FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Tablet with Bluetooth, DTS/UNII a/b/g/n, and ANT+

MODEL NUMBER: SM-T355

FCC ID: A3LSMT355

REPORT NUMBER: 15I19901-E5

ISSUE DATE: FEBRUARY 12, 2015

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

Prepared by
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	**SAMSUNG ELECTRONICS CO., LTD.**
EUT DESCRIPTION:	**GSM/WCDMA/LTE Tablet with Bluetooth, WLAN DTS/UNII a/b/g/n, and ANT+**
MODEL:	**SM-T355**
SERIAL NUMBER:	**2044001 (Radiated), 2044002 (Conducted)**
DATE TESTED:	**JANUARY 29 – FEBRUARY 12, 2015**

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:

PENG ZHANG
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.

Tested By:

Jonathan Hsu
CONSUMER TECHNOLOGY DIVISION
LAB ENGINEER
UL Verification Services Inc.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.4-2009.

3. FACILITIES AND ACCREDITATION

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(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☐ Chamber C(IC: 2324B-3)	☒ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☒ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

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.

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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 40000 MHz	4.94 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Tablet with Bluetooth, DTS/UNII a/b/g/n, and ANT+.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Total Output Power (dBm)	Total Output Power (mW)
5180 - 5240	802.11n HT20	11.64	14.59
5260 - 5320	802.11n HT20	11.34	13.61
5500 - 5700	802.11n HT20	11.21	13.21
5745 - 5825	802.11n HT20	11.54	14.26
5190 - 5230	802.11n HT40	9.69	9.31
5270 - 5310	802.11n HT40	9.08	8.09
5510 - 5670	802.11n HT40	9.45	8.81
5755 - 5795	802.11n HT40	8.99	7.93
5180 - 5240	802.11a	11.7	14.79
5260 - 5320	802.11a	11.24	13.30
5500 - 5700	802.11a	11.26	13.37
5745 - 5825	802.11a	11.4	13.80

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 2.4 dBi.

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5.4. 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

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

802.11a mode: 6 Mbps

802.11n HT20mode: MCS0

802.11n HT40mode: MCS0

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	SAMSUNG	SM-T355	N/A	N/A
Earphone	SAMSUNG	SM-T355	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

EUT was set in the Hidden menu mode to enable WLAN UNII communications.

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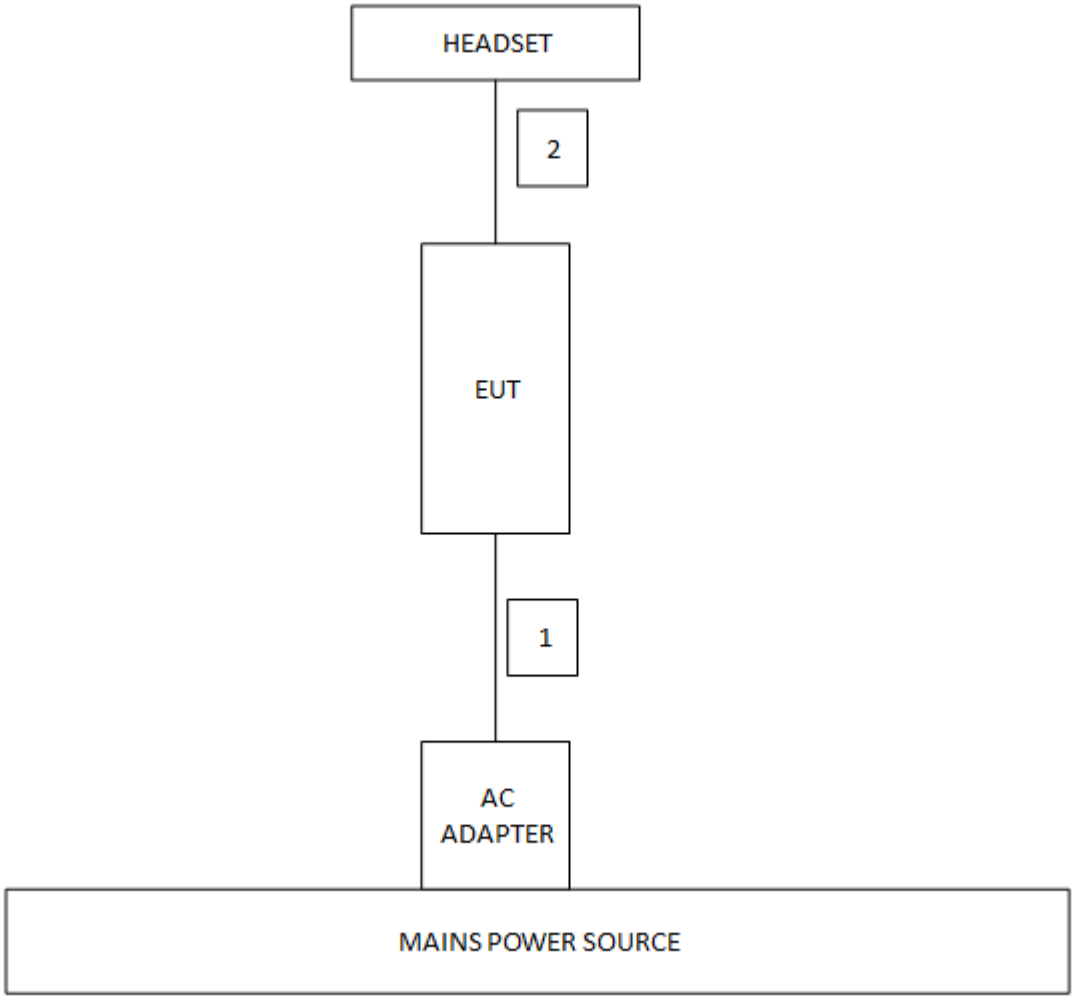
SETUP DIAGRAM FOR TESTS



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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	C01069	12/20/15
Spectrum Analyzer,9KHz-40GHz	HP	8564E	C00986	04/01/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/15
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/15
Antenna, Horn,18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/15
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/15
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/15
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/15
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/15
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/15
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	F00219	05/23/15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	F00222	05/22/15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	F00224	05/22/15

Test Equipment List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Version 9.5, 07/22/14
Conducted Software	UL	UL EMC	Version 9.5, 05/17/14
CLT Software	UL	UL RF	Version 1.0, 02/02/15
Antenna Port Software	UL	UL RF	Version 2.1.1.1, 1/20/15

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7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.407 (a)	Occupied Band width (26dB)	N/A	Conducted	Pass	44.16MHz
15.407	6dB Band width (5.8Ghz)	500KHz		Pass	16.38MHz
15.407 (a)(2)	TX Cond. Power5.15-2.25, 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		Pass	11.7dBm
15.407 (a)(3)	TX Cond. Power 5.725-5.825	< 30dBm or 17+10Log(OBW)		Pass	11.54dBm
15.407 (a)(5)	PSD (5.2,5.3,5.5GHz)	<11dBm		Pass	0.55dBm
15.407 (a)(5)	PSD (5.8GHz)	30dBm per 500kHz			-2.09dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Radiated	Pass	48.33dBuV(PK)
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m		Pass	49.38dBuV/m
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Radiated / Condcuted	Pass	N/A

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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	1.40	1.50	0.932	93.2%	0.31	0.717
802.11n HT20	1.30	1	0.930	93.0%	0.32	0.772
802.11n HT40	0.64	1	0.863	86.3%	0.64	1.575

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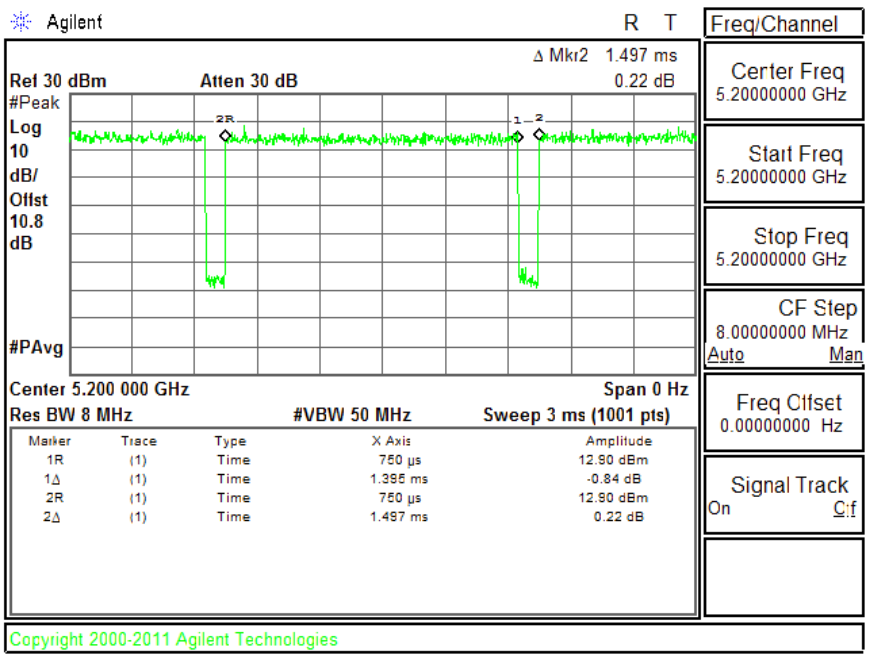
8.2. DUTY CYCLE PLOTS

DUTY CYCLE 802.11a MODE



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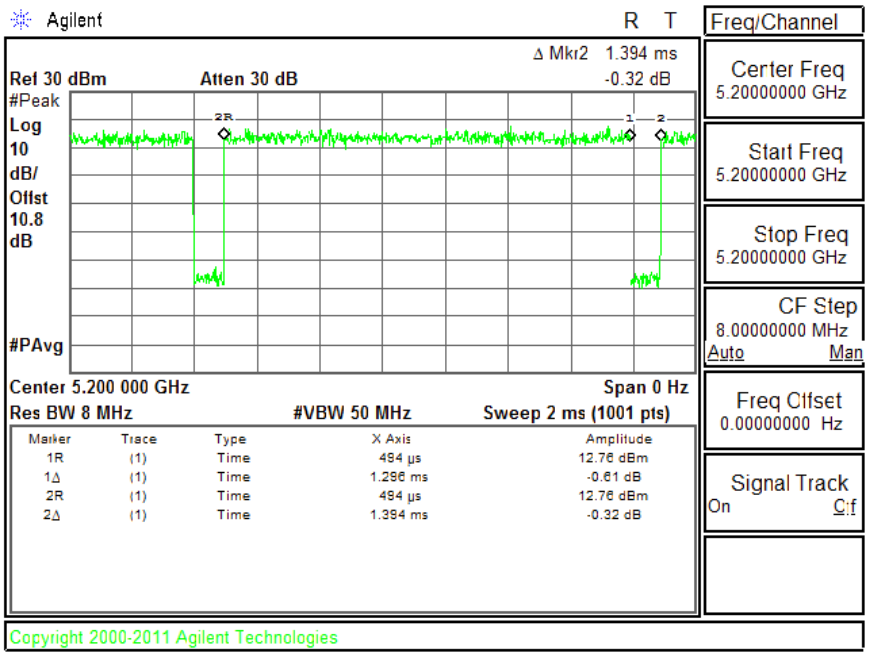
DUTY CYCLE 802.11n HT20 MODE



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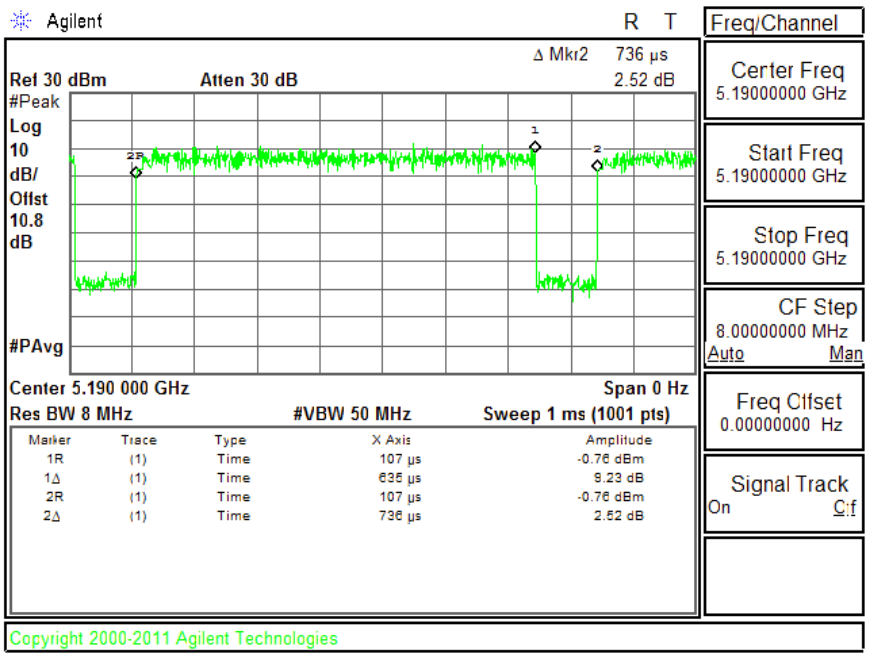
DUTY CYCLE 802.11n HT40 MODE



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9. MEASUREMENT METHOD

789033 D02 General UNII Test Procedures New Rules v01

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.

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10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

RESULTS

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10.1.1. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.410	0.5
Mid	5785	16.440	0.5
High	5825	16.380	0.5
Worst		16.440	

10.1.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.700	0.5
Mid	5785	17.700	0.5
High	5825	17.640	0.5
Worst		17.700	

10.1.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	35.880	0.5
High	5795	35.820	0.5
Worst		35.880	

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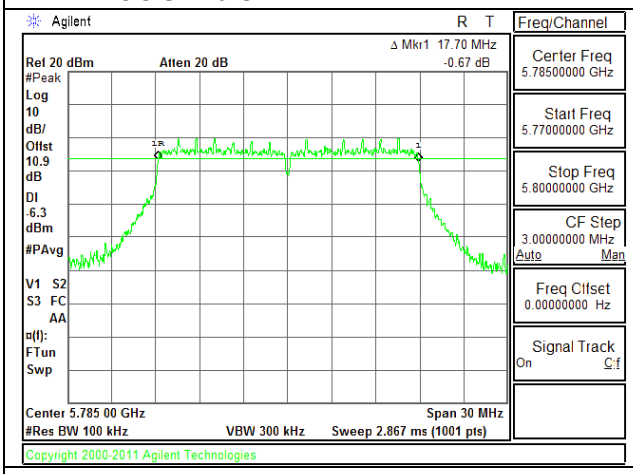
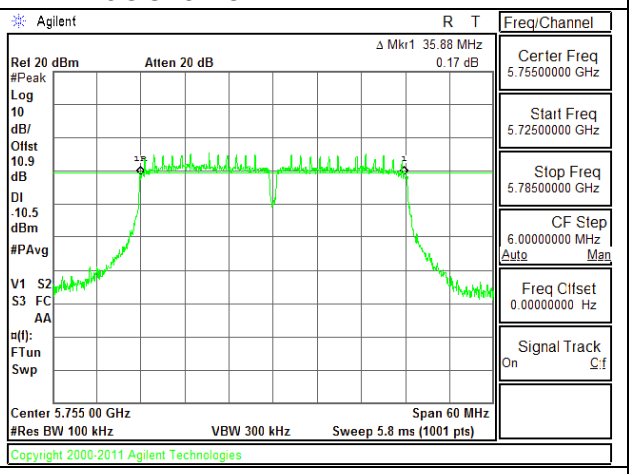
10.1.4. 6 dB BANDWIDTH MID CH PLOTS

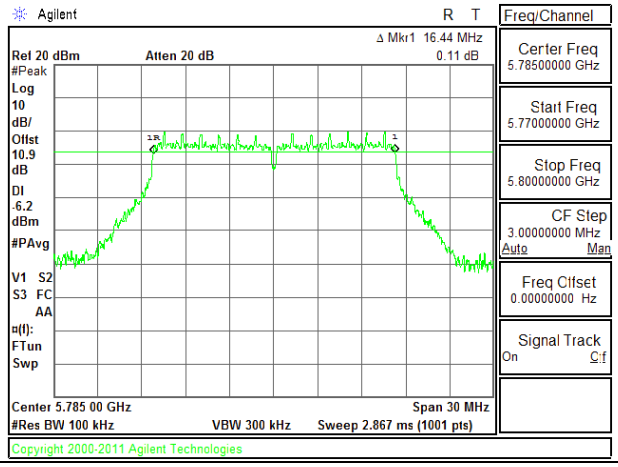
11n HT20 5.8 Mid Ch



11n HT40 5.8 Low Ch



11a HT20 5.8 Mid Ch



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10.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.75
Mid	5200	22.62
High	5240	21.99
Worst		22.62

10.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.53
Mid	5200	22.41
High	5240	22.62
Worst		22.62

10.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	44.16
Mid	5230	43.50
Worst		44.16

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10.2.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.08
Mid	5300	21.87
High	5320	21.66
Worst		22.08

10.2.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.71
Mid	5300	22.68
High	5320	21.78
Worst		22.71

10.2.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	43.92
High	5310	43.32
Worst		43.92

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10.2.7. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.75
Mid	5580	21.90
High	5700	22.14
Worst		22.14

10.2.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	22.23
Mid	5580	22.68
High	5700	22.32
Worst		22.68

10.2.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	44.04
Mid	5550	43.68
High	5670	43.80
Worst		44.04

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10.2.10. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	22.26
Mid	5785	23.13
High	5825	21.51
Worst		23.13

10.2.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	22.29
Mid	5785	22.83
High	5825	22.23
Worst		22.83

10.2.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5755	43.38
High	5795	44.04
Worst		44.04

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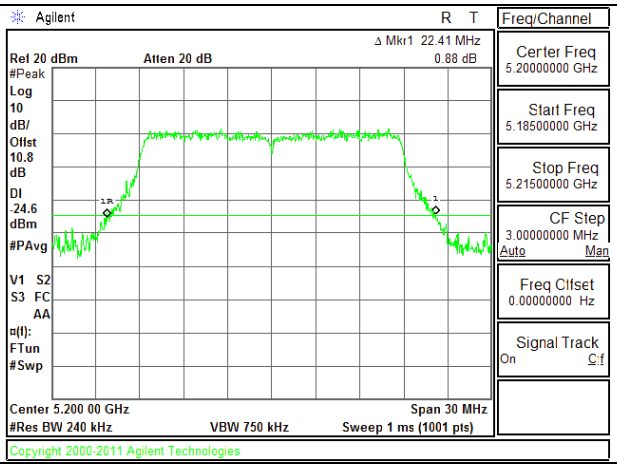
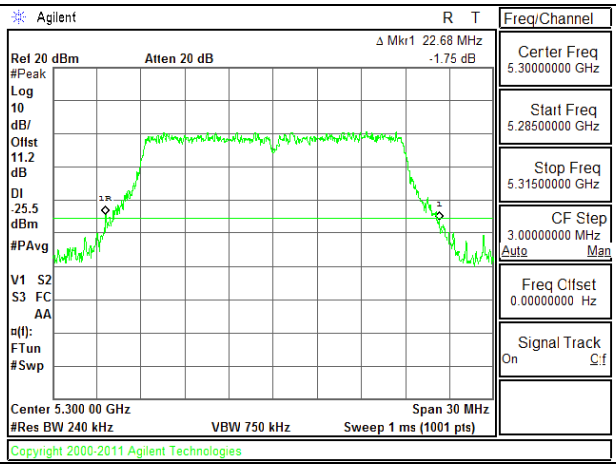
10.2.13. 26 dB BANDWIDTH PLOTS

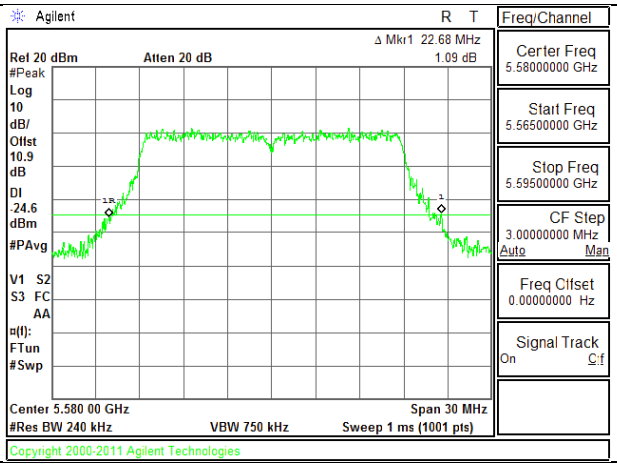
11n HT20 5.2 Mid Ch



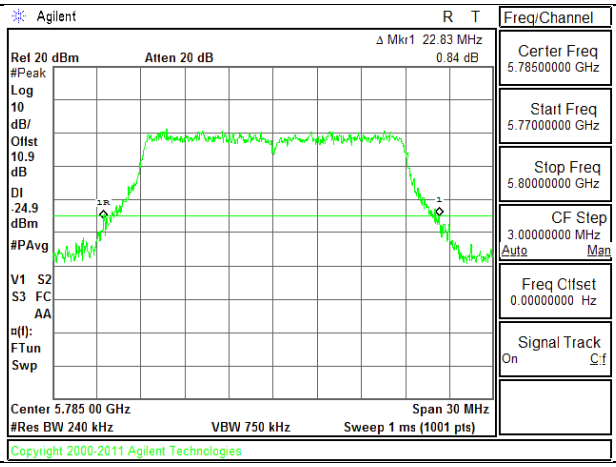
11n HT20 5.3 Mid Ch



11n HT20 5.5 Mid Ch



11n HT20 5.8 Mid Ch



11n HT40 5.2 Low Ch

11n HT40 5.3 Low Ch

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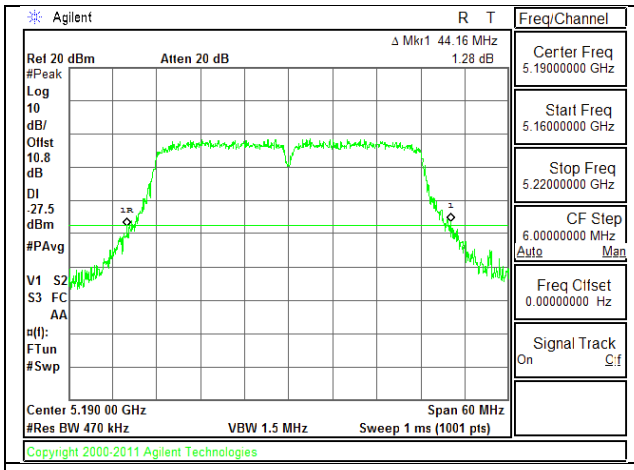
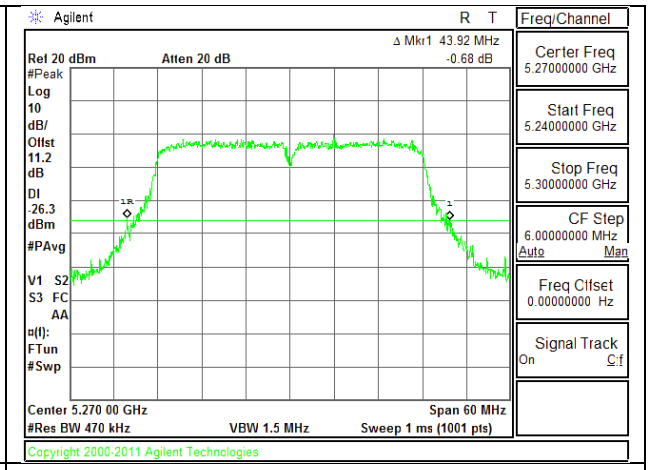
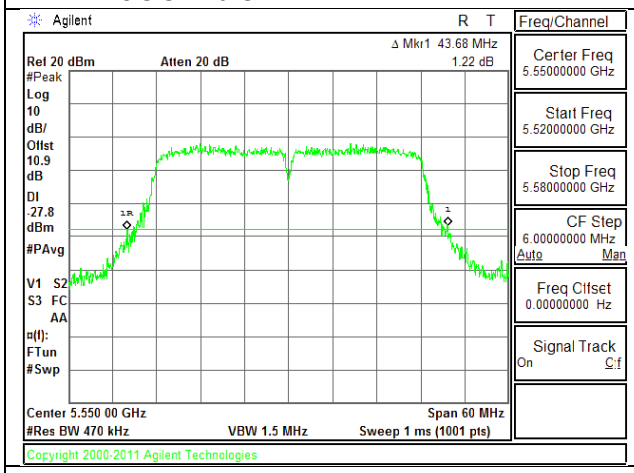


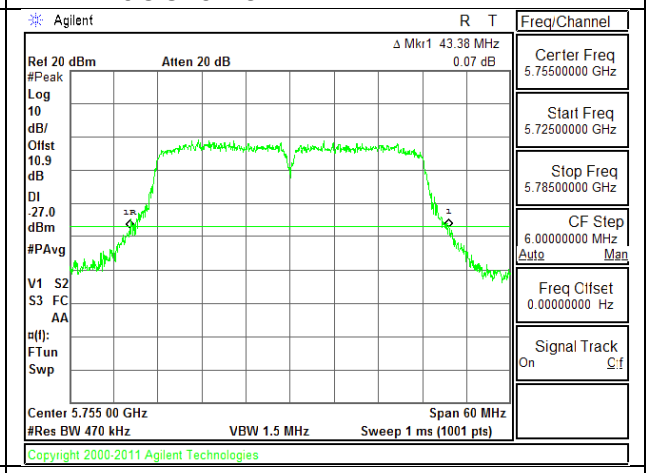
11n HT40 5.5 Mid Ch



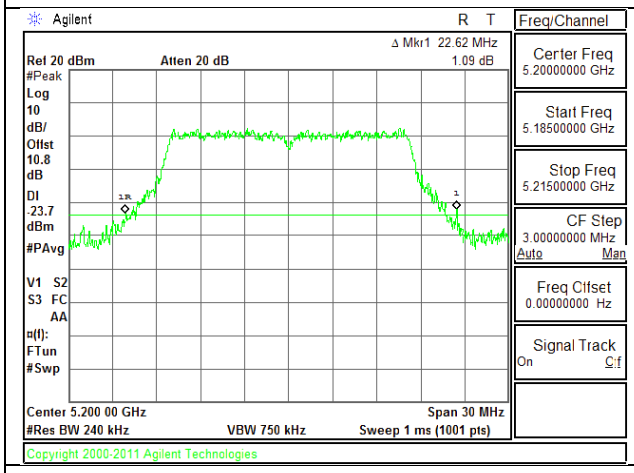
11n HT40 5.8 Low Ch



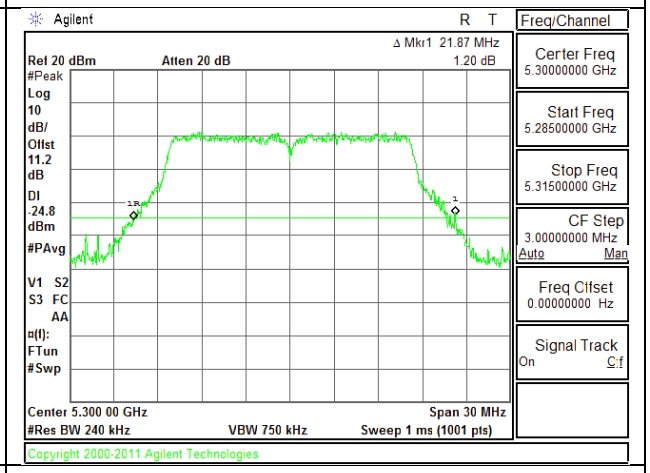
11a HT20 5.2 Mid Ch



11a HT20 5.3 Mid Ch



11a HT20 5.5 Mid Ch



11a HT20 5.8 Mid Ch

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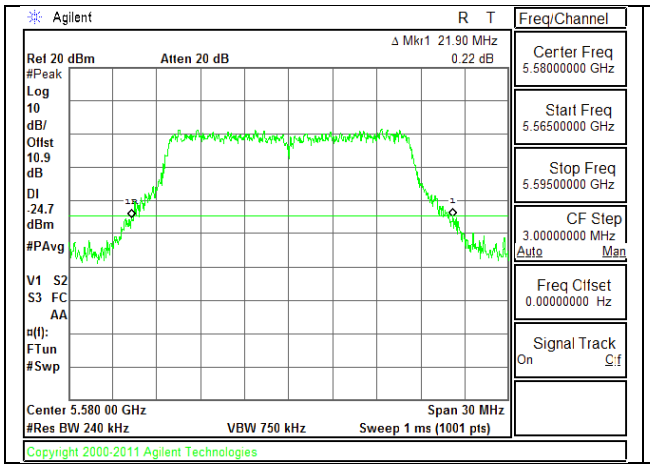

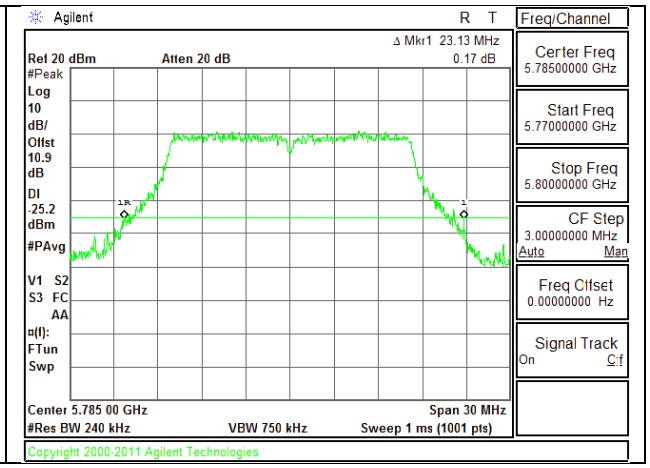

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10.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.53
Mid	5200	16.48
High	5240	16.55
Worst		16.55

10.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.71
Mid	5200	17.63
High	5240	17.68
Worst		17.71

10.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.10
Mid	5230	36.09
Worst		36.10

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10.3.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.55
Mid	5300	16.45
High	5320	16.46
Worst		16.55

10.3.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.71
Mid	5300	17.70
High	5320	17.69
Worst		17.71

10.3.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.08
High	5310	35.75
Worst		36.08

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10.3.7. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.46
Mid	5580	16.45
High	5700	16.44
Worst		16.46

10.3.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.62
Mid	5580	17.68
High	5700	17.69
Worst		17.69

10.3.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.18
Mid	5550	36.09
High	5670	36.05
Worst		36.18

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10.3.10. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.45
Mid	5785	16.58
High	5825	16.49
Worst		16.58

10.3.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.70
Mid	5785	17.67
High	5825	17.70
Worst		17.70

10.3.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.08
High	5795	36.16
Worst		36.16

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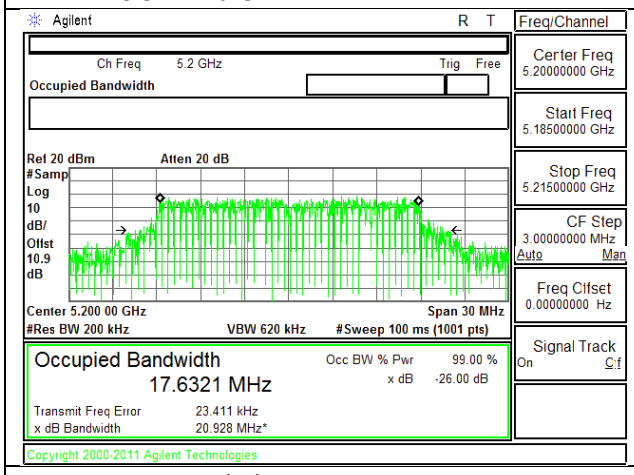
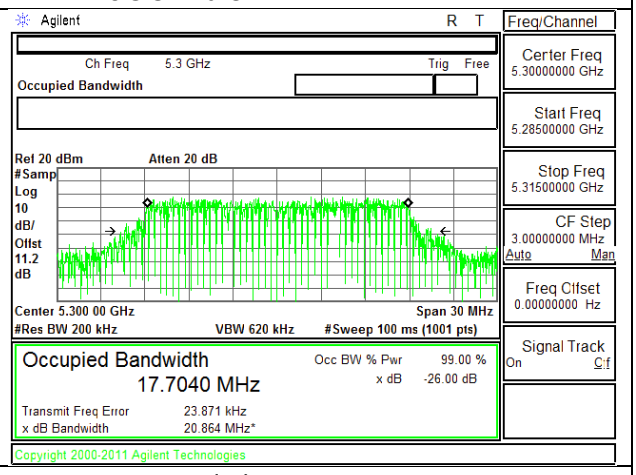
10.3.1. 99% BANDWIDTH PLOTS

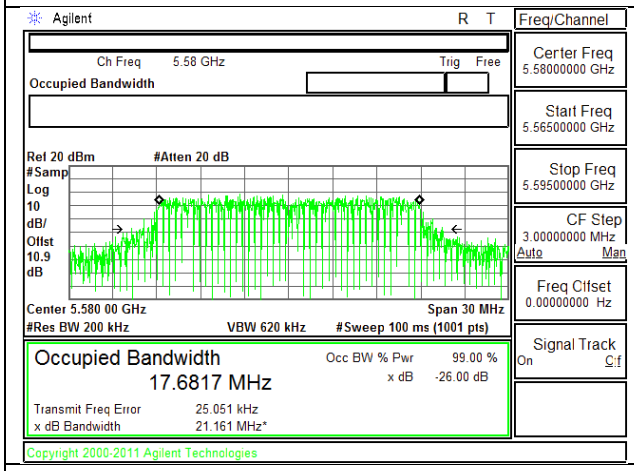
11n HT20 5.2 Mid Ch



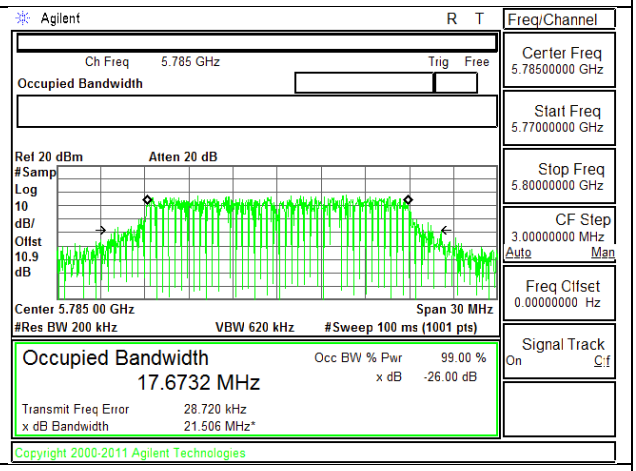
11n HT20 5.3 Mid Ch



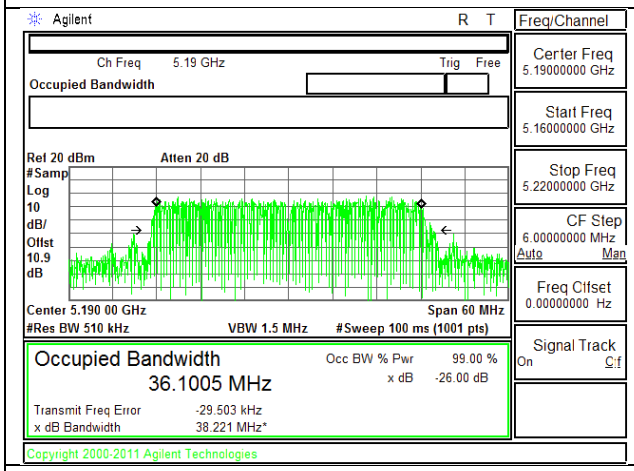
11n HT20 5.5 Mid Ch



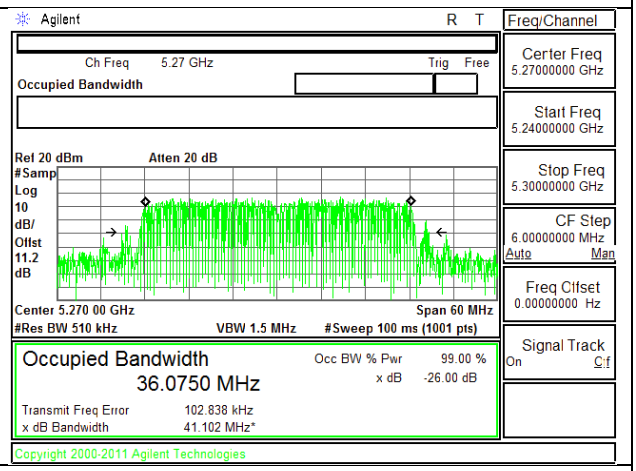
11n HT20 5.8 Mid Ch



11n HT40 5.2 Low Ch



11n HT40 5.3 Low Ch



11n HT40 5.5 Mid Ch

11n HT40 5.8 Low Ch

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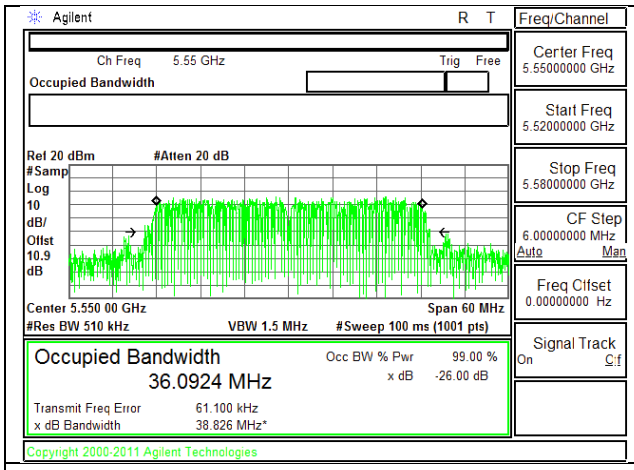
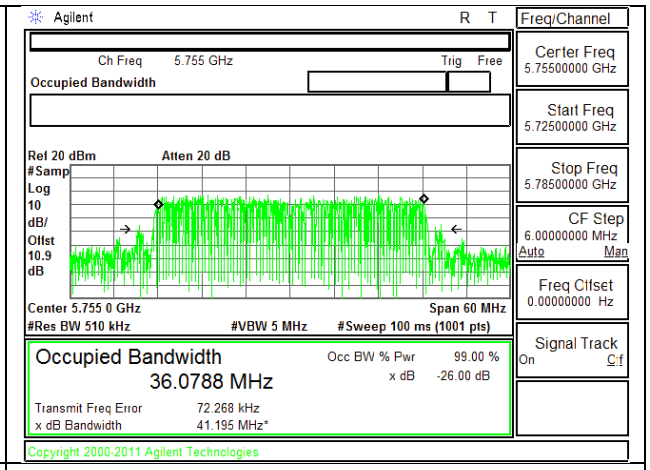
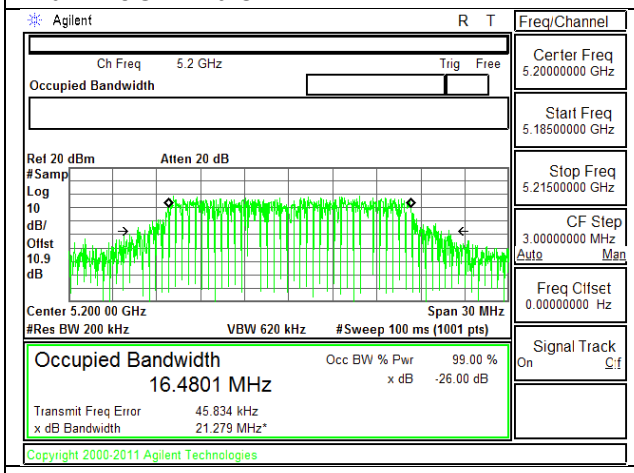


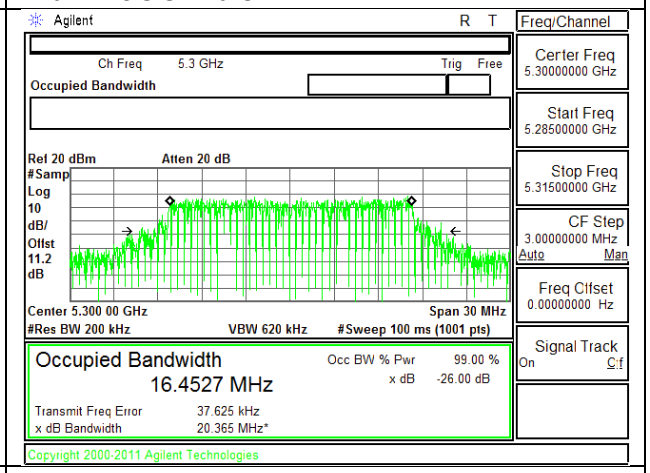
11a HT20 5.2 Mid Ch



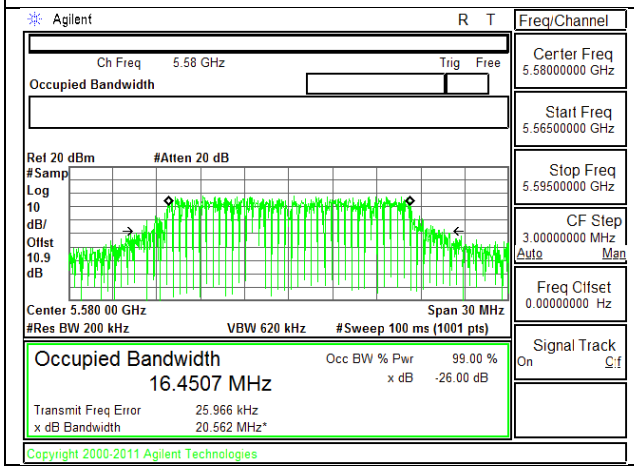
11a HT20 5.3 Mid Ch

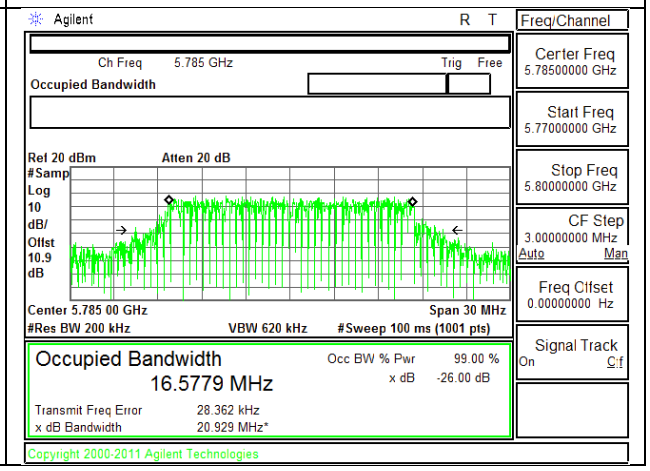


11a HT20 5.5 Mid Ch



11a HT20 5.8 Mid Ch





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10.4. 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 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

10.4.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	11.40
Mid	5200	11.40
High	5240	11.30
Worst		11.40

10.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	11.00
Mid	5200	11.20
High	5240	11.30
Worst		11.30

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10.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5190	9.30
Mid	5230	8.70
Worst		9.30

10.4.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	11.00
Mid	5300	10.90
High	5320	10.90
Worst		11.00

10.4.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	10.80
Mid	5300	10.90
High	5320	10.90
Worst		10.90

10.4.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5270	9.20
High	5310	9.00
Worst		9.20

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10.4.7. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	10.90
Mid	5580	11.20
High	5700	10.90
Worst		11.20

10.4.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	10.90
Mid	5580	11.20
High	5700	11.00
Worst		11.20

10.4.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5510	8.70
Mid	5550	9.00
High	5670	8.90
Worst		9.00

10.4.10. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	11.00
Mid	5785	10.80
High	5825	11.00
Worst		11.00

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10.4.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	10.90
Mid	5785	10.80
High	5825	11.00
Worst		11.00

10.4.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5755	9.10
High	5795	8.90
Worst		9.10

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10.5. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1) (2) (3)

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 250 mW or 11 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.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

DIRECTIONAL ANTENNA GAIN

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

Test Methodology

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RESULTS

10.5.1. 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	21.75	16.530	2.40
Mid	5200	22.62	16.480	2.40
High	5240	21.99	16.550	2.40

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	24.00	22.18	19.78	19.78	11.00	10.00	10.00
Mid	5200	24.00	22.17	19.77	19.77	11.00	10.00	10.00
High	5240	24.00	22.19	19.79	19.79	11.00	10.00	10.00

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	11.392	11.70	24.00	-12.30
Mid	5200	11.258	11.57	24.00	-12.43
High	5240	11.140	11.45	24.00	-12.55

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	0.240	0.55	11.00	-10.45
Mid	5200	0.080	0.39	11.00	-10.61
High	5240	0.030	0.34	11.00	-10.66

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10.5.2. 802.11n HT20 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	22.53	17.710	2.40
Mid	5200	22.41	17.630	2.40
High	5240	22.62	17.680	2.40

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	24.00	22.48	20.08	20.08	11.00	10.00	10.00
Mid	5200	24.00	22.46	20.06	20.06	11.00	10.00	10.00
High	5240	24.00	22.47	20.07	20.07	11.00	10.00	10.00

Duty Cycle CF (dB)	0.32	**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	11.016	11.34	24.00	-12.66
Mid	5200	11.194	11.51	24.00	-12.49
High	5240	11.322	11.64	24.00	-12.36

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.570	-0.25	11.00	-11.25
Mid	5200	-0.310	0.01	11.00	-10.99
High	5240	-0.010	0.31	11.00	-10.69

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10.5.3. 802.11n HT40 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	5190	44.16	36.100	2.40
Mid	5230	43.50	36.090	2.40

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	5190	24.00	23.00	20.60	20.60	11.00	10.00	10.00
Mid	5230	24.00	23.00	20.60	20.60	11.00	10.00	10.00
Duty Cycle CF (dB)		0.64	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	5190	9.046	9.69	24.00	-14.31
Mid	5230	8.455	9.10	24.00	-14.91

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-5.300	-4.66	11.00	-15.66
Mid	5230	-5.740	-5.10	11.00	-16.10

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10.5.4. 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	22.08	16.550	2.40
Mid	5300	21.87	16.450	2.40
High	5320	21.66	16.460	2.40

