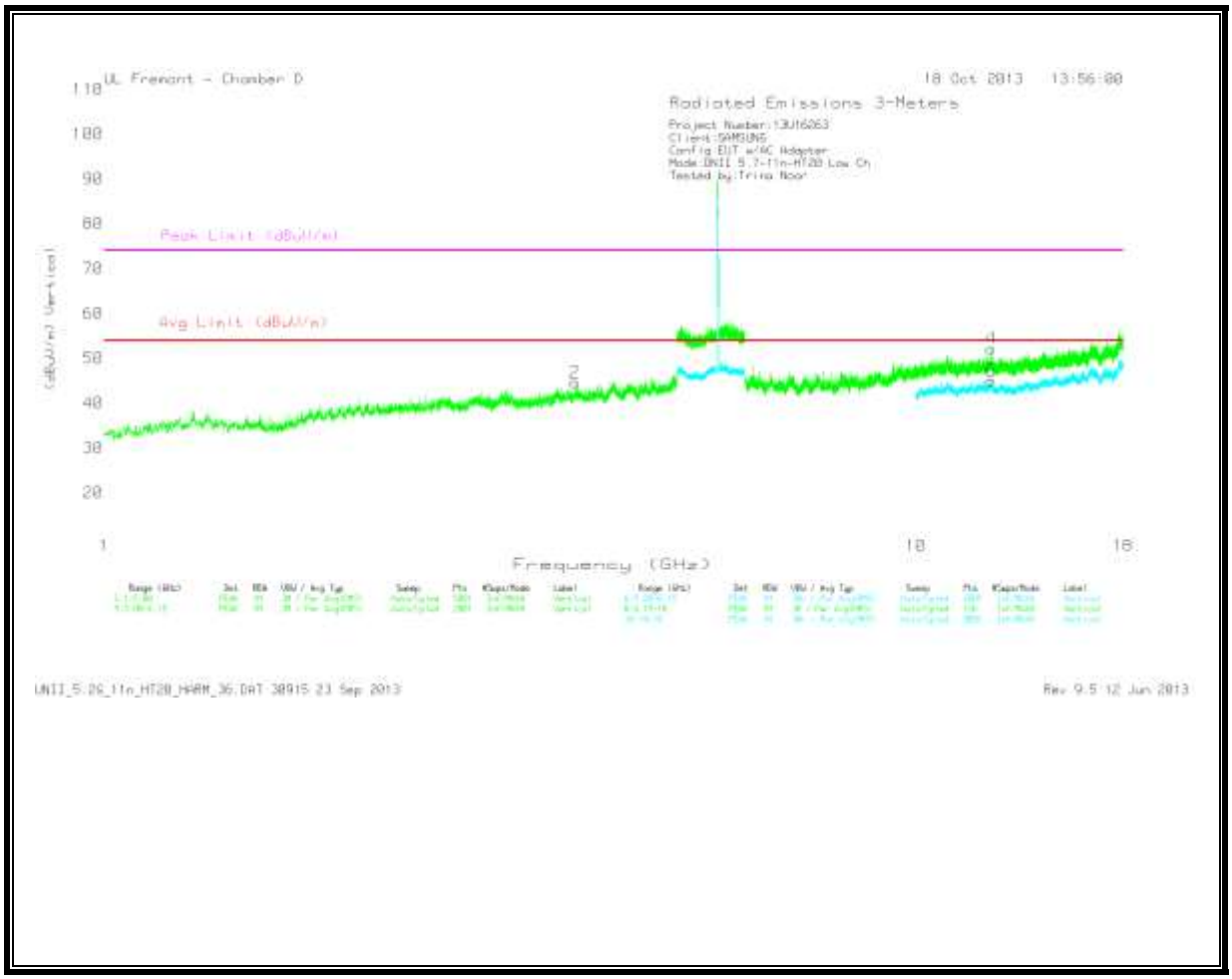
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /6GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	10.943	33.5	PK	38.7	-22	50.2	53.97	-3.77	74	-23.8	0-360	100	H
4	10.956	33.68	PK	38.7	-22.2	50.18	53.97	-3.79	74	-23.82	0-360	200	V
5	10.94	28.12	PK	38.7	-22	44.82	53.97	-9.15	74	-29.18	0-360	100	H
6	10.948	28.06	PK	38.7	-22.1	44.66	53.97	-9.31	74	-29.34	0-360	200	V

PK - Peak detector
UNII_5.2G_11n_HT20_HARM_36.DAT 30915 23 Sep 2013 Rev 9.5 12 Jun 2013

HIGH CHANNEL
HORIZONTAL



HIGH CHANNEL
VERTICAL



HIGH CHANNEL 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	3.801	41.66	PK	33.6	-29.4	45.86	53.97	-8.11	74	-28.14	0-360	100	H
2	3.801	40.38	PK	33.6	-29.4	44.58	53.97	-9.39	74	-29.42	0-360	200	V

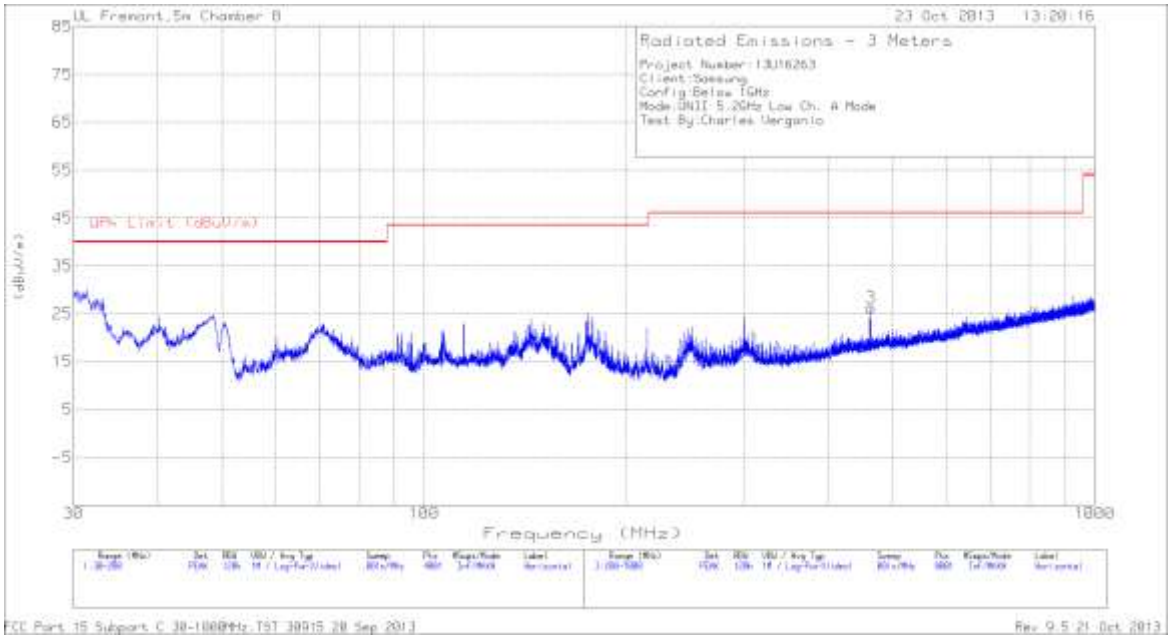
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl /6GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	12.277	35.4	PK	39.2	-23.5	51.1	53.97	-2.87	74	-22.9	0-360	100	H
4	12.383	35.71	PK	39.2	-22.7	52.21	53.97	-1.76	74	-21.79	0-360	100	V
5	12.28	28.18	PK	39.2	-23.5	43.88	53.97	-10.09	74	-30.12	0-360	100	H
6	12.381	28.49	PK	39.2	-22.7	44.99	53.97	-8.98	74	-29.01	0-360	100	V

PK - Peak detector

12. WORST-CASE BELOW 1 GHz (in the 5.2 GHz Band)

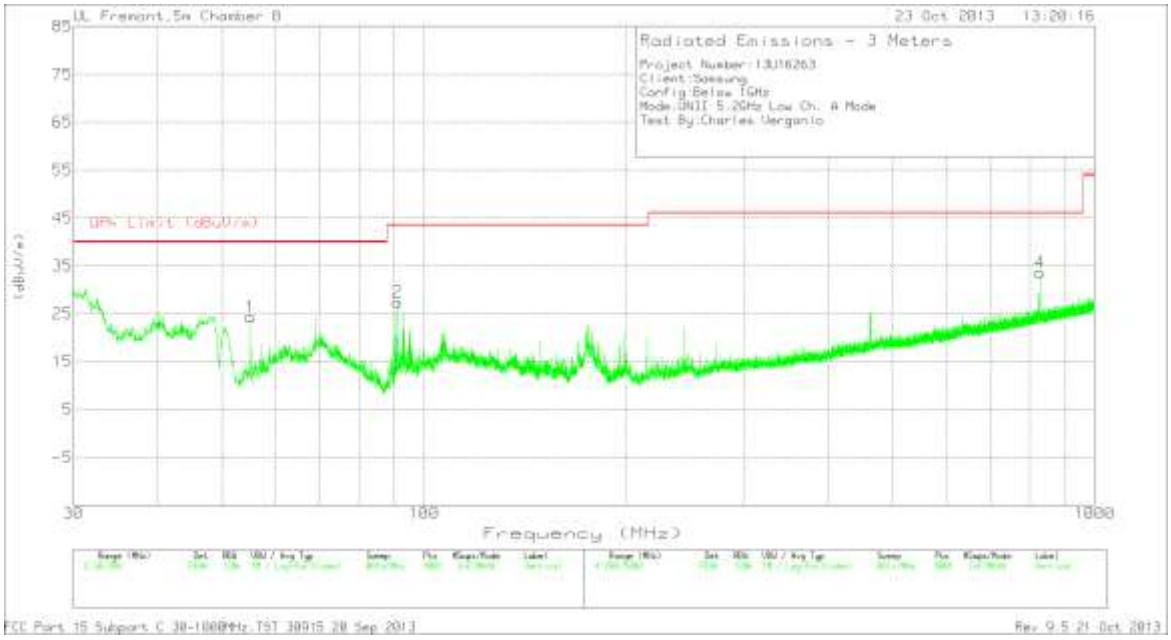
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



Worst Case Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	55.075	46.12	PK	6.8	-28.6	24.32	40	-15.68	0-360	100	V
2	91.285	47.69	PK	7.8	-28.1	27.39	43.52	-16.13	0-360	100	V
3	463.7	35.05	PK	17.1	-25.9	26.25	46.02	-19.77	0-360	100	H
4	828.7	35.78	PK	21.6	-23.8	33.58	46.02	-12.44	0-360	300	V

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 20 Sep 2013 Rev 9.5 21 Oct 2013

13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

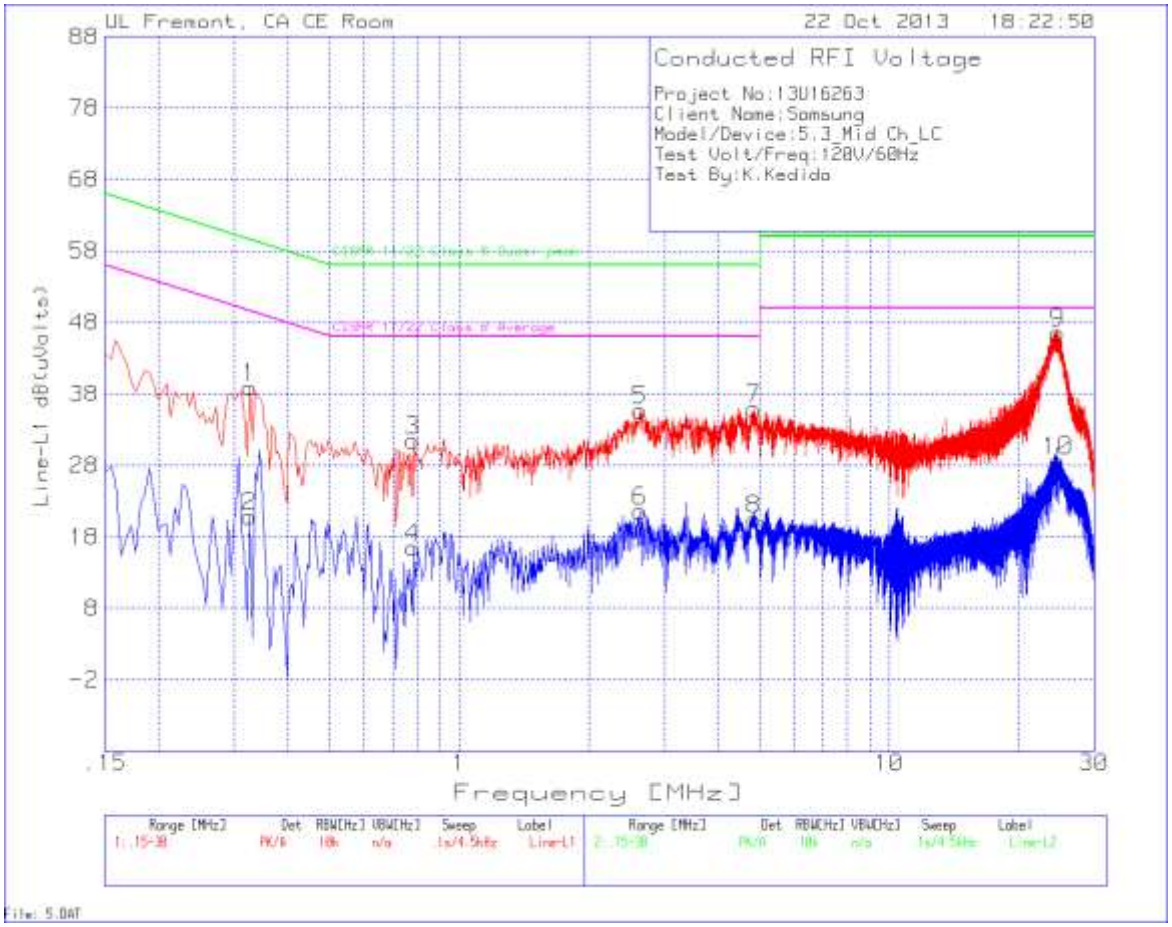
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