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	5260	24.00	23.19	29.19	23.19	11.00	11.00	11.00
Mid	5300	24.00	23.16	29.16	23.16	11.00	11.00	11.00
High	5320	24.00	23.16	29.16	23.16	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	10.800	11.11	24.00	-12.89
Mid	5300	10.932	11.24	24.00	-12.76
High	5320	10.707	11.02	24.00	-12.98

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	-0.380	-0.07	11.00	-11.07
Mid	5300	-0.220	0.09	11.00	-10.91
High	5320	-0.470	-0.16	11.00	-11.16

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10.5.5. 802.11n HT20 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	22.71	17.710	2.40
Mid	5300	22.68	17.700	2.40
High	5320	21.78	17.690	2.40

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	5260	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.48	29.48	23.48	11.00	11.00	11.00
High	5320	24.00	23.48	29.48	23.48	11.00	11.00	11.00

Duty Cycle CF (dB)	0.32	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	10.774	11.09	24.00	-12.91
Mid	5300	11.019	11.34	24.00	-12.66
High	5320	10.738	11.06	24.00	-12.94

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	-0.680	-0.36	11.00	-11.36
Mid	5300	-0.350	-0.03	11.00	-11.03
High	5320	-0.700	-0.38	11.00	-11.38

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10.5.6. 802.11n HT40 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	5270	43.9	36.1	2.40
High	5310	43.3	35.8	2.40

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	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.64	**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	5270	8.44	9.08	24.00	-14.92
High	5310	8.44	9.08	24.00	-14.92

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-5.98	-5.34	11.00	-16.34
High	5310	-5.79	-5.15	11.00	-16.15

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10.5.7. 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	21.75	16.460	2.40
Mid	5580	21.90	16.450	2.40
High	5700	22.14	16.440	2.40

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	23.16	29.16	23.16	11.00	11.00	11.00
Mid	5580	24.00	23.16	29.16	23.16	11.00	11.00	11.00
High	5700	24.00	23.16	29.16	23.16	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	10.876	11.19	24.00	-12.81
Mid	5580	10.946	11.26	24.00	-12.74
High	5700	10.784	11.09	24.00	-12.91

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-0.420	-0.11	11.00	-11.11
Mid	5580	-0.230	0.08	11.00	-10.92
High	5700	-0.410	-0.10	11.00	-11.10

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10.5.8. 802.11n HT20 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	22.23	0.620	2.40
Mid	5580	22.68	17.680	2.40
High	5700	22.32	17.690	2.40

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	8.92	14.92	8.92	11.00	11.00	11.00
Mid	5580	24.00	23.47	29.47	23.47	11.00	11.00	11.00
High	5700	24.00	23.48	29.48	23.48	11.00	11.00	11.00

Duty Cycle CF (dB)	0.32	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	10.361	10.68	24.00	-13.32
Mid	5580	10.653	10.97	24.00	-13.03
High	5700	10.886	11.21	24.00	-12.79

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	-1.000	-0.68	11.00	-11.68
Mid	5580	-0.540	-0.22	11.00	-11.22
High	5700	-0.520	-0.20	11.00	-11.20

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10.5.9. 802.11n HT40 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	5510	44.0	36.180	2.40
Mid	5550	43.7	36.090	2.40
High	5670	43.8	36.050	2.40

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	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.64	**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	5510	8.139	8.78	24.00	-15.22
Mid	5550	8.800	9.44	24.00	-14.56
High	5670	8.811	9.45	24.00	-14.55

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-6.150	-5.51	11.00	-16.51
Mid	5550	-5.530	-4.89	11.00	-15.89
High	5670	-5.410	-4.77	11.00	-15.77

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10.5.10. 802.11a MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	22.3	16.5	2.40
Mid	5785	23.1	16.6	2.40
High	5825	21.5	16.5	2.40

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	5745	30.00	29.16	35.16	29.16	30.00	17.00	17.00
Mid	5785	30.00	29.20	35.20	29.20	30.00	17.00	17.00
High	5825	30.00	29.17	35.17	29.17	30.00	17.00	17.00

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	5745	11.23	11.54	30.00	-18.47
Mid	5785	10.63	10.94	30.00	-19.06
High	5825	10.79	11.10	30.00	-18.90

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-2.40	-2.09	17.00	-19.09
Mid	5785	-2.77	-2.46	17.00	-19.46
High	5825	-2.49	-2.18	17.00	-19.18

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10.5.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5745	22.3	17.7	2.40
Mid	5785	22.8	17.7	2.40
High	5825	22.2	17.7	2.40

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	5745	30.00	29.48	35.48	29.48	30.00	17.00	17.00
Mid	5785	30.00	29.47	35.47	29.47	30.00	17.00	17.00
High	5825	30.00	29.48	35.48	29.48	30.00	17.00	17.00

Duty Cycle CF (dB)	0.32	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	5745	11.08	11.40	30.00	-18.60
Mid	5785	10.52	10.84	30.00	-19.16
High	5825	10.72	11.04	30.00	-18.96

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-2.83	-2.51	17.00	-19.51
Mid	5785	-3.20	-2.88	17.00	-19.88
High	5825	-3.17	-2.85	17.00	-19.85

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10.5.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5755	43.4	36.1	2.40
High	5795	44.0	36.2	2.40

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	5755	30.00	30.00	36.00	30.00	30.00	17.00	17.00
High	5795	30.00	30.00	36.00	30.00	30.00	17.00	17.00

Duty Cycle CF (dB)	0.64	**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	5755	8.35	8.99	30.00	-21.01
High	5795	8.21	8.85	30.00	-21.15

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-7.58	-6.94	17.00	-23.94
High	5795	-8.48	-7.84	17.00	-24.84

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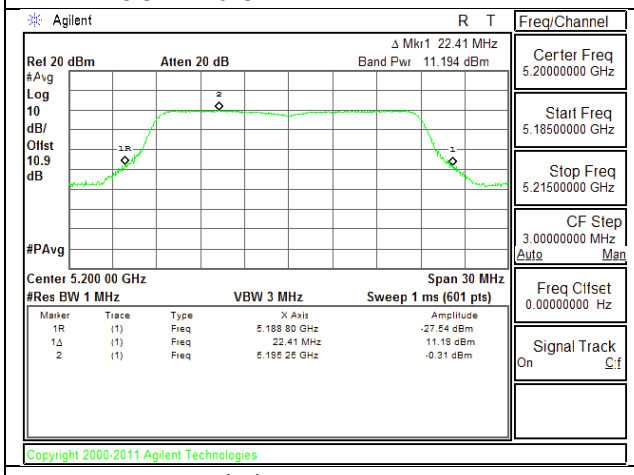
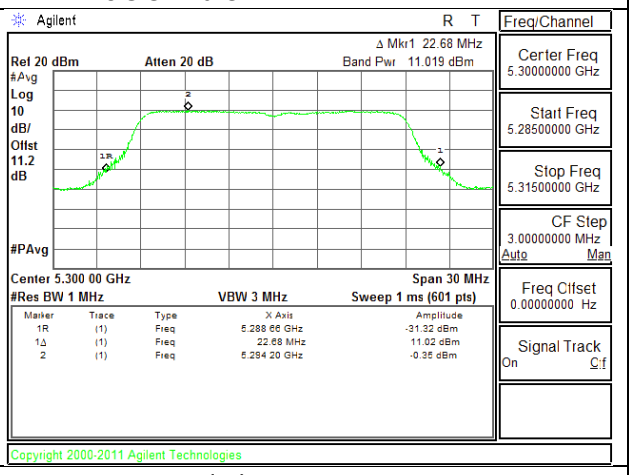
10.5.1. OUTPUT POWER AND PPSD PLOTS, Chain 0

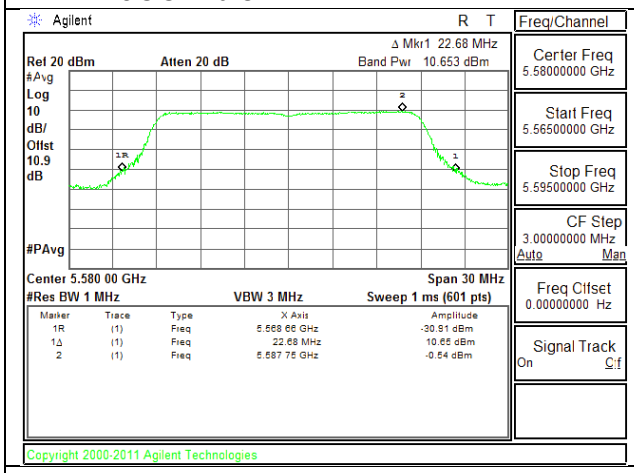
11n HT20 5.2 Mid Ch



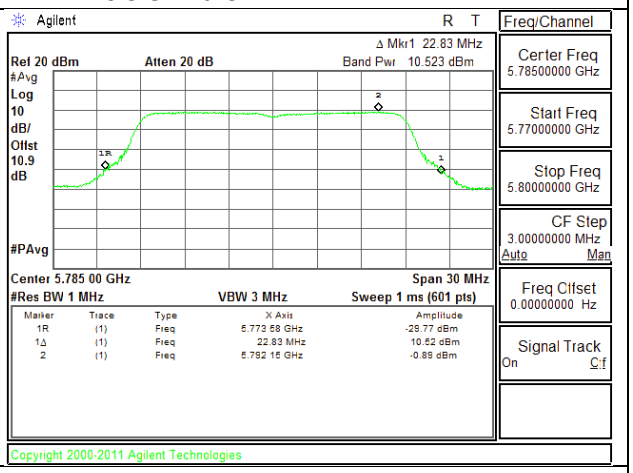
11n HT20 5.3 Mid Ch



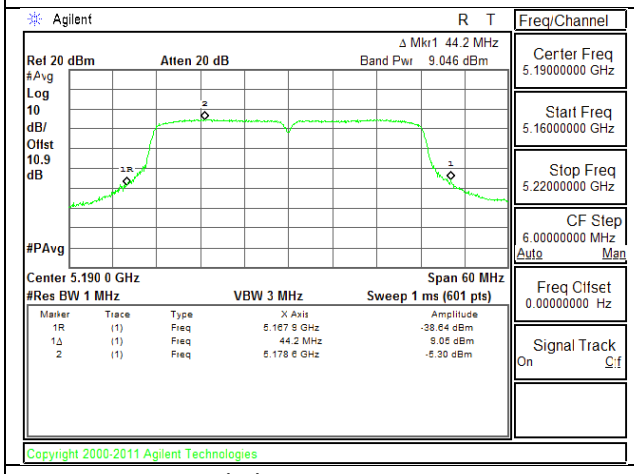
11n HT20 5.5 Mid Ch



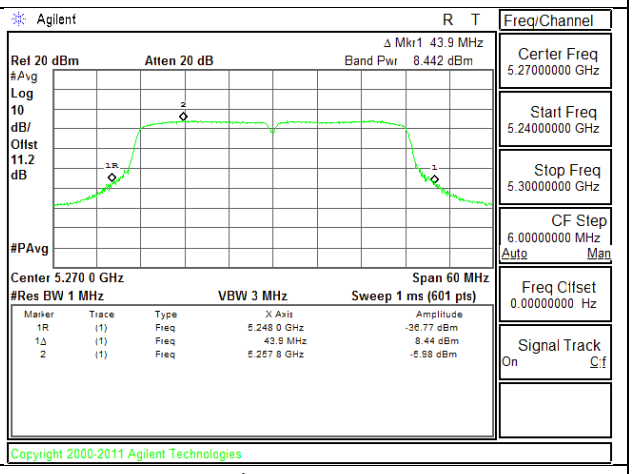
11n HT20 5.8 Mid Ch



11n HT40 5.2 Low Ch



11n HT40 5.3 Low Ch



11n HT40 5.5 Mid Ch

11n HT40 5.8 Low Ch

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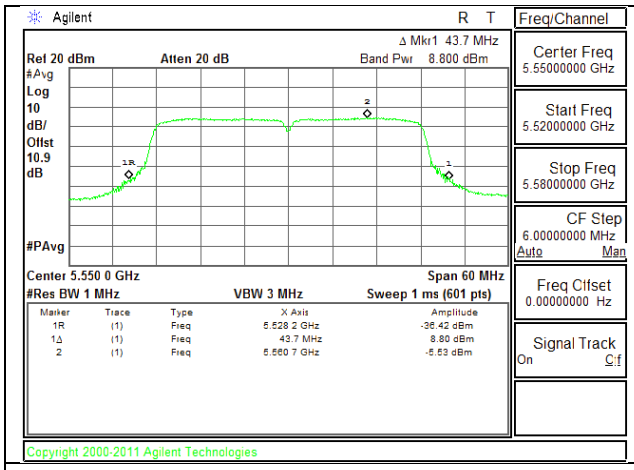
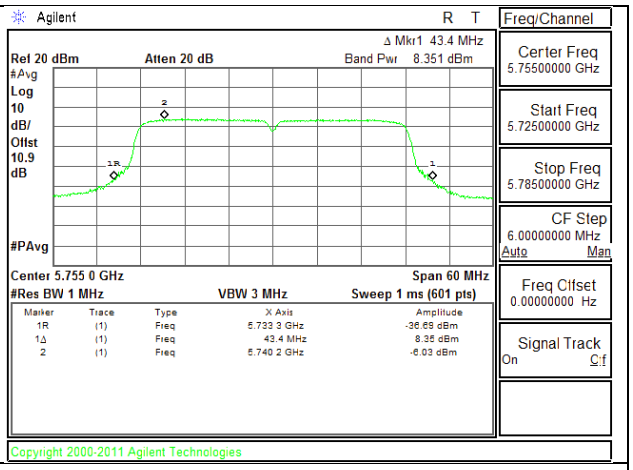
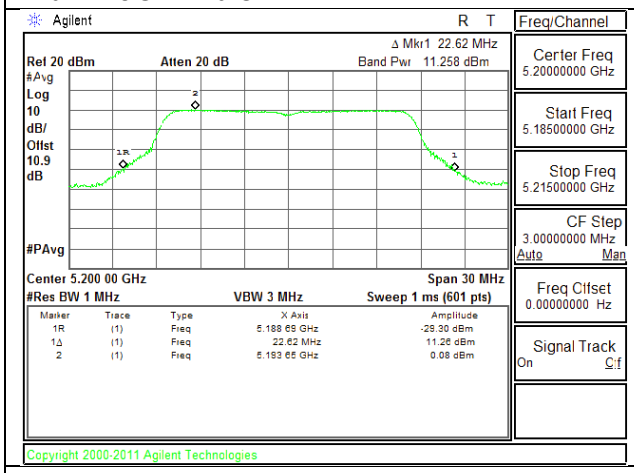
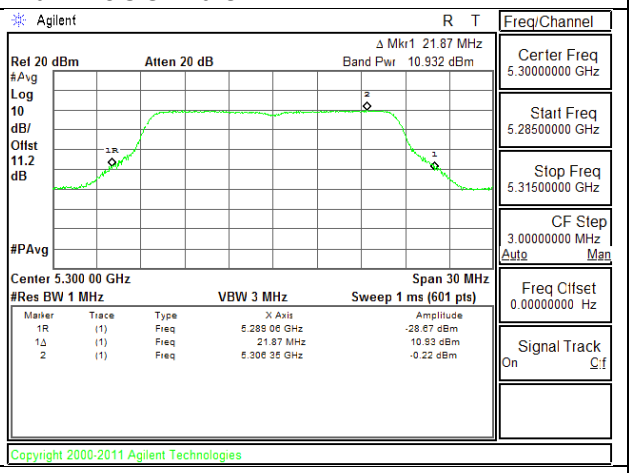




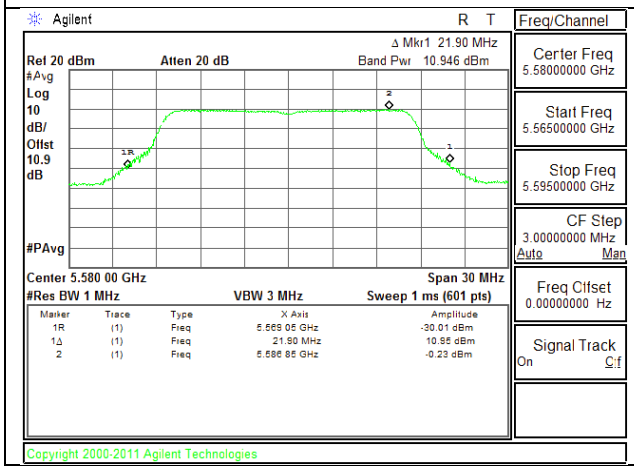
11a HT20 5.2 Mid Ch



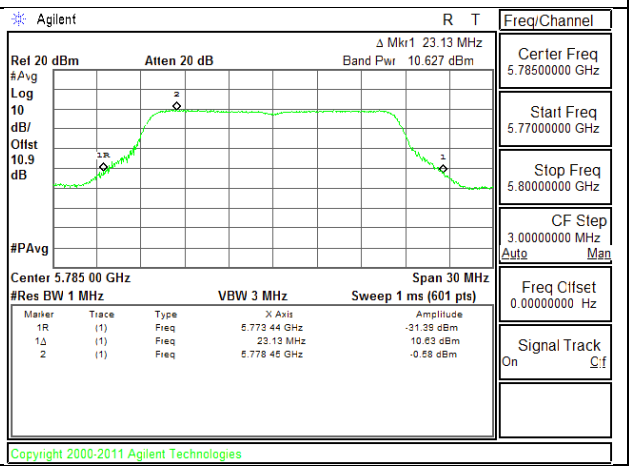
11a HT20 5.3 Mid Ch



11a HT20 5.5 Mid Ch



11a HT20 5.8 Mid Ch



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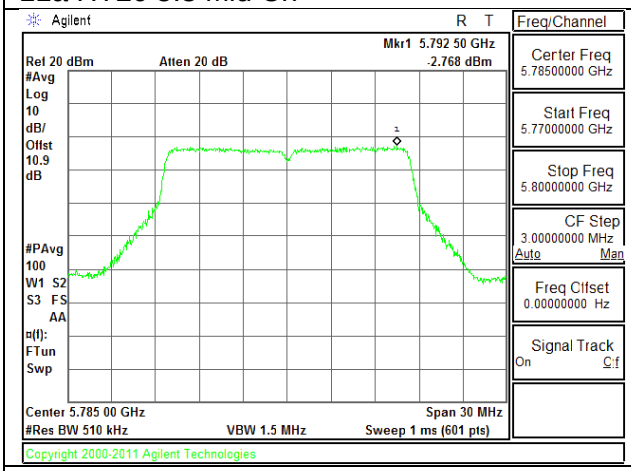
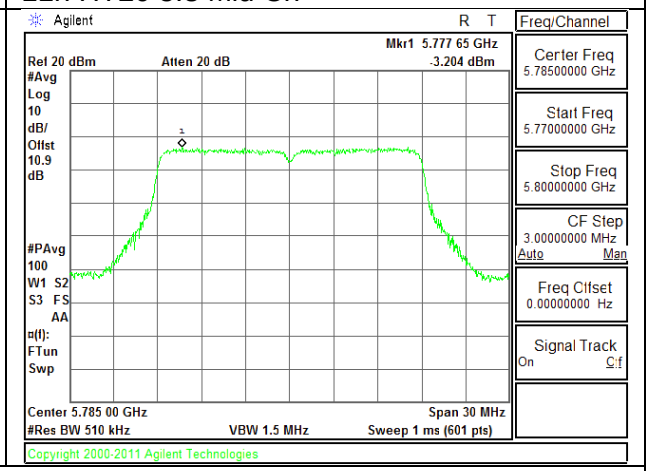
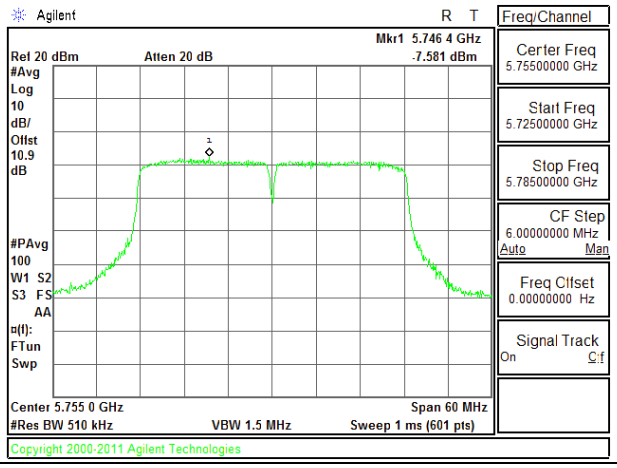
11a HT20 5.8 Mid Ch



11n HT20 5.8 Mid Ch



11n HT40 5.8 Low Ch



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11. TRANSMITTER ABOVE 1 GHz

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 G) 6) d) Method AD:

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 add duty cycle factor to the reading offset for average measurements.

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The spectrum from 1GHz 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.

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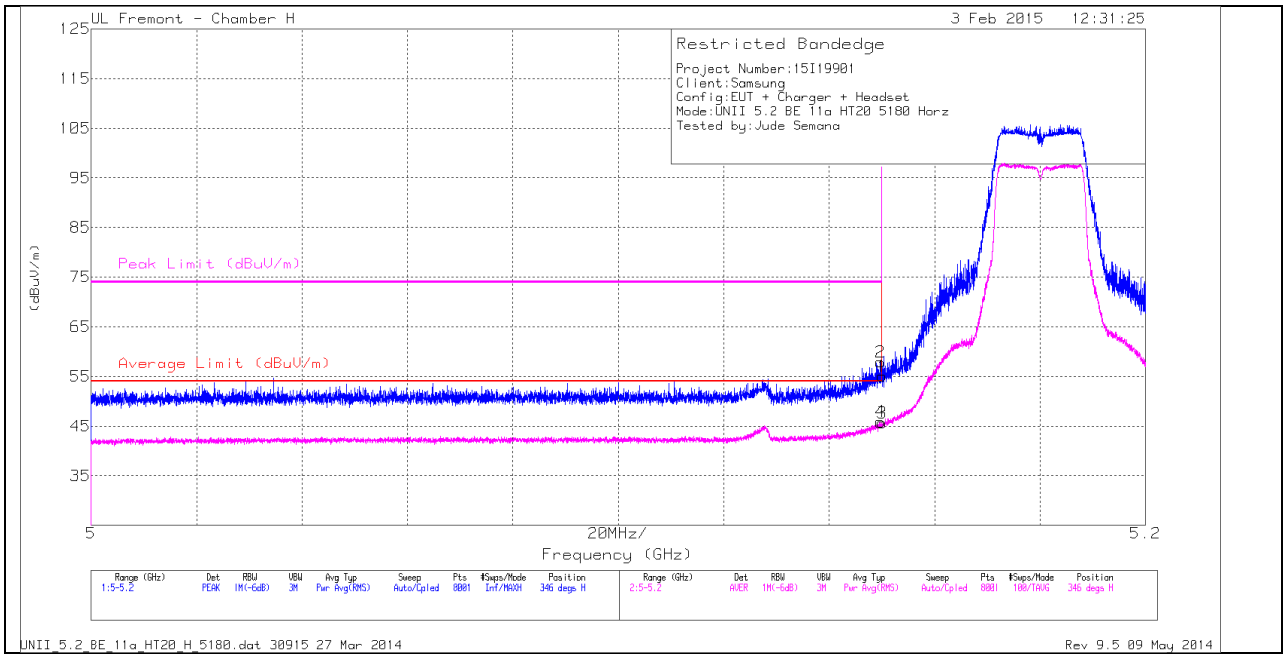
11.1. 5.2 GHz

11.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	43.37	PK	34.5	-22.8	0	55.07	-	-	74	-18.93	346	313	H
2	* 5.15	46.18	PK	34.5	-22.8	0	57.88	-	-	74	-16.12	346	313	H
3	* 5.15	33.63	RMS	34.5	-22.8	.3	45.63	54	-8.37	-	-	346	313	H
4	* 5.15	33.83	RMS	34.5	-22.8	.3	45.83	54	-8.17	-	-	346	313	H

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

PK - Peak detector

RMS - RMS detection

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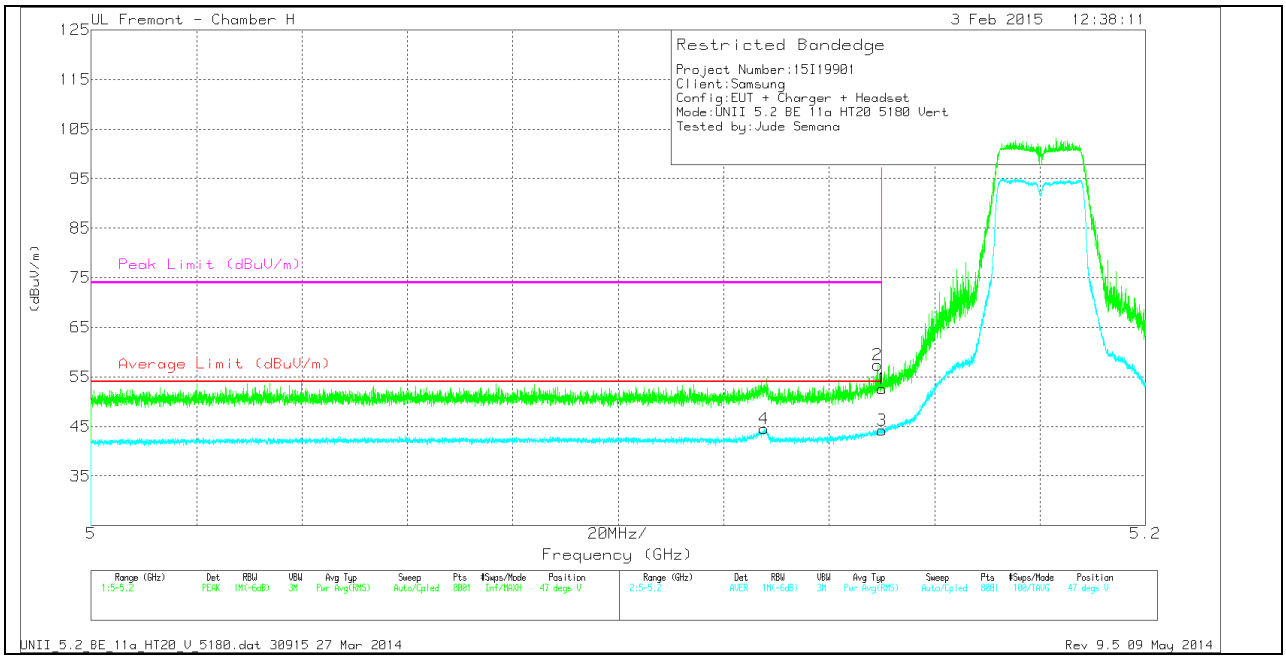
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	40.89	PK	34.5	-22.8	0	52.59	-	-	74	-21.41	47	289	V
2	* 5.149	45.71	PK	34.5	-22.8	0	57.41	-	-	74	-16.59	47	289	V
3	* 5.15	32.2	RMS	34.5	-22.8	.3	44.2	54	-9.8	-	-	47	289	V
4	* 5.128	32.52	RMS	34.5	-22.8	.3	44.52	54	-9.48	-	-	47	289	V

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

PK - Peak detector

RMS - RMS detection

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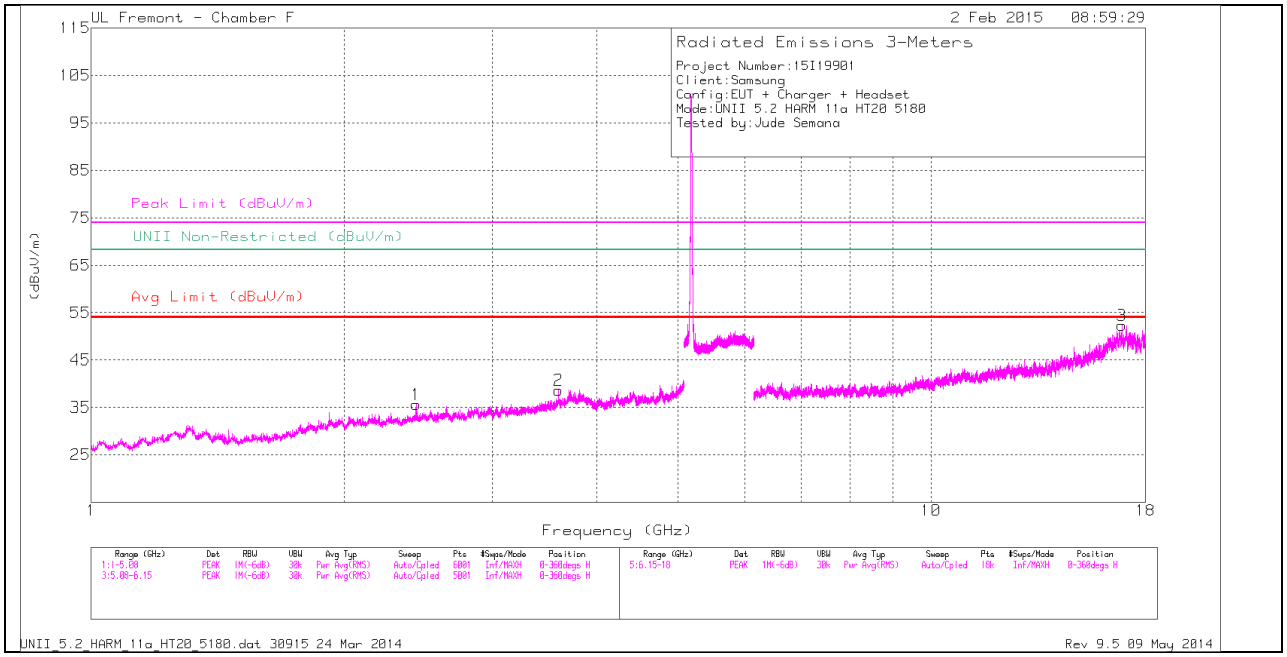
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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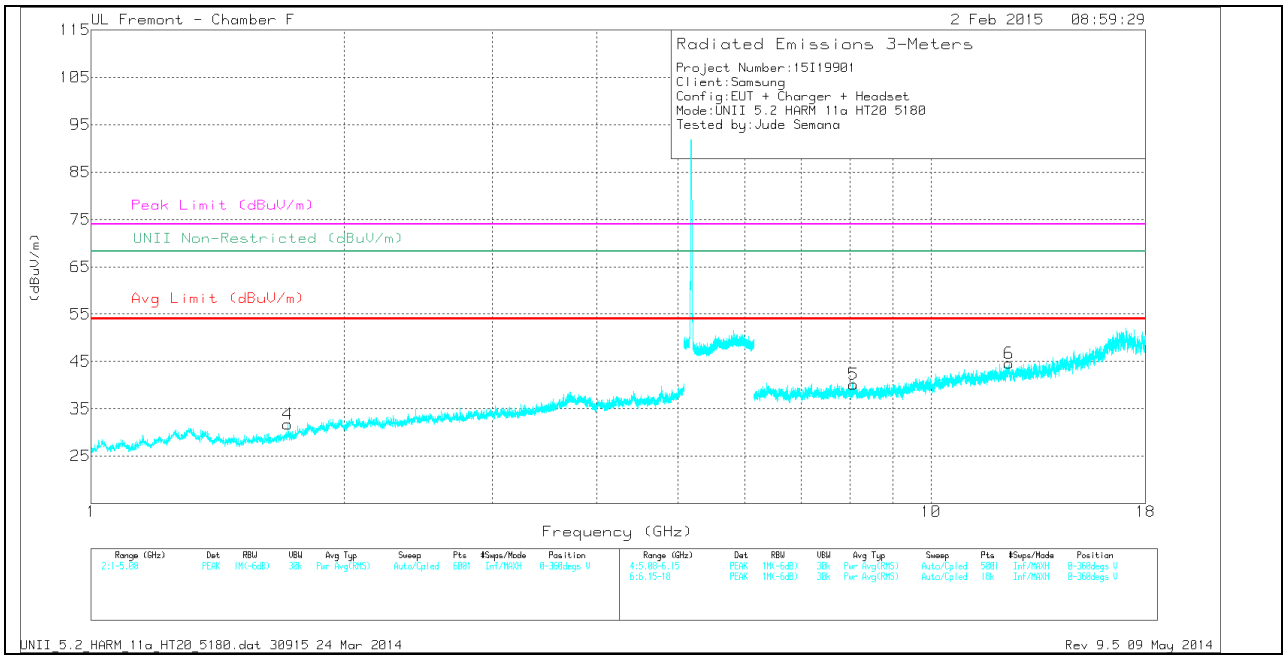
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.436	34.11	PK	32.4	-30.9	0	35.61	-	-	-	-	68.2	-32.59	0-360	201	H
2	* 3.601	33.27	PK	34.9	-29.5	0	38.67	-	-	74	-35.33	-	-	0-360	201	H
4	1.715	34.14	PK	29.4	-31.8	0	31.74	-	-	-	-	68.2	-36.46	0-360	101	V
3	16.87	28.3	PK	41.4	-17.4	0	52.3	-	-	-	-	68.2	-15.9	0-360	100	H
5	* 8.081	29.17	PK	35.7	-24.7	0	40.17	-	-	74	-33.83	-	-	0-360	101	V
6	* 12.379	27.7	PK	38.9	-22	0	44.6	-	-	74	-29.4	-	-	0-360	101	V

PK - Peak detector

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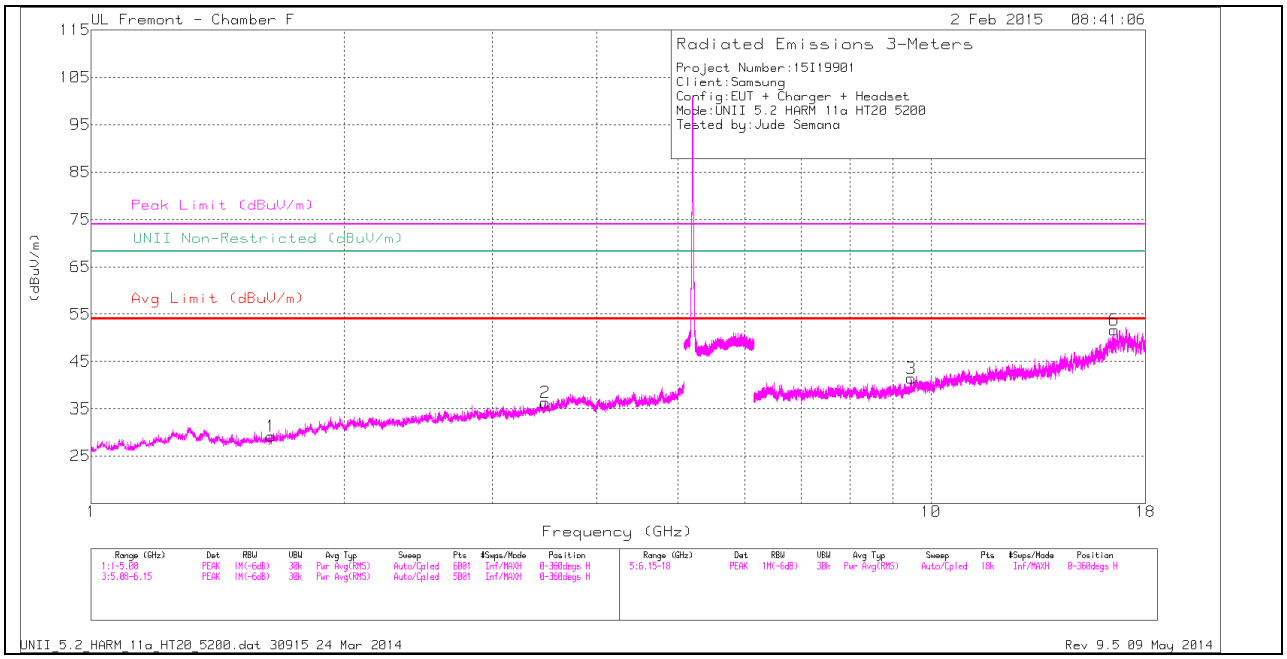
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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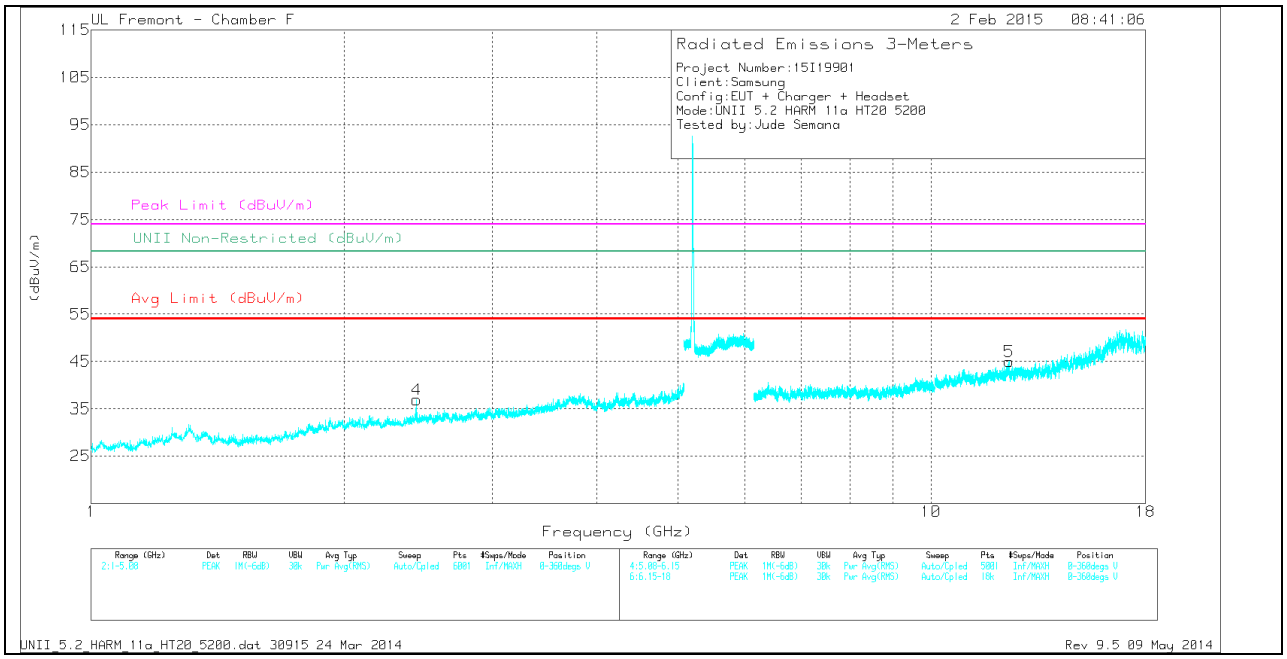
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.637	32.12	PK	28.8	-31.7	0	29.22	-	-	-	-	68.2	-38.98	0-360	201	H
2	3.47	31.62	PK	34.2	-29.5	0	36.32	-	-	-	-	68.2	-31.88	0-360	98	H
4	2.44	35.43	PK	32.4	-30.9	0	36.93	-	-	-	-	68.2	-31.27	0-360	101	V
3	* 9.467	27.42	PK	36.8	-22.8	0	41.42	-	-	74	-32.58	-	-	0-360	101	H
6	16.514	29.5	PK	41.2	-19	0	51.7	-	-	-	-	68.2	-16.5	0-360	101	H
5	* 12.393	28.58	PK	38.9	-22.5	0	44.98	-	-	74	-29.02	-	-	0-360	101	V

PK - Peak detector

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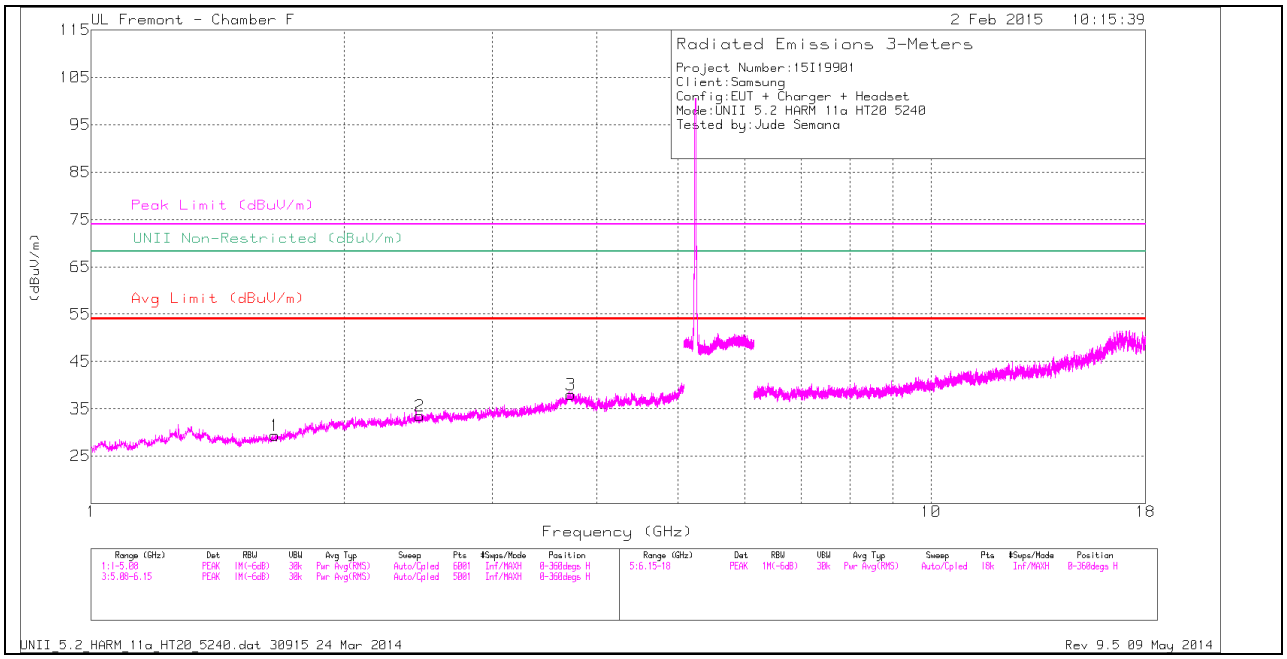
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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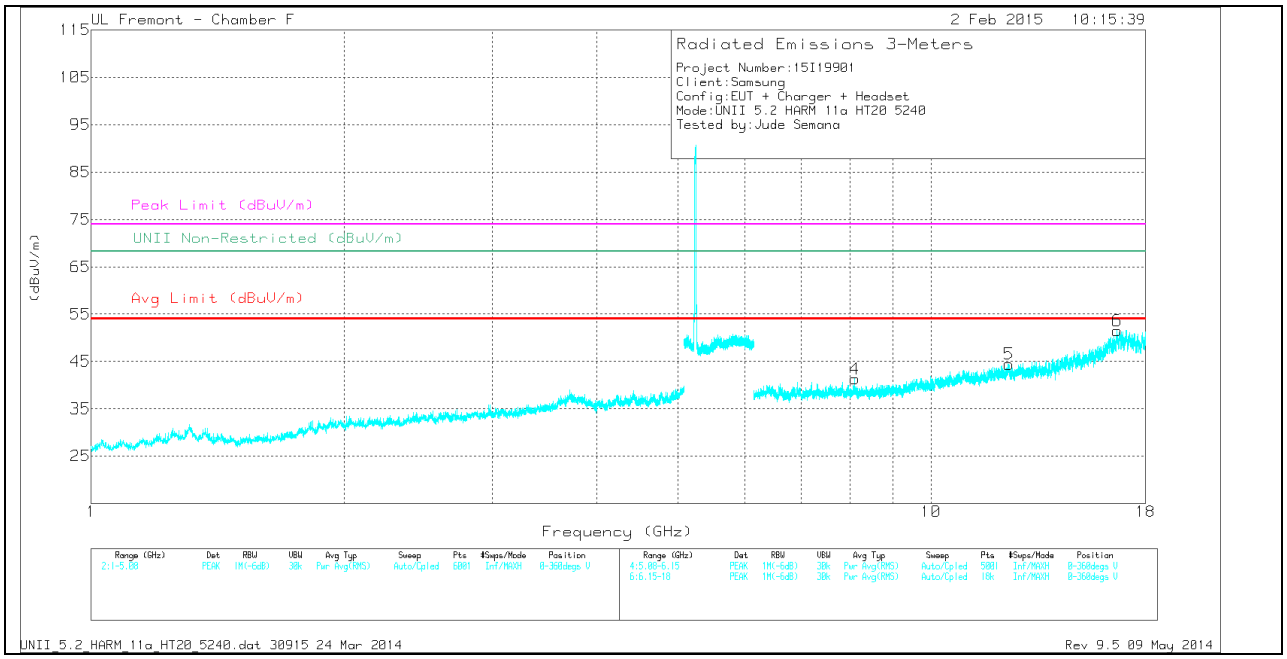
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.656	32.32	PK	28.9	-31.8	0	29.42	-	-	-	-	68.2	-38.78	0-360	100	H
2	2.46	31.82	PK	32.5	-30.8	0	33.52	-	-	-	-	68.2	-34.68	0-360	100	H
3	* 3.723	32.62	PK	34.7	-29.3	0	38.02	-	-	74	-35.98	-	-	0-360	100	H
4	* 8.111	30.25	PK	35.7	-24.6	0	41.35	-	-	74	-32.65	-	-	0-360	101	V
5	* 12.377	27.52	PK	38.9	-22	0	44.42	-	-	74	-29.58	-	-	0-360	101	V
6	16.649	27.13	PK	41.3	-16.9	0	51.53	-	-	-	-	68.2	-16.67	0-360	101	V