6 WORST EMISSIONS

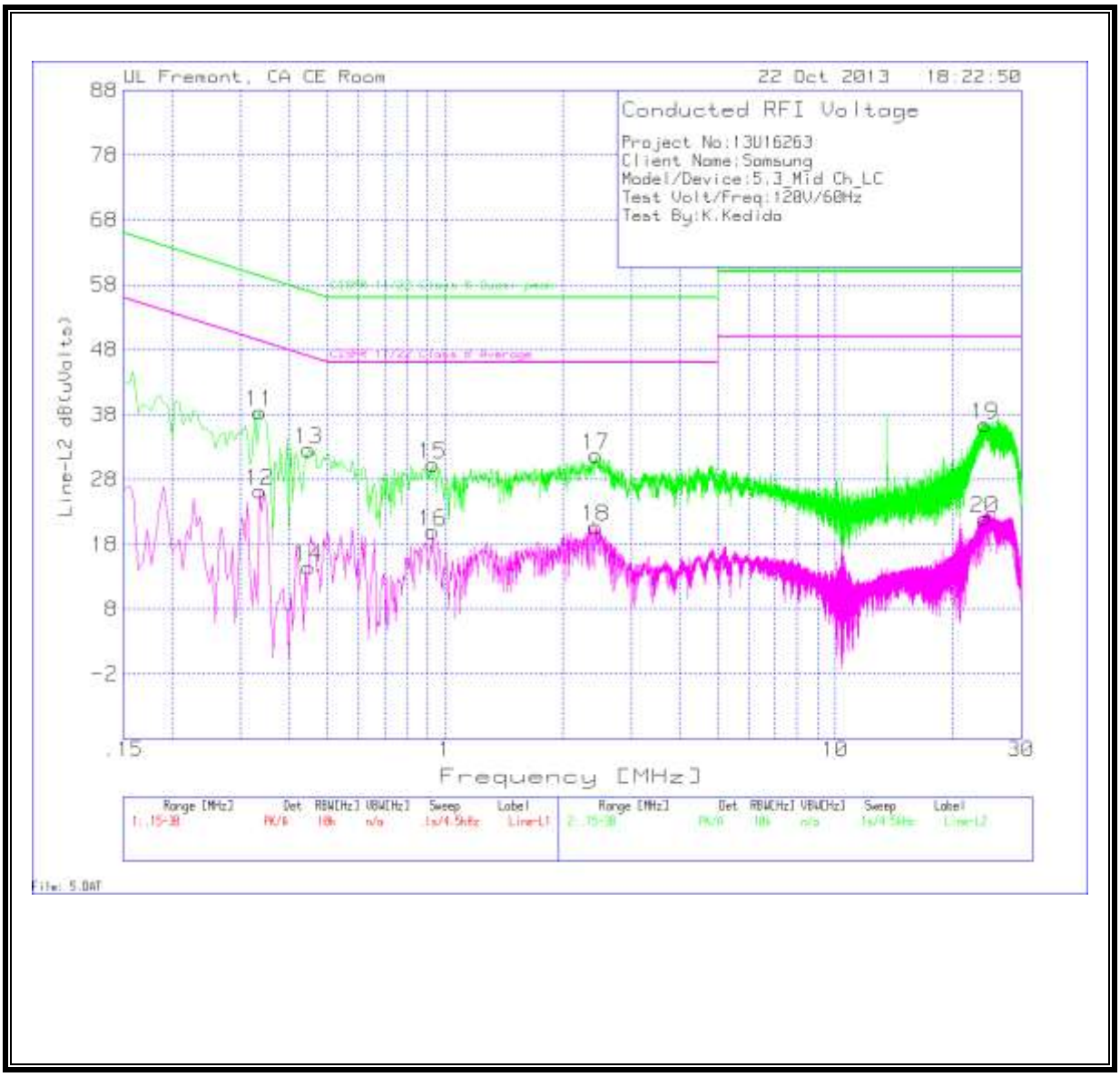


LINE 1 RESULTS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	.3255	38.81	PK	.1	0	38.91	59.6	-20.69	-	-
2	.3255	20.73	Av	.1	0	20.83	-	-	49.6	-28.77
3	.78	31.33	PK	.1	0	31.43	56	-24.57	-	-
4	.78	16.39	Av	.1	0	16.49	-	-	46	-29.51
5	2.634	35.48	PK	.1	.1	35.68	56	-20.32	-	-
6	2.634	21.38	Av	.1	.1	21.58	-	-	46	-24.42
7	4.848	35.76	PK	.1	.1	35.96	56	-20.04	-	-
8	4.848	20.2	Av	.1	.1	20.4	-	-	46	-25.6
9	24.6345	45.88	PK	.4	.3	46.58	60	-13.42	-	-
10	24.6345	27.99	Av	.4	.3	28.69	-	-	50	-21.31