PK - Peak detector

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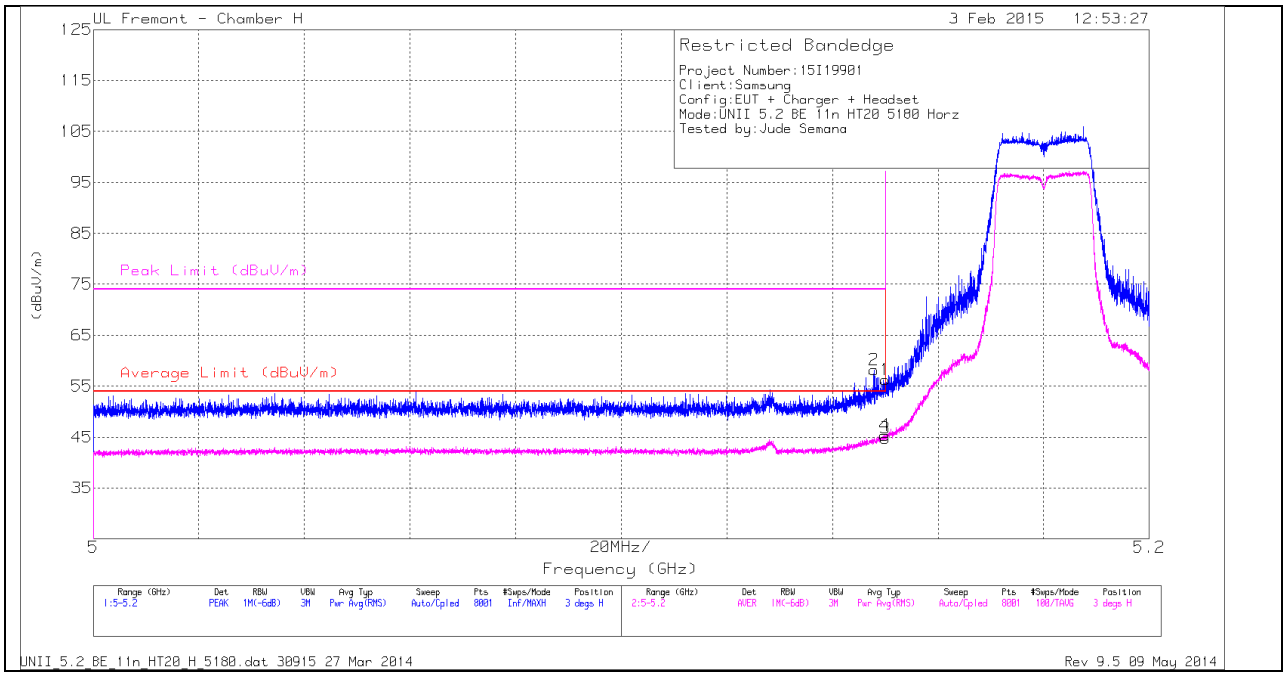
11.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	44.56	PK	34.5	-22.8	0	56.26	-	-	74	-17.74	3	312	H
2	* 5.148	46.5	PK	34.5	-22.8	0	58.2	-	-	74	-15.8	3	312	H
3	* 5.15	32.7	RMS	34.5	-22.8	.32	44.72	54	-9.28	-	-	3	312	H
4	* 5.15	33.27	RMS	34.5	-22.8	.32	45.29	54	-8.71	-	-	3	312	H

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

PK - Peak detector

RMS - RMS detection

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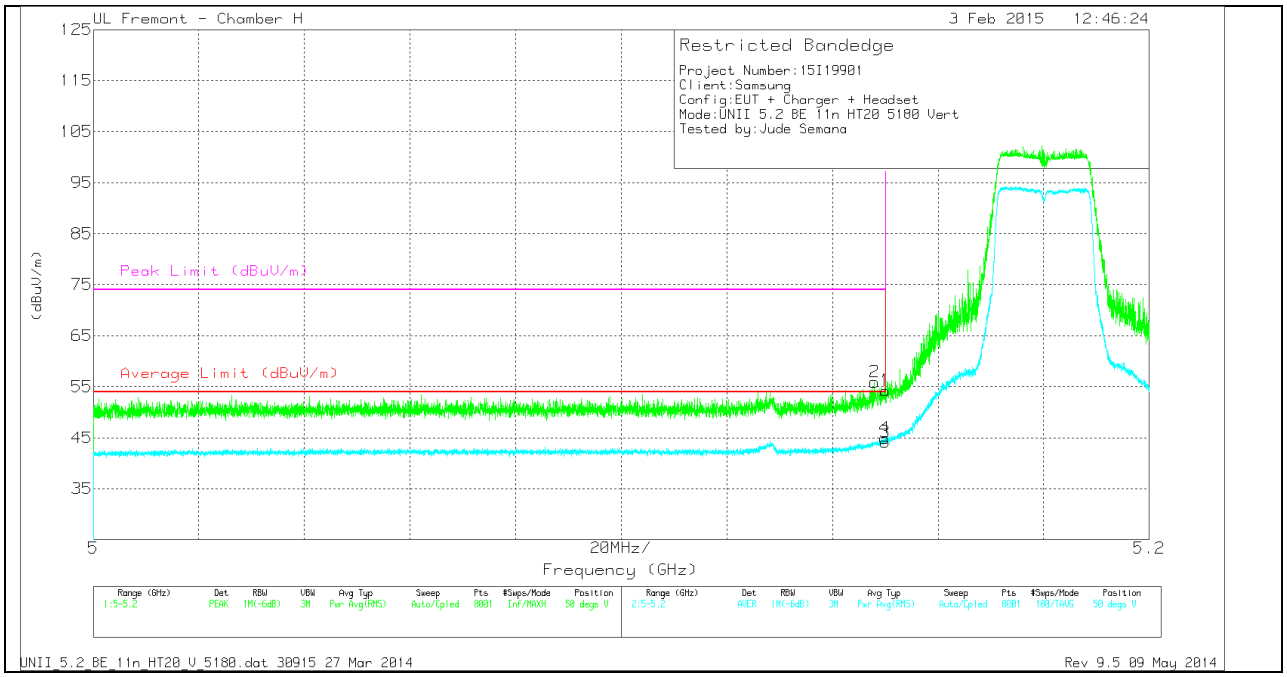
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	42.51	PK	34.5	-22.8	0	54.21	-	-	74	-19.79	50	318	V
2	* 5.148	44.25	PK	34.5	-22.8	0	55.95	-	-	74	-18.05	50	318	V
3	* 5.15	32.08	RMS	34.5	-22.8	.32	44.10	54	-9.90	-	-	50	318	V
4	* 5.15	32.9	RMS	34.5	-22.8	.32	44.92	54	-9.08	-	-	50	318	V

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

PK - Peak detector

RMS - RMS detection

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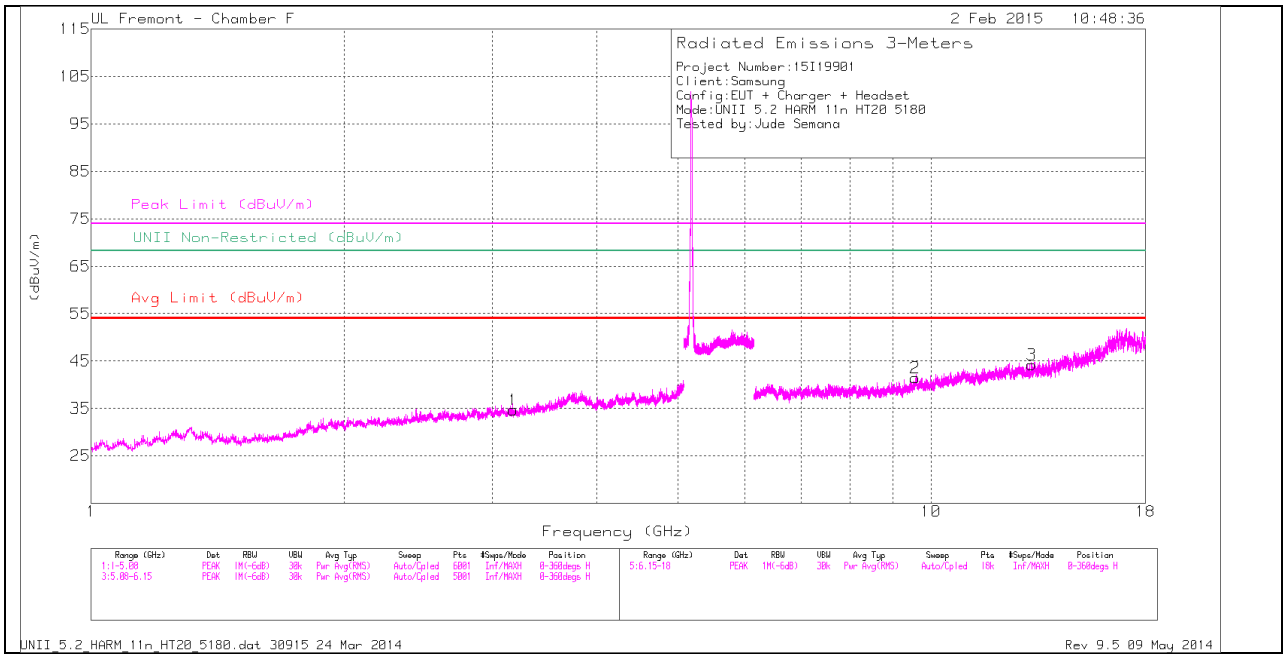
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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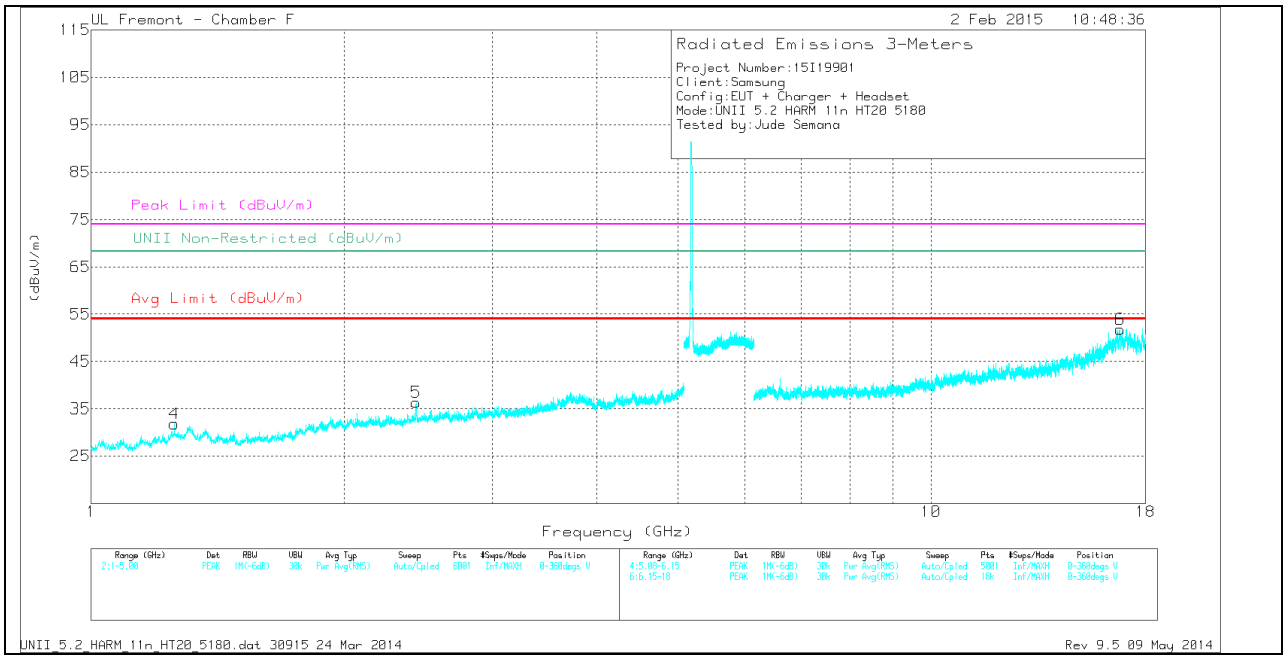
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.181	31.61	PK	33.3	-30.2	0	34.71	-	-	-	-	68.2	-33.49	0-360	201	H
4	* 1.256	34.45	PK	29.6	-32.2	0	31.85	-	-	74	-42.15	-	-	0-360	101	V
5	2.437	34.86	PK	32.4	-30.9	0	36.36	-	-	-	-	68.2	-31.84	0-360	201	V
2	9.578	26.46	PK	36.9	-21.9	0	41.46	-	-	-	-	68.2	-26.74	0-360	201	H
3	13.17	28.21	PK	39	-23	0	44.21	-	-	-	-	68.2	-23.99	0-360	201	H
6	16.785	27.39	PK	41.5	-17.1	0	51.79	-	-	-	-	68.2	-16.41	0-360	101	V

PK - Peak detector

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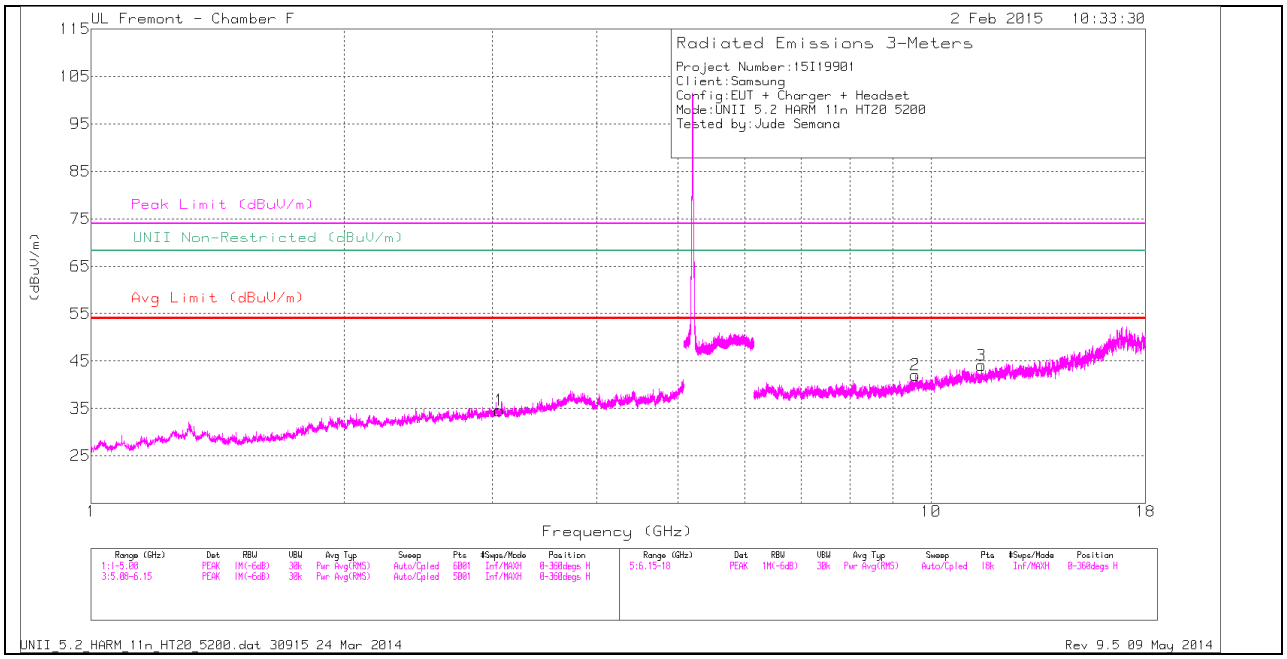
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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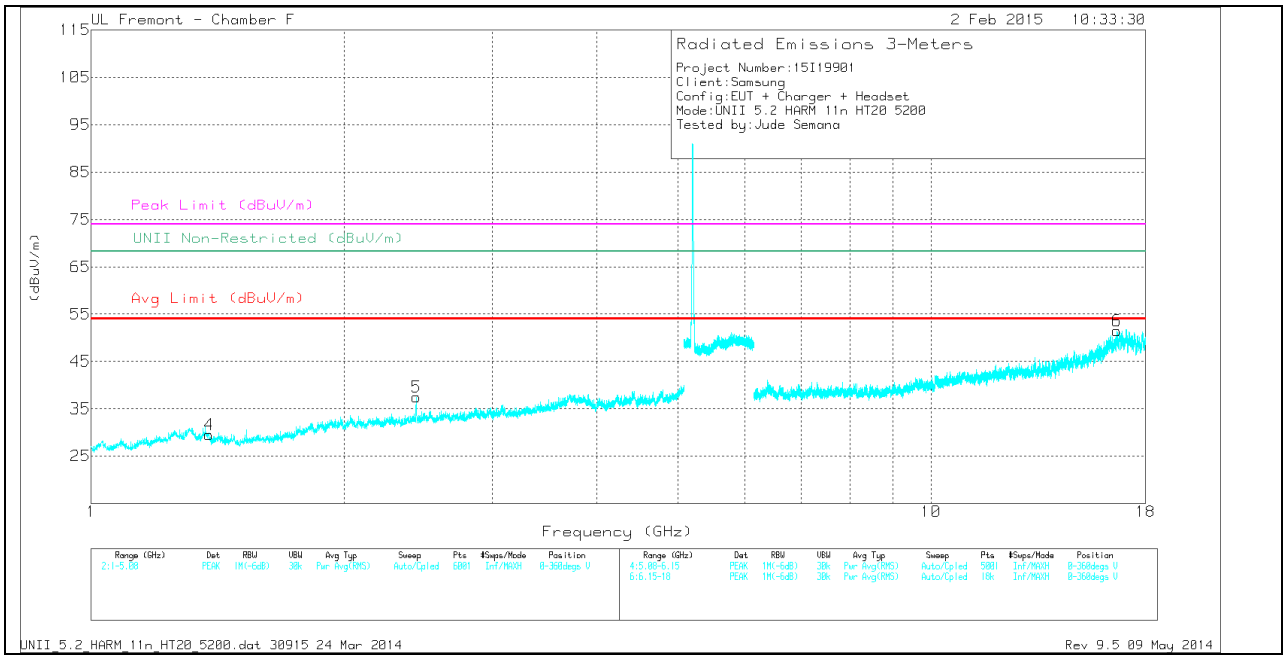
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.061	31.17	PK	33.3	-29.9	0	34.57	-	-	-	-	68.2	-33.63	0-360	201	H
4	* 1.381	31.9	PK	29.4	-31.8	0	29.5	-	-	74	-44.5	-	-	0-360	101	V
5	2.44	36	PK	32.4	-30.9	0	37.5	-	-	-	-	68.2	-30.7	0-360	201	V
2	9.58	27.03	PK	36.9	-21.9	0	42.03	-	-	-	-	68.2	-26.17	0-360	101	H
3	* 11.481	28.69	PK	38.4	-23	0	44.09	-	-	74	-29.91	-	-	0-360	201	H
6	16.643	27.39	PK	41.3	-17.2	0	51.49	-	-	-	-	68.2	-16.71	0-360	201	V

PK - Peak detector

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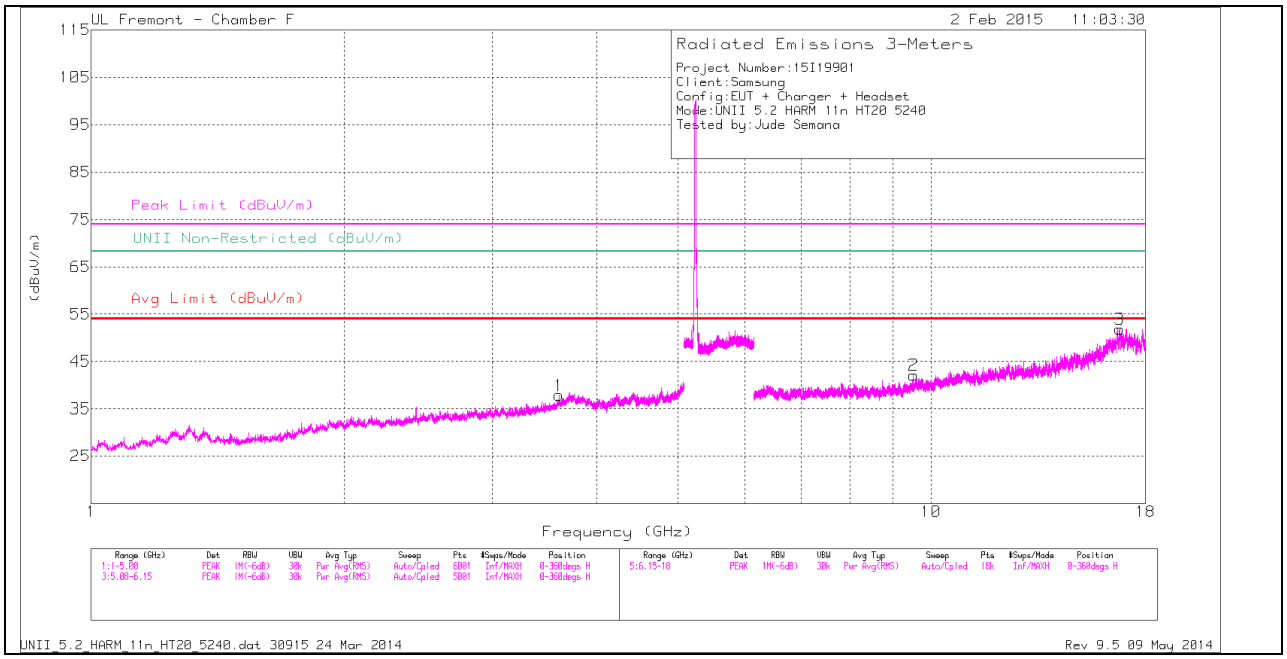
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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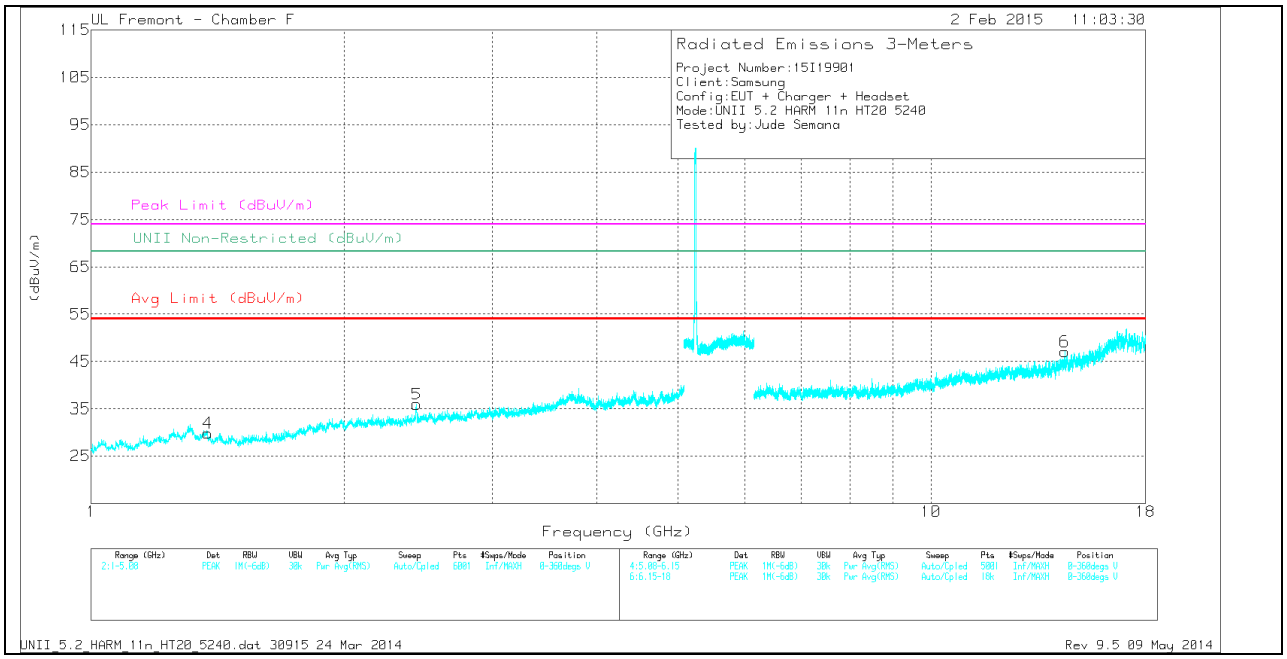
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.606	32.58	PK	34.9	-29.6	0	37.88	-	-	74	-36.12	-	-	0-360	100	H
4	* 1.376	32.33	PK	29.4	-31.9	0	29.83	-	-	74	-44.17	-	-	0-360	101	V
5	2.441	34.48	PK	32.4	-30.9	0	35.98	-	-	-	-	68.2	-32.22	0-360	101	V
2	9.523	27.85	PK	36.9	-22.6	0	42.15	-	-	-	-	68.2	-26.05	0-360	201	H
3	16.776	27.12	PK	41.5	-16.8	0	51.82	-	-	-	-	68.2	-16.38	0-360	101	H
6	14.42	29.76	PK	39.7	-22.4	0	47.06	-	-	-	-	68.2	-21.14	0-360	201	V

PK - Peak detector

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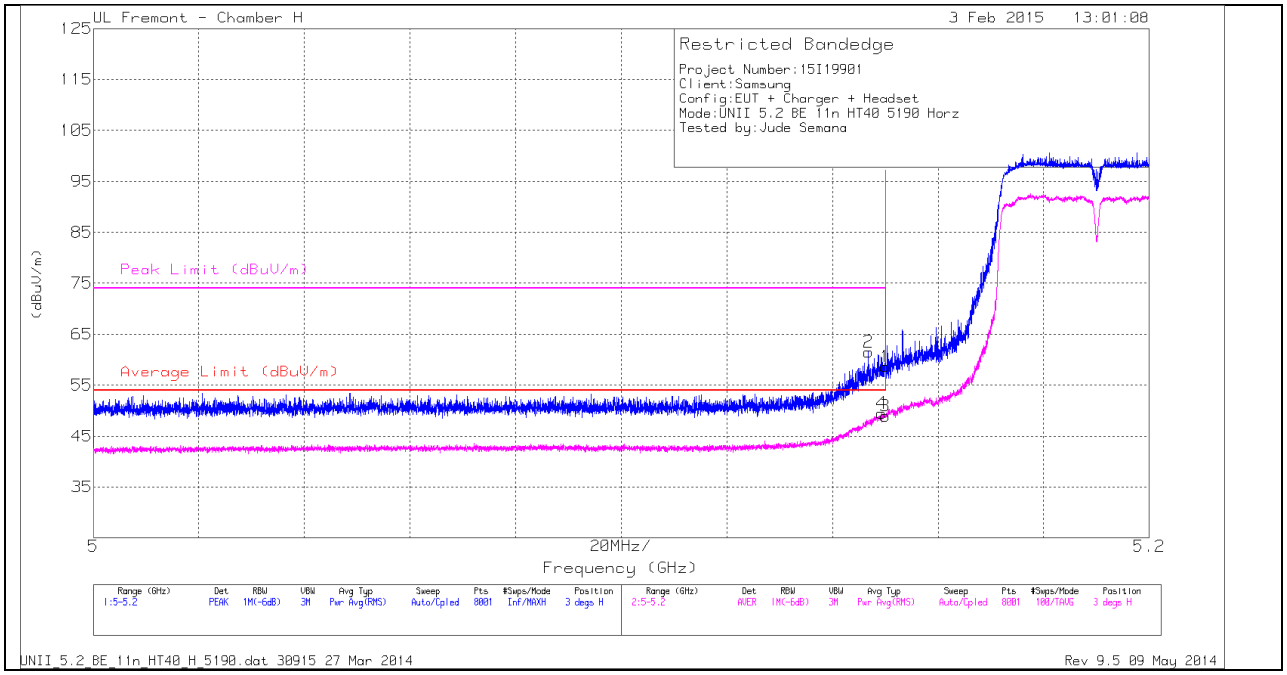
11.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	46.95	PK	34.5	-22.8	0	58.65	-	-	74	-15.35	3	284	H
2	* 5.147	49.81	PK	34.5	-22.8	0	61.51	-	-	74	-12.49	3	284	H
3	* 5.15	36.5	RMS	34.5	-22.8	.64	48.84	54	-5.16	-	-	3	284	H
4	* 5.149	37.04	RMS	34.5	-22.8	.64	49.38	54	-4.62	-	-	3	284	H

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

PK - Peak detector

RMS - RMS detection

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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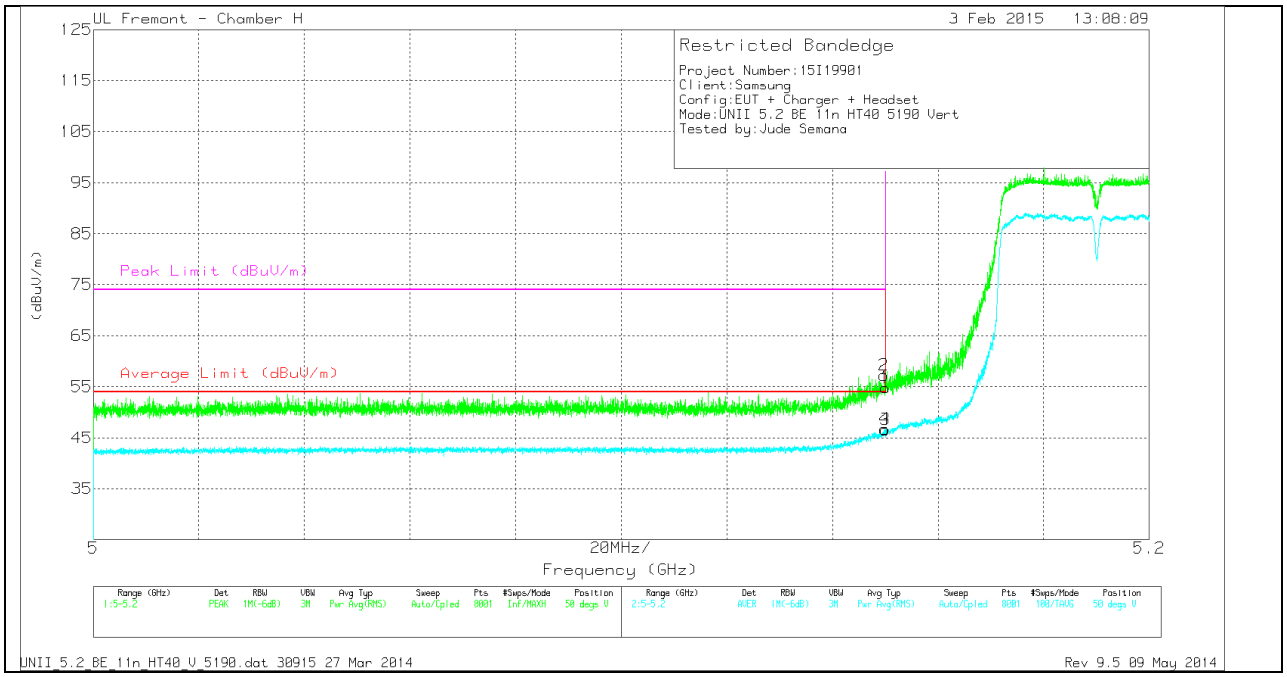
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	43.1	PK	34.5	-22.8	0	54.8	-	-	74	-19.2	50	287	V
2	* 5.15	45.56	PK	34.5	-22.8	0	57.26	-	-	74	-16.74	50	287	V
3	* 5.15	34.16	RMS	34.5	-22.8	.64	46.50	54	-7.50	-	-	50	287	V
4	* 5.15	34.3	RMS	34.5	-22.8	.64	46.64	54	-7.36	-	-	50	287	V

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

PK - Peak detector

RMS - RMS detection

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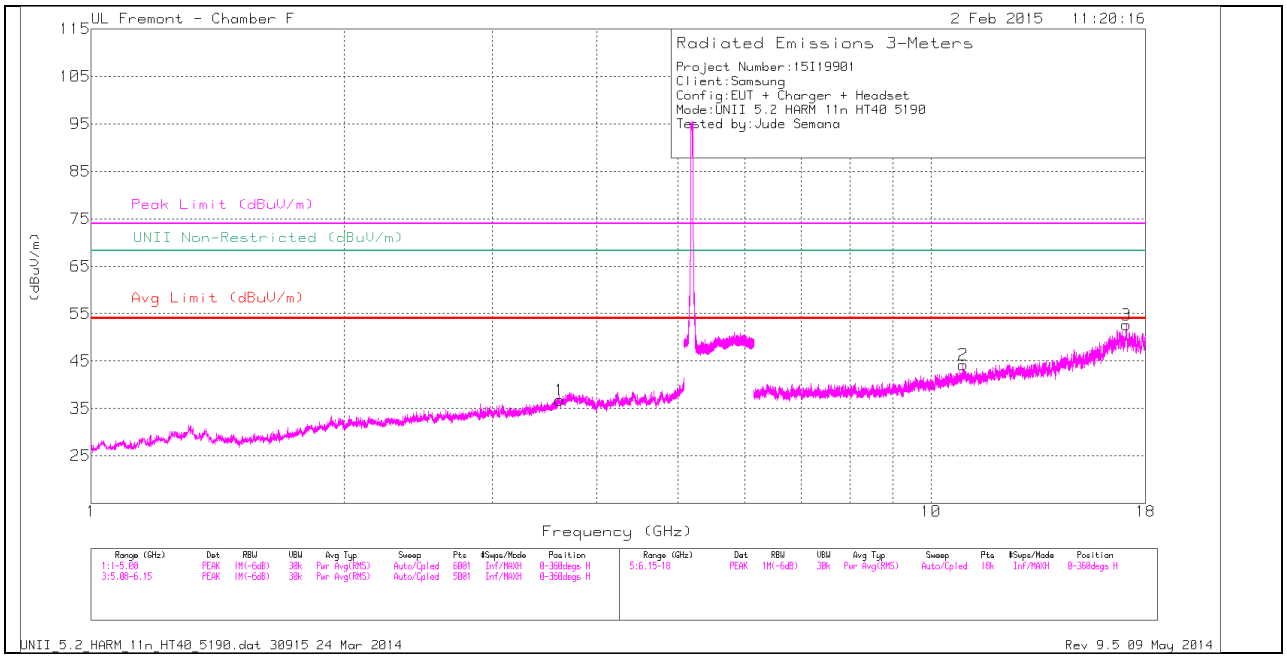
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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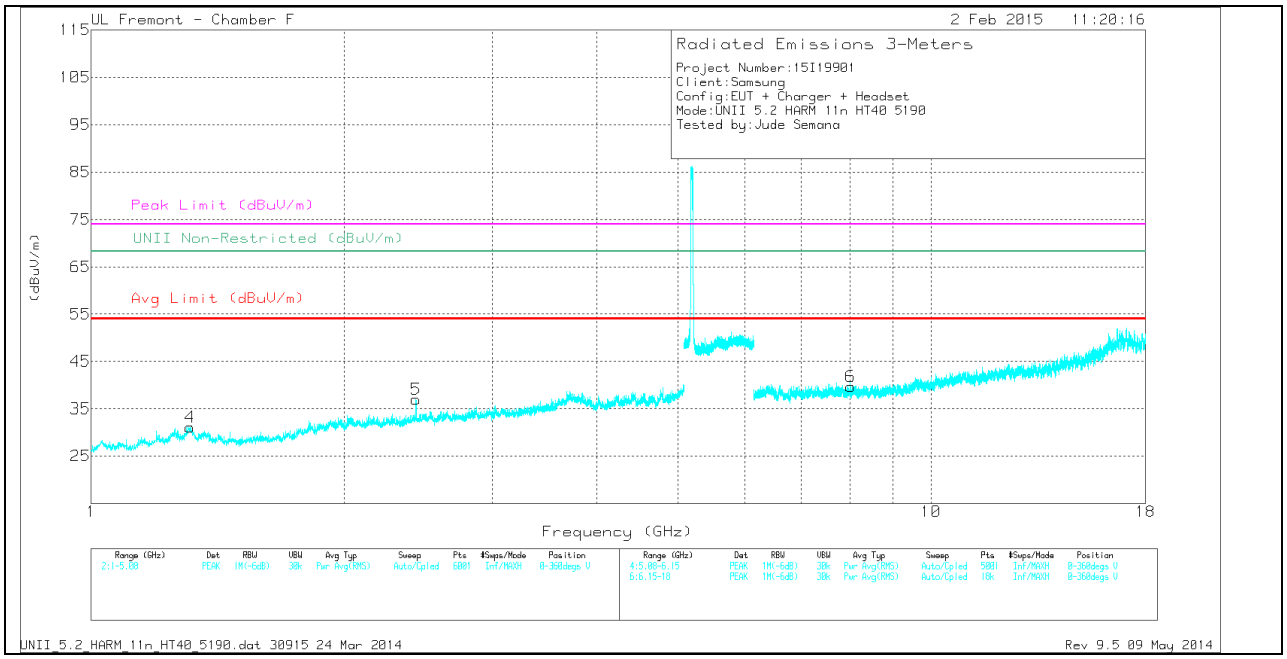
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.613	31.47	PK	34.9	-29.6	0	36.77	-	-	74	-37.23	-	-	0-360	201	H
4	* 1.311	32.5	PK	30	-31.4	0	31.1	-	-	74	-42.9	-	-	0-360	101	V
5	2.435	35.51	PK	32.4	-30.9	0	37.01	-	-	-	-	68.2	-31.19	0-360	201	V
2	* 10.914	28.23	PK	38.1	-22.1	0	44.23	-	-	74	-29.77	-	-	0-360	201	H
3	17.078	27.82	PK	41.2	-16.4	0	52.62	-	-	-	-	68.2	-15.58	0-360	201	H
6	8.022	29.42	PK	35.7	-25.4	0	39.72	-	-	-	-	68.2	-28.48	0-360	201	V

PK - Peak detector

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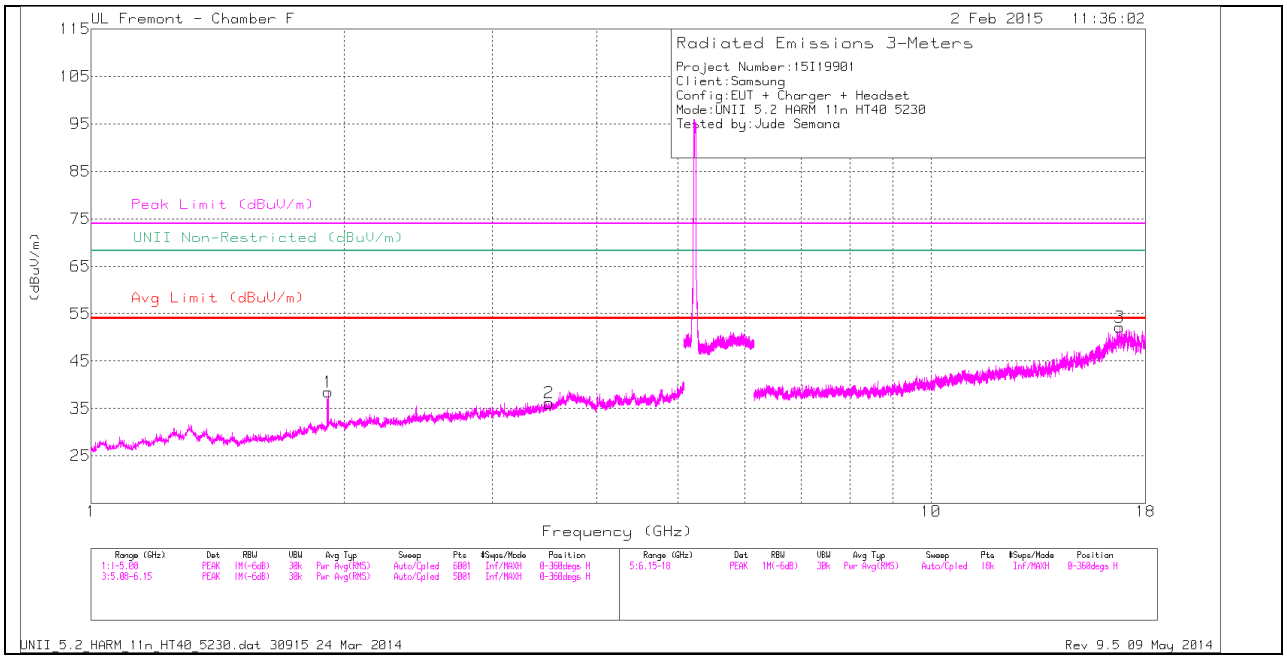
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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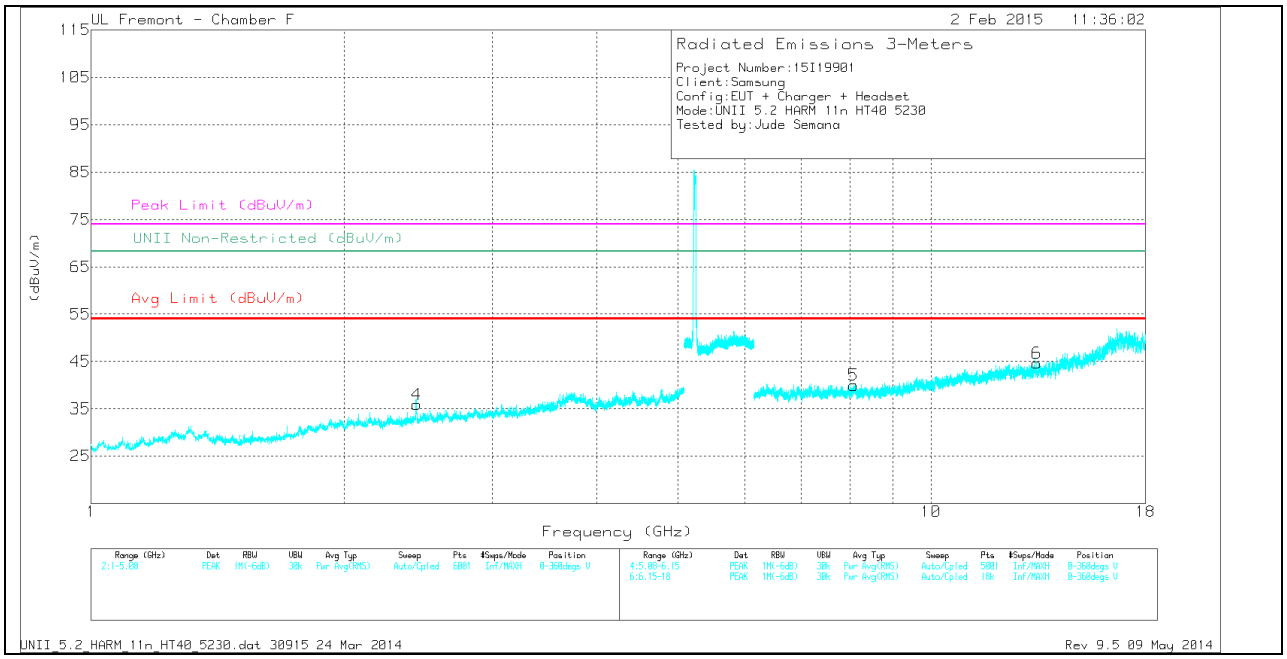
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.915	38.41	PK	31.5	-31.4	0	38.51	-	-	-	-	68.2	-29.69	0-360	201	H
2	* 3.507	31.45	PK	34.4	-29.7	0	36.15	-	-	74	-37.85	-	-	0-360	101	H
4	2.44	34.46	PK	32.4	-30.9	0	35.96	-	-	-	-	68.2	-32.24	0-360	101	V
3	16.761	27.47	PK	41.4	-16.7	0	52.17	-	-	-	-	68.2	-16.03	0-360	201	H
5	* 8.091	28.88	PK	35.7	-24.6	0	39.98	-	-	74	-34.02	-	-	0-360	101	V
6	* 13.354	28.72	PK	39.1	-23.2	0	44.62	-	-	74	-29.38	-	-	0-360	101	V

PK - Peak detector

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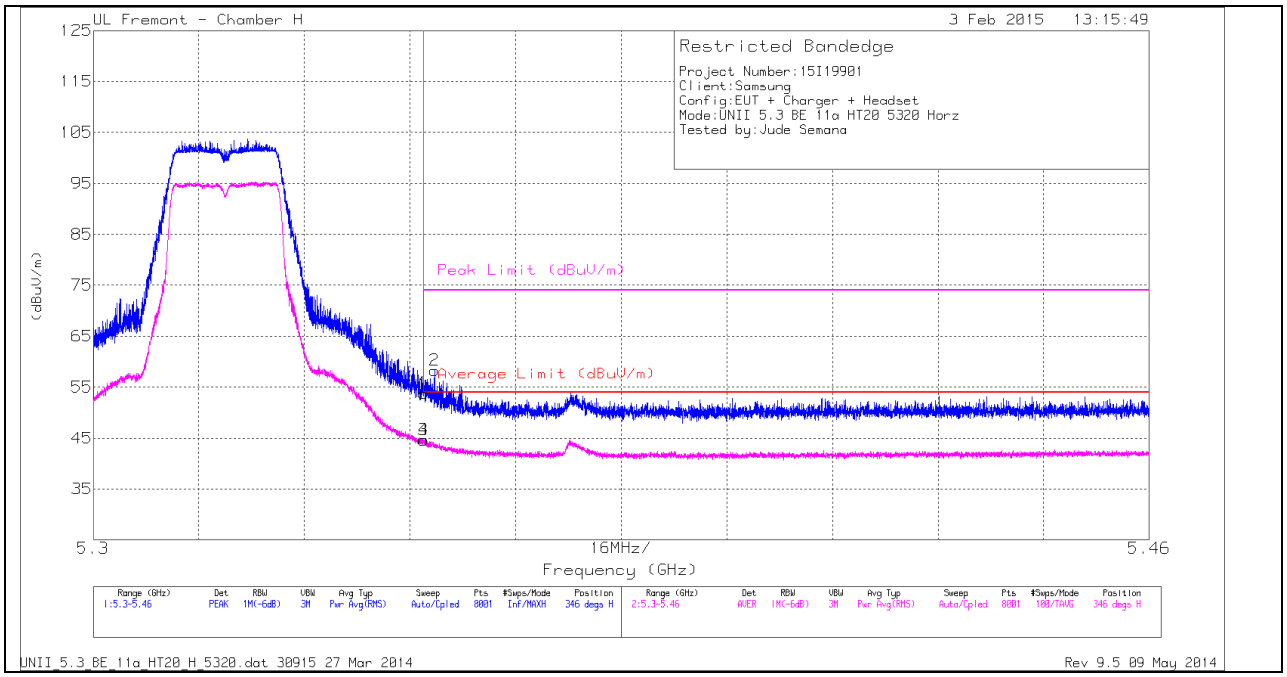
11.2. 5.3 GHz

11.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	41.58	PK	34.9	-22.7	0	53.78	-	-	74	-20.22	346	328	H
2	* 5.352	46.06	PK	34.9	-22.7	0	58.26	-	-	74	-15.74	346	328	H
3	* 5.35	32.12	RMS	34.9	-22.7	.3	44.62	54	-9.38	-	-	346	328	H
4	* 5.35	32.16	RMS	34.9	-22.7	.3	44.66	54	-9.34	-	-	346	328	H