LINE 2 RESULTS



LINE 2 RESULTS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
11	.3345	38.24	PK	.1	0	38.34	59.3	-20.96	-	-
12	.3345	26.14	Av	.1	0	26.24	-	-	49.3	-23.06
13	.447	32.52	PK	.1	0	32.62	56.9	-24.28	-	-
14	.447	14.3	Av	.1	0	14.4	-	-	46.9	-32.5
15	.9285	30.19	PK	.1	0	30.29	56	-25.71	-	-
16	.9285	19.86	Av	.1	0	19.96	-	-	46	-26.04
17	2.4405	31.51	PK	.1	.1	31.71	56	-24.29	-	-
18	2.4405	20.55	Av	.1	.1	20.75	-	-	46	-25.25
19	24.252	35.79	PK	.4	.3	36.49	60	-23.51	-	-
20	24.252	21.32	Av	.4	.3	22.02	-	-	50	-27.98

14. DYNAMIC FREQUENCY SELECTION

14.1. OVERVIEW

14.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** …

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client **(without DFS)**	Client **(with DFS)**
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.		

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows: For the Short pulse radar Test Signals this instant is the end of the *Burst*. For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated. For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission. The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Signal

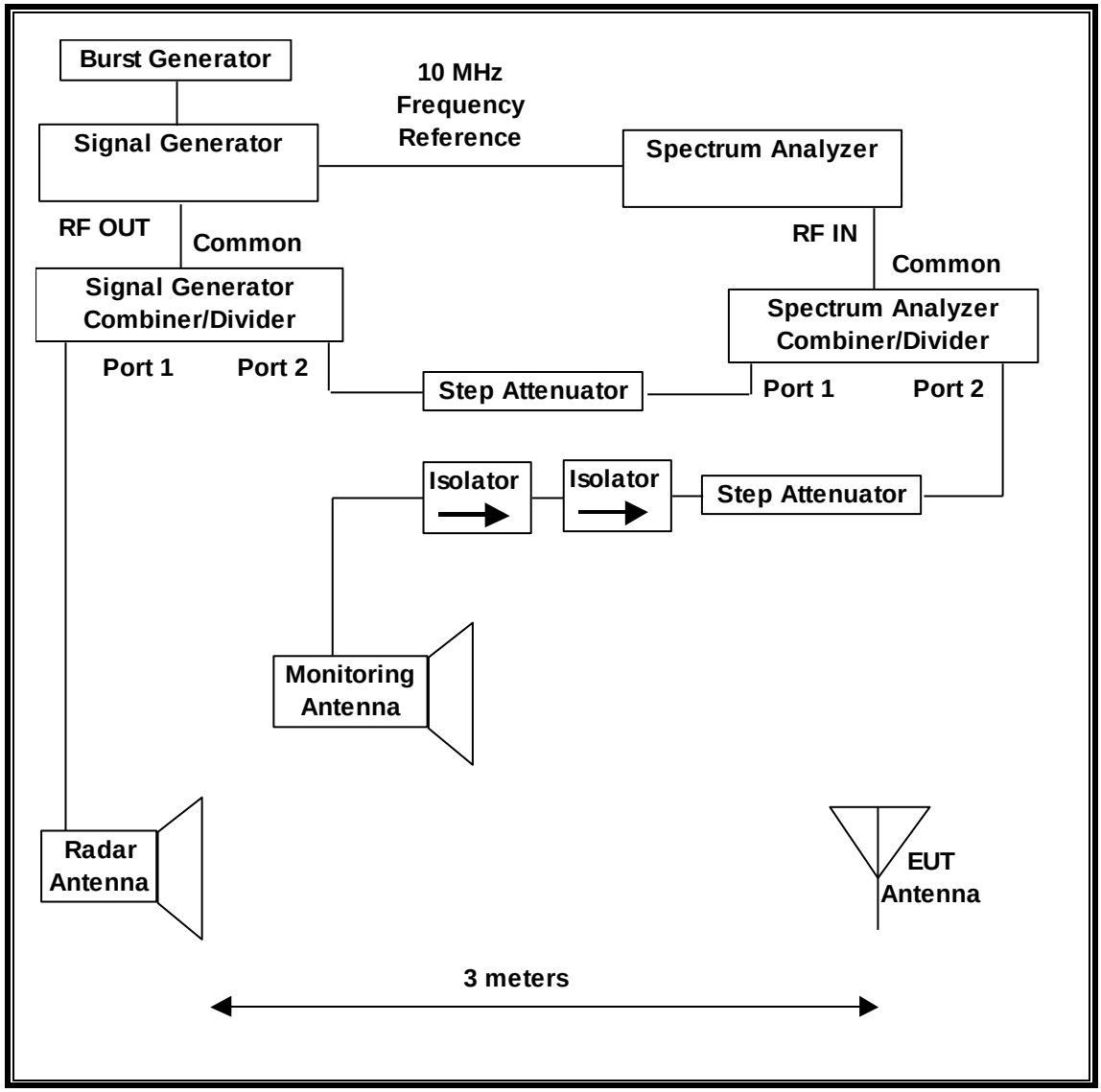
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

14.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Freqeuncy Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

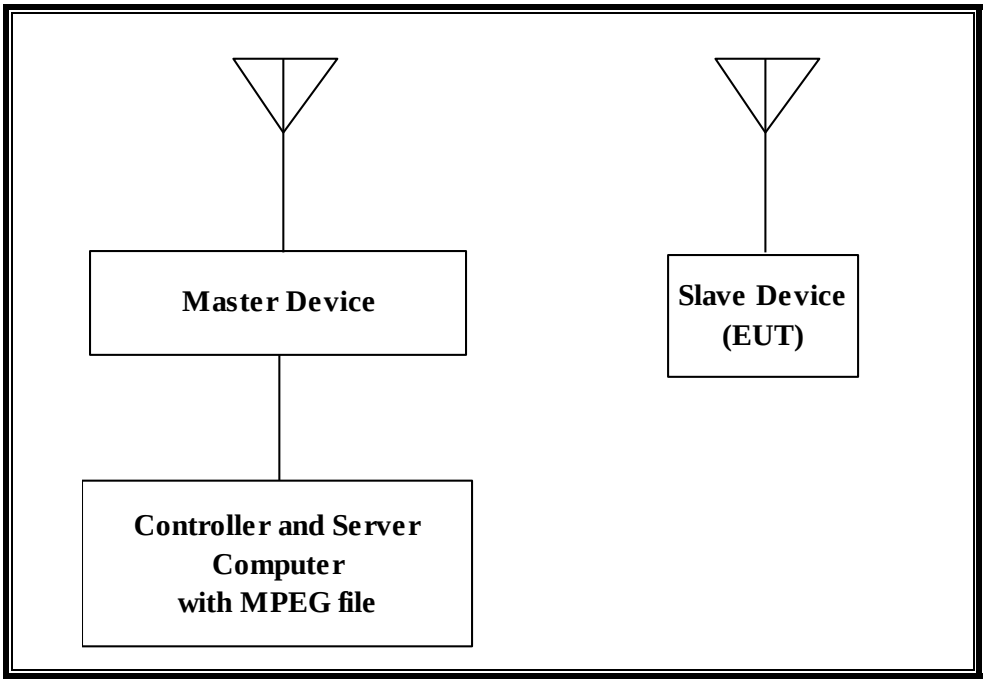
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/10/14
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/12/14