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

PK - Peak detector

RMS - RMS detection

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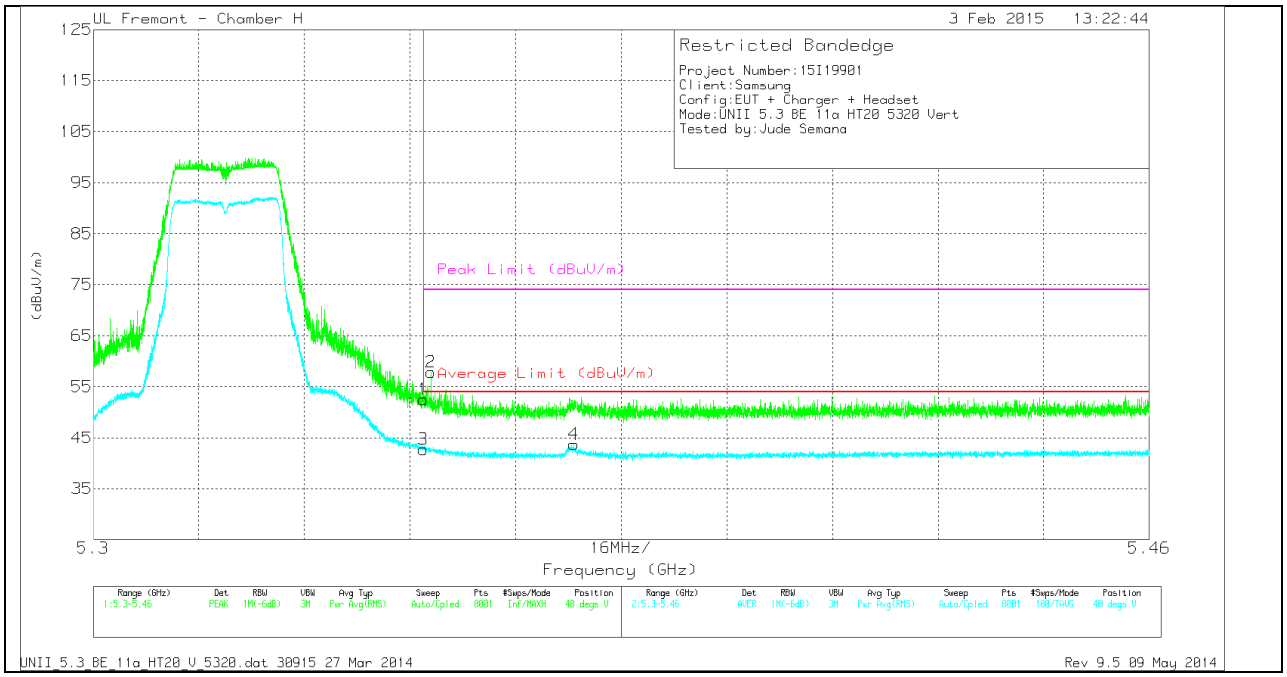
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	40.29	PK	34.9	-22.7	0	52.49	-	-	74	-21.51	48	333	V
2	* 5.351	45.67	PK	34.9	-22.7	0	57.87	-	-	74	-16.13	48	333	V
3	* 5.35	30.18	RMS	34.9	-22.7	.3	42.68	54	-11.32	-	-	48	333	V
4	* 5.373	31.19	RMS	34.9	-22.7	.3	43.69	54	-10.31	-	-	48	333	V

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

PK - Peak detector

RMS - RMS detection

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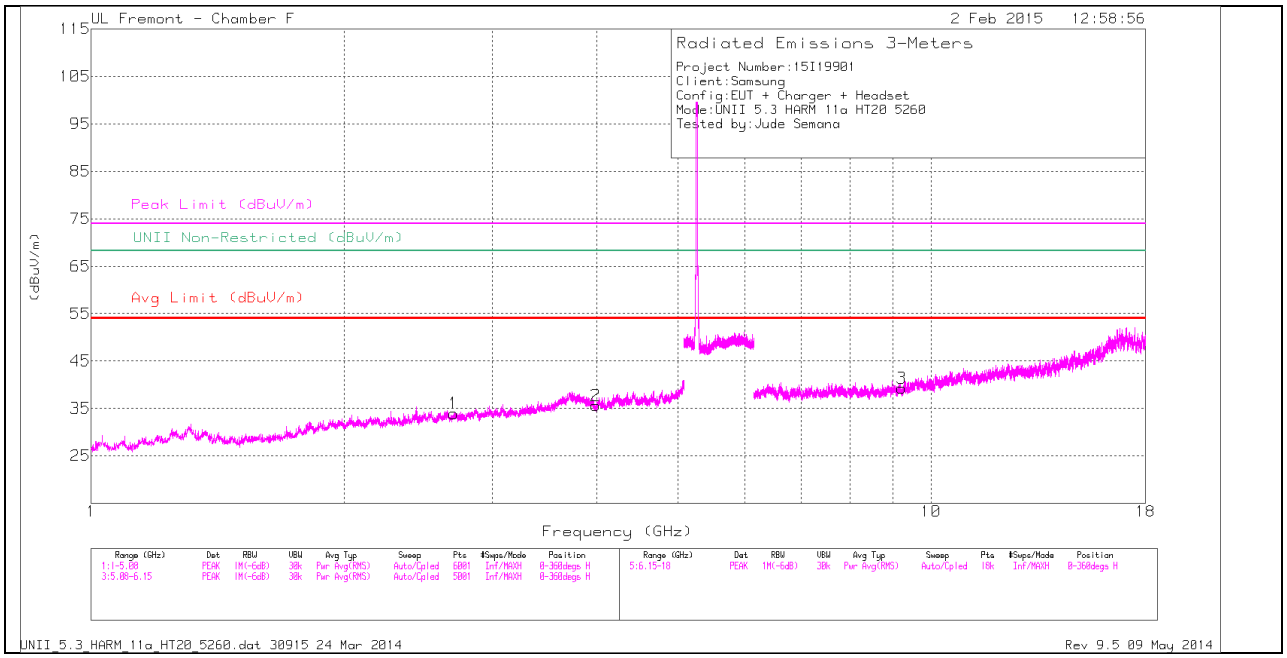
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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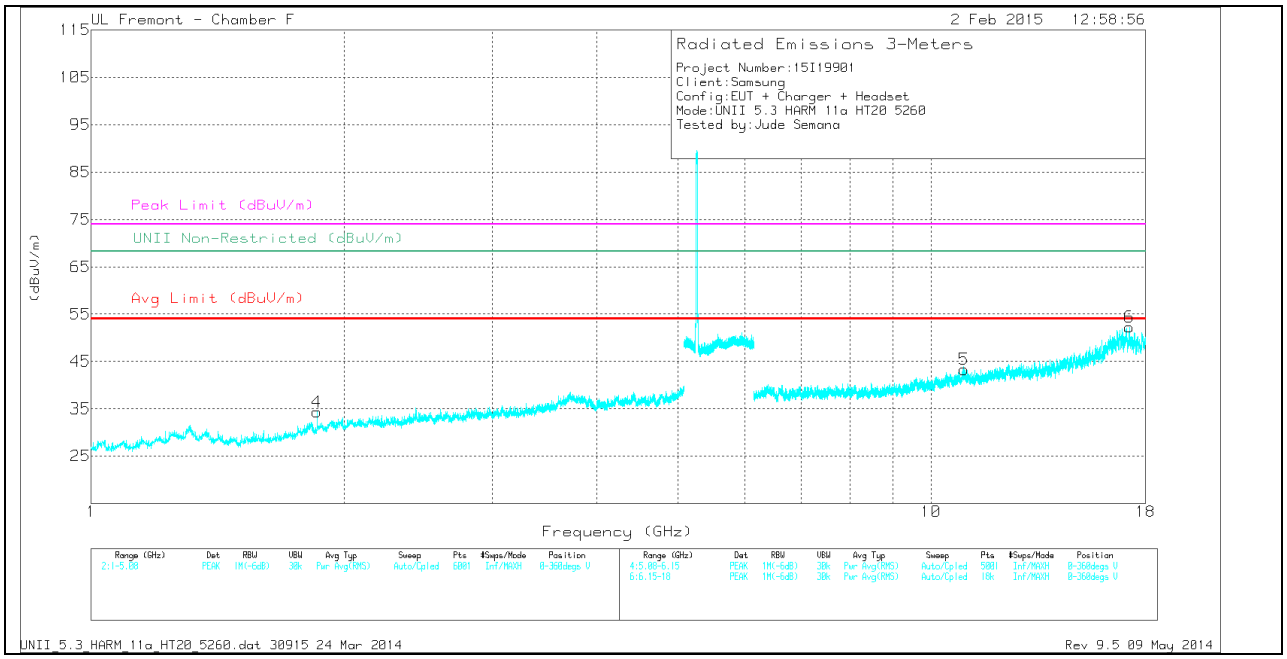
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.701	31.62	PK	32.7	-30.4	0	33.92	-	-	74	-40.08	-	-	0-360	100	H
2	* 3.989	30.93	PK	33.8	-29.1	0	35.63	-	-	74	-38.37	-	-	0-360	100	H
4	1.857	34.95	PK	30.9	-31.5	0	34.35	-	-	-	-	68.2	-33.85	0-360	201	V
3	9.225	26.99	PK	36.3	-24	0	39.29	-	-	-	-	68.2	-28.91	0-360	101	H
5	* 10.947	27.5	PK	38.1	-22.3	0	43.3	-	-	74	-30.7	-	-	0-360	201	V
6	17.215	28.98	PK	41	-17.7	0	52.28	-	-	-	-	68.2	-15.92	0-360	201	V

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

PK - Peak detector

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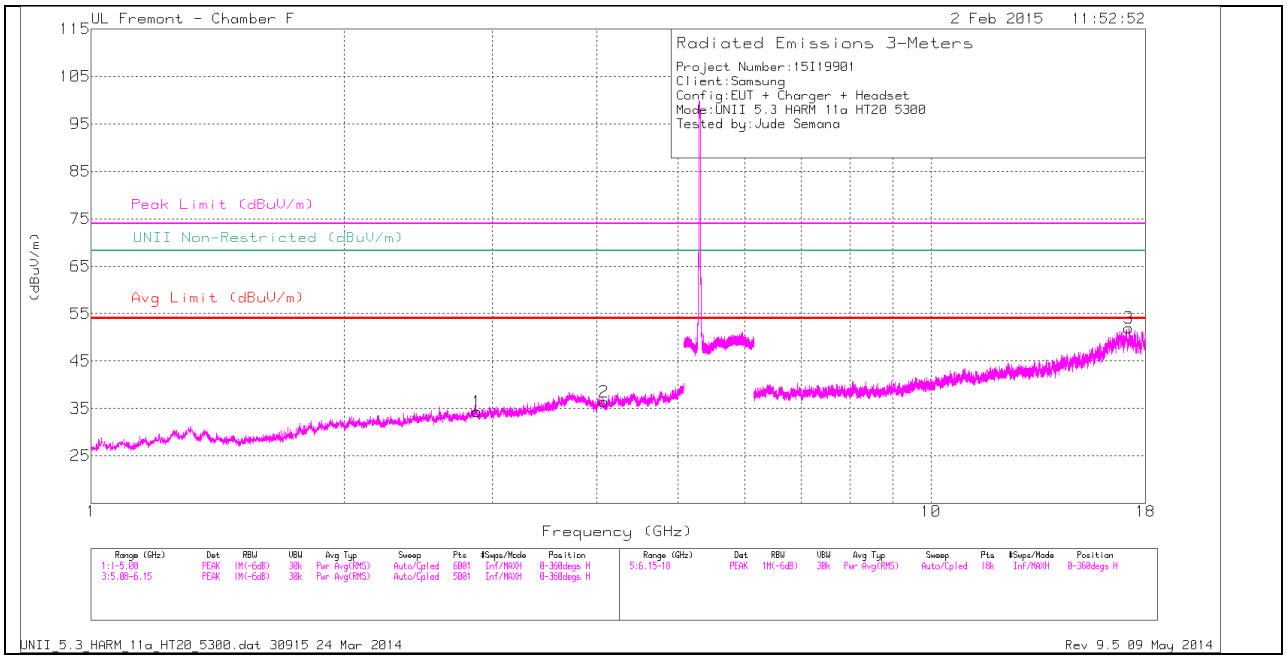
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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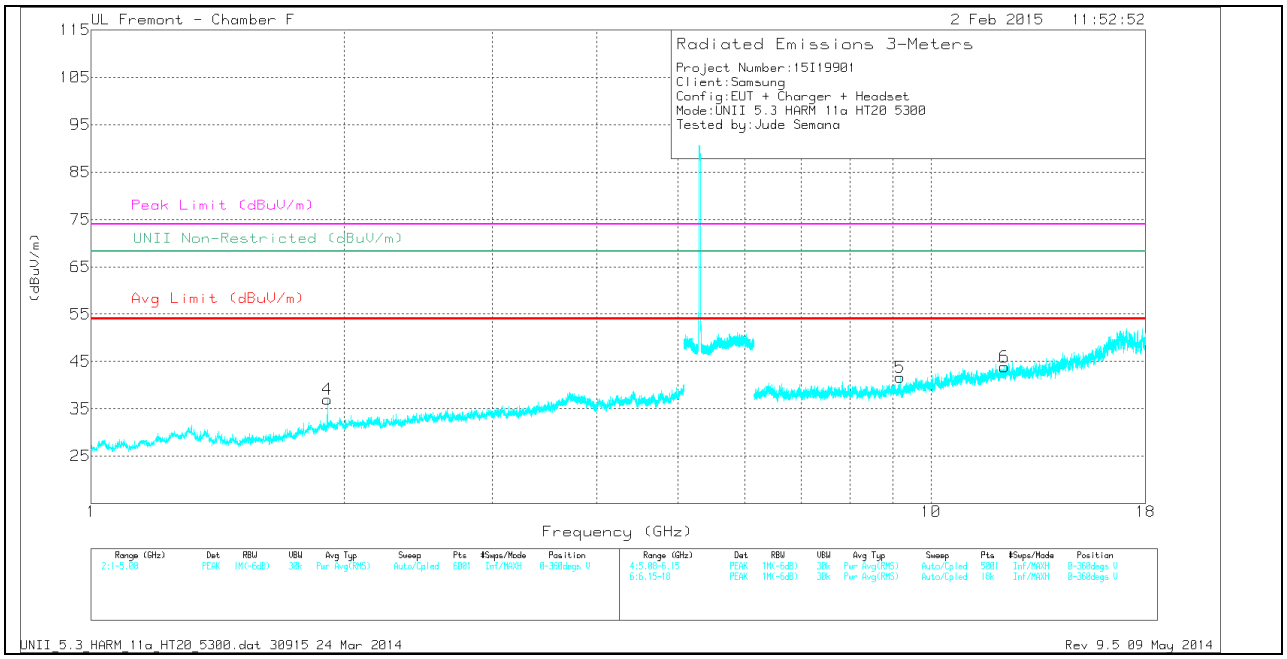
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.879	30.94	PK	33.1	-29.7	0	34.34	-	-	74	-39.66	-	-	0-360	201	H
2	* 4.079	31.19	PK	33.7	-28.5	0	36.39	-	-	74	-37.61	-	-	0-360	101	H
4	1.911	37	PK	31.4	-31.4	0	37	-	-	-	-	68.2	-31.2	0-360	201	V
3	17.192	28.36	PK	41	-17.4	0	51.96	-	-	-	-	68.2	-16.24	0-360	201	H
5	* 9.183	28.75	PK	36.3	-23.4	0	41.65	-	-	74	-32.35	-	-	0-360	101	V
6	* 12.224	28.3	PK	38.9	-23.3	0	43.9	-	-	74	-30.1	-	-	0-360	201	V

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

PK - Peak detector

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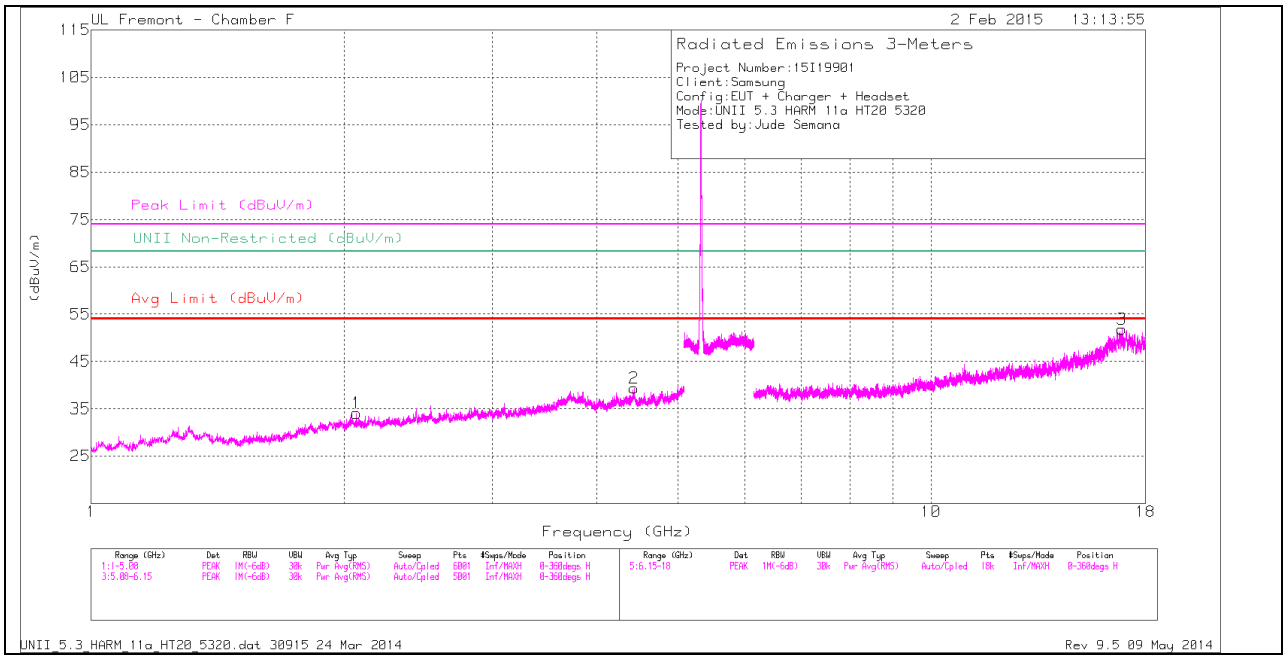
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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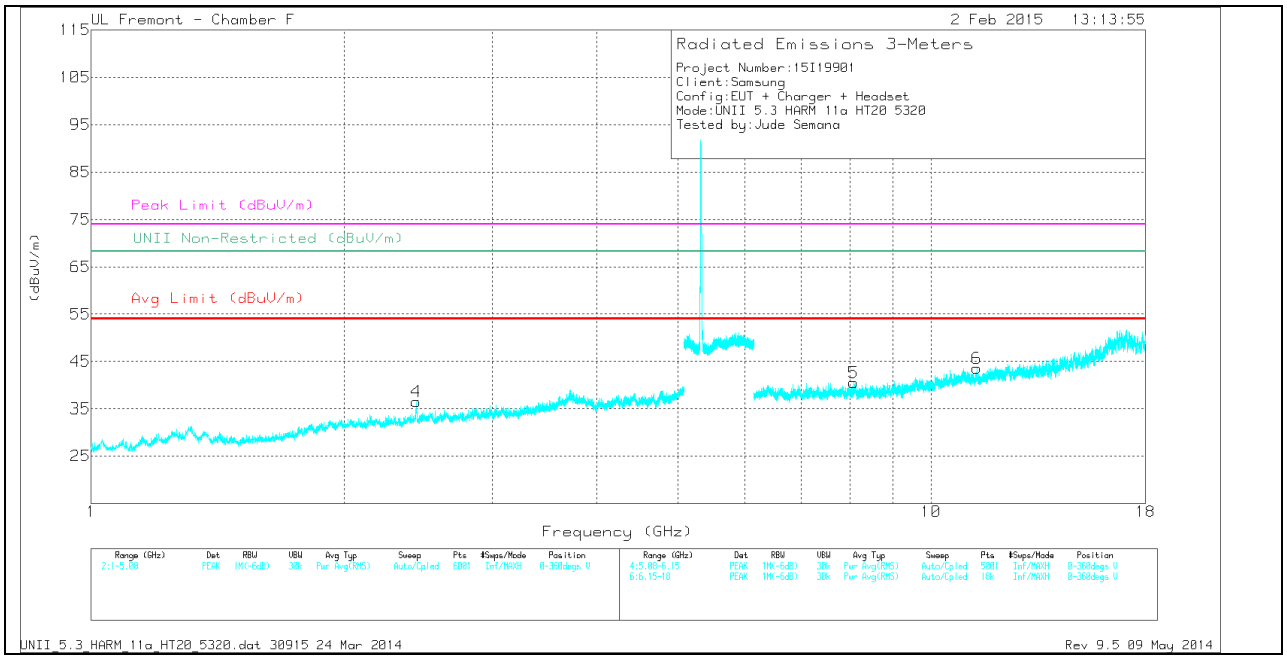
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.069	33.28	PK	31.8	-31	0	34.08	-	-	-	-	68.2	-34.12	0-360	100	H
2	4.429	32.76	PK	33.9	-27.3	0	39.36	-	-	-	-	68.2	-28.84	0-360	100	H
4	2.439	35.02	PK	32.4	-30.9	0	36.52	-	-	-	-	68.2	-31.68	0-360	101	V
3	16.862	28.04	PK	41.4	-17.6	0	51.84	-	-	-	-	68.2	-16.36	0-360	201	H
5	* 8.087	29.33	PK	35.7	-24.5	0	40.53	-	-	74	-33.47	-	-	0-360	101	V
6	* 11.329	27.45	PK	38.2	-22.1	0	43.55	-	-	74	-30.45	-	-	0-360	101	V

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

PK - Peak detector

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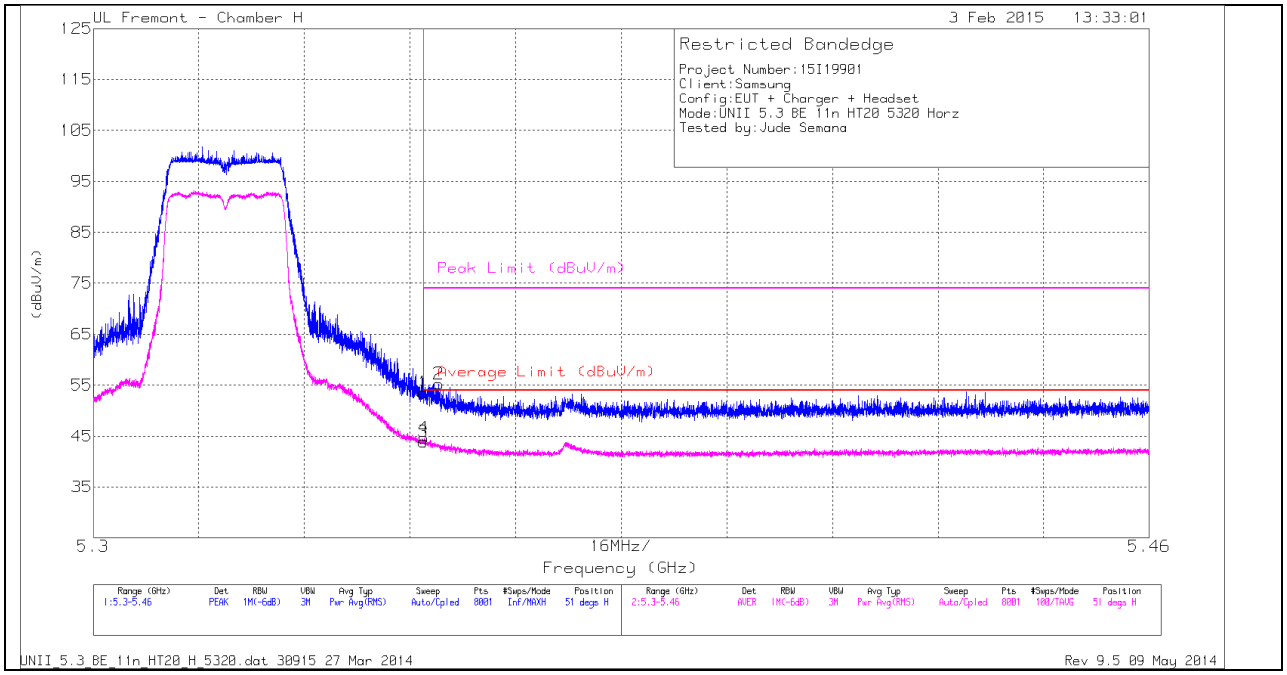
11.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	41.34	PK	34.9	-22.7	0	53.54	-	-	74	-20.46	51	303	H
2	* 5.352	43.05	PK	34.9	-22.7	0	55.25	-	-	74	-18.75	51	303	H
3	* 5.35	31.35	RMS	34.9	-22.7	.32	43.87	54	-10.13	-	-	51	303	H
4	* 5.35	32.08	RMS	34.9	-22.7	.32	44.60	54	-9.40	-	-	51	303	H

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

PK - Peak detector

RMS - RMS detection

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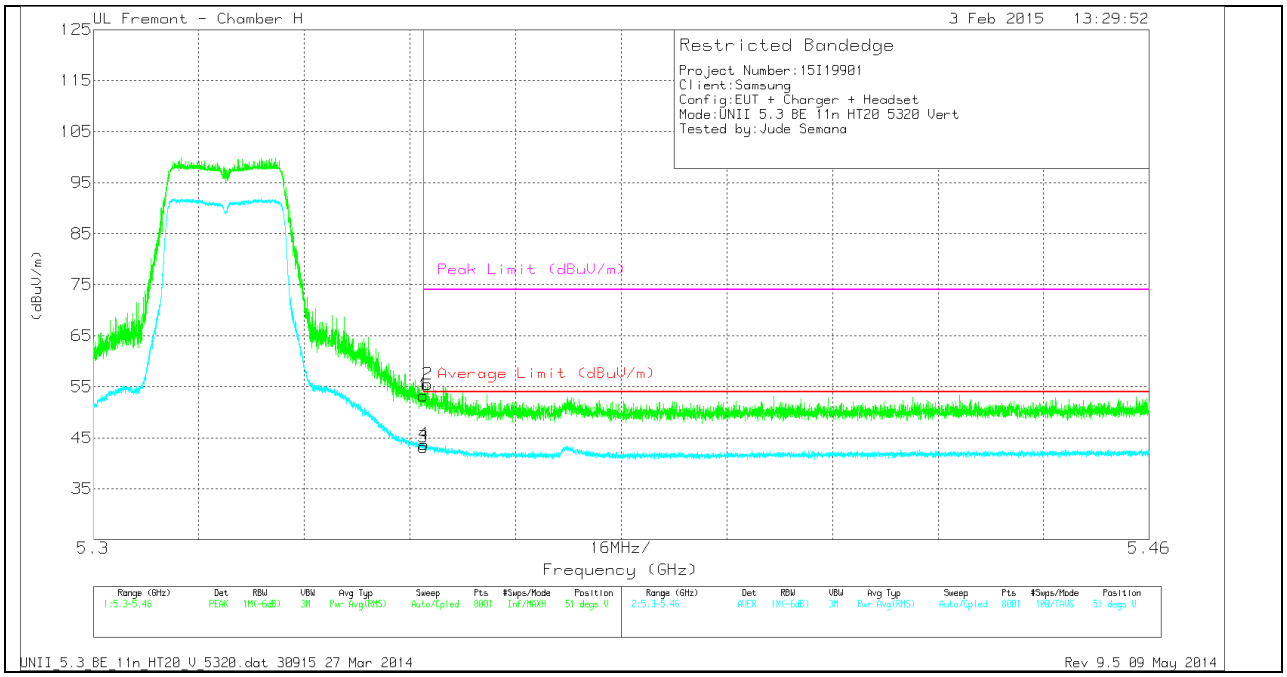
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	41.06	PK	34.9	-22.7	0	53.26	-	-	74	-20.74	51	303	V
2	* 5.351	43.31	PK	34.9	-22.7	0	55.51	-	-	74	-18.49	51	303	V
3	* 5.35	30.63	RMS	34.9	-22.7	.32	43.15	54	-10.85	-	-	51	303	V
4	* 5.35	31.16	RMS	34.9	-22.7	.32	43.68	54	-10.32	-	-	51	303	V

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

PK - Peak detector

RMS - RMS detection

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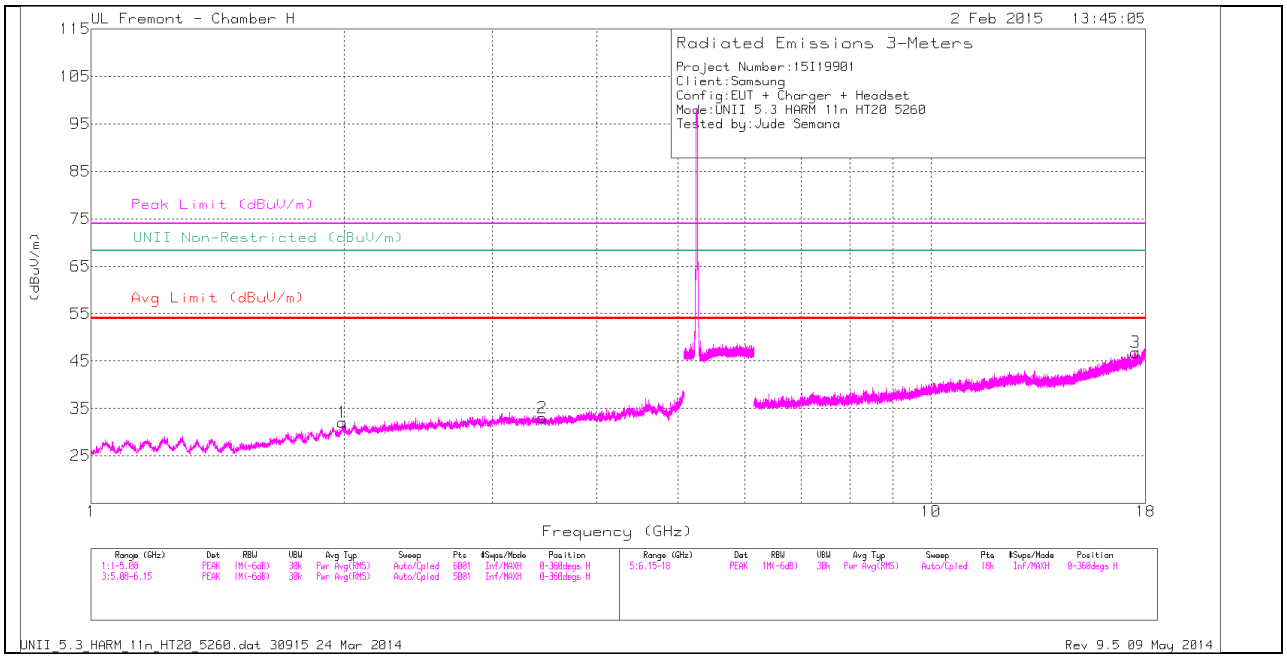
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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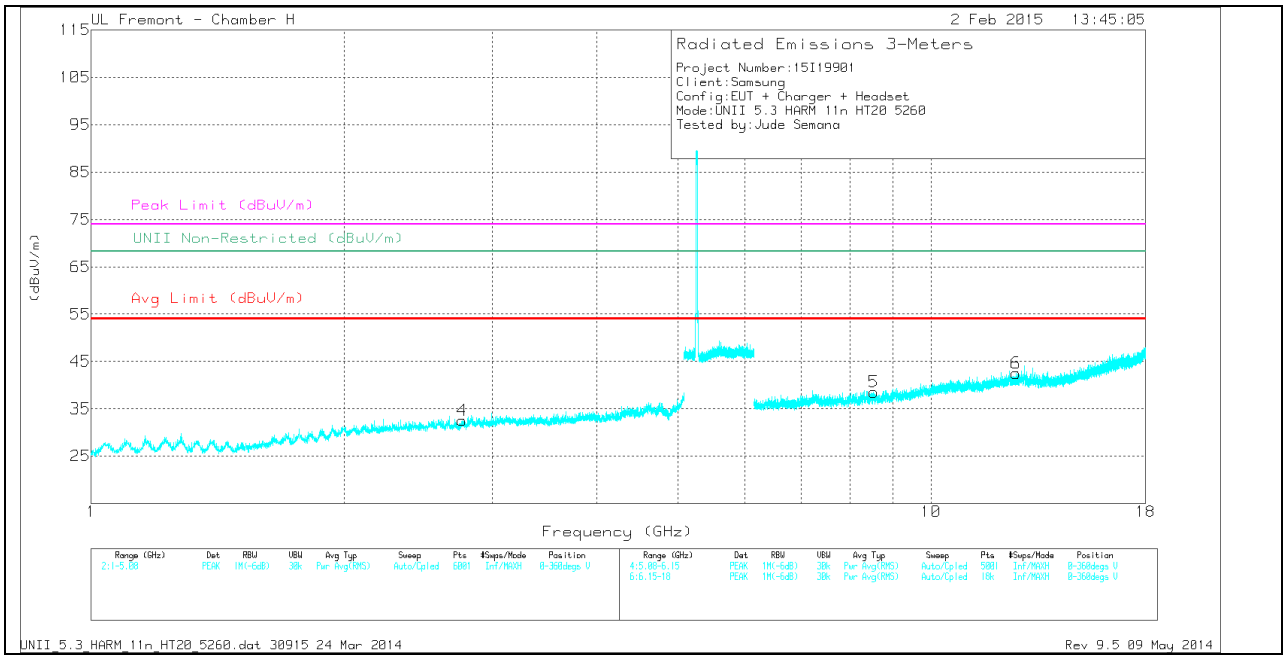
LOW CHANNEL VERTICAL



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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.701	31.62	PK	32.7	-30.4	0	33.92	-	-	74	-40.08	-	-	0-360	100	H
2	* 3.989	30.93	PK	33.8	-29.1	0	35.63	-	-	74	-38.37	-	-	0-360	100	H
4	1.857	34.95	PK	30.9	-31.5	0	34.35	-	-	-	-	68.2	-33.85	0-360	201	V
3	9.225	26.99	PK	36.3	-24	0	39.29	-	-	-	-	68.2	-28.91	0-360	101	H
5	* 10.947	27.5	PK	38.1	-22.3	0	43.3	-	-	74	-30.7	-	-	0-360	201	V
6	17.215	28.98	PK	41	-17.7	0	52.28	-	-	-	-	68.2	-15.92	0-360	201	V

PK - Peak detector

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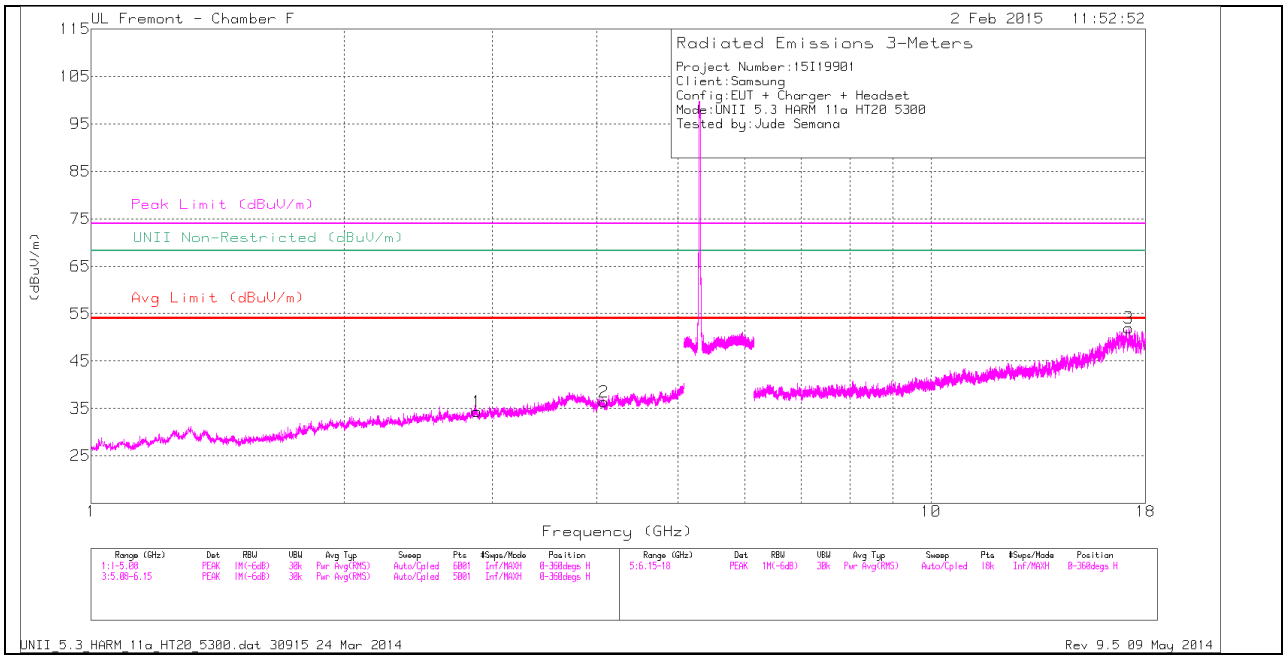
MID CHANNEL HORIZONTAL



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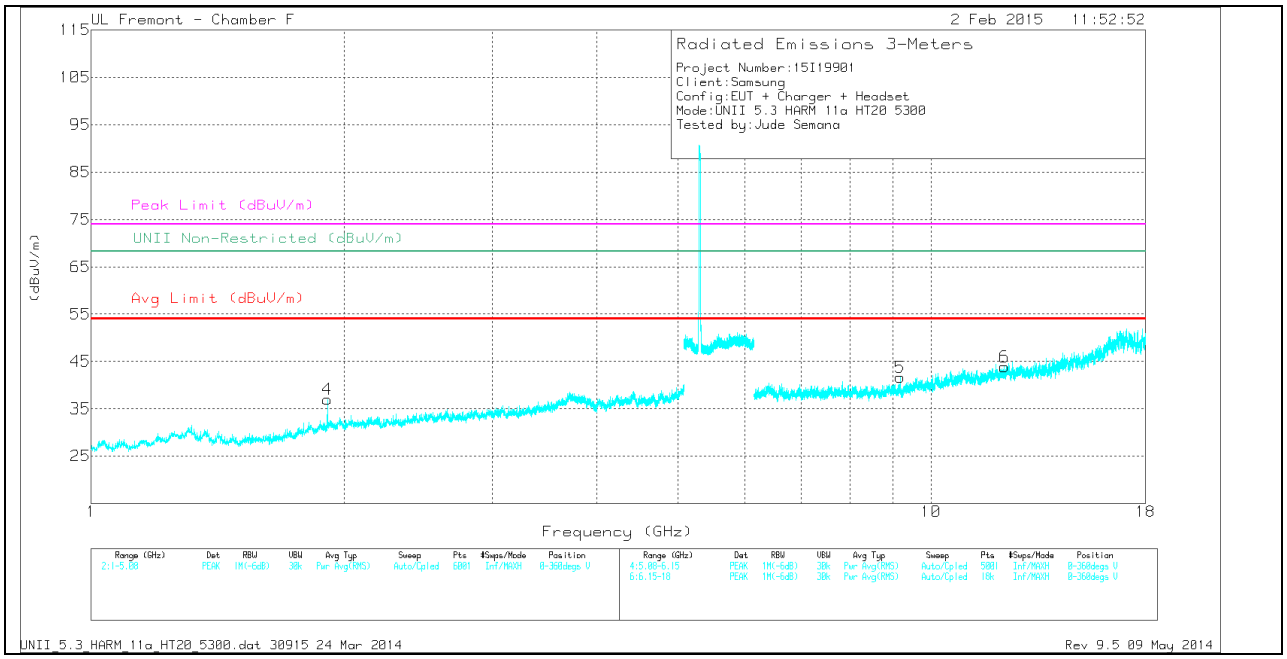
MID CHANNEL VERTICAL



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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.879	30.94	PK	33.1	-29.7	0	34.34	-	-	74	-39.66	-	-	0-360	201	H
2	* 4.079	31.19	PK	33.7	-28.5	0	36.39	-	-	74	-37.61	-	-	0-360	101	H
4	1.911	37	PK	31.4	-31.4	0	37	-	-	-	-	68.2	-31.2	0-360	201	V
3	17.192	28.36	PK	41	-17.4	0	51.96	-	-	-	-	68.2	-16.24	0-360	201	H
5	* 9.183	28.75	PK	36.3	-23.4	0	41.65	-	-	74	-32.35	-	-	0-360	101	V
6	* 12.224	28.3	PK	38.9	-23.3	0	43.9	-	-	74	-30.1	-	-	0-360	201	V

PK - Peak detector

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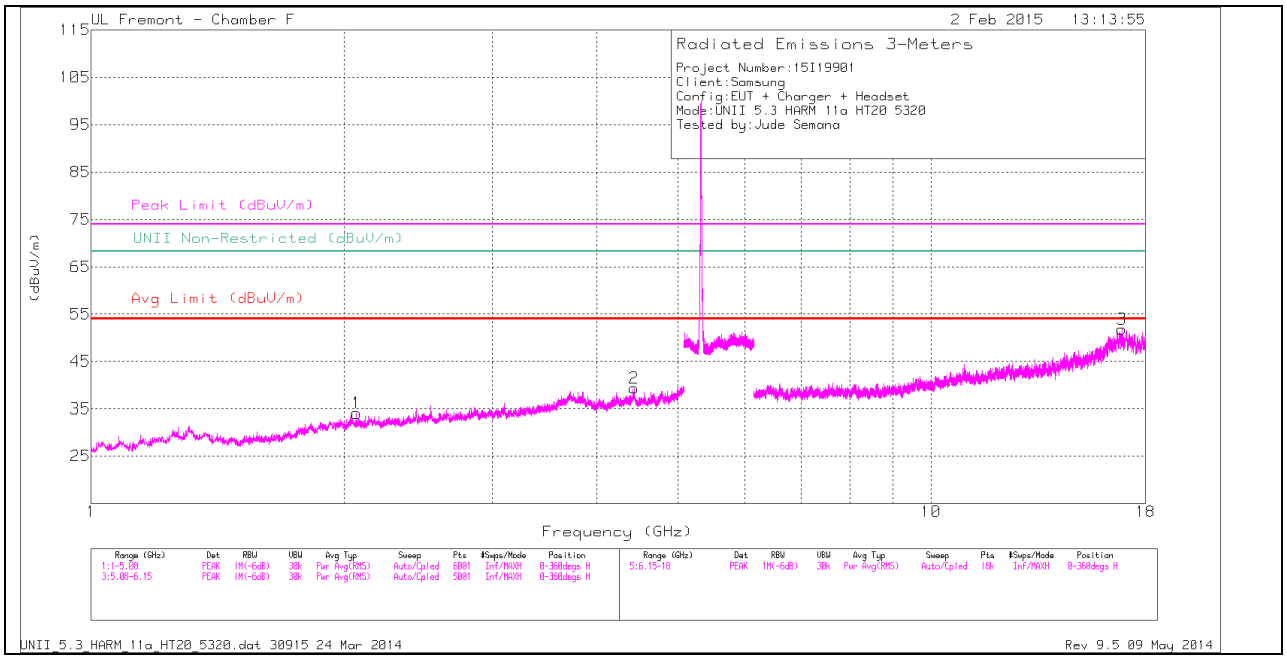
HIGH CHANNEL HORIZONTAL



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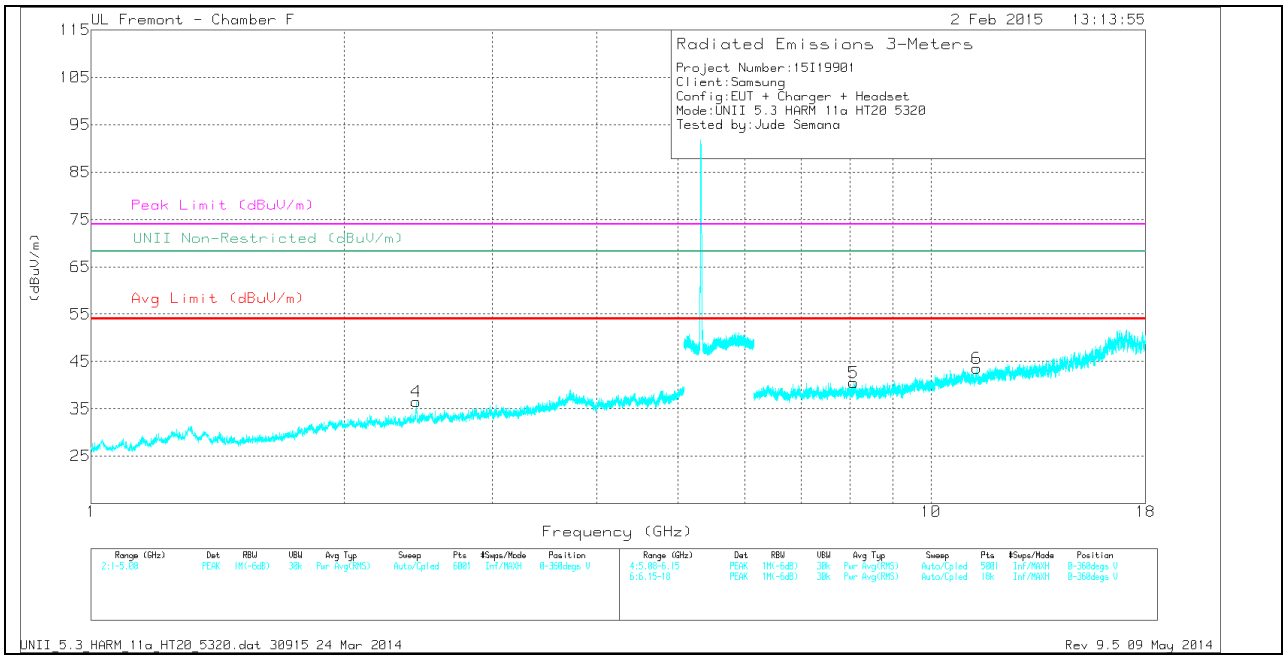
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.069	33.28	PK	31.8	-31	0	34.08	-	-	-	-	68.2	-34.12	0-360	100	H
2	4.429	32.76	PK	33.9	-27.3	0	39.36	-	-	-	-	68.2	-28.84	0-360	100	H
4	2.439	35.02	PK	32.4	-30.9	0	36.52	-	-	-	-	68.2	-31.68	0-360	101	V
3	16.862	28.04	PK	41.4	-17.6	0	51.84	-	-	-	-	68.2	-16.36	0-360	201	H
5	* 8.087	29.33	PK	35.7	-24.5	0	40.53	-	-	74	-33.47	-	-	0-360	101	V
6	* 11.329	27.45	PK	38.2	-22.1	0	43.55	-	-	74	-30.45	-	-	0-360	101	V

PK - Peak detector

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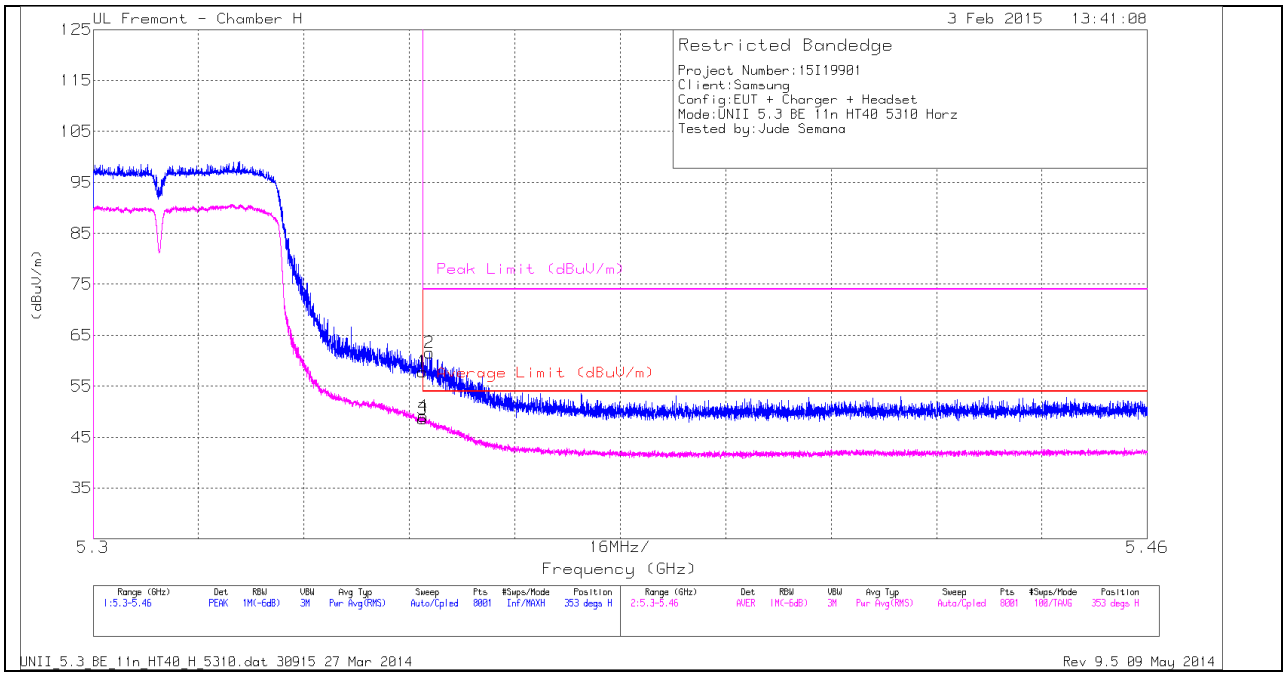
11.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	45.58	PK	34.9	-22.7	0	57.78	-	-	74	-16.22	353	298	H
2	* 5.351	49.37	PK	34.9	-22.7	0	61.57	-	-	74	-12.43	353	298	H
3	* 5.35	35.99	RMS	34.9	-22.7	.64	48.83	54	-5.17	-	-	353	298	H
4	* 5.35	36.52	RMS	34.9	-22.7	.64	49.36	54	-4.64	-	-	353	298	H

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

PK - Peak detector

RMS - RMS detection

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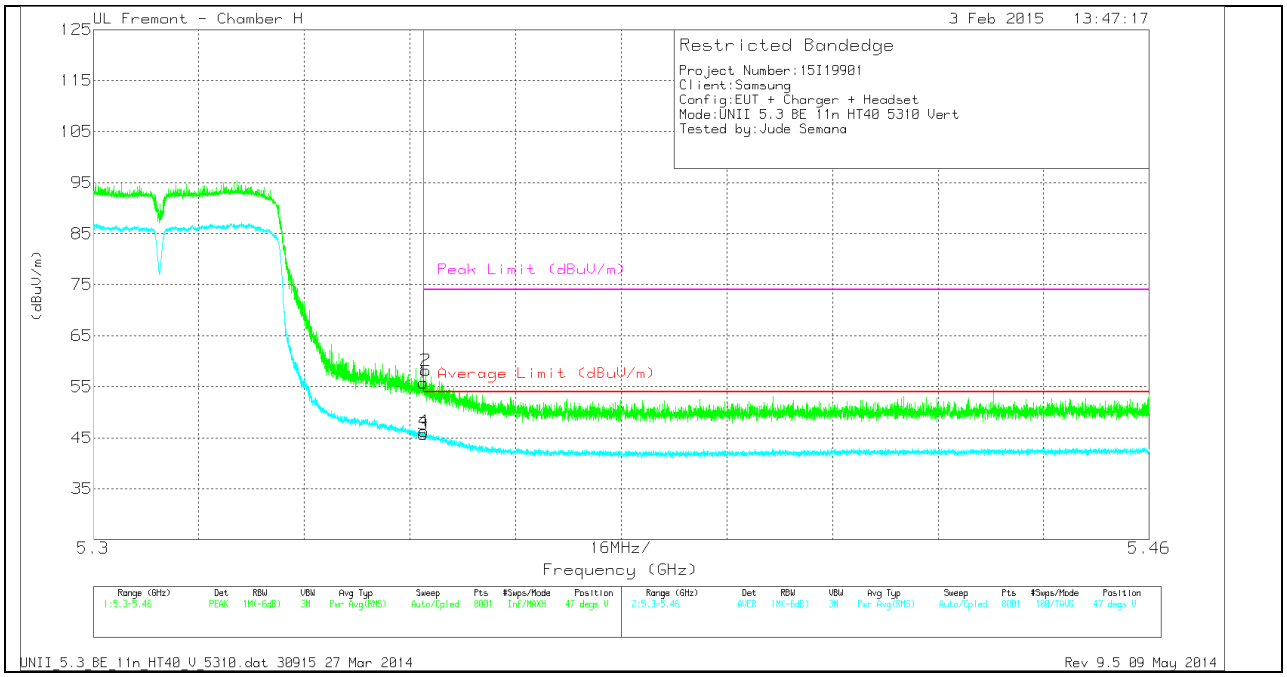
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	43.59	PK	34.9	-22.7	0	55.79	-	-	74	-18.21	47	302	V
2	* 5.35	46.01	PK	34.9	-22.7	0	58.21	-	-	74	-15.79	47	302	V
3	* 5.35	32.74	RMS	34.9	-22.7	.64	45.58	54	-8.42	-	-	47	302	V
4	* 5.35	33.36	RMS	34.9	-22.7	.64	46.20	54	-7.8	-	-	47	302	V

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

PK - Peak detector

RMS - RMS detection

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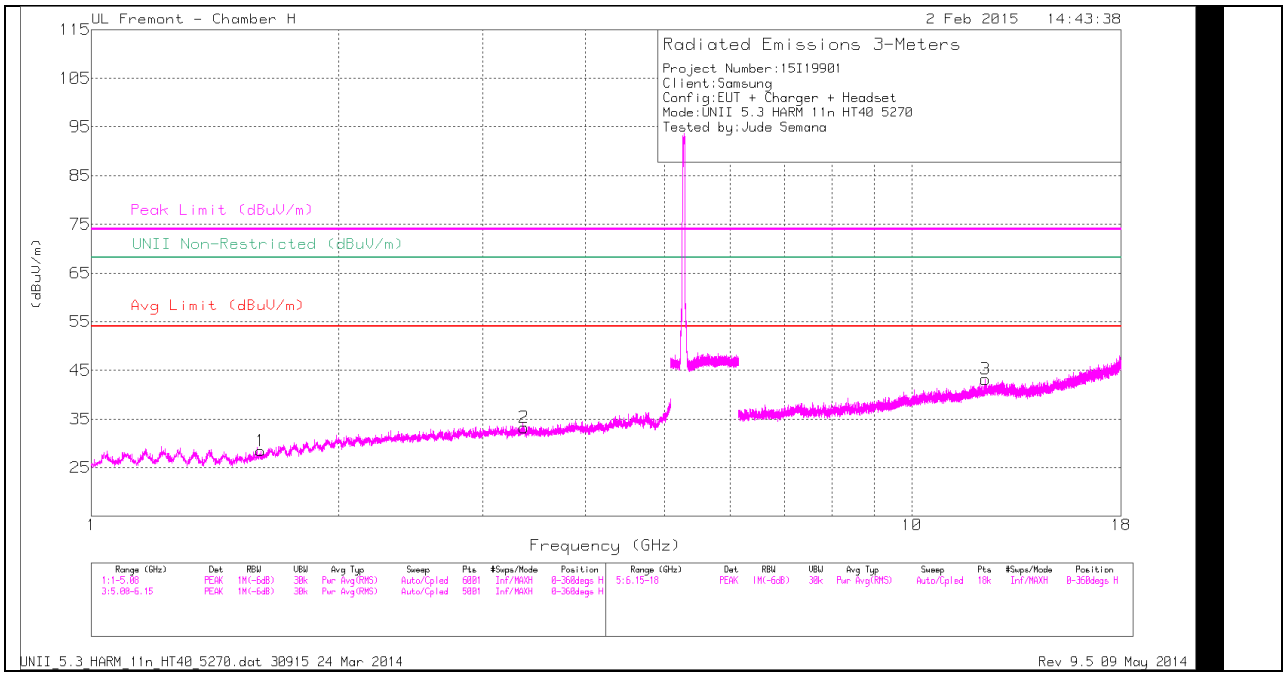
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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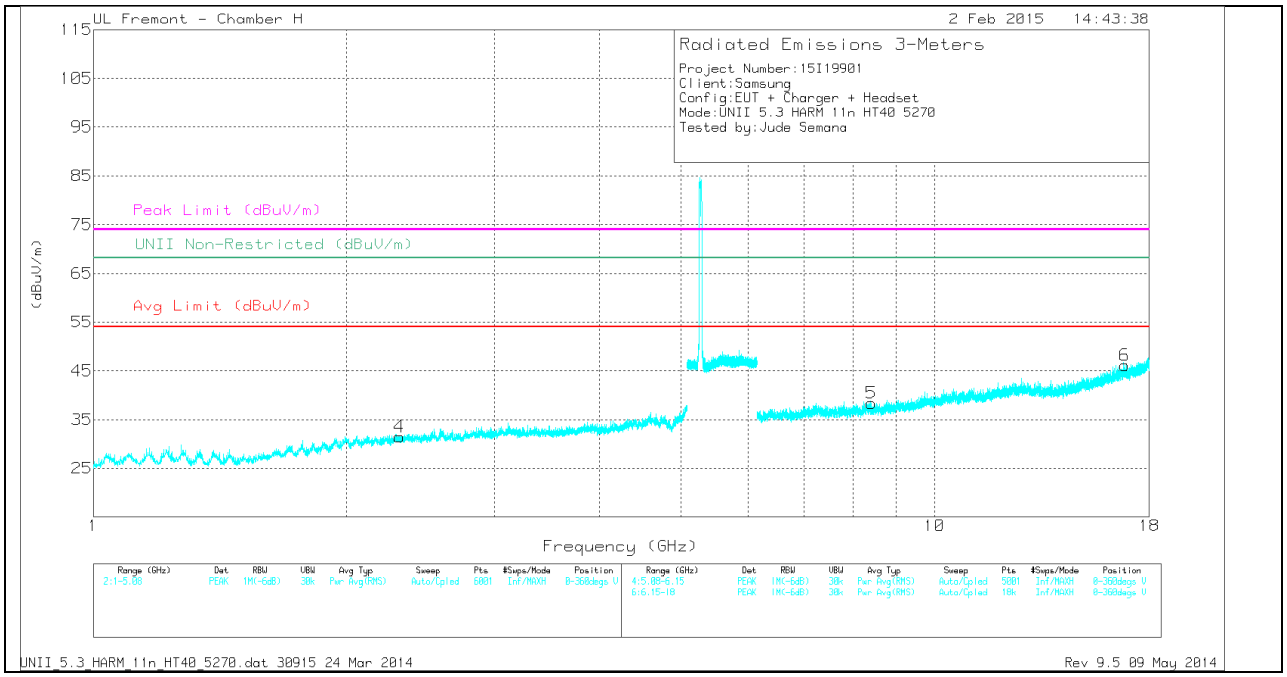
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.609	34.88	PK	28.6	-35	0	28.48	-	-	74	-45.52	-	-	0-360	100	H
4	* 2.312	33.57	PK	31.8	-33.9	0	31.47	-	-	74	-42.53	-	-	0-360	201	V
3	* 12.295	29.9	PK	39	-25.7	0	43.2	-	-	74	-30.8	-	-	0-360	100	H
5	* 8.411	31.17	PK	36.1	-28.9	0	38.37	-	-	74	-35.63	-	-	0-360	201	V
2	3.369	33.37	PK	32.9	-33	0	33.27	-	-	-	-	68.2	-34.93	0-360	201	H
6	16.834	27.32	PK	42.3	-23.5	0	46.12	-	-	-	-	68.2	-22.08	0-360	201	V

PK - Peak detector

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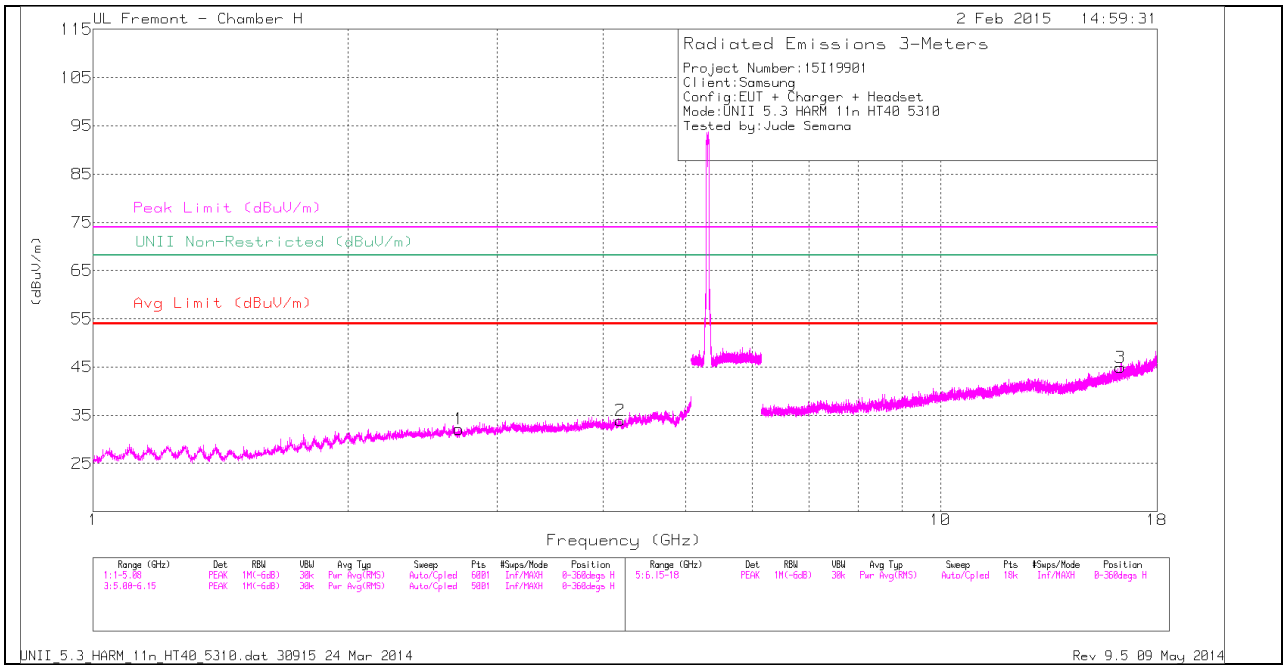
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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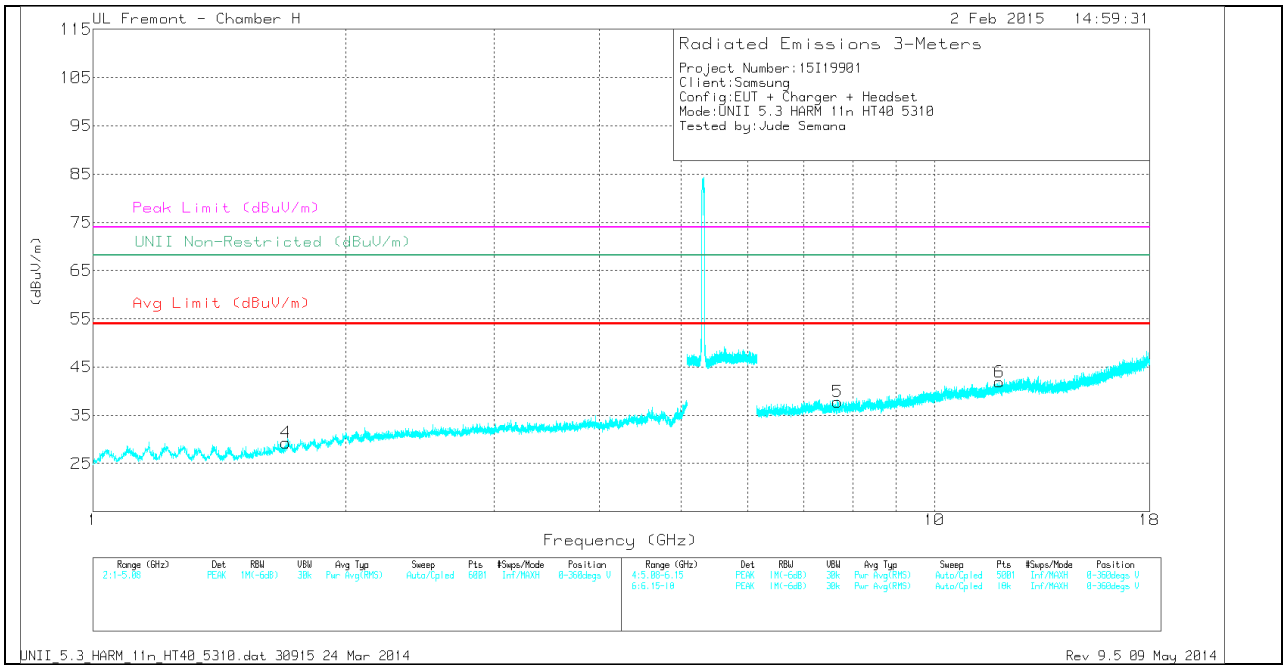
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.701	34.01	PK	32.3	-34.2	0	32.11	-	-	74	-41.89	-	-	0-360	100	H
2	* 4.189	33.12	PK	33.5	-32.7	0	33.92	-	-	74	-40.08	-	-	0-360	201	H
4	* 1.697	34.4	PK	29.3	-34.4	0	29.3	-	-	74	-44.7	-	-	0-360	201	V
5	* 7.673	31.1	PK	36.1	-29.4	0	37.8	-	-	74	-36.2	-	-	0-360	201	V
6	* 11.94	28.6	PK	38.7	-25.4	0	41.9	-	-	74	-32.1	-	-	0-360	100	V
3	16.298	27.52	PK	41.4	-24	0	44.92	-	-	-	-	68.2	-23.28	0-360	100	H

PK - Peak detector

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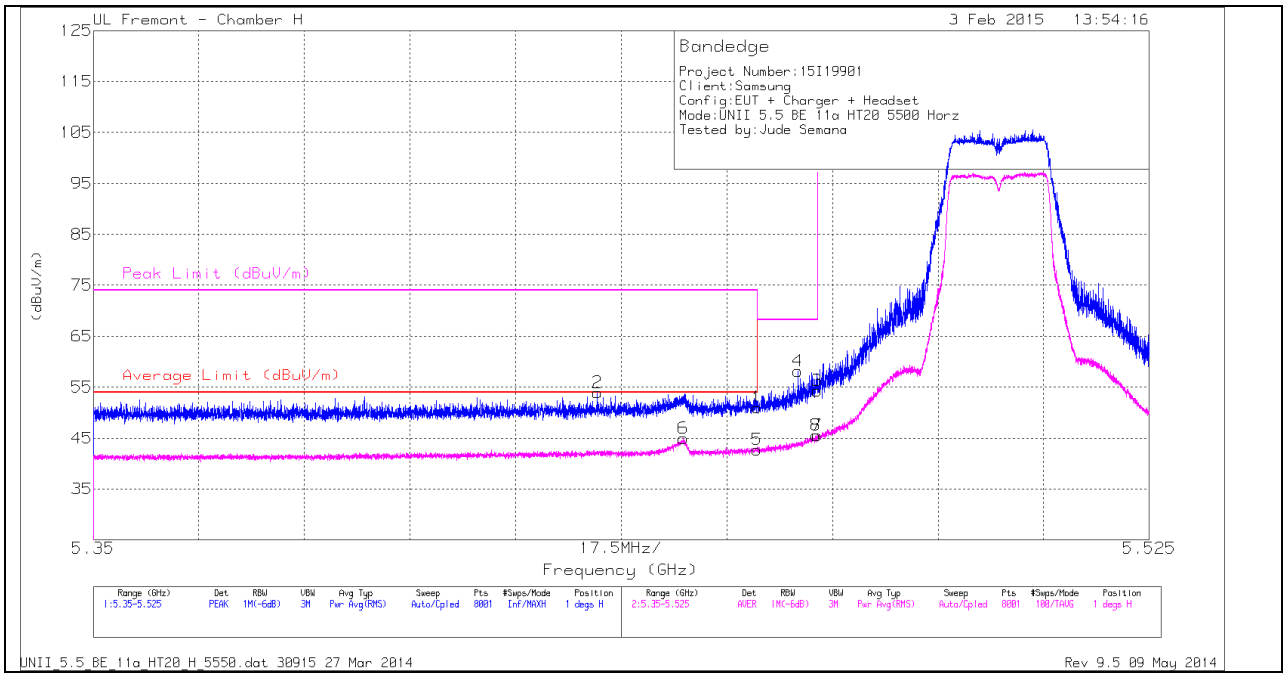
11.3. 5.5-5.6 GHz

11.3.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	38.48	PK	35	-22.5	0	50.98	-	-	74	-23.02	1	309	H
2	* 5.434	41.42	PK	35	-22.5	0	53.92	-	-	74	-20.08	1	309	H
5	* 5.46	29.92	RMS	35	-22.5	.3	42.72	54	-11.28	-	-	1	309	H
6	* 5.448	32.15	RMS	35	-22.5	.3	44.95	54	-9.05	-	-	1	309	H
4	5.467	45.58	PK	35	-22.4	0	58.18	-	-	68.2	-10.02	1	309	H
3	5.47	41.6	PK	35.1	-22.4	0	54.3	-	-	68.2	-13.9	1	309	H
7	5.47	32.5	RMS	35.1	-22.4	.3	45.5	-	-	-	-	1	309	H
8	5.47	32.54	RMS	35.1	-22.4	.3	45.54	-	-	-	-	1	309	H

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

PK - Peak detector

RMS - RMS detection

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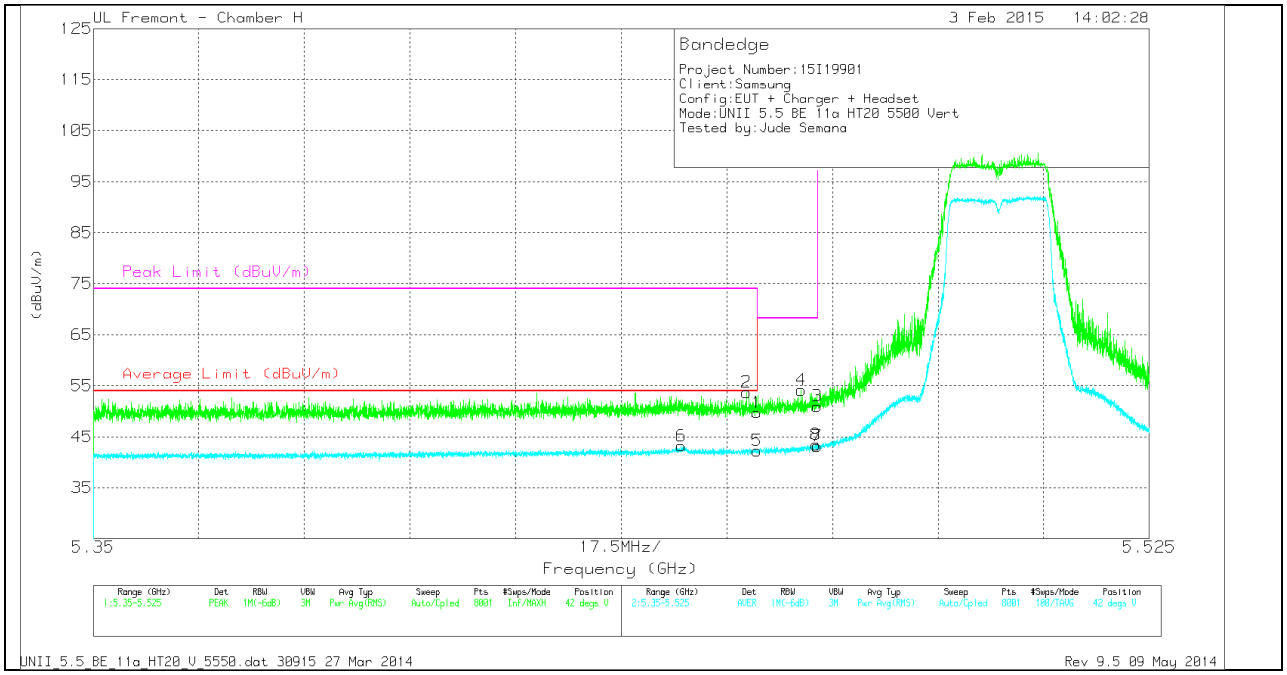
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.25	PK	35	-22.5	0	49.75	-	-	74	-24.25	42	282	V
2	* 5.458	41.22	PK	35	-22.5	0	53.72	-	-	74	-20.28	42	282	V
5	* 5.46	29.43	RMS	35	-22.5	.3	42.23	54	-11.77	-	-	42	282	V
6	* 5.447	30.39	RMS	35	-22.5	.3	43.19	54	-10.81	-	-	42	282	V
4	5.467	41.55	PK	35	-22.4	0	54.15	-	-	68.2	-14.05	42	282	V
3	5.47	38.28	PK	35.1	-22.4	0	50.98	-	-	68.2	-17.22	42	282	V
7	5.47	30.12	RMS	35.1	-22.4	.3	43.12	-	-	-	-	42	282	V
8	5.47	30.44	RMS	35.1	-22.4	.3	43.44	-	-	-	-	42	282	V

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

PK - Peak detector

RMS - RMS detection

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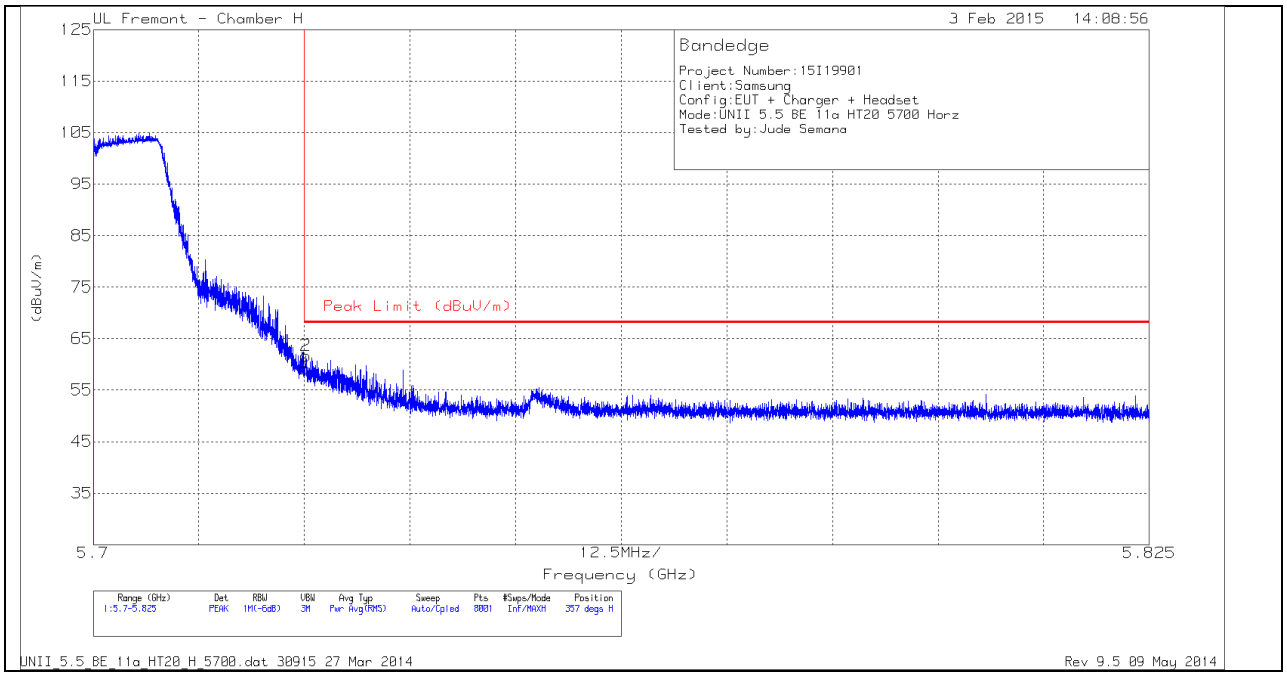
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	46.55	PK	35	-22.4	0	59.15	68.2	-9.05	357	313	H
2	5.725	49.09	PK	35	-22.4	0	61.69	68.2	-6.51	357	313	H

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

PK - Peak detector

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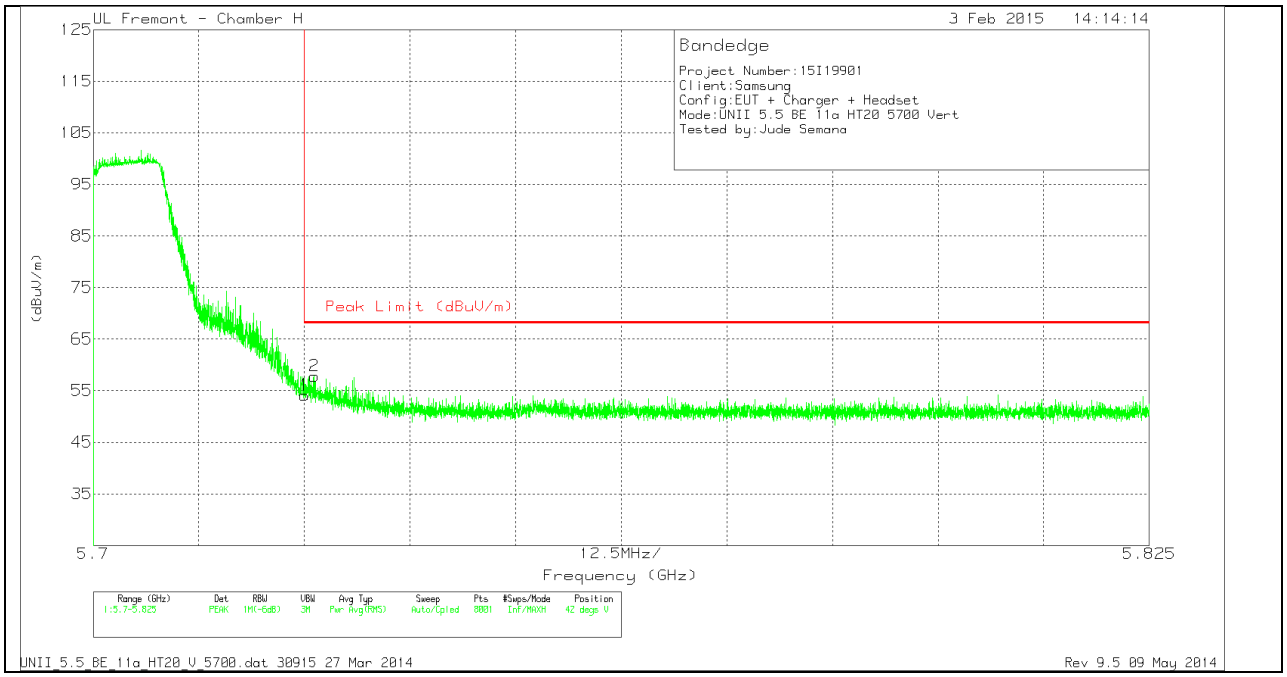
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	41.5	PK	35	-22.4	0	54.1	68.2	-14.1	42	396	V
2	5.726	45.21	PK	35	-22.4	0	57.81	68.2	-10.39	42	396	V

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

PK - Peak detector

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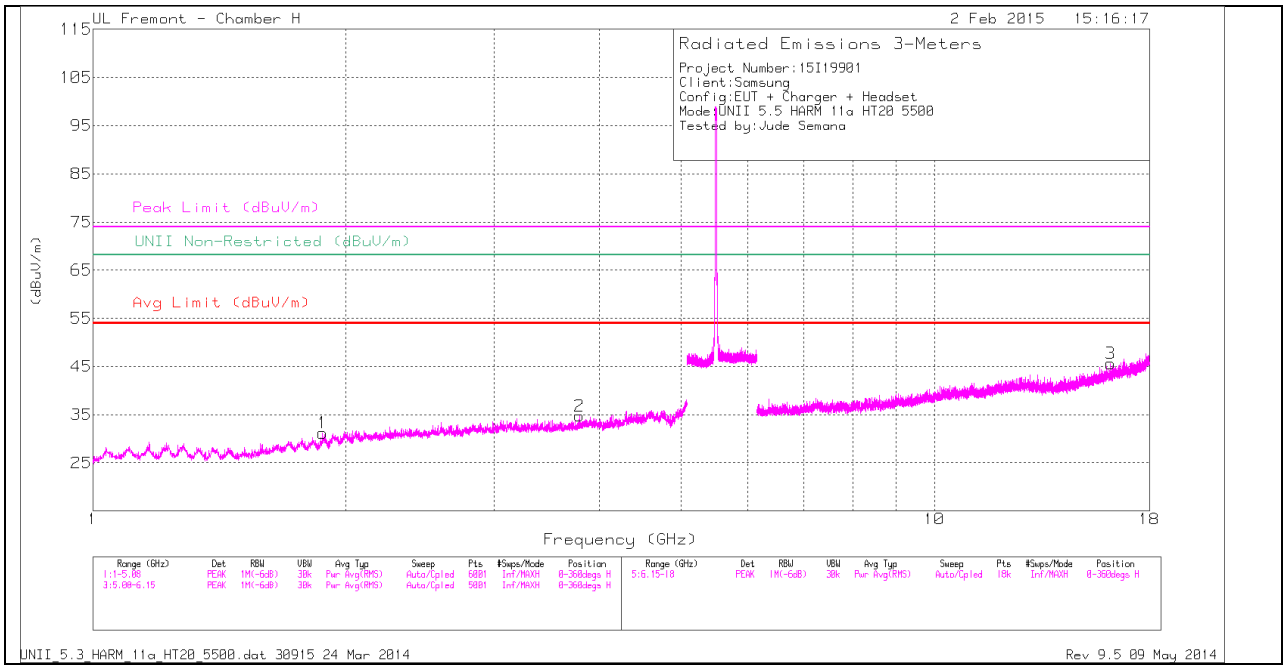
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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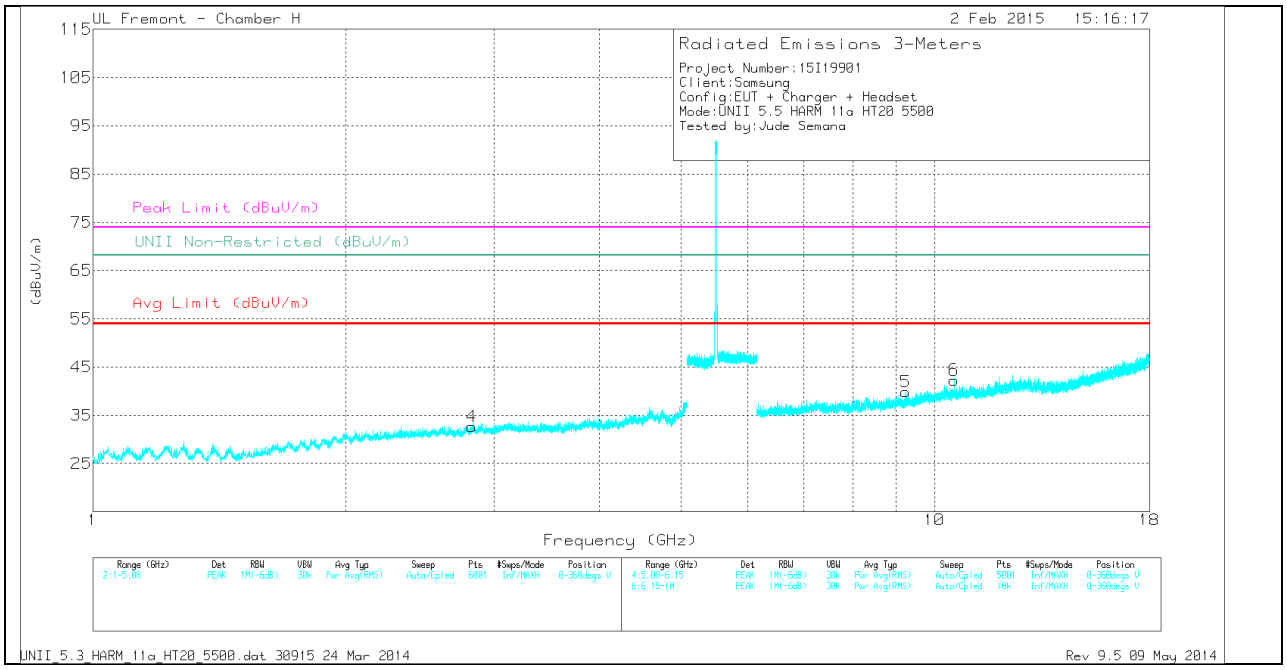
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.787	34.63	PK	33.2	-33.1	0	34.73	-	-	74	-39.27	-	-	0-360	100	H
4	* 2.821	33.38	PK	32.4	-33.1	0	32.68	-	-	74	-41.32	-	-	0-360	100	V
3	* 16.193	28.39	PK	41.3	-24.1	0	45.59	-	-	74	-28.41	-	-	0-360	100	H
1	1.876	35.48	PK	30.5	-34.8	0	31.18	-	-	-	-	68.2	-37.02	0-360	100	H
5	9.241	30.78	PK	36.6	-27.5	0	39.88	-	-	-	-	68.2	-28.32	0-360	100	V
6	10.552	29.68	PK	37.6	-25	0	42.28	-	-	-	-	68.2	-25.92	0-360	100	V

PK - Peak detector

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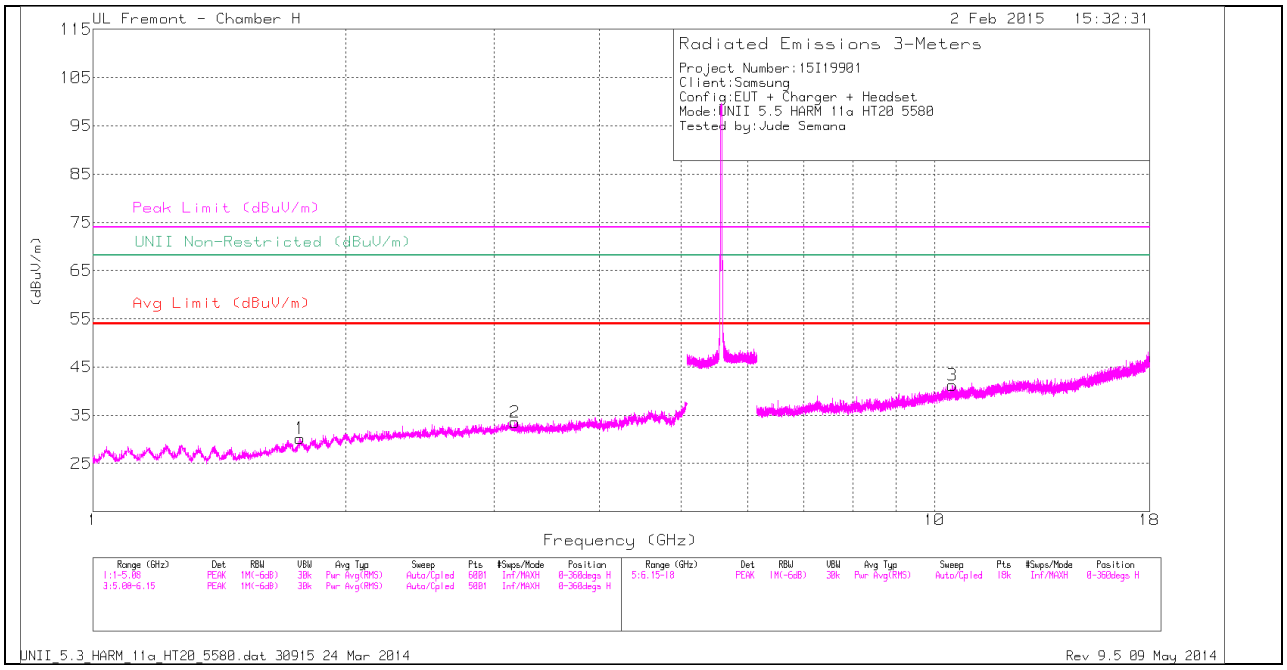
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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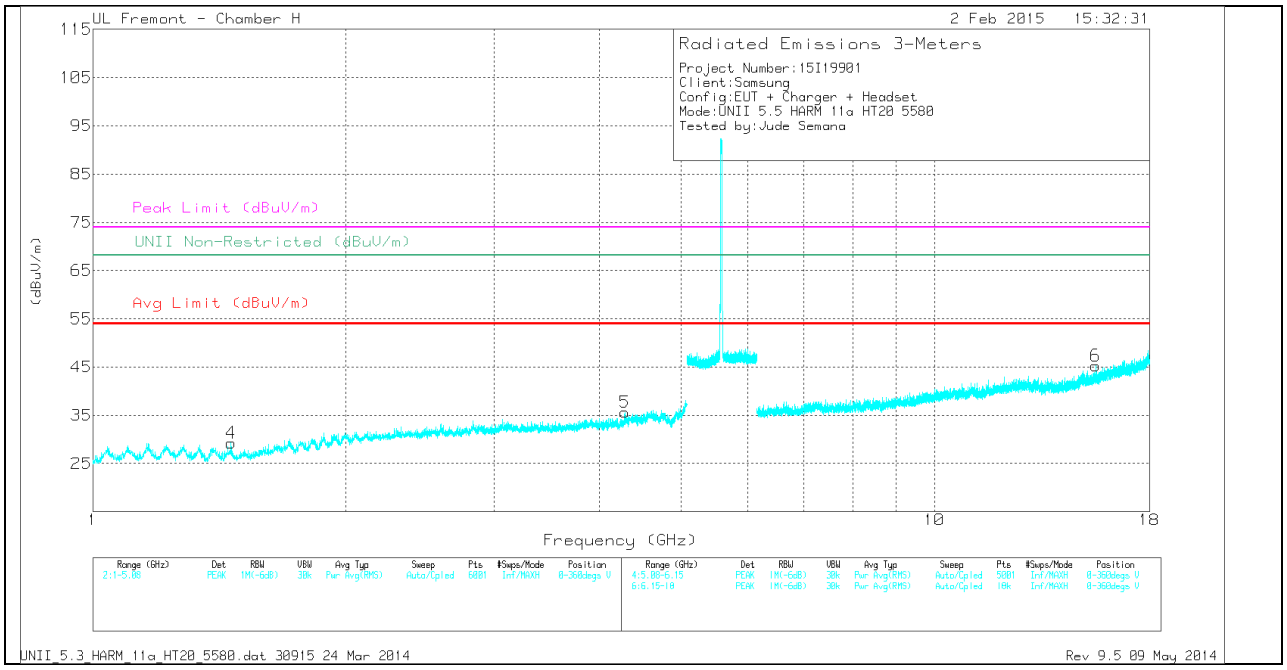
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.46	36.26	PK	27.9	-34.9	0	29.26	-	-	74	-44.74	-	-	0-360	201	V
5	* 4.288	33.96	PK	33.6	-31.9	0	35.66	-	-	74	-38.34	-	-	0-360	100	V
6	* 15.545	29.76	PK	40.8	-25.3	0	45.26	-	-	74	-28.74	-	-	0-360	100	V
1	1.762	35.01	PK	29.8	-34.6	0	30.21	-	-	-	-	68.2	-37.99	0-360	201	H
2	3.173	33.67	PK	32.9	-33	0	33.57	-	-	-	-	68.2	-34.63	0-360	201	H
3	10.503	29.03	PK	37.6	-25.4	0	41.23	-	-	-	-	68.2	-26.97	0-360	201	H