14.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Wireless Access Point	Cisco	AIR-AP1252AG-A-K9	FTX120690N2	LDK102061
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH112490BD	DoC
Notebook PC (Controller/Server)	Dell	PP18L	10657517725	DoC
AC Adapter (Controller/Server PC)	Dell	LA65SN0-00	CN-ODF263-71615-6AU-1019	DoC

14.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 9.13dBm EIRP in the 5250-5350 MHz band and 9.19dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of -1.3dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using MX Player (Android App).

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the access point is revision 12.4(25d)JA1.

UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102061. The minimum antenna gain for the Master Device is 3.5 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

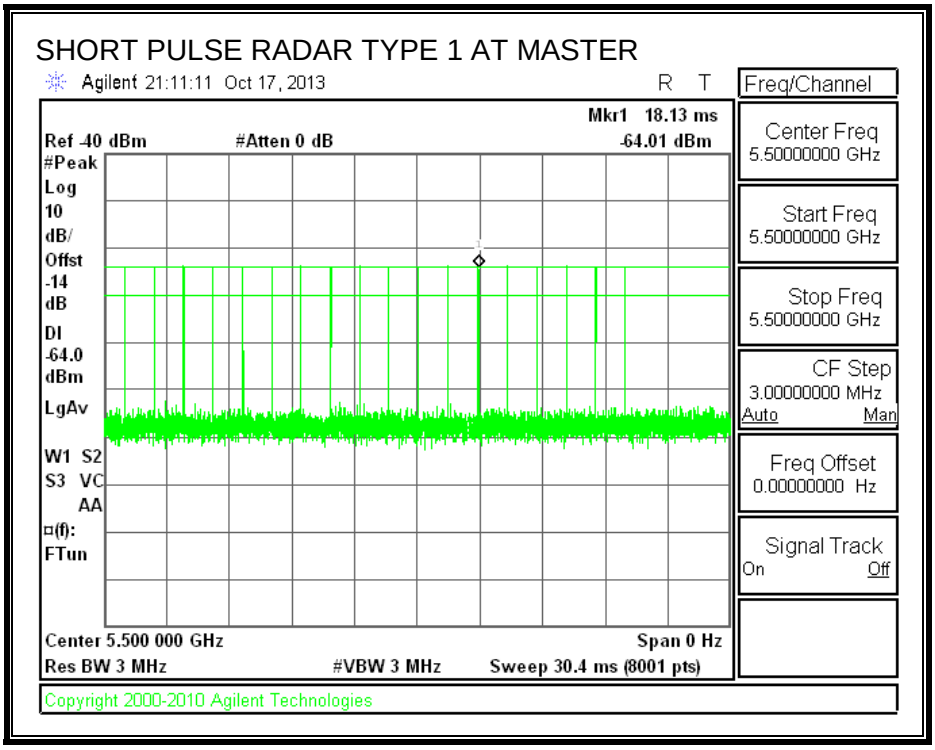
14.2. RESULTS FOR 20 MHz BANDWIDTH

14.2.1. TEST CHANNEL

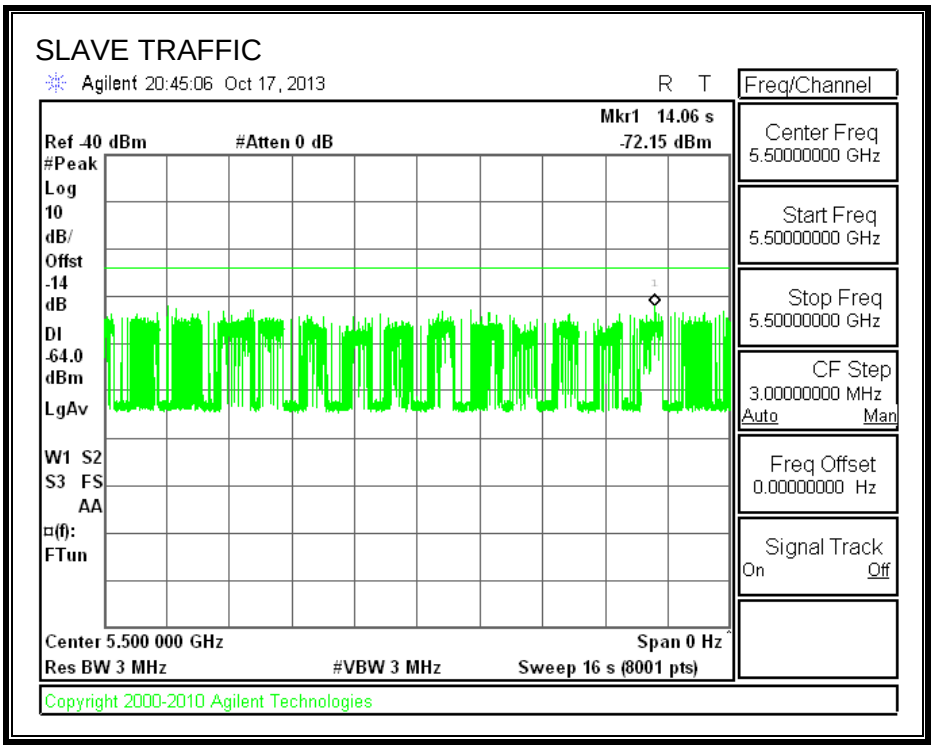
All tests were performed at a channel center frequency of 5500 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