PK - Peak detector

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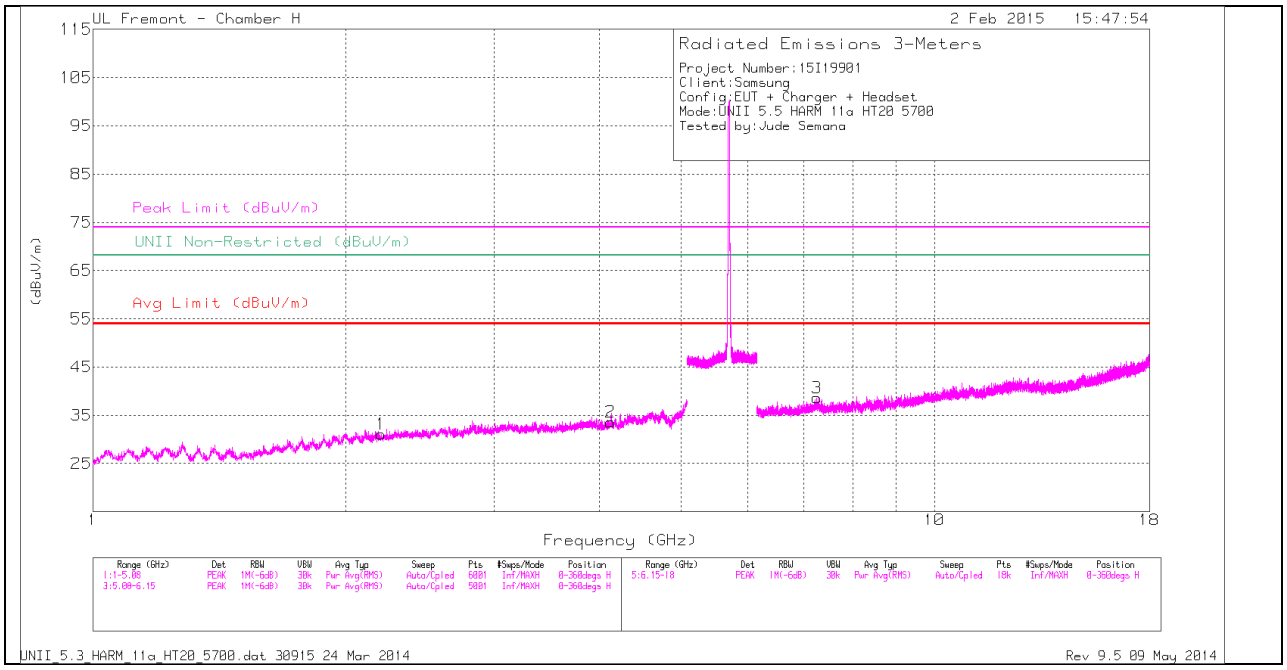
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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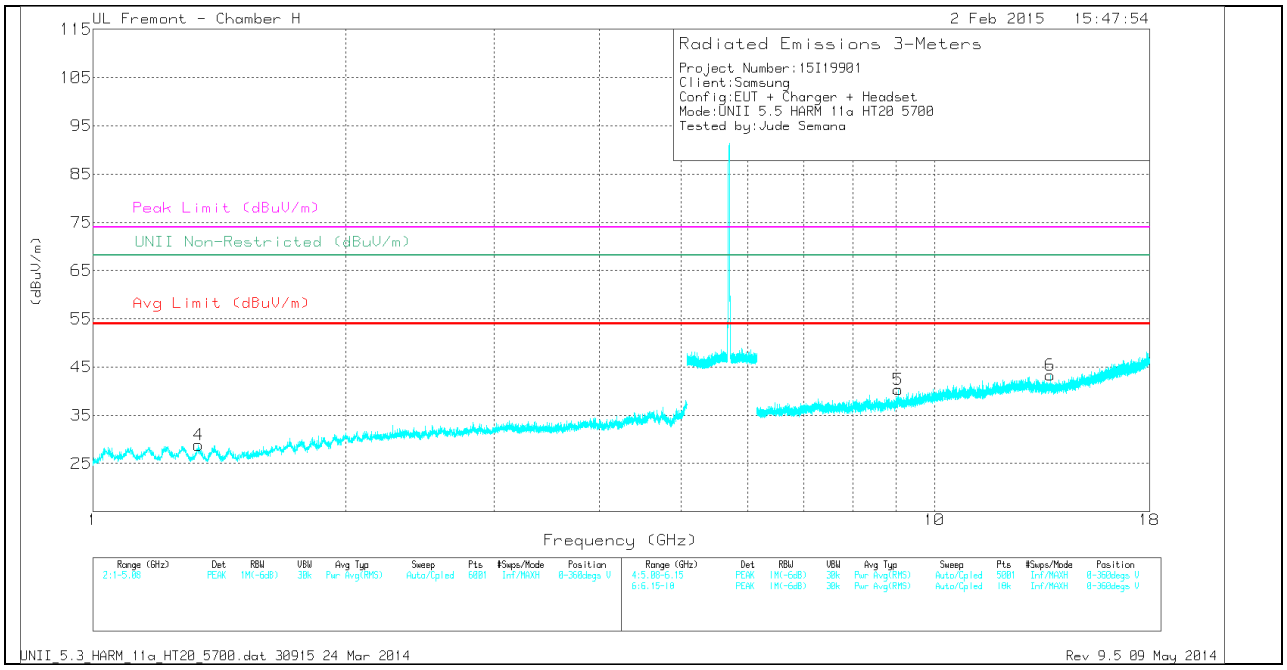
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.201	34.09	PK	31.6	-34.6	0	31.09	-	-	74	-42.91	-	-	0-360	201	H
2	* 4.125	32.21	PK	33.5	-32.1	0	33.61	-	-	74	-40.39	-	-	0-360	100	H
4	* 1.335	35.84	PK	28.6	-35.6	0	28.84	-	-	74	-45.16	-	-	0-360	100	V
3	* 7.25	31.41	PK	36.2	-29	0	38.61	-	-	74	-35.39	-	-	0-360	201	H
5	* 9.062	30.73	PK	36.4	-26.8	0	40.33	-	-	74	-33.67	-	-	0-360	201	V
6	13.726	29.91	PK	39.1	-25.7	0	43.31	-	-	-	-	68.2	-24.89	0-360	201	V

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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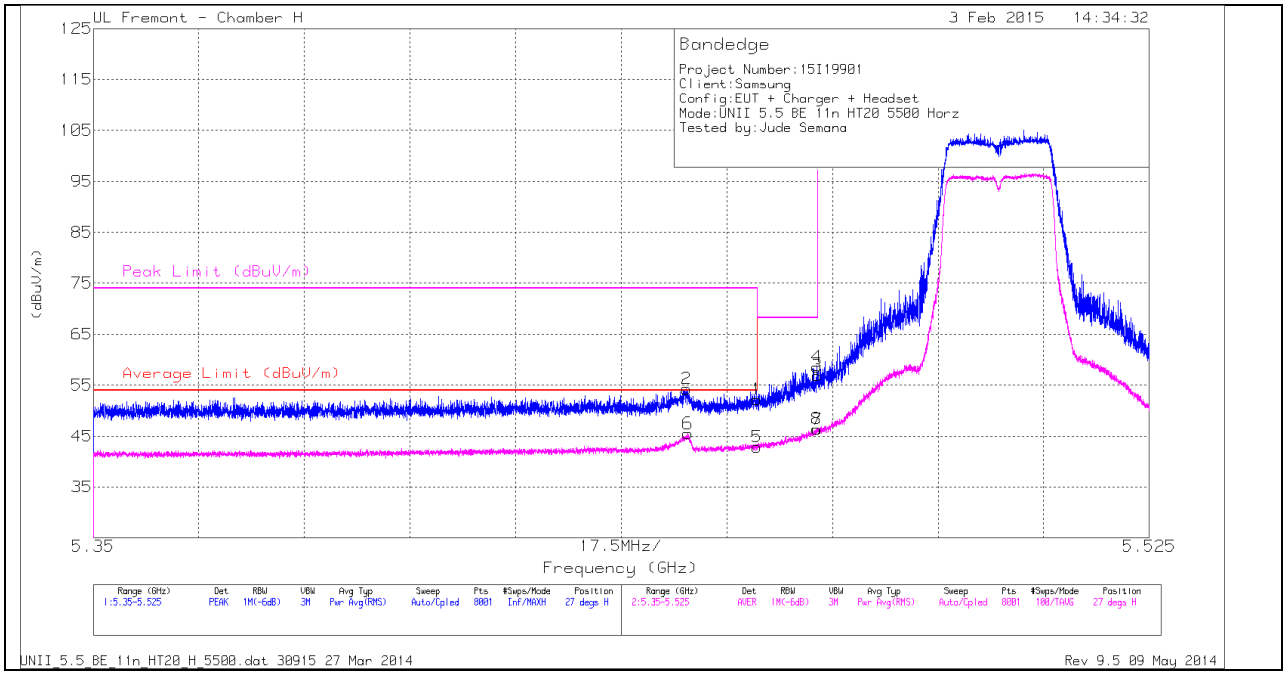
11.3.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	39.67	PK	35	-22.5	0	52.17	-	-	74	-21.83	27	283	H
2	* 5.448	41.8	PK	35	-22.5	0	54.3	-	-	74	-19.7	27	283	H
5	* 5.46	29.98	RMS	35	-22.5	.32	42.80	54	-11.20	-	-	27	283	H
6	* 5.449	32.62	RMS	35	-22.5	.32	45.44	54	-8.56	-	-	27	283	H
3	5.47	44.16	PK	35.1	-22.4	0	56.86	-	-	68.2	-11.34	27	283	H
4	5.47	45.86	PK	35.1	-22.4	0	58.56	-	-	68.2	-9.64	27	283	H
7	5.47	33.28	RMS	35.1	-22.4	.32	46.30	-	-	-	-	27	283	H
8	5.47	33.33	RMS	35.1	-22.4	.32	46.35	-	-	-	-	27	283	H

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

PK - Peak detector

RMS - RMS detection

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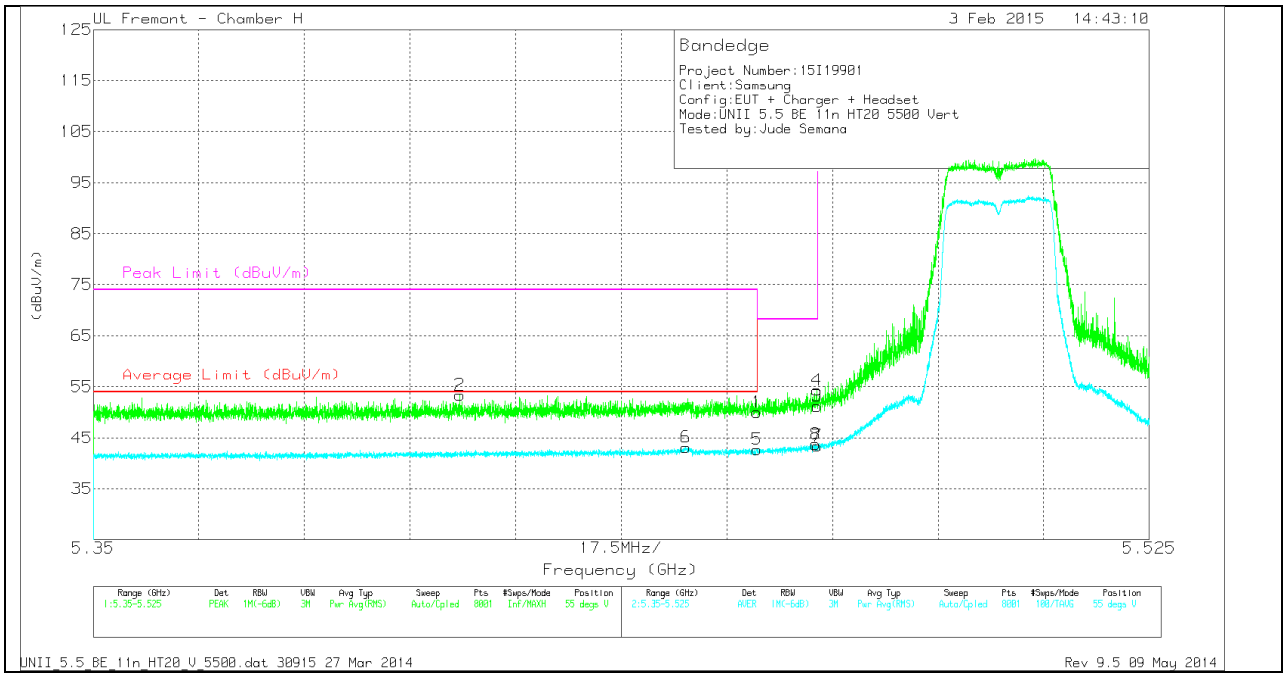
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.48	PK	35	-22.5	0	49.98	-	-	74	-24.02	55	282	V
2	* 5.411	40.85	PK	35	-22.5	0	53.35	-	-	74	-20.65	55	282	V
5	* 5.46	29.82	RMS	35	-22.5	.32	42.64	54	-11.36	-	-	55	282	V
6	* 5.448	30.26	RMS	35	-22.5	.32	43.08	54	-10.92	-	-	55	282	V
3	5.47	38.48	PK	35.1	-22.4	0	51.18	-	-	68.2	-17.02	55	282	V
4	5.47	41.64	PK	35.1	-22.4	0	54.34	-	-	68.2	-13.86	55	282	V
7	5.47	30.32	RMS	35.1	-22.4	.32	43.34	-	-	-	-	55	282	V
8	5.47	30.68	RMS	35.1	-22.4	.32	43.70	-	-	-	-	55	282	V

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

PK - Peak detector

RMS - RMS detection

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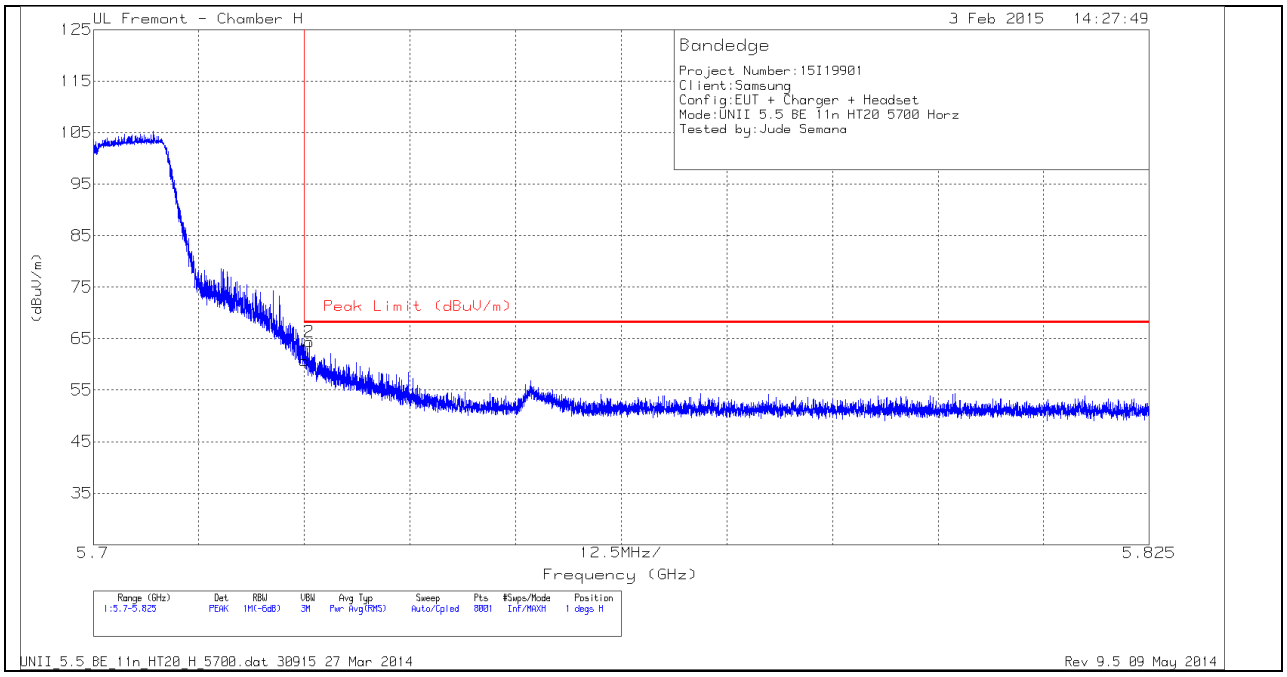
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	48.1	PK	35	-22.4	0	60.7	68.2	-7.5	1	217	H
2	5.726	51.76	PK	35	-22.4	0	64.36	68.2	-3.84	1	217	H

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

PK - Peak detector

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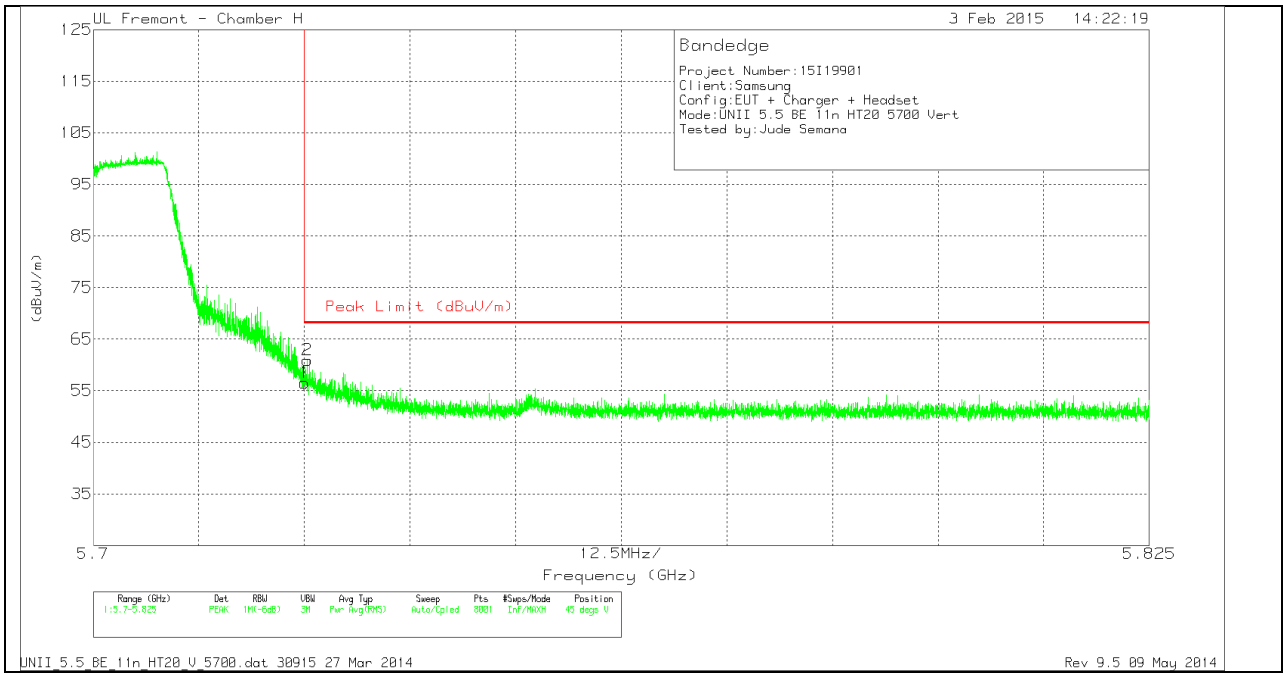
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	43.94	PK	35	-22.4	0	56.54	68.2	-11.66	45	394	V
2	5.725	48.3	PK	35	-22.4	0	60.9	68.2	-7.3	45	394	V

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

PK - Peak detector

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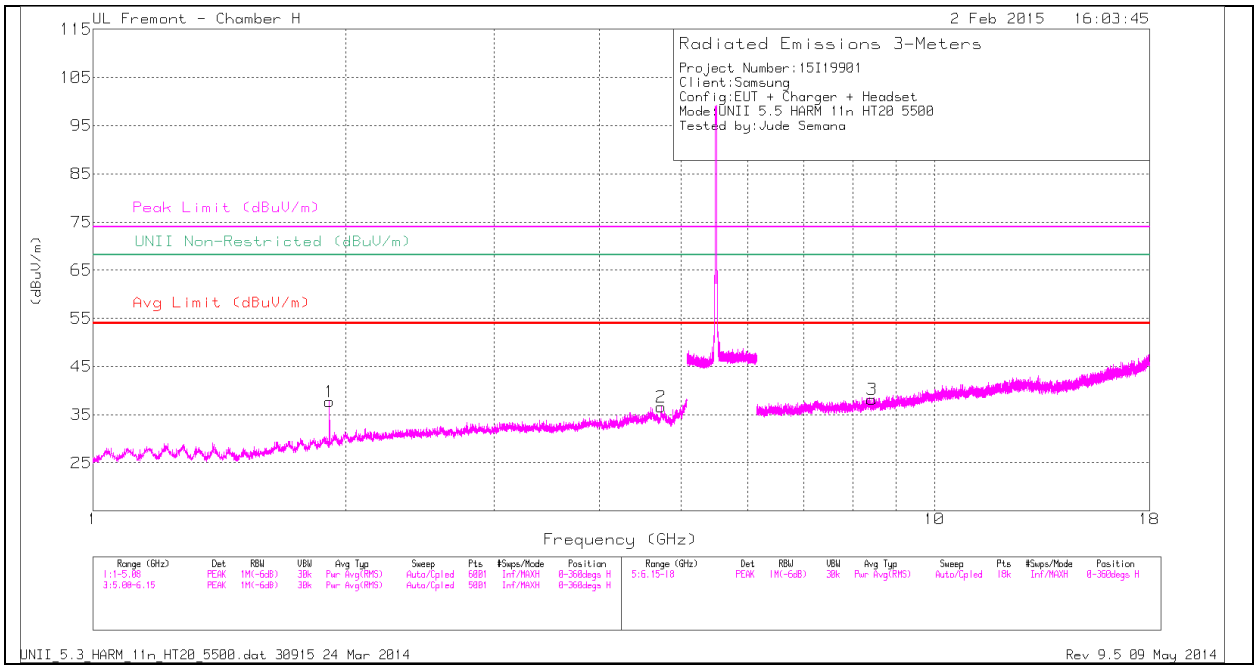
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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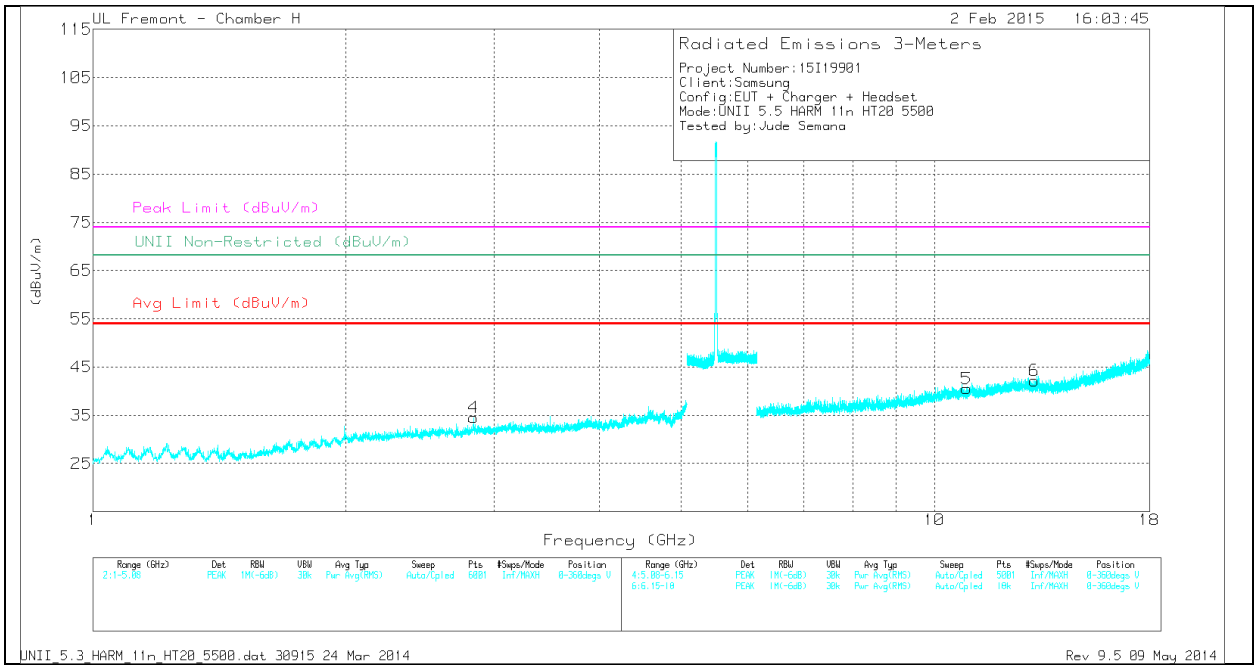
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.734	33.82	PK	34.3	-31.5	0	36.62	-	-	74	-37.38	-	-	0-360	201	H
4	* 2.836	35.02	PK	32.5	-33	0	34.52	-	-	74	-39.48	-	-	0-360	201	V
3	* 8.43	31.06	PK	36.1	-29	0	38.16	-	-	74	-35.84	-	-	0-360	201	H
5	* 10.92	28.54	PK	37.7	-25.7	0	40.54	-	-	74	-33.46	-	-	0-360	201	V
1	1.911	41.81	PK	30.7	-34.8	0	37.71	-	-	-	-	68.2	-30.49	0-360	100	H
6	13.144	28.74	PK	39.1	-25.7	0	42.14	-	-	-	-	68.2	-26.06	0-360	201	V

PK - Peak detector

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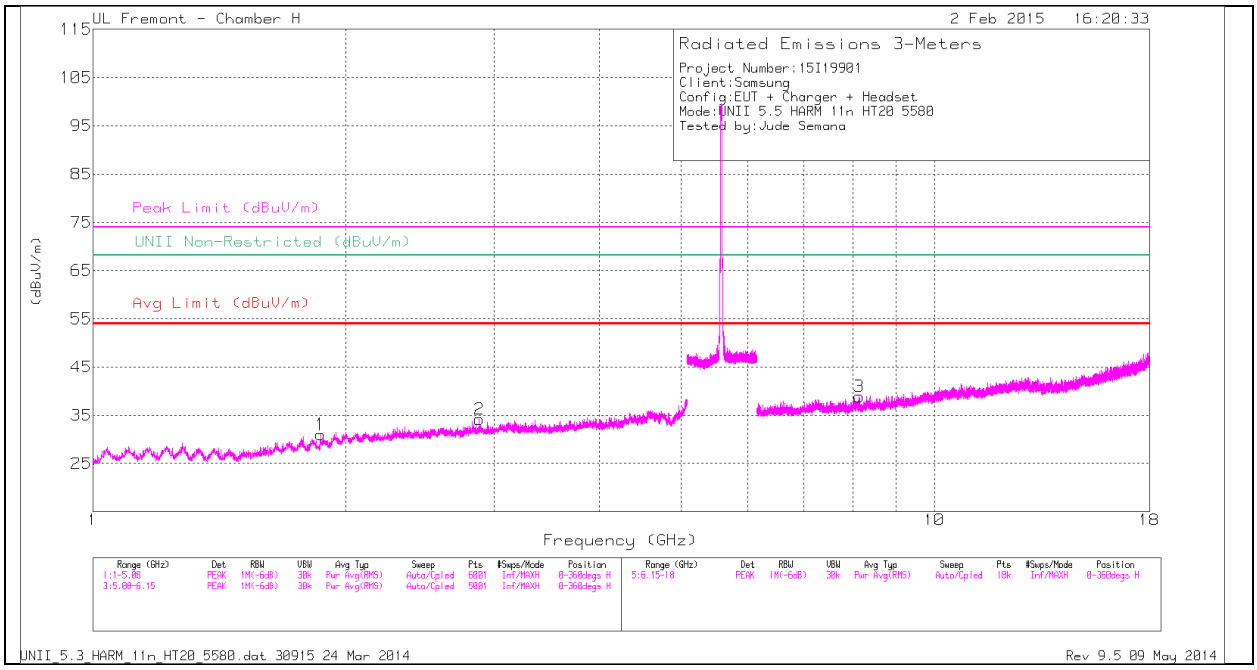
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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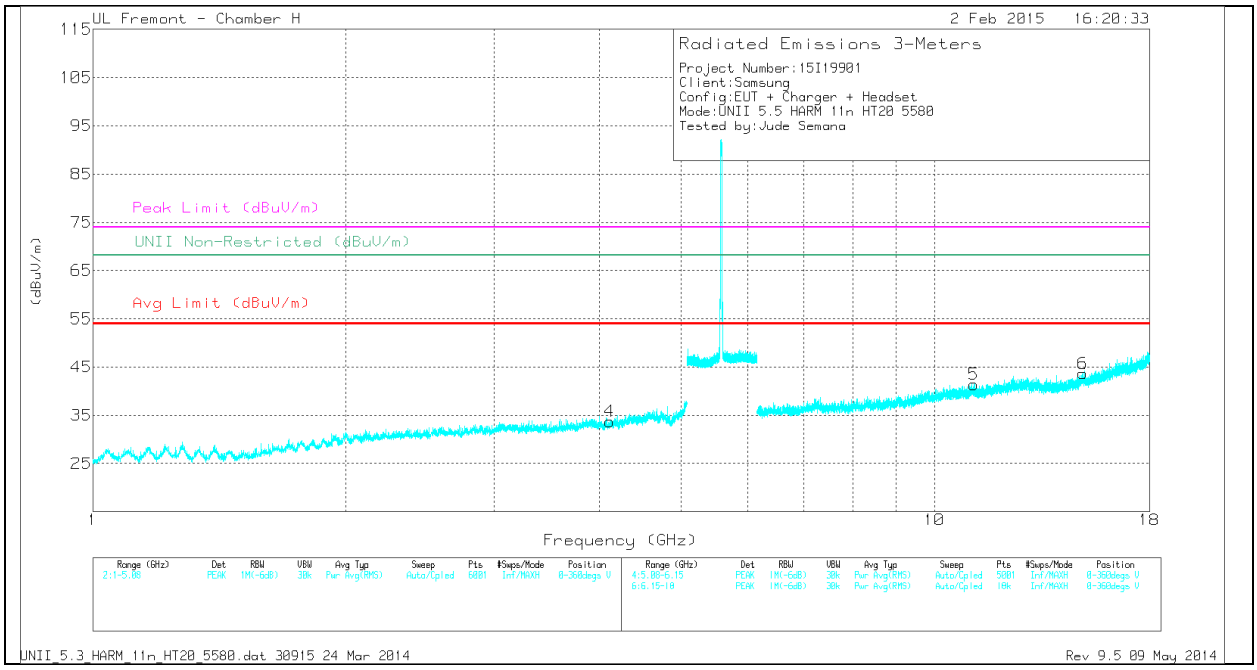
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.879	34.69	PK	32.6	-33.1	0	34.19	-	-	74	-39.81	-	-	0-360	201	H
4	* 4.114	32.33	PK	33.5	-32.1	0	33.73	-	-	74	-40.27	-	-	0-360	100	V
3	* 8.137	31.5	PK	36.1	-28.7	0	38.9	-	-	74	-35.1	-	-	0-360	201	H
5	* 11.134	28.89	PK	37.9	-25.4	0	41.39	-	-	74	-32.61	-	-	0-360	201	V
1	1.865	35.6	PK	30.4	-35	0	31	-	-	-	-	68.2	-37.2	0-360	100	H
6	15.014	28.47	PK	40.6	-25.4	0	43.67	-	-	-	-	68.2	-24.53	0-360	201	V

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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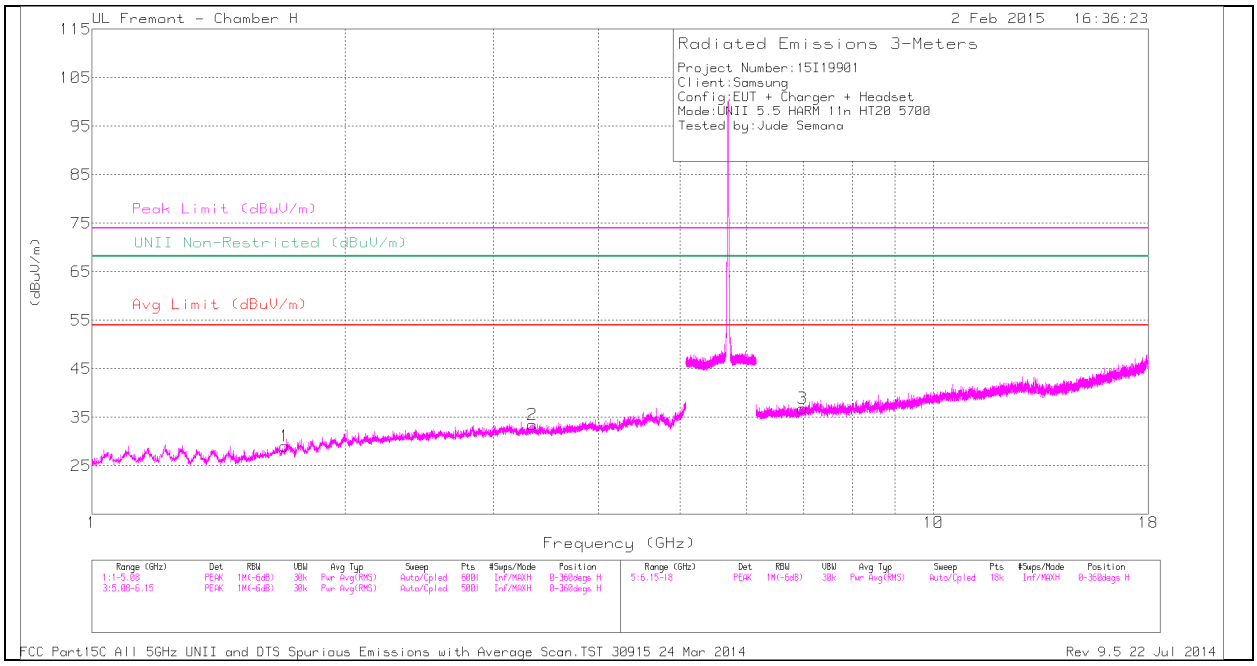
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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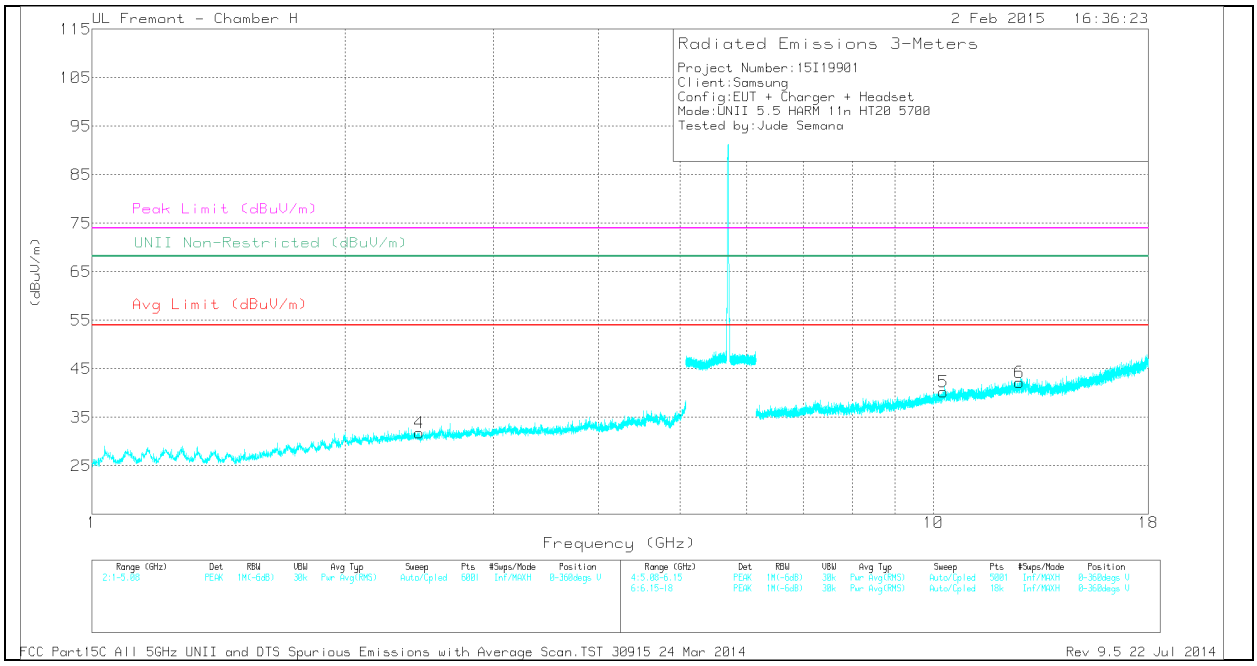
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.694	34.23	PK	29.2	-34.4	0	29.03	-	-	74	-44.97	-	-	0-360	201	H
2	* 3.335	33.54	PK	32.9	-32.9	0	33.54	-	-	74	-40.46	-	-	0-360	201	H
6	* 12.643	28.28	PK	39.2	-25.3	0	42.18	-	-	74	-31.82	-	-	0-360	100	V
4	2.448	34.05	PK	32.1	-34.4	0	31.75	-	-	-	-	68.2	-36.45	0-360	100	V
3	6.989	30.86	PK	35.8	-29.8	0	36.86	-	-	-	-	68.2	-31.34	0-360	100	H
5	10.279	28.13	PK	37.4	-25.3	0	40.23	-	-	-	-	68.2	-27.97	0-360	100	V

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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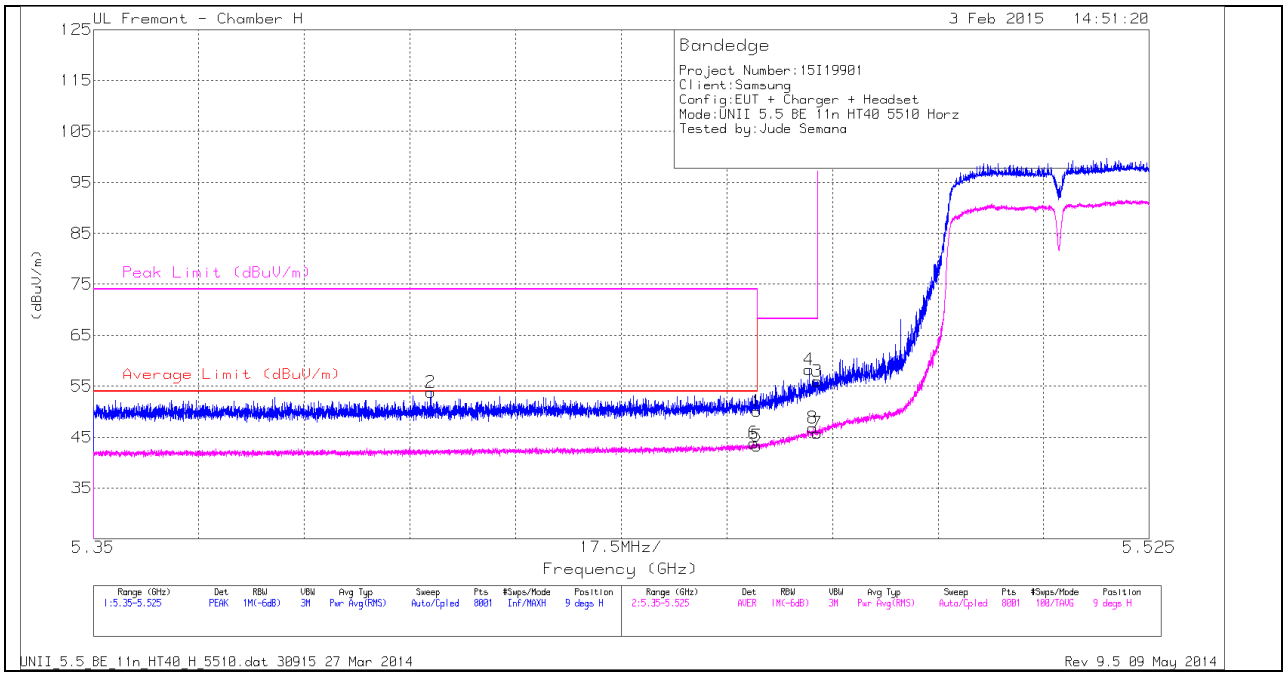
11.3.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.58	PK	35	-22.5	0	50.08	-	-	74	-23.92	9	306	H
2	* 5.406	41.39	PK	34.9	-22.5	0	53.79	-	-	74	-20.21	9	306	H
5	* 5.46	30.02	RMS	35	-22.5	.64	43.16	54	-10.84	-	-	9	306	H
6	* 5.459	30.59	RMS	35	-22.5	.64	43.73	54	-10.27	-	-	9	306	H
4	5.469	45.63	PK	35	-22.4	0	58.23	-	-	68.2	-9.97	9	306	H
8	5.469	33.37	RMS	35.1	-22.4	.64	46.71	-	-	-	-	9	306	H
3	5.47	43.28	PK	35.1	-22.4	0	55.98	-	-	68.2	-12.22	9	306	H
7	5.47	32.36	RMS	35.1	-22.4	.64	45.70	-	-	-	-	9	306	H

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

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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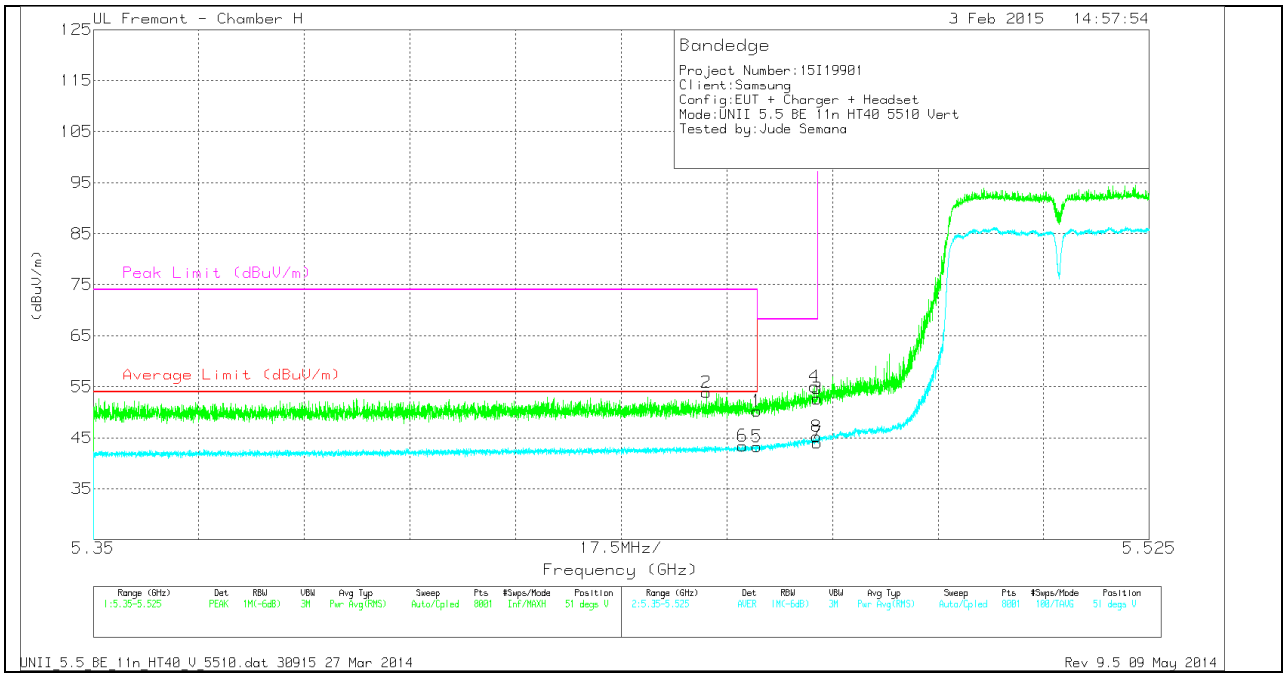
RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.46	37.73	PK	35	-22.5	0	50.23	-	-	74	-23.77	51	285	V
2	* 5.452	41.4	PK	35	-22.5	0	53.9	-	-	74	-20.1	51	285	V
5	* 5.46	30.02	RMS	35	-22.5	.64	43.16	54	-10.84	-	-	51	285	V
6	* 5.458	30.15	RMS	35	-22.5	.64	43.29	54	-10.71	-	-	51	285	V
3	5.47	39.99	PK	35.1	-22.4	0	52.69	-	-	68.2	-15.51	51	285	V
4	5.47	42.32	PK	35.1	-22.4	0	55.02	-	-	68.2	-13.18	51	285	V
7	5.47	30.59	RMS	35.1	-22.4	.64	43.93	-	-	-	-	51	285	V
8	5.47	31.82	RMS	35.1	-22.4	.64	45.16	-	-	-	-	51	285	V

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

PK - Peak detector

RMS - RMS detection

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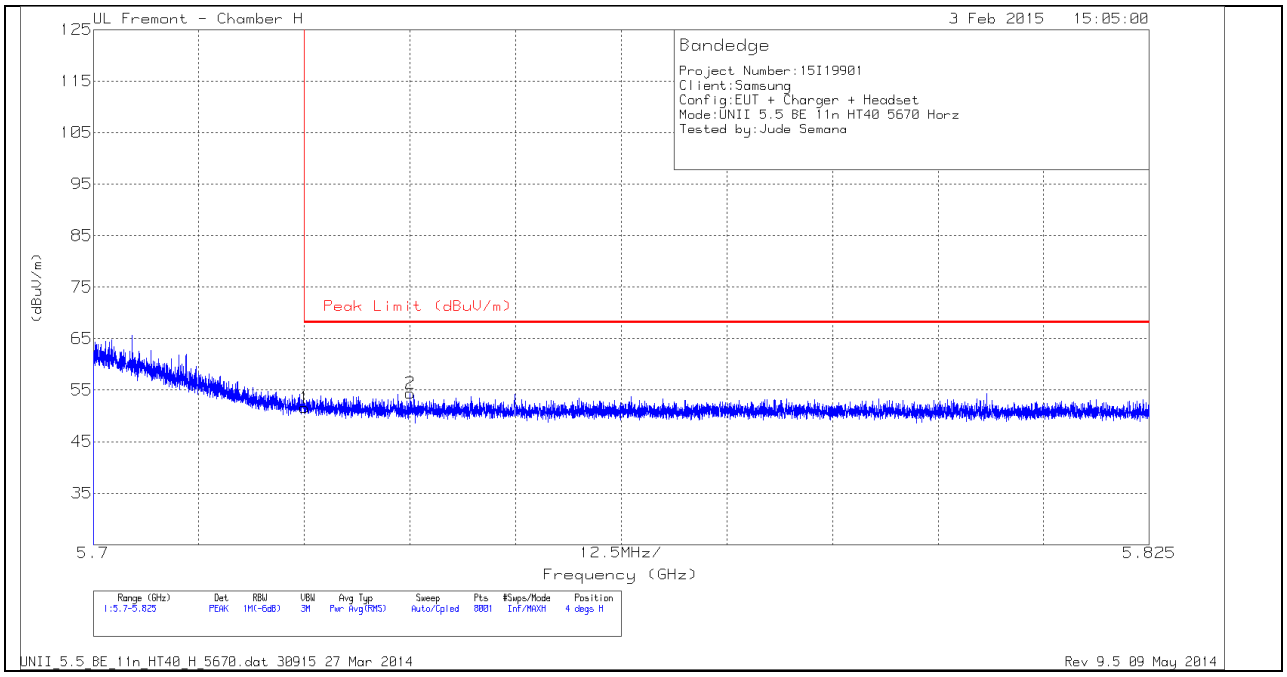
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	38.99	PK	35	-22.4	0	51.59	68.2	-16.61	4	289	H
2	5.738	41.78	PK	35	-22.4	0	54.38	68.2	-13.82	4	289	H

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

PK - Peak detector

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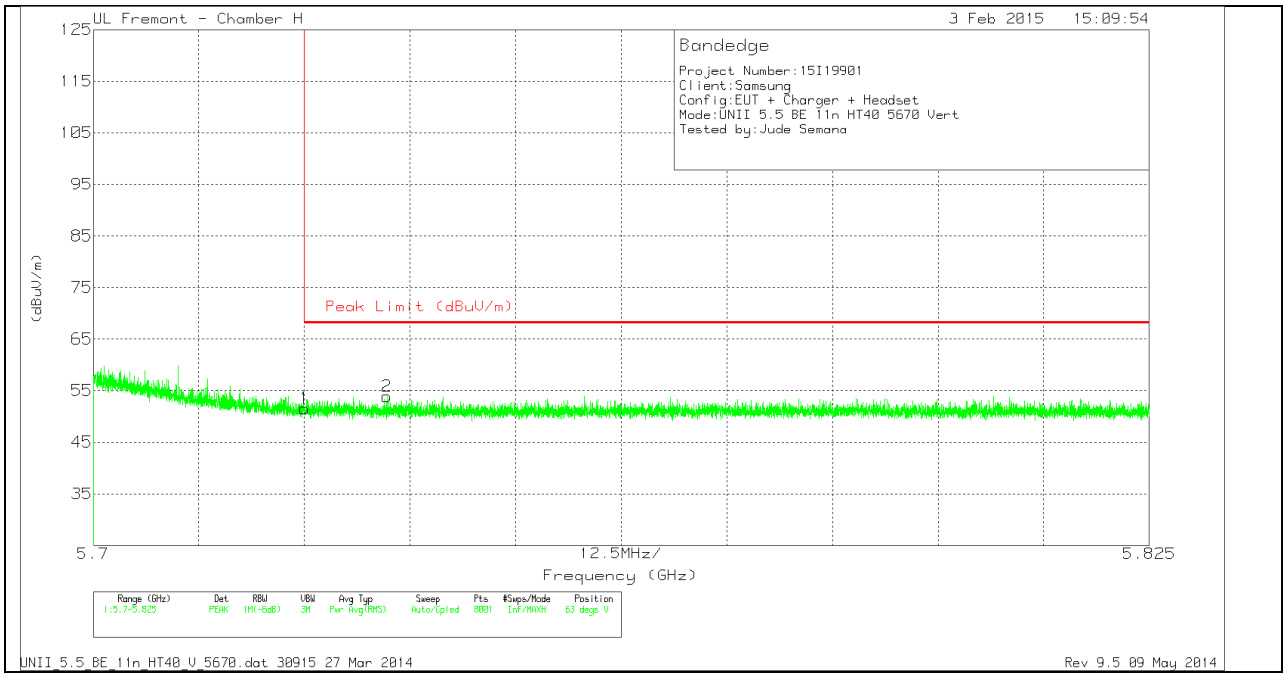
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	38.97	PK	35	-22.4	0	51.57	68.2	-16.63	63	321	V
2	5.735	41.29	PK	35	-22.4	0	53.89	68.2	-14.31	63	321	V

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

PK - Peak detector

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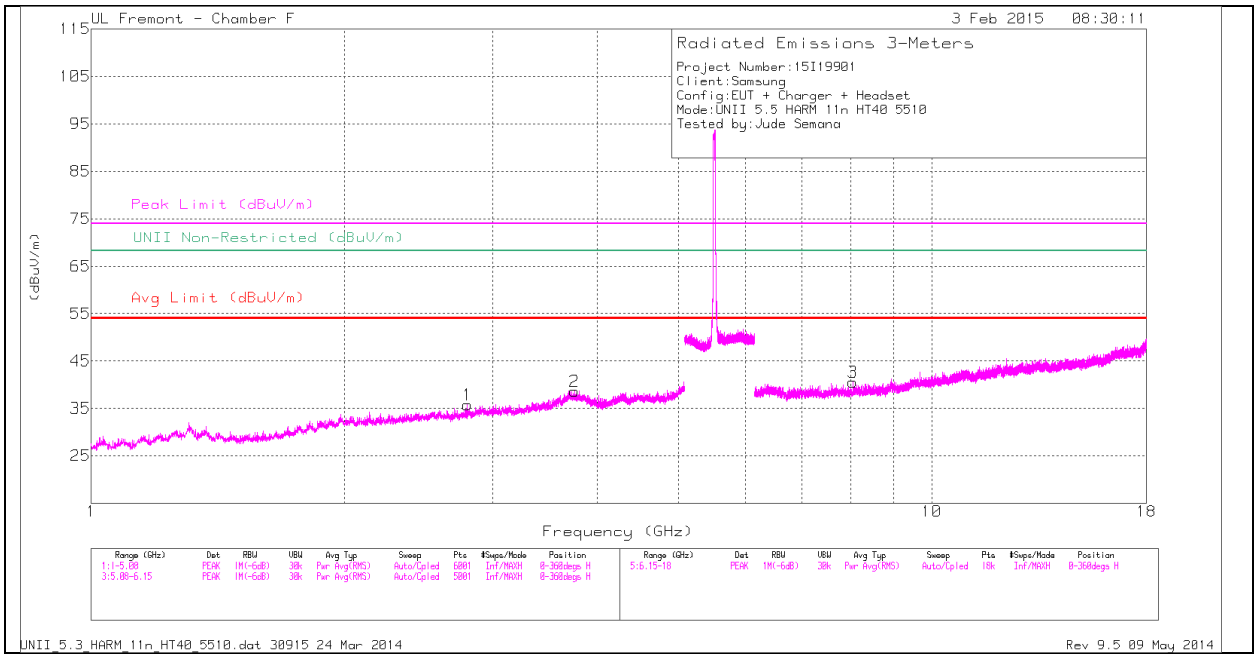
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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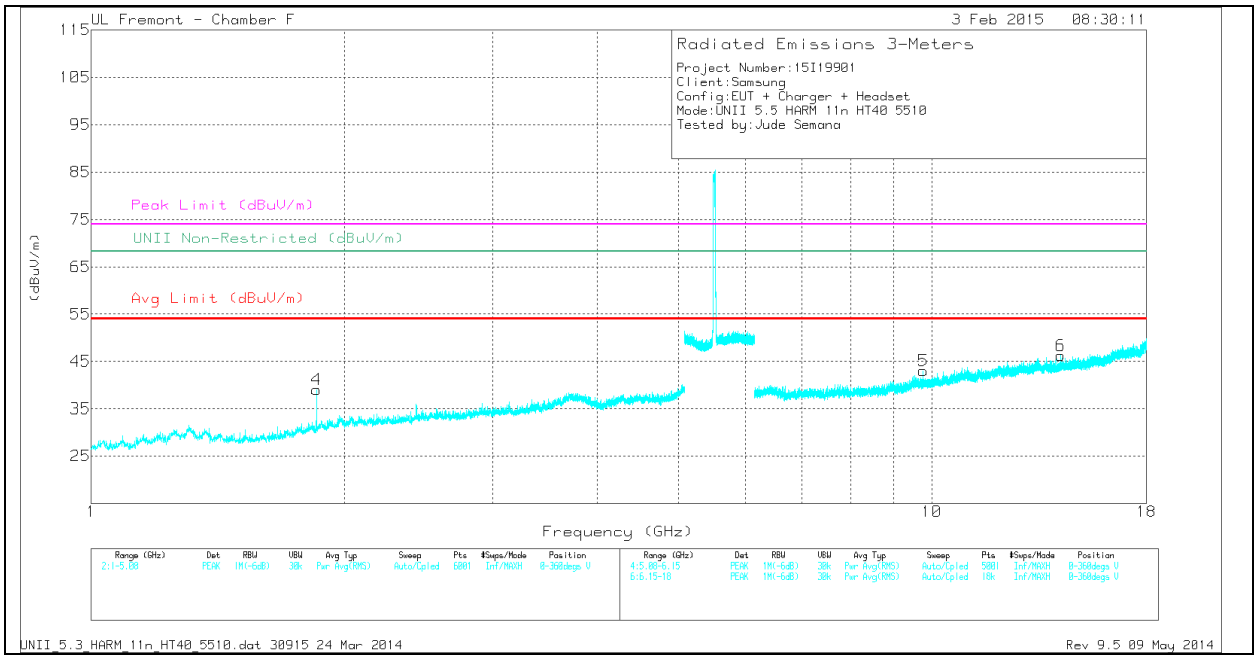
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.802	32.79	PK	32.9	-29.9	0	35.79	-	-	74	-38.21	-	-	0-360	101	H
2	* 3.759	33.42	PK	34.6	-29.4	0	38.62	-	-	74	-35.38	-	-	0-360	101	H
4	1.854	39.38	PK	30.9	-31.2	0	39.08	-	-	-	-	68.2	-29.12	0-360	201	V
3	* 8.054	29.65	PK	35.7	-24.8	0	40.55	-	-	74	-33.45	-	-	0-360	100	H
5	9.766	28.14	PK	37.1	-22.2	0	43.04	-	-	-	-	68.2	-25.16	0-360	101	V
6	14.231	30.2	PK	39.3	-23.2	0	46.3	-	-	-	-	68.2	-21.9	0-360	101	V

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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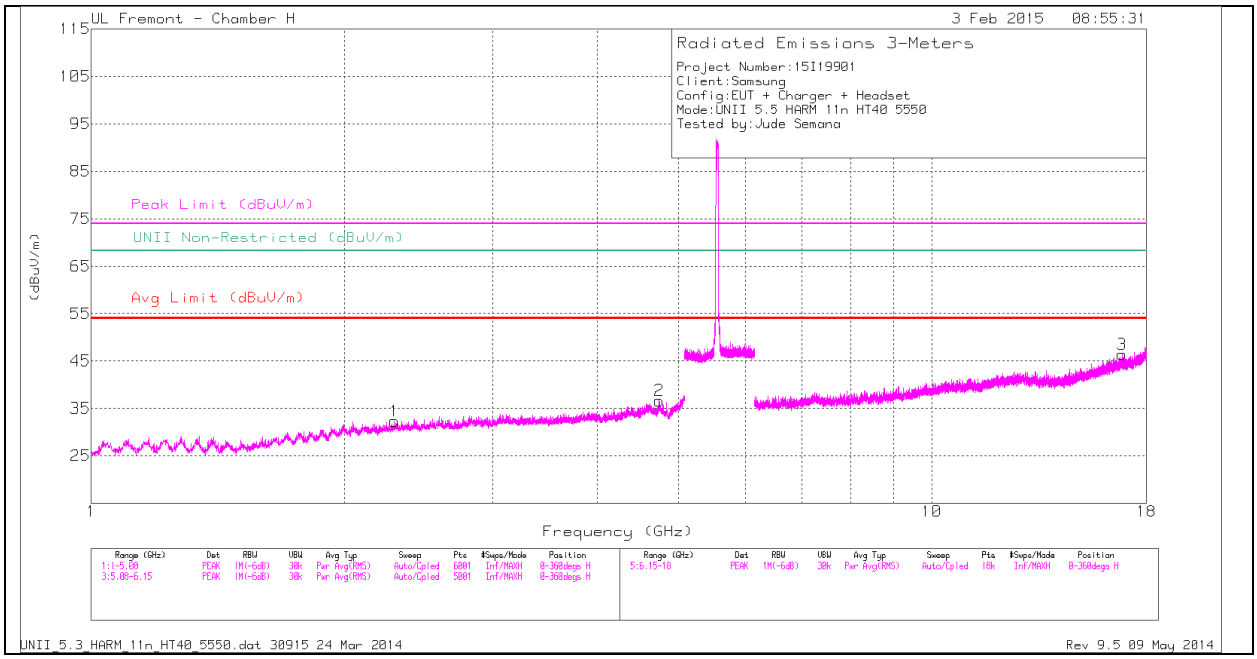
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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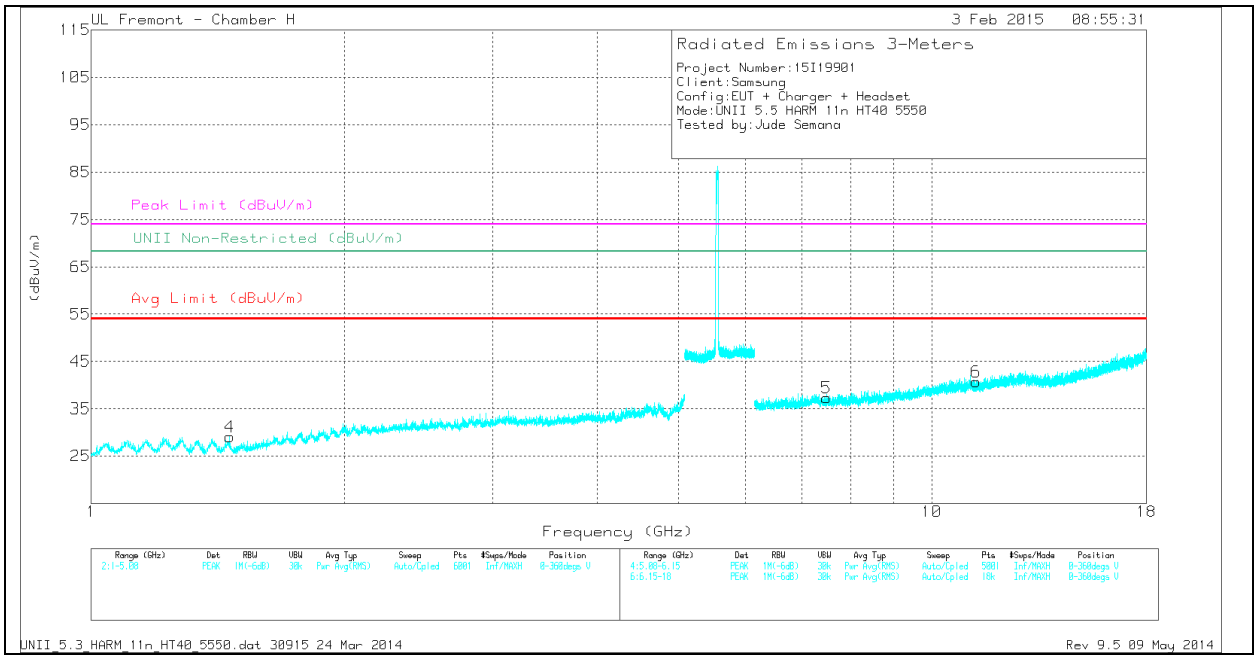
MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.294	34.52	PK	31.8	-34	0	32.32	-	-	74	-41.68	-	-	0-360	98	H
2	* 4.739	33.84	PK	34.3	-31.5	0	36.64	-	-	74	-37.36	-	-	0-360	98	H
4	* 1.461	36.13	PK	27.9	-34.9	0	29.13	-	-	74	-44.87	-	-	0-360	100	V
5	* 7.497	30.7	PK	36.1	-29.5	0	37.3	-	-	74	-36.7	-	-	0-360	201	V
6	* 11.29	28.22	PK	37.9	-25.4	0	40.72	-	-	74	-33.28	-	-	0-360	201	V
3	16.83	27.61	PK	42.3	-23.5	0	46.41	-	-	-	-	68.2	-21.79	0-360	201	H

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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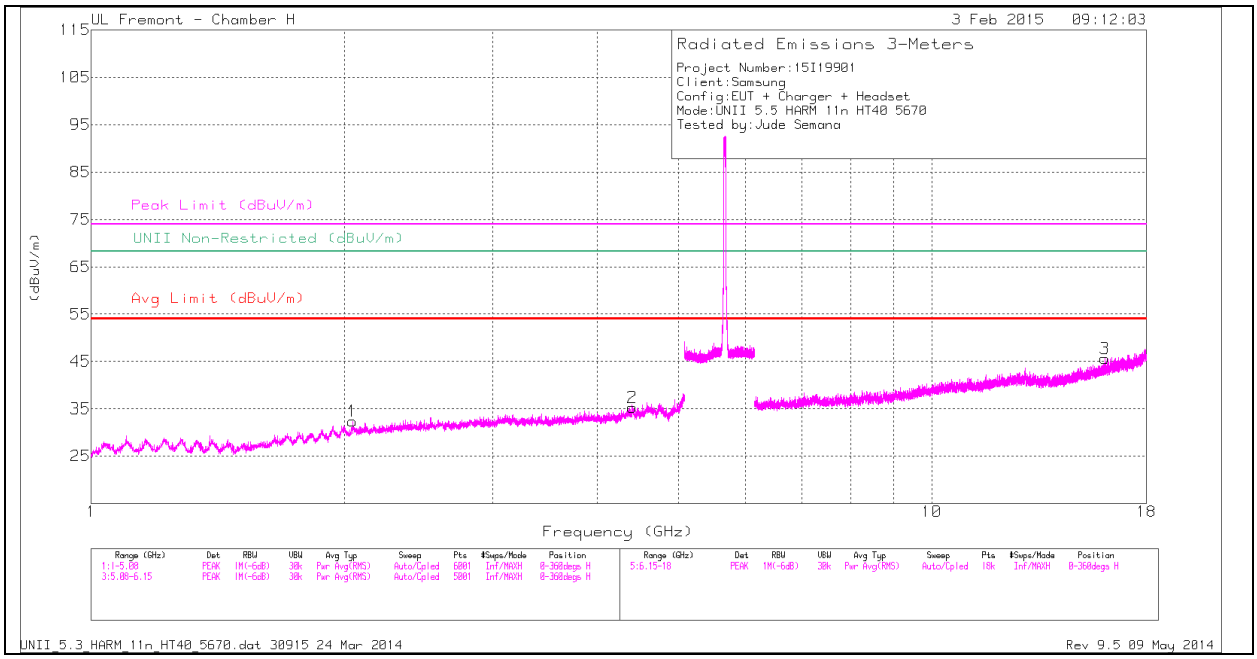
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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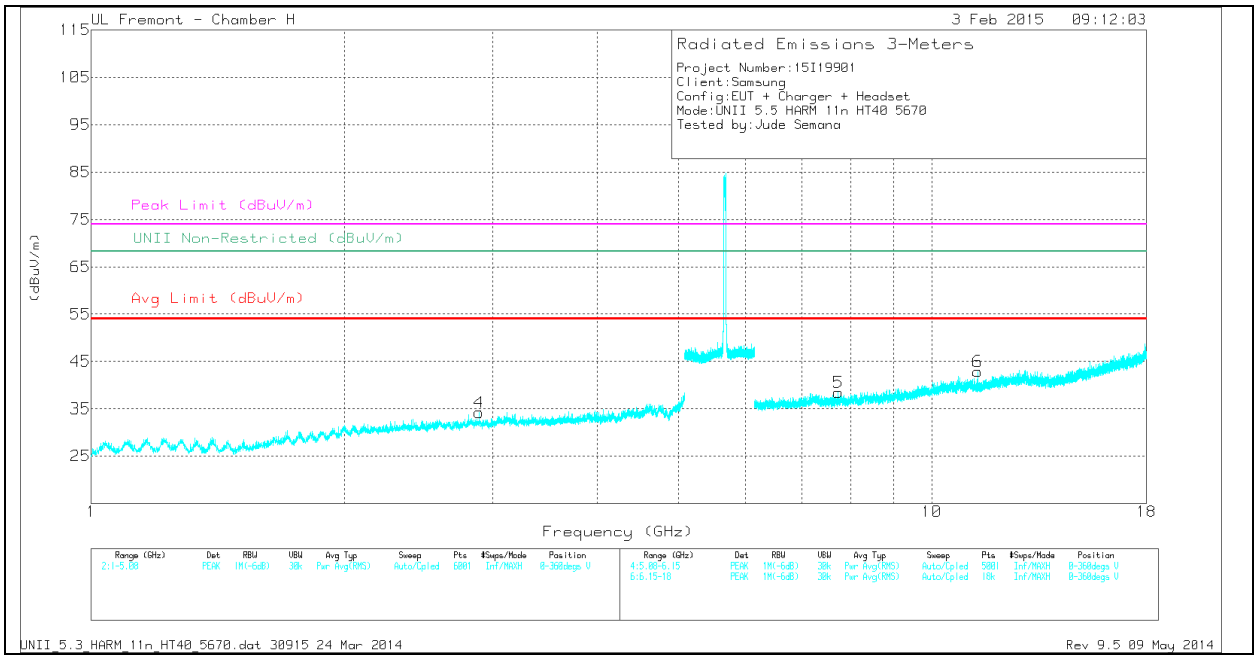
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.893	35.03	PK	32.6	-33.4	0	34.23	-	-	74	-39.77	-	-	0-360	201	V
3	* 16.065	28.65	PK	41.2	-24.2	0	45.65	-	-	74	-28.35	-	-	0-360	201	H
5	* 7.736	31.86	PK	36.1	-29.5	0	38.46	-	-	74	-35.54	-	-	0-360	100	V
6	* 11.34	30.15	PK	38	-25.3	0	42.85	-	-	74	-31.15	-	-	0-360	201	V
1	2.046	35.46	PK	31.4	-34.5	0	32.36	-	-	-	-	68.2	-35.84	0-360	201	H
2	4.401	32.93	PK	33.8	-31.4	0	35.33	-	-	-	-	68.2	-32.87	0-360	100	H

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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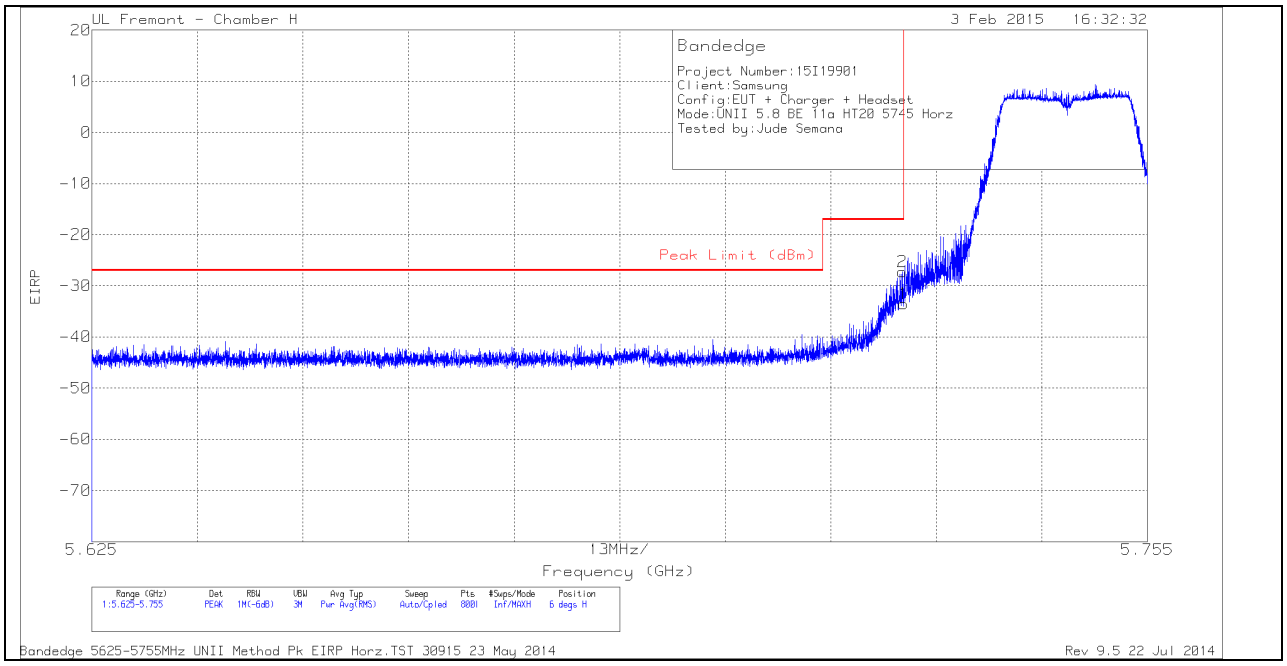
11.4. 5.8 GHz

11.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-57.92	PK	35	-22.4	11.8	0	-33.52	-17	-16.52	6	283	H
2	5.725	-51.6	PK	35	-22.4	11.8	0	-27.2	-17	-10.2	6	283	H

PK - Peak detector

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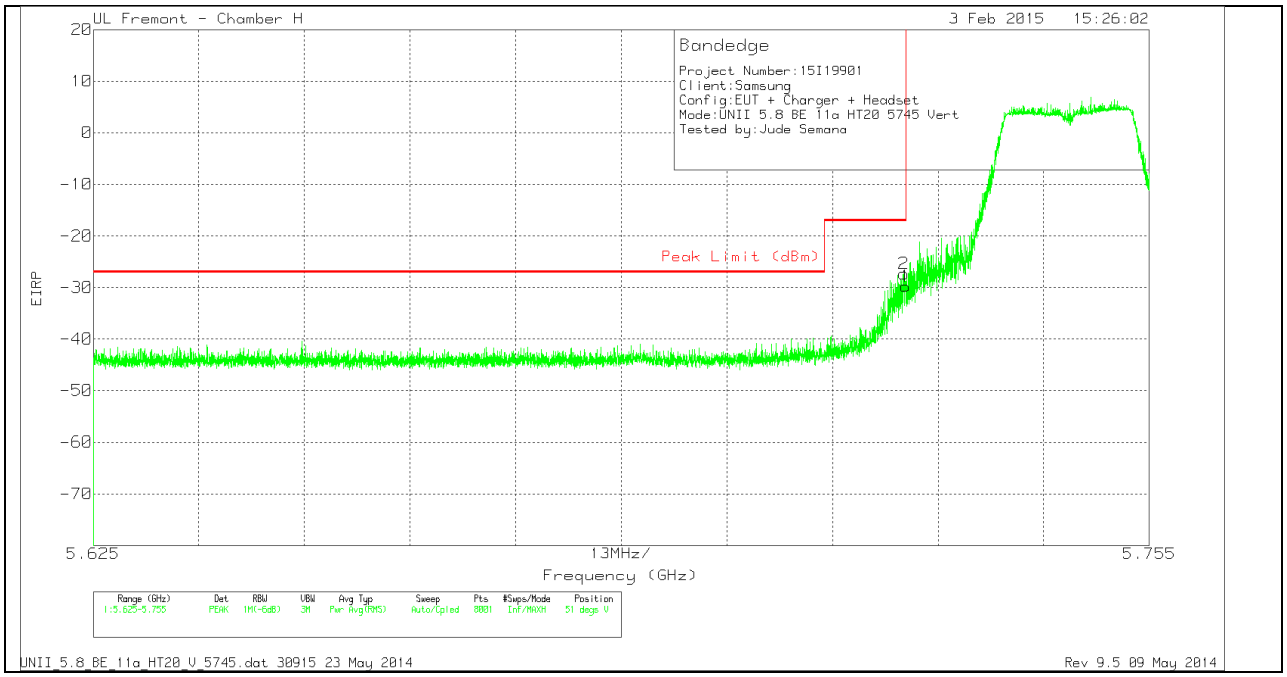
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-54.16	PK	35	-22.4	11.8	0	-29.76	-17	-12.76	51	316	V
2	5.725	-51.73	PK	35	-22.4	11.8	0	-27.33	-17	-10.33	51	316	V

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

PK - Peak detector

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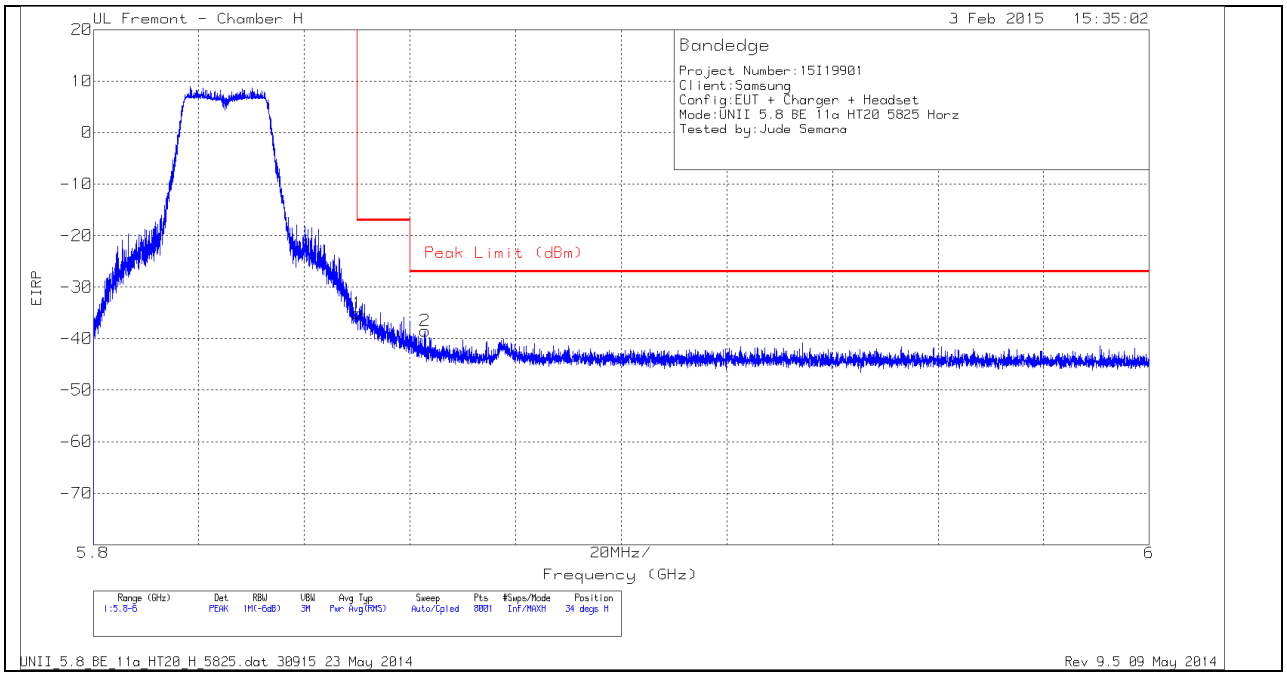
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-59.83	PK	35.1	-22.2	11.8	0	-35.13	-17	-18.13	34	214	H
2	5.863	-63.2	PK	35.1	-22.2	11.8	0	-38.5	-27	-11.5	34	214	H

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

PK - Peak detector

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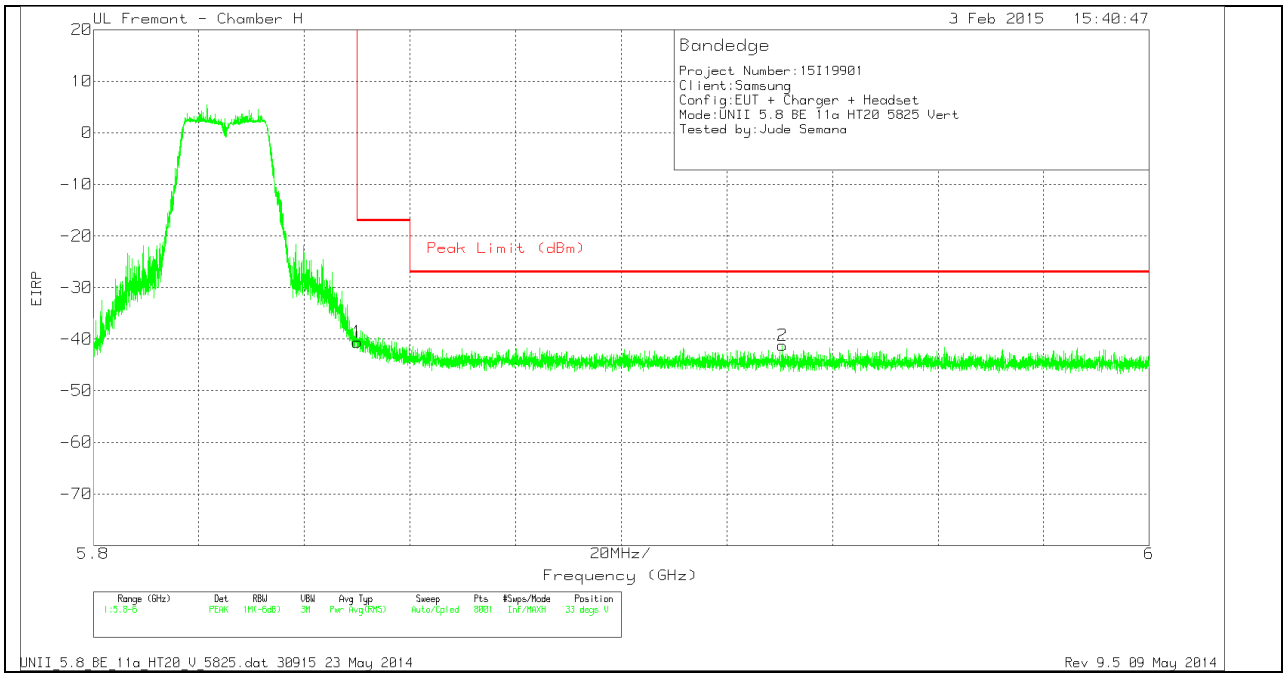
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-65.3	PK	35.1	-22.2	11.8	0	-40.6	-17	-23.6	33	338	V
2	5.931	-65.91	PK	35.1	-22.2	11.8	0	-41.21	-27	-14.21	33	338	V

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

PK - Peak detector

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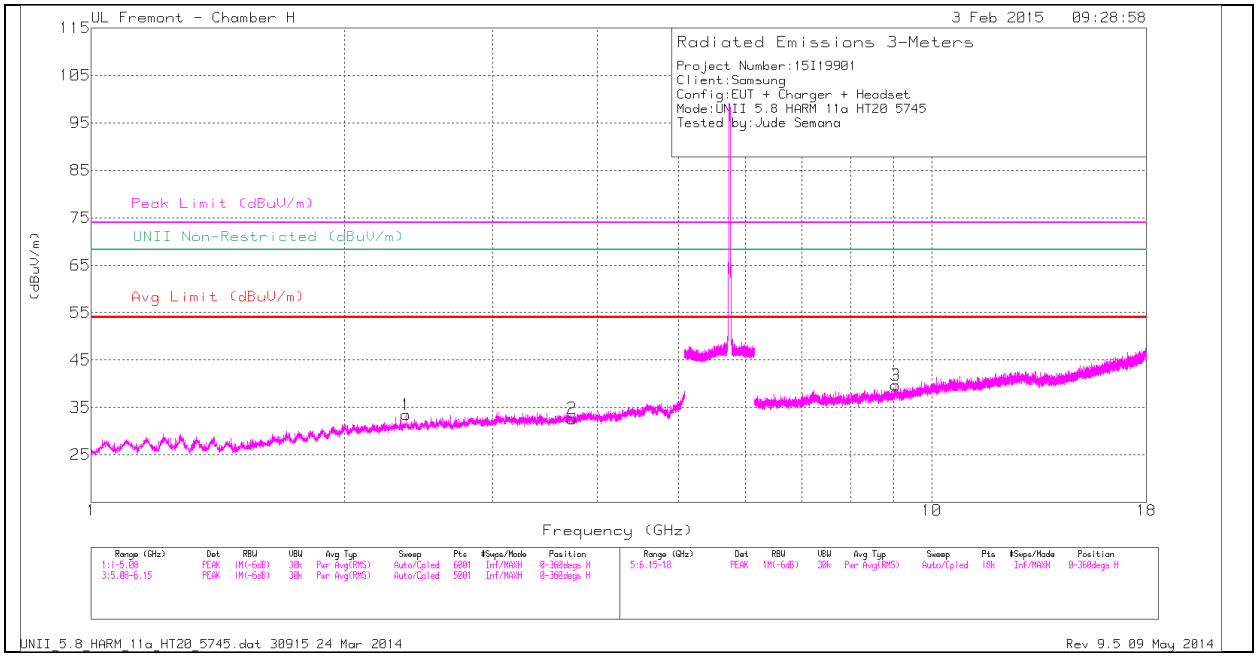
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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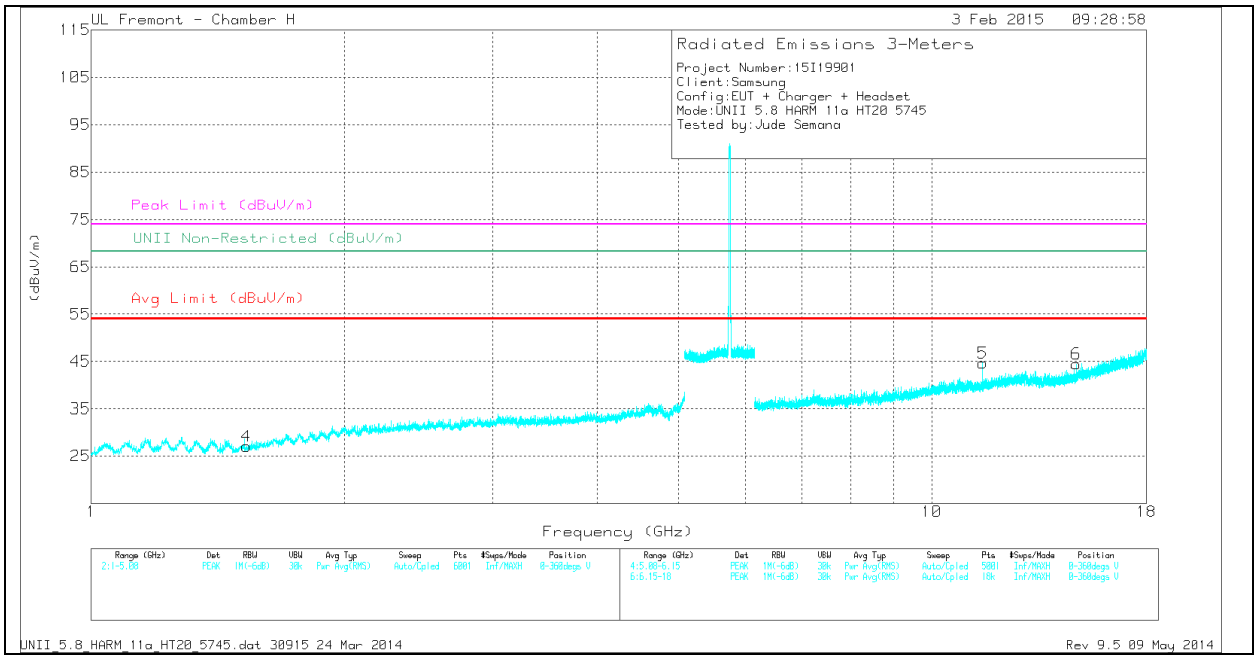
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.37	35.57	PK	31.9	-34	0	33.47	-	-	74	-40.53	-	-	0-360	201	H
2	* 3.733	32.55	PK	33.2	-33.1	0	32.65	-	-	74	-41.35	-	-	0-360	201	H
4	* 1.53	34.28	PK	27.9	-35.1	0	27.08	-	-	74	-46.92	-	-	0-360	100	V
3	* 9.058	30.2	PK	36.4	-26.9	0	39.7	-	-	74	-34.3	-	-	0-360	201	H
5	* 11.489	32.47	PK	38.1	-25.9	0	44.67	-	-	74	-29.33	-	-	0-360	201	V
6	14.857	30.56	PK	40.4	-26.5	0	44.46	-	-	-	-	68.2	-23.74	0-360	100	V

PK - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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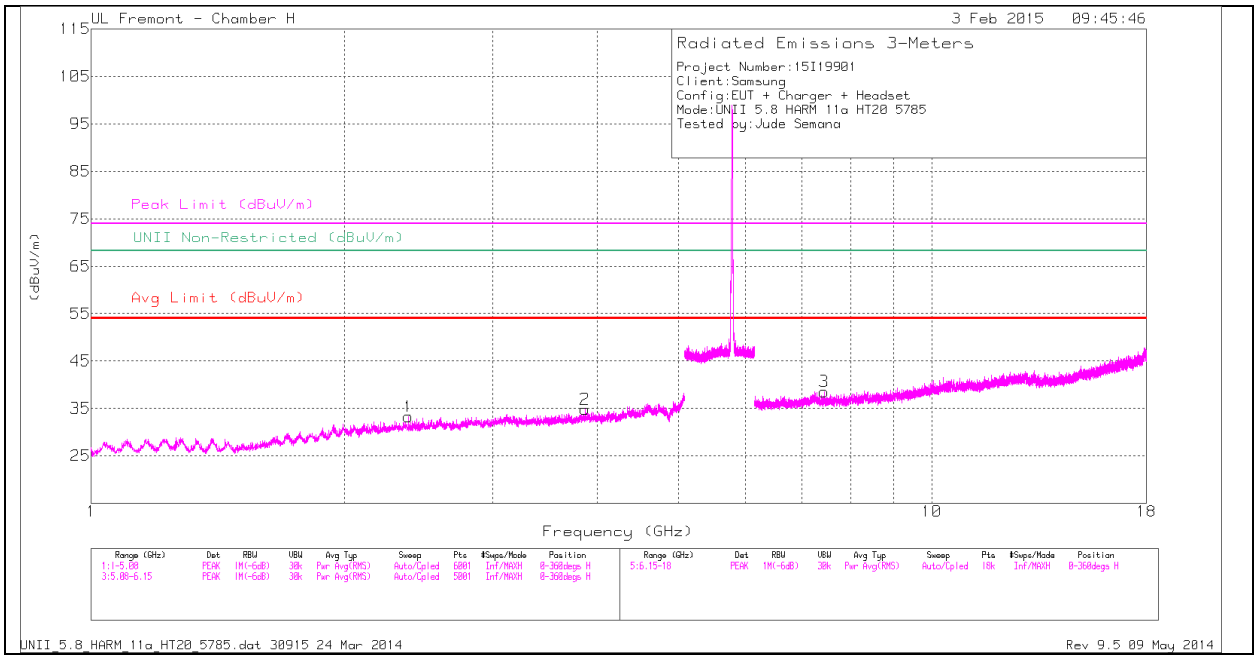
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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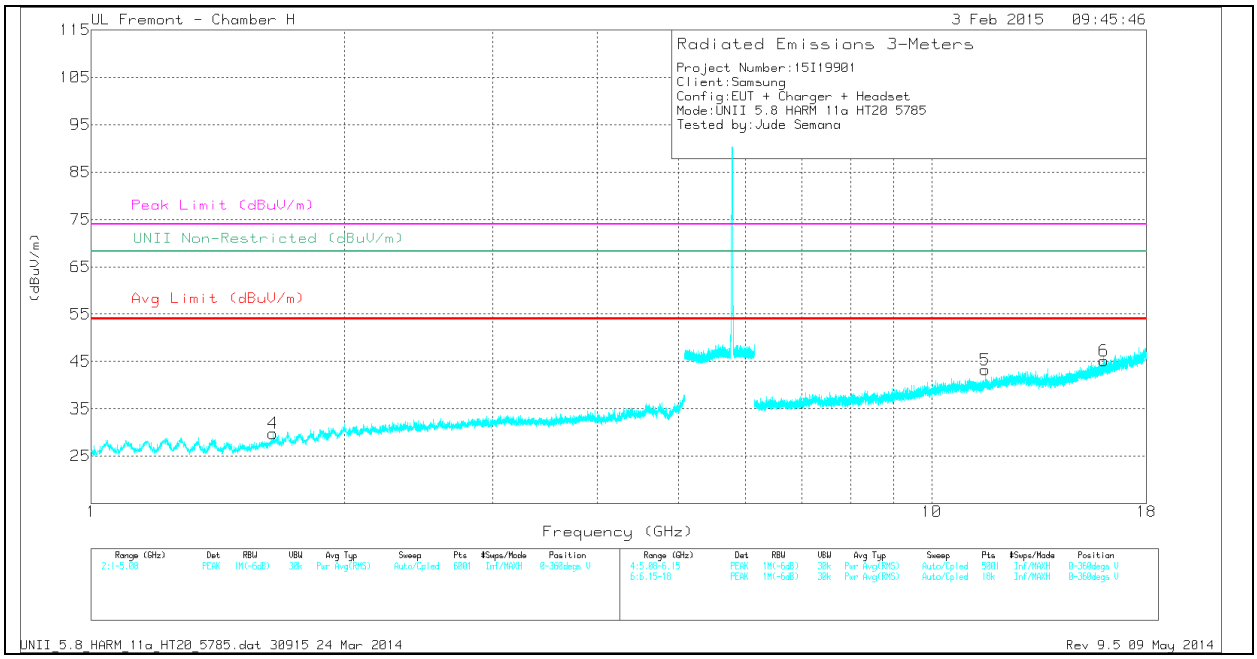
MID CHANNEL VERTICAL



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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.384	35.38	PK	32	-34.1	0	33.28	-	-	74	-40.72	-	-	0-360	100	H
2	* 3.87	34.15	PK	33.3	-32.6	0	34.85	-	-	74	-39.15	-	-	0-360	100	H
3	* 7.446	32.34	PK	36.1	-29.9	0	38.54	-	-	74	-35.46	-	-	0-360	100	H
5	* 11.57	30.26	PK	38.2	-25.2	0	43.26	-	-	74	-30.74	-	-	0-360	201	V
6	* 16.025	28.26	PK	41.2	-24.3	0	45.16	-	-	74	-28.84	-	-	0-360	201	V
4	1.645	35.39	PK	28.9	-34.5	0	29.79	-	-	-	-	68.2	-38.41	0-360	201	V

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.57	38.1	PK1	38.2	-25.2	0	51.1	-	-	74	-22.9	-	-	286	352	V
* 11.57	31.31	AD1	38.2	-25.2	.3	44.61	54	-9.39	-	-	-	-	286	352	V