14.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

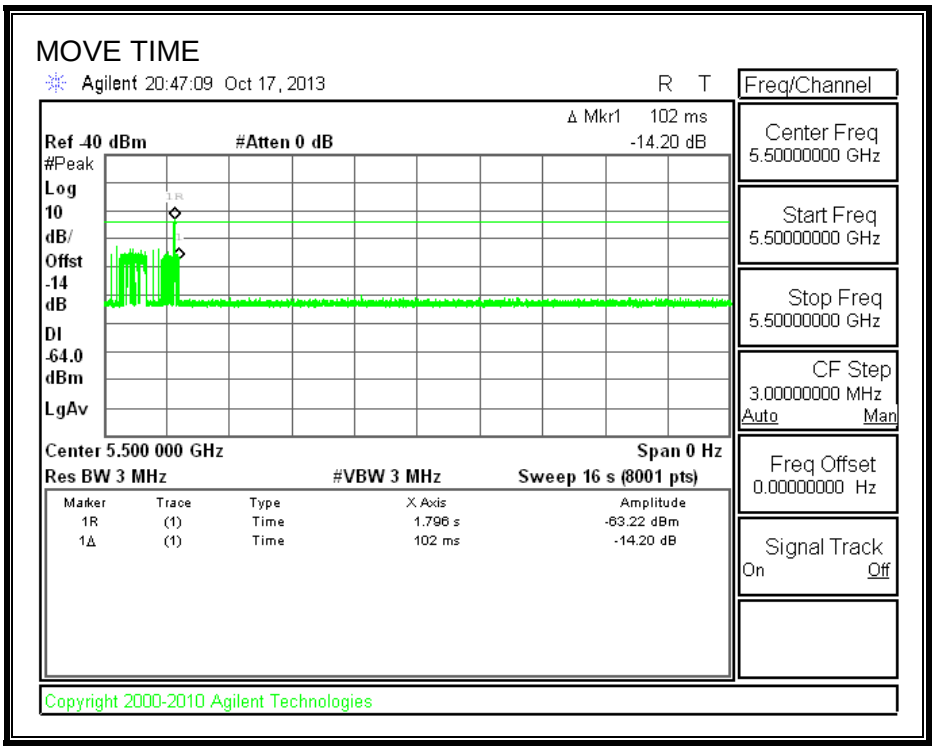
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

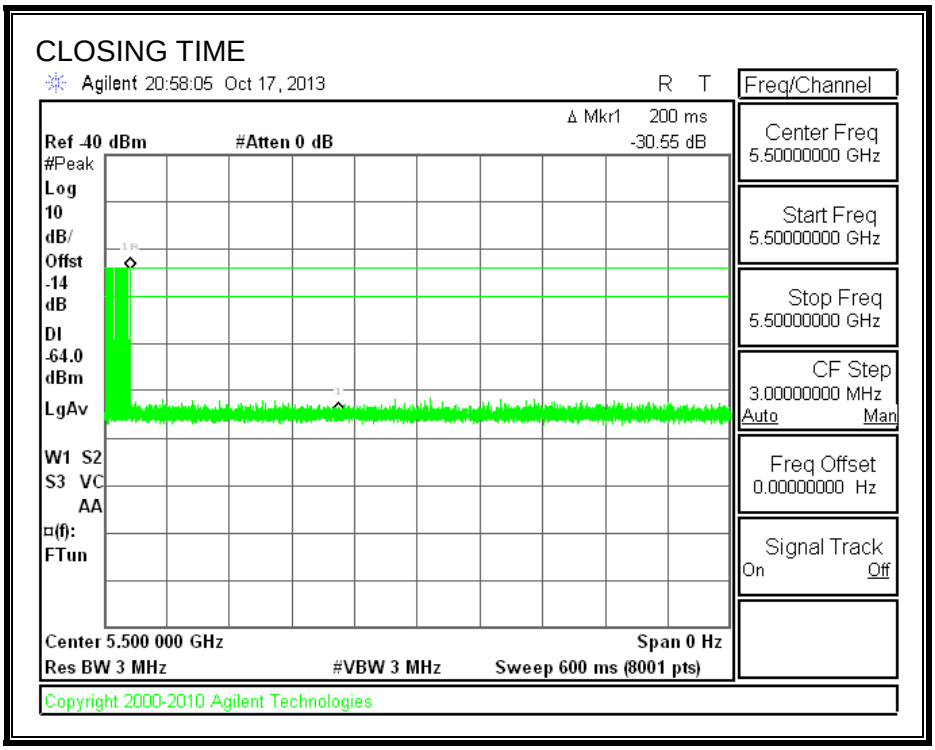
Channel Move Time (sec)	Limit (sec)
0.102	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



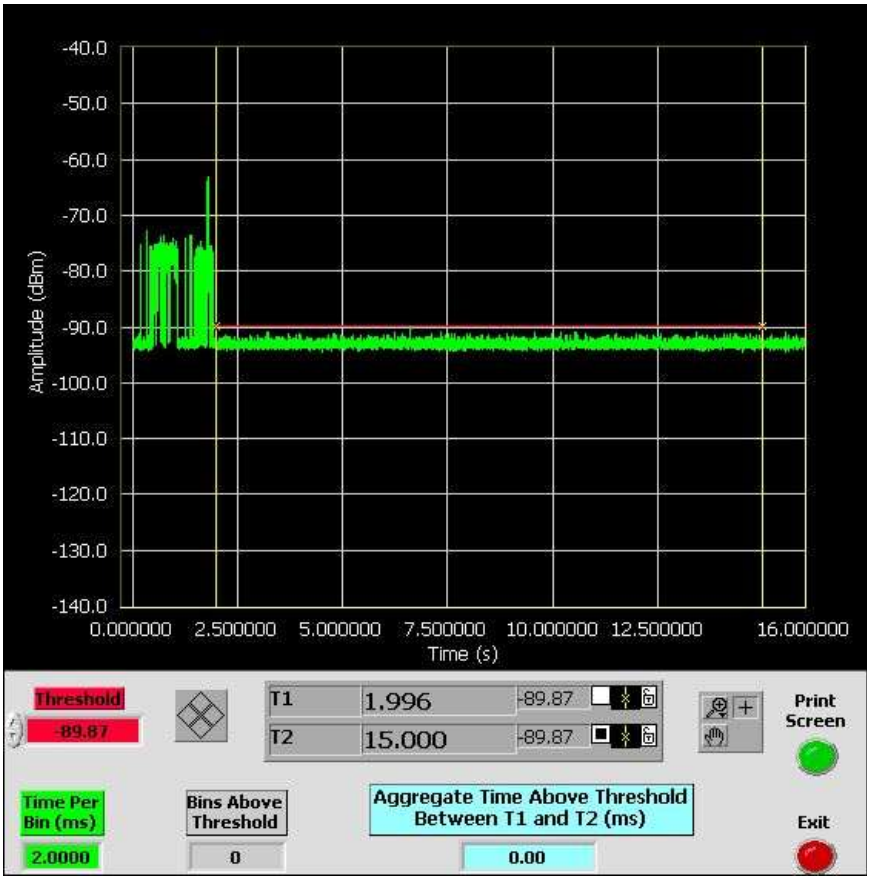
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME



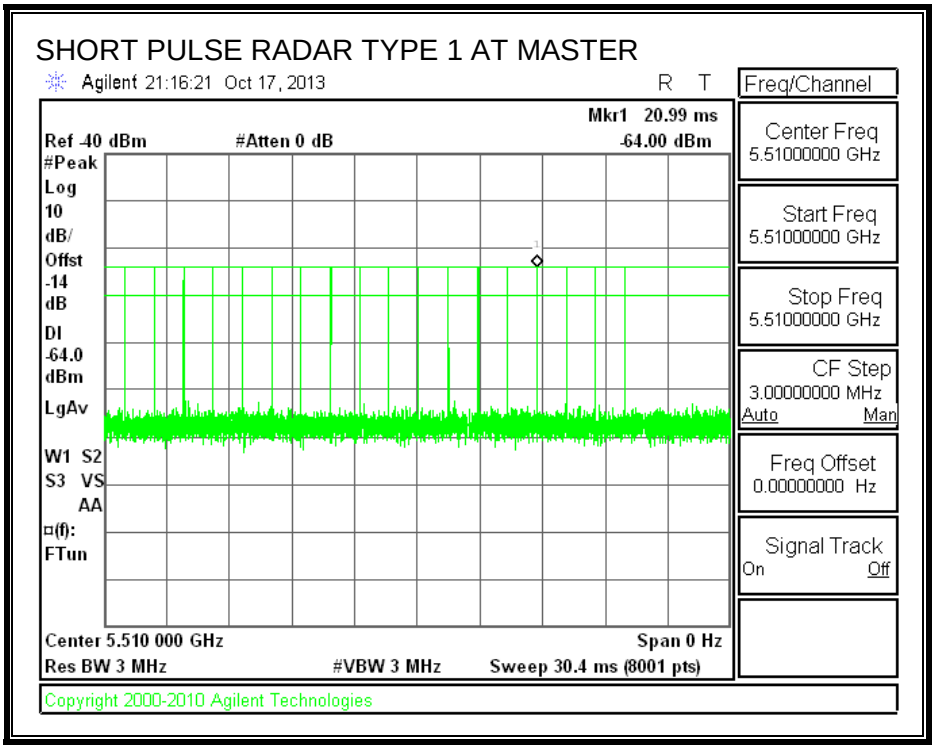
14.3. RESULTS FOR 40 MHz BANDWIDTH

14.3.1. TEST CHANNEL

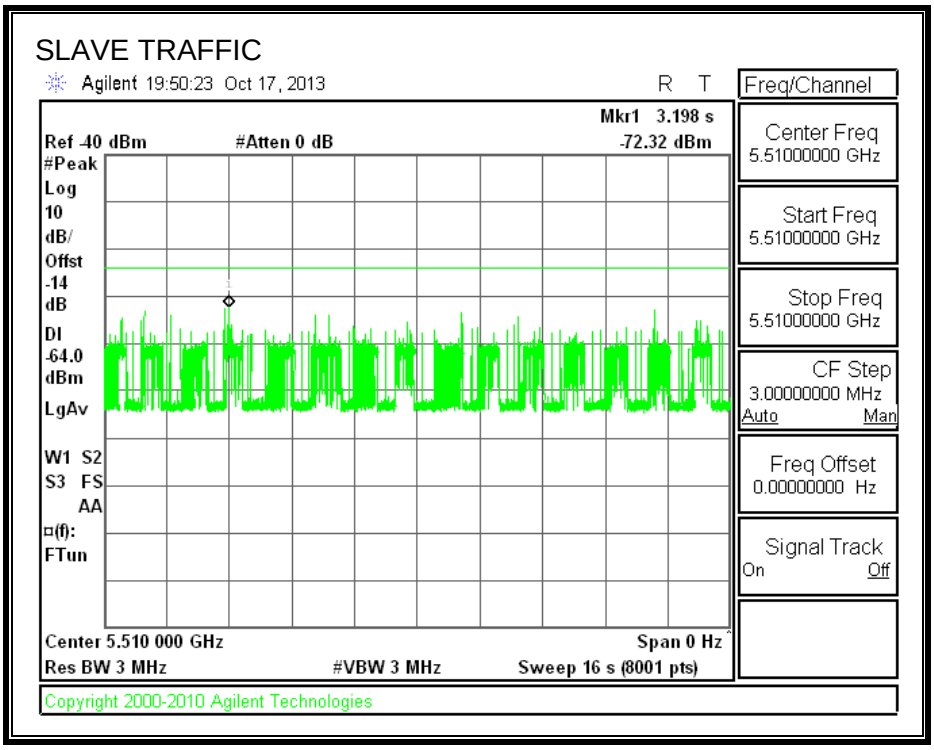
All tests were performed at a channel center frequency of 5510 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



14.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

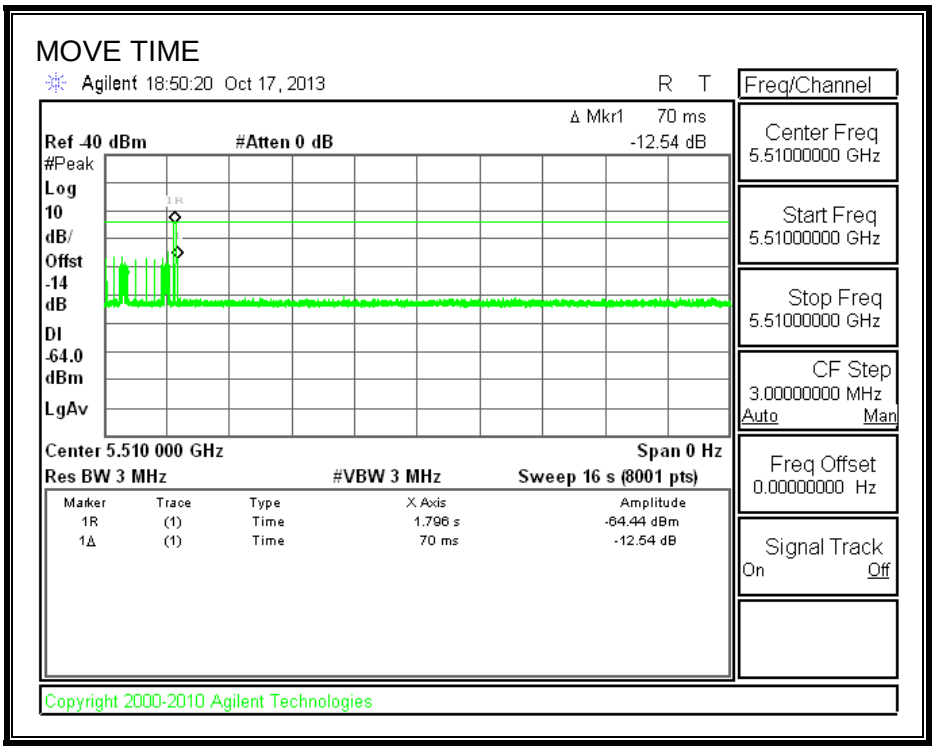
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

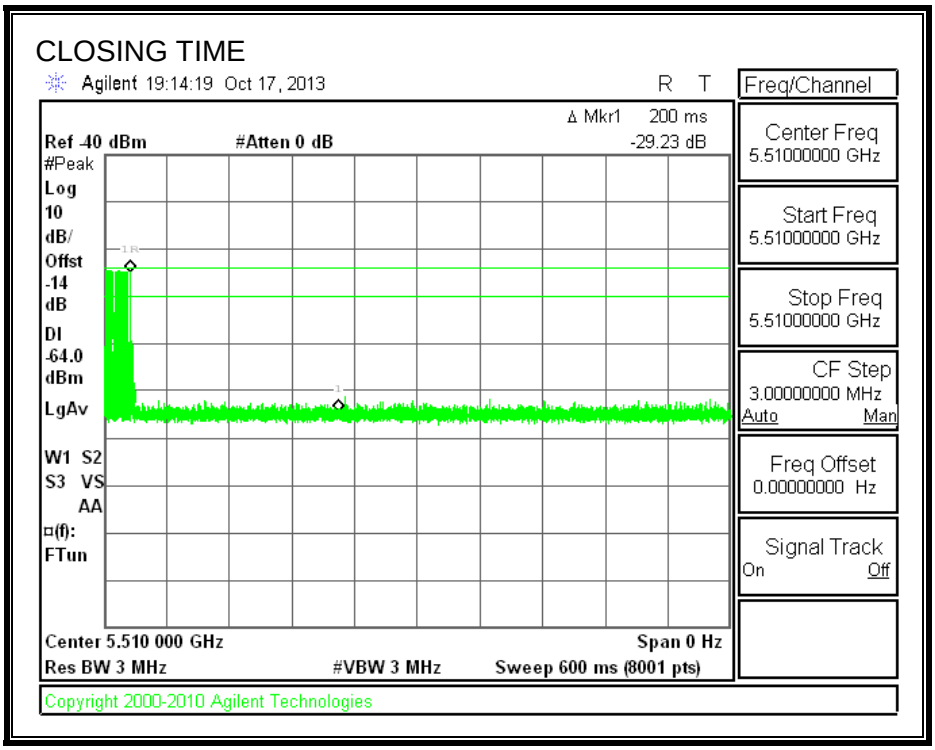
Channel Move Time (sec)	Limit (sec)
0.070	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



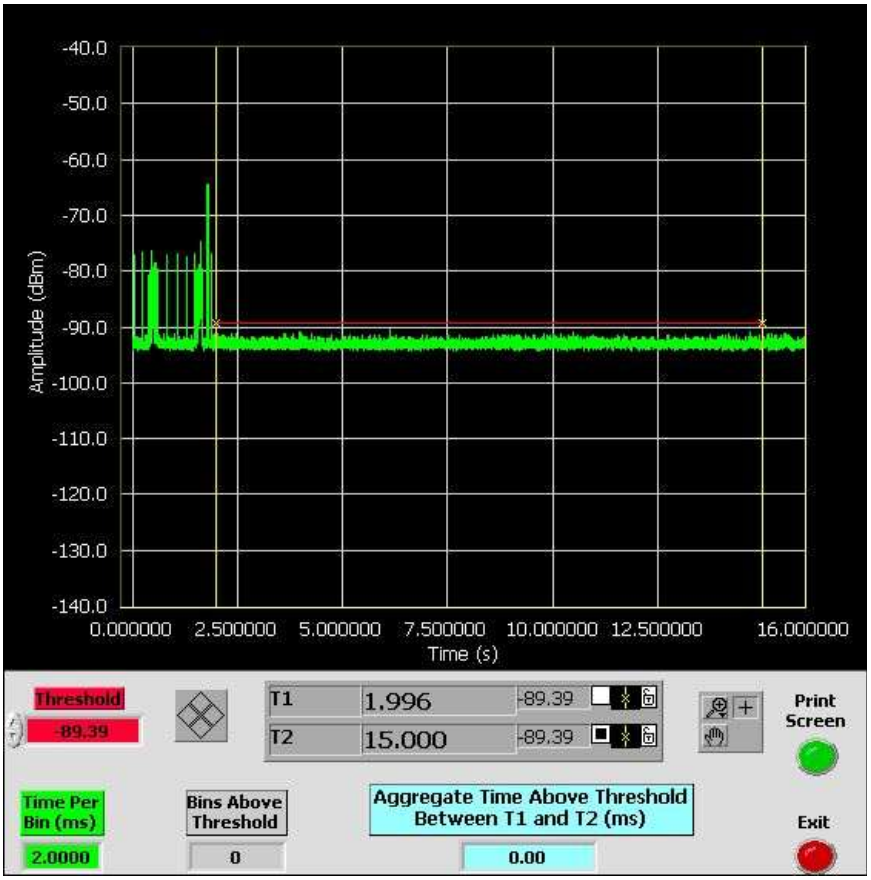
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME



14.3.5. NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.