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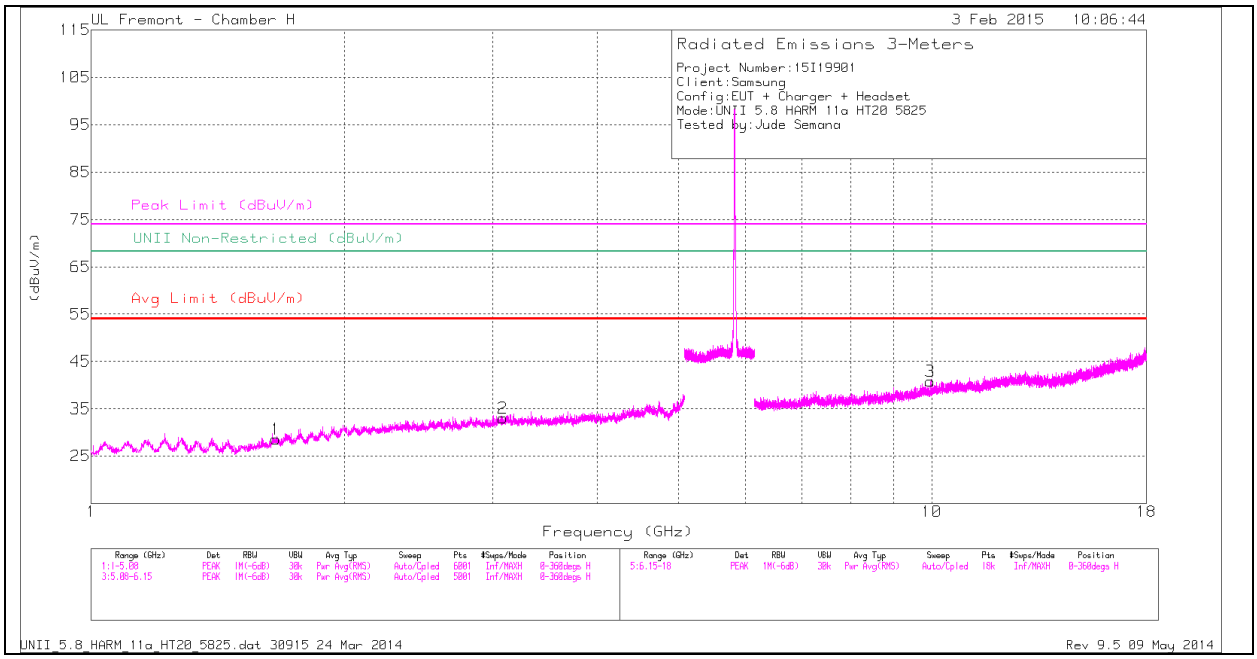
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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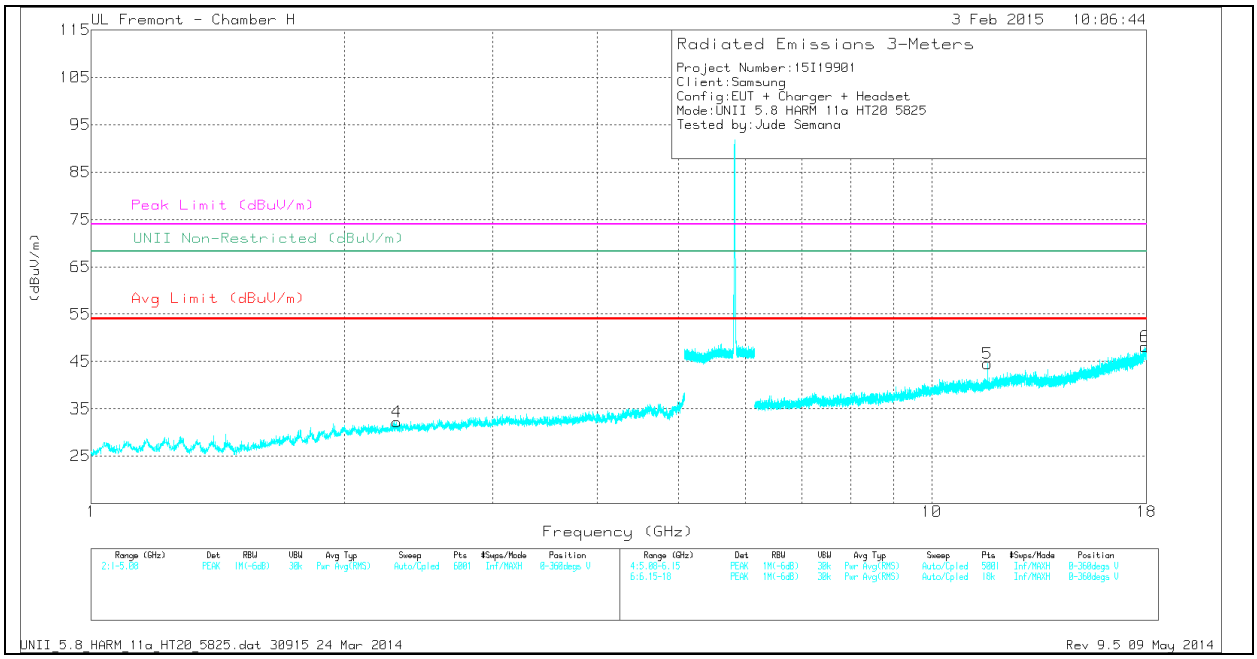
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 11.65	31.86	PK	38.3	-25.6	0	44.56	-	-	74	-29.44	-	-	0-360	201	V
6	* 17.93	26.23	PK	42.5	-20.6	0	48.13	-	-	74	-25.87	-	-	0-360	201	V
1	1.659	34.15	PK	29	-34.5	0	28.65	-	-	-	-	68.2	-39.55	0-360	201	H
4	2.309	34.35	PK	31.8	-33.9	0	32.25	-	-	-	-	68.2	-35.95	0-360	201	V
2	3.087	33.06	PK	32.8	-32.8	0	33.06	-	-	-	-	68.2	-35.14	0-360	201	H
3	9.96	30.09	PK	37.2	-26.5	0	40.79	-	-	-	-	68.2	-27.41	0-360	201	H

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.65	38.04	PK1	38.3	-25.6	0	50.74	-	-	74	-23.26	-	-	5	220	V
* 11.65	30.32	AD1	38.3	-25.6	.3	43.32	54	-10.68	-	-	-	-	5	220	V

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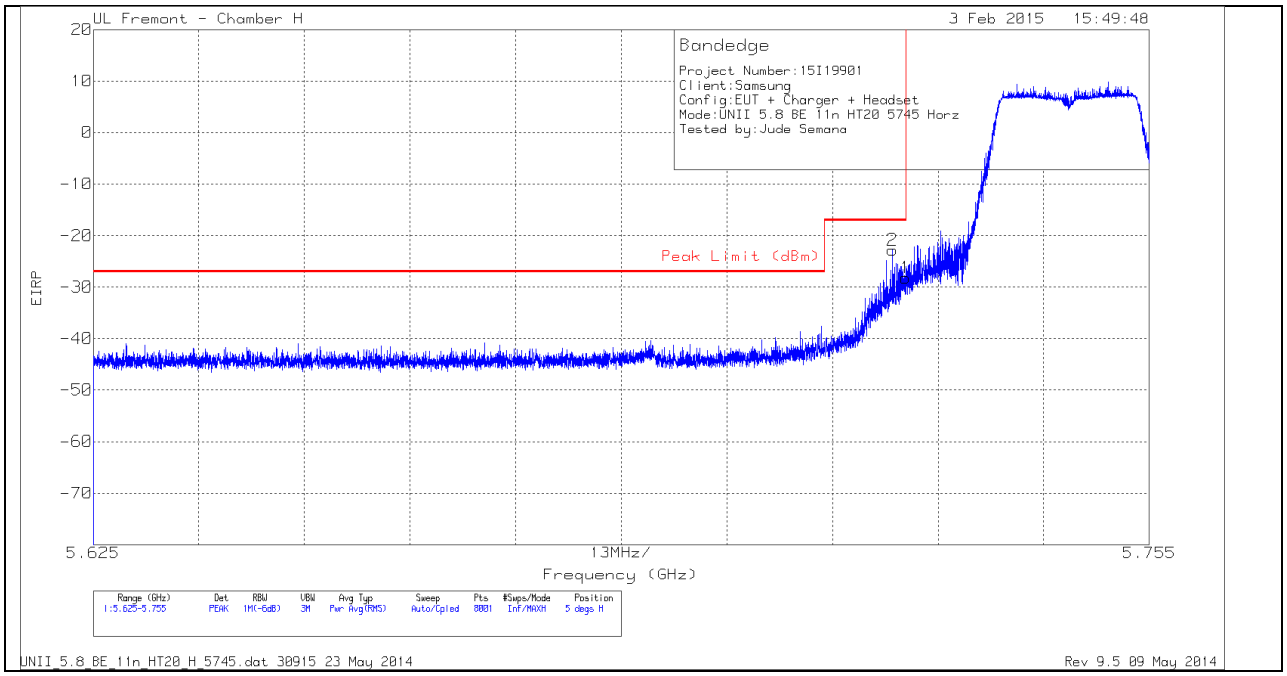
11.4.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.723	-47.13	PK	35	-22.5	11.8	0	-22.83	-17	-5.83	5	284	H
1	5.725	-52.62	PK	35	-22.4	11.8	0	-28.22	-17	-11.22	5	284	H

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

PK - Peak detector

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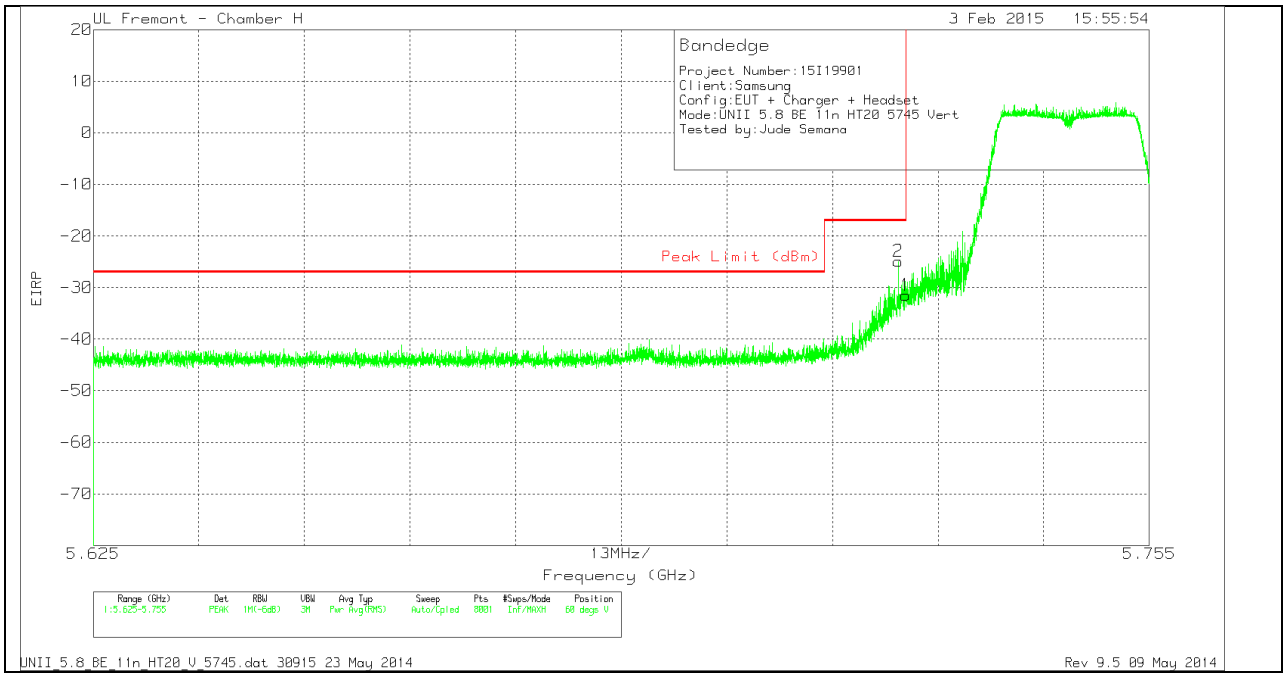
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.724	-49.31	PK	35	-22.4	11.8	0	-24.91	-17	-7.91	60	393	V
1	5.725	-55.9	PK	35	-22.4	11.8	0	-31.5	-17	-14.5	60	393	V

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

PK - Peak detector

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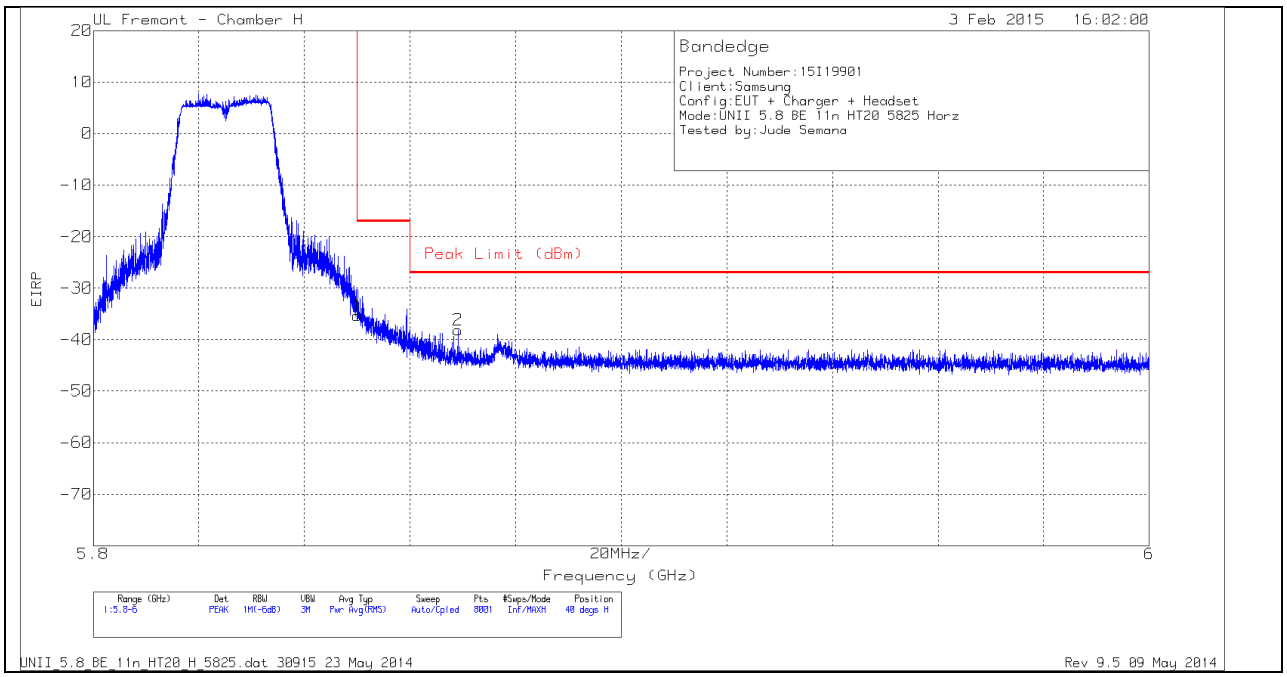
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-60.01	PK	35.1	-22.2	11.8	0	-35.31	-17	-18.31	40	277	H
2	5.869	-62.85	PK	35.1	-22.2	11.8	0	-38.15	-27	-11.15	40	277	H

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

PK - Peak detector

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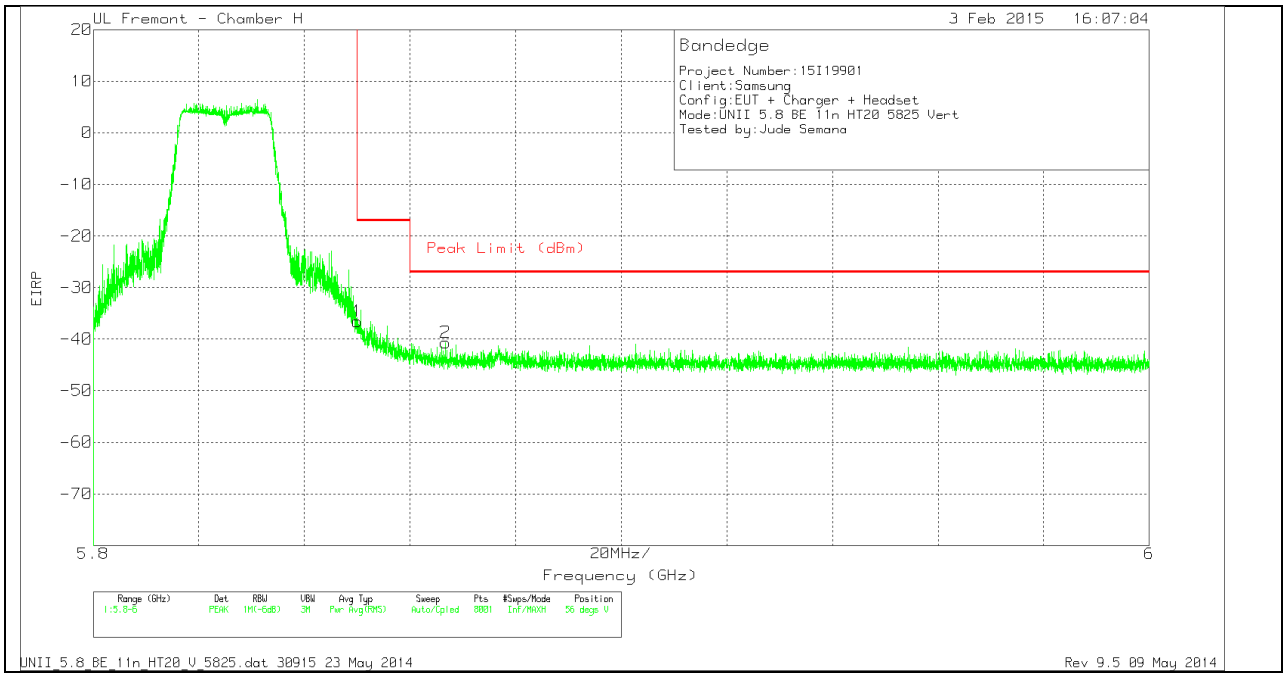
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-61.26	PK	35.1	-22.2	11.8	0	-36.56	-17	-19.56	56	310	V
2	5.867	-65.36	PK	35.1	-22.2	11.8	0	-40.66	-27	-13.66	56	310	V

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

PK - Peak detector

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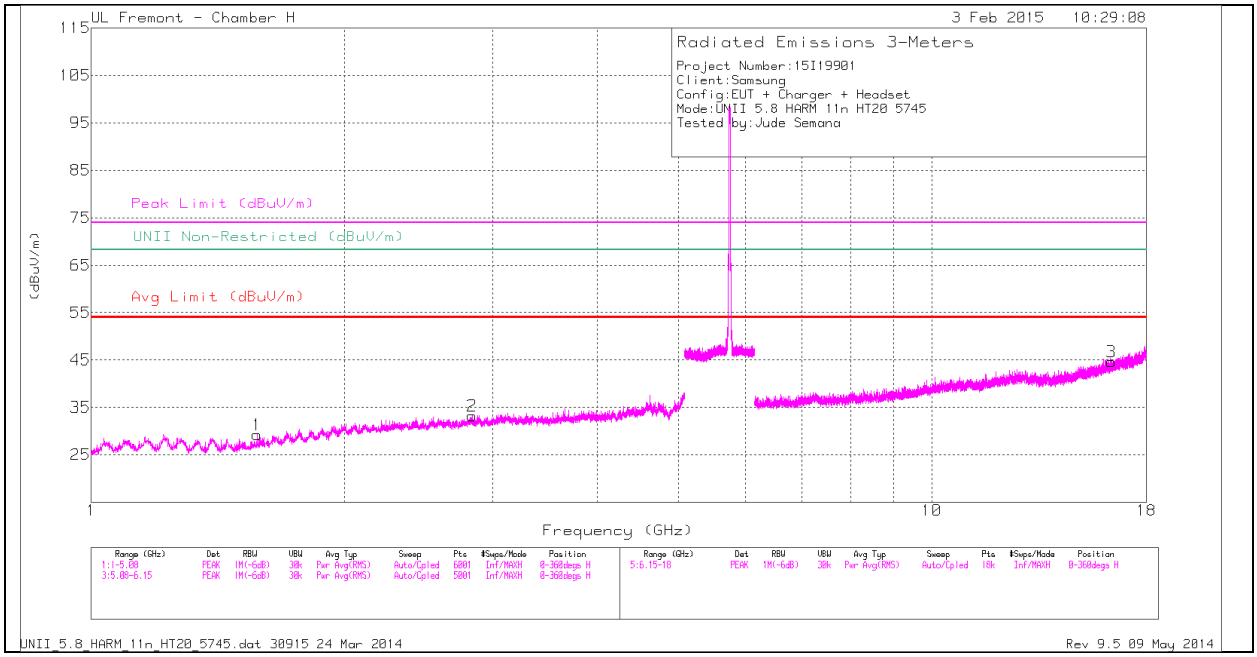
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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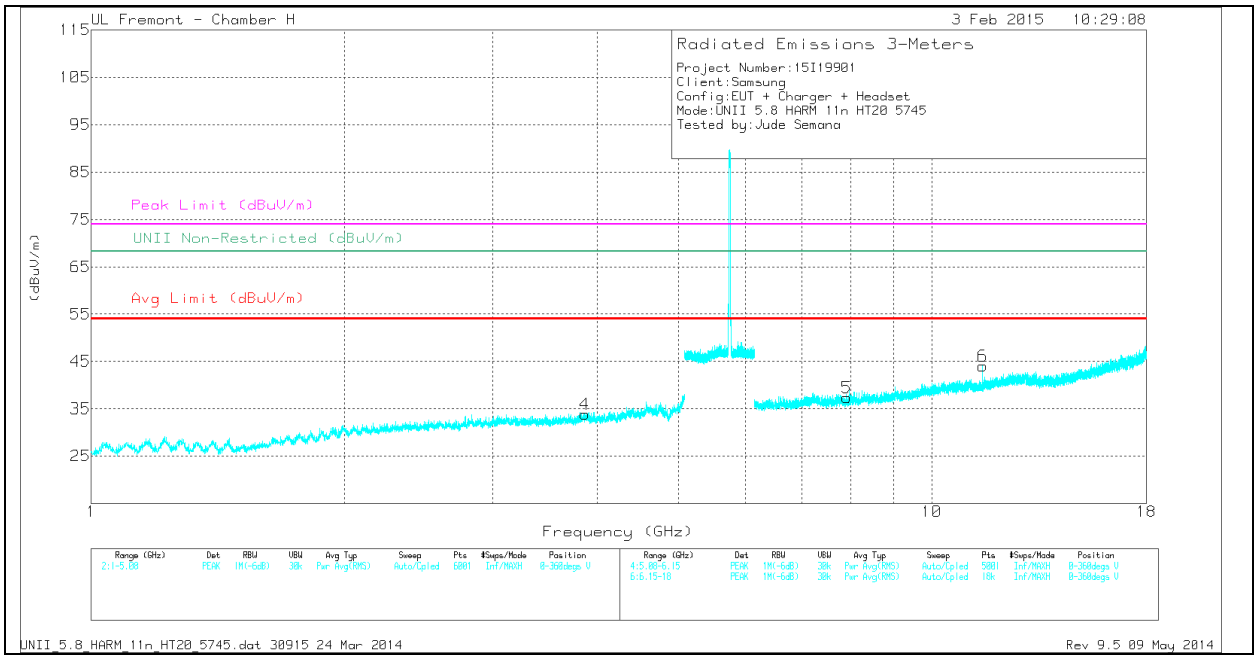
LOW CHANNEL VERTICAL



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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.576	36.06	PK	28.3	-35.1	0	29.26	-	-	74	-44.74	-	-	0-360	201	H
2	* 2.839	33.85	PK	32.5	-33.1	0	33.25	-	-	74	-40.75	-	-	0-360	100	H
4	* 3.865	33.3	PK	33.3	-32.7	0	33.9	-	-	74	-40.1	-	-	0-360	100	V
6	* 11.489	31.85	PK	38.1	-25.9	0	44.05	-	-	74	-29.95	-	-	0-360	201	V
5	7.925	31.08	PK	36	-29.7	0	37.38	-	-	-	-	68.2	-30.82	0-360	100	V
3	16.344	27.11	PK	41.5	-24	0	44.61	-	-	-	-	68.2	-23.59	0-360	100	H

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.49	38.18	PK1	38.1	-25.9	0	50.38	-	-	74	-23.62	-	-	340	192	V
* 11.49	29.64	AD1	38.1	-25.9	.32	42.24	54	-11.76	-	-	-	-	340	192	V

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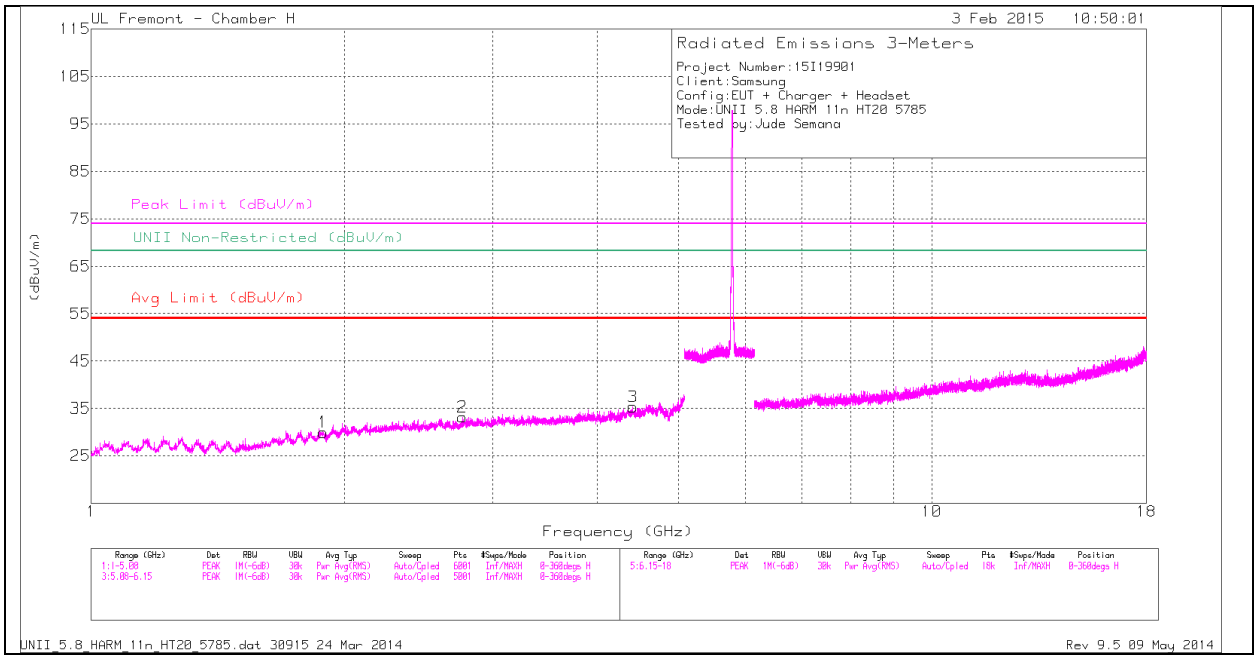
MID CHANNEL HORIZONTAL



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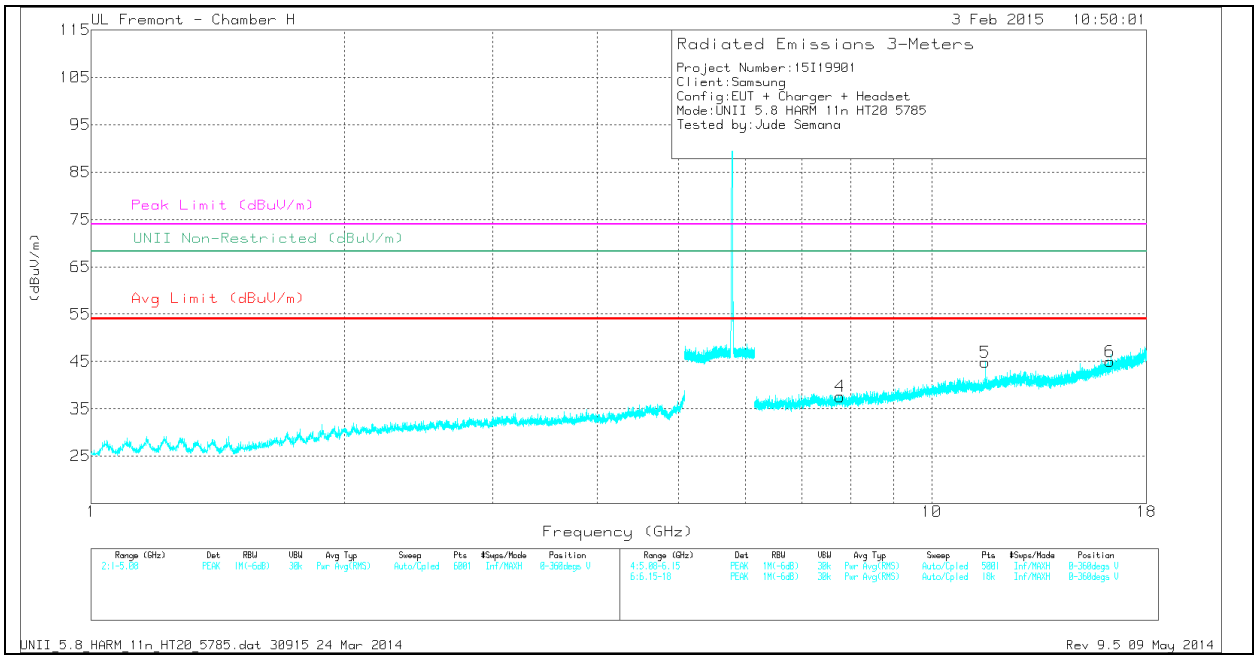
MID CHANNEL VERTICAL



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MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.766	34.79	PK	32.3	-33.9	0	33.19	-	-	74	-40.81	-	-	0-360	201	H
5	* 11.57	31.86	PK	38.2	-25.2	0	44.86	-	-	74	-29.14	-	-	0-360	201	V
1	1.887	34.16	PK	30.6	-34.8	0	29.96	-	-	-	-	68.2	-38.24	0-360	201	H
3	4.408	33.15	PK	33.8	-31.6	0	35.35	-	-	-	-	68.2	-32.85	0-360	201	H
4	7.778	30.58	PK	36.1	-29.1	0	37.58	-	-	-	-	68.2	-30.62	0-360	100	V
6	16.282	28.01	PK	41.4	-24.4	0	45.01	-	-	-	-	68.2	-23.19	0-360	100	V

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.57	39.07	PK1	38.2	-25.2	0	52.07	-	-	74	-21.93	-	-	271	223	V
* 11.57	31.74	AD1	38.2	-25.2	.32	45.14	54	-8.86	-	-	-	-	271	223	V

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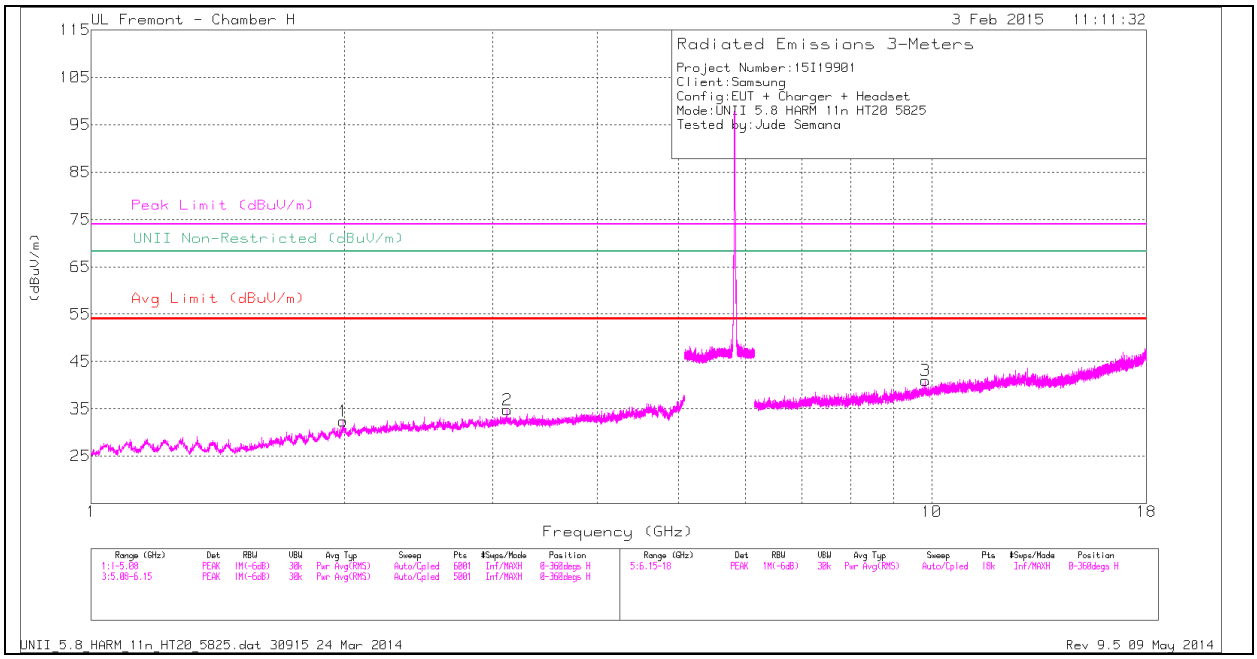
HIGH CHANNEL HORIZONTAL



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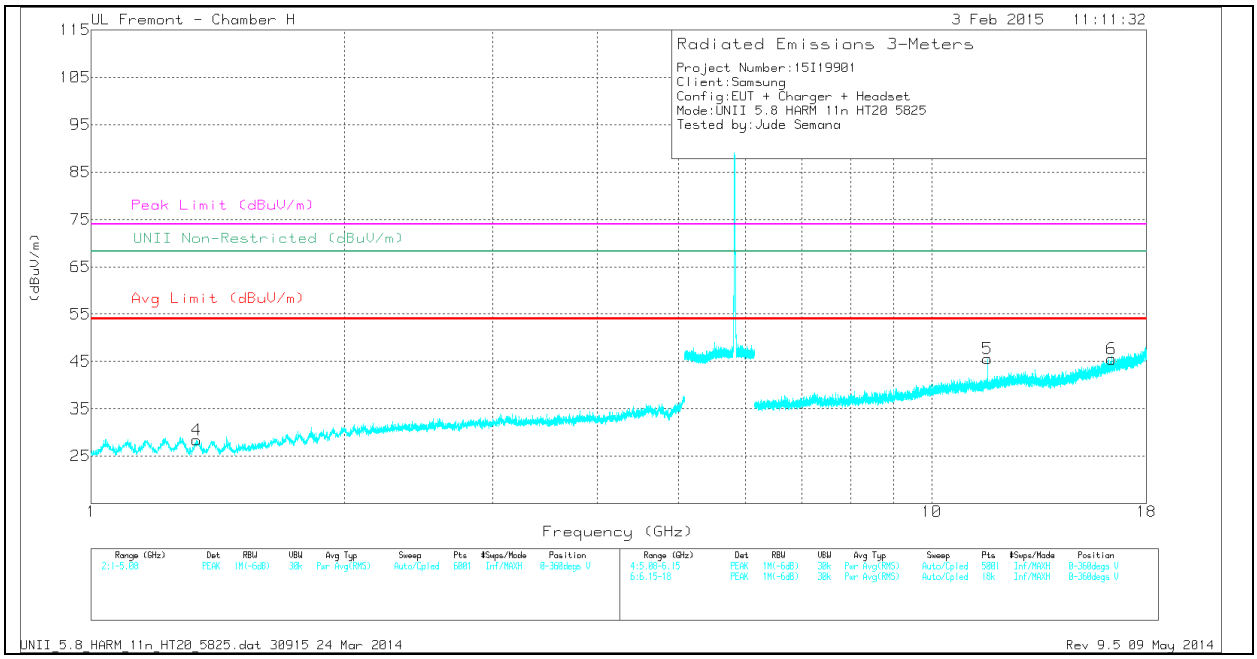
HIGH CHANNEL VERTICAL



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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.335	35.43	PK	28.6	-35.6	0	28.43	-	-	74	-45.57	-	-	0-360	100	V
5	* 11.65	32.89	PK	38.3	-25.6	0	45.59	-	-	74	-28.41	-	-	0-360	201	V
1	1.993	35.67	PK	31.3	-34.5	0	32.47	-	-	-	-	68.2	-35.73	0-360	201	H
2	3.125	34.58	PK	32.9	-32.7	0	34.78	-	-	-	-	68.2	-33.42	0-360	201	H
3	9.822	30.09	PK	37	-26.1	0	40.99	-	-	-	-	68.2	-27.21	0-360	201	H
6	16.369	27.73	PK	41.5	-23.7	0	45.53	-	-	-	-	68.2	-22.67	0-360	201	V

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.65	39.42	PK1	38.3	-25.6	0	52.12	-	-	74	-21.88	-	-	271	286	V
* 11.65	32.7	AD1	38.3	-25.6	.32	45.8	54	-8.2	-	-	-	-	271	286	V

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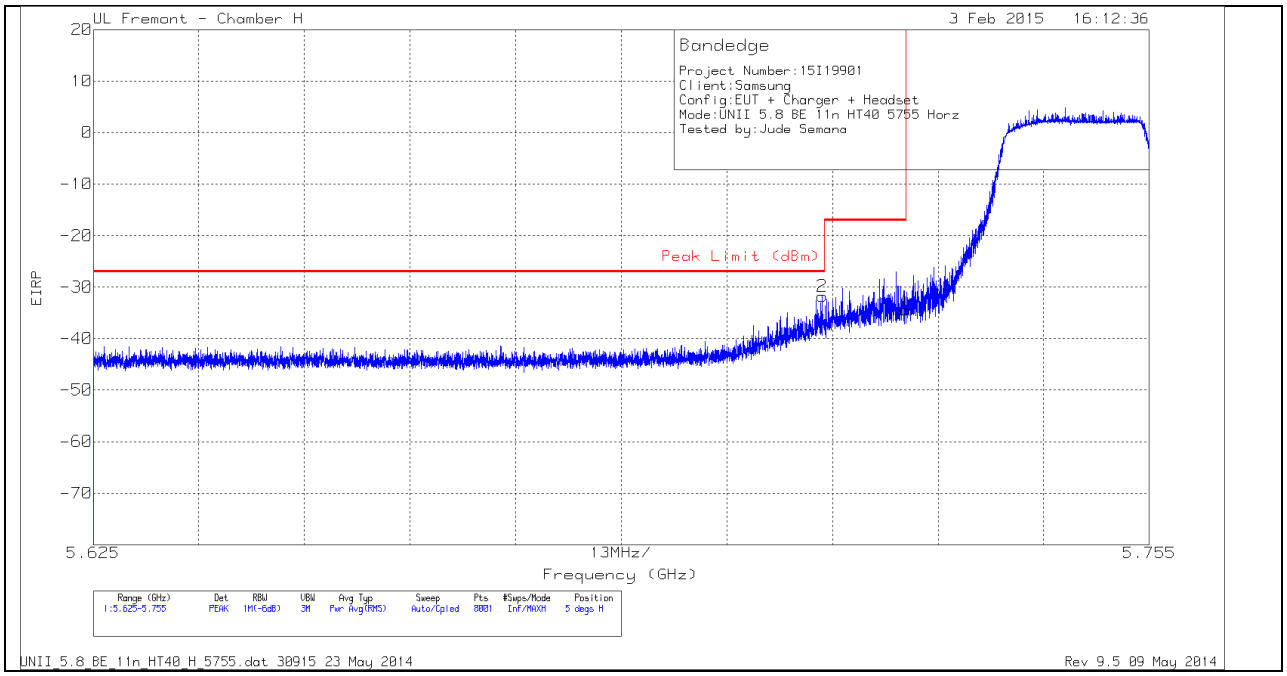
11.4.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.715	-56.18	PK	35	-22.4	11.8	0	-31.78	-27	-4.78	5	197	H
1	5.725	-58.87	PK	35	-22.4	11.8	0	-34.47	-17	-17.47	5	197	H

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

PK - Peak detector

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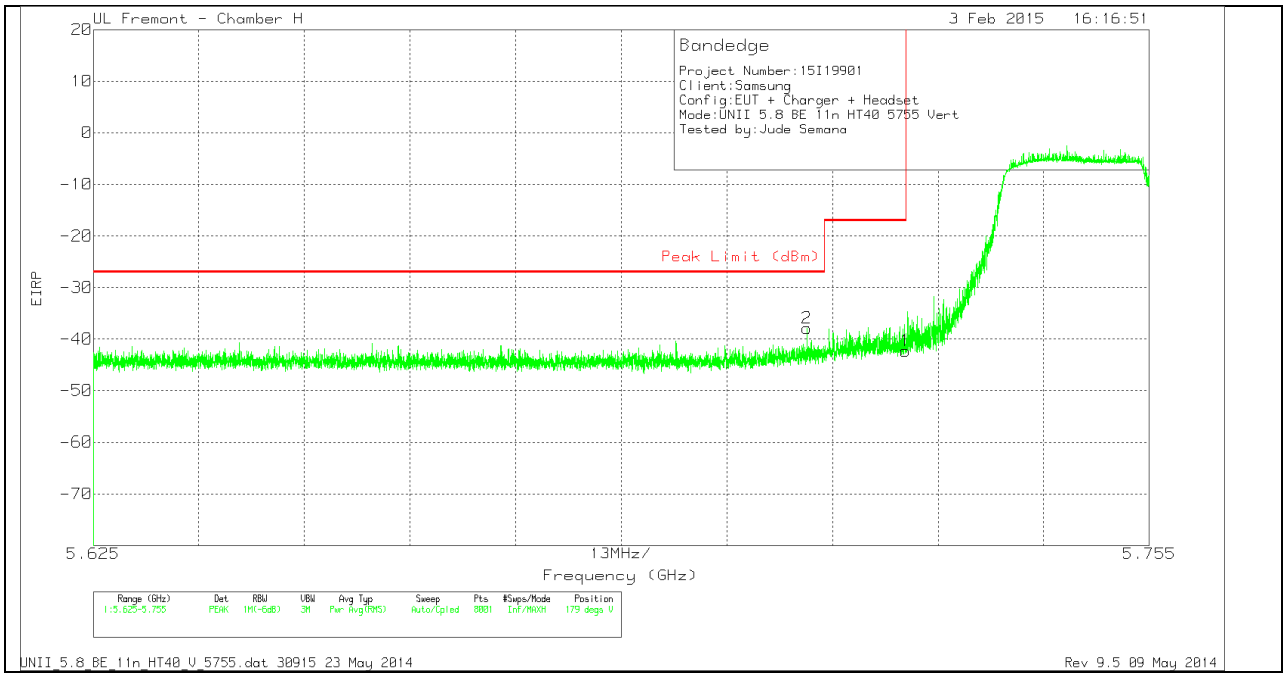
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.713	-62.28	PK	35	-22.4	11.8	0	-37.88	-27	-10.88	179	191	V
1	5.725	-66.68	PK	35	-22.4	11.8	0	-42.28	-17	-25.28	179	191	V

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

PK - Peak detector

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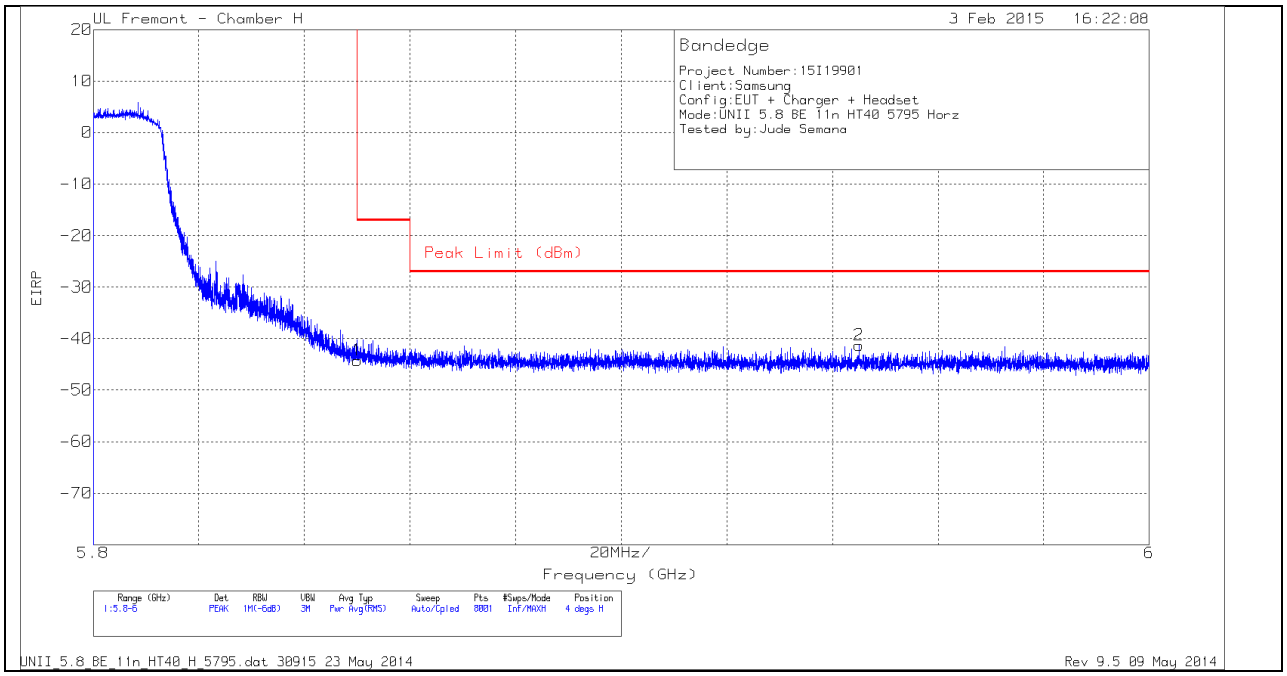
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-68.95	PK	35.1	-22.2	11.8	0	-44.25	-17	-27.25	4	258	H
2	5.945	-66.21	PK	35.2	-22.1	11.8	0	-41.31	-27	-14.31	4	258	H

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

PK - Peak detector

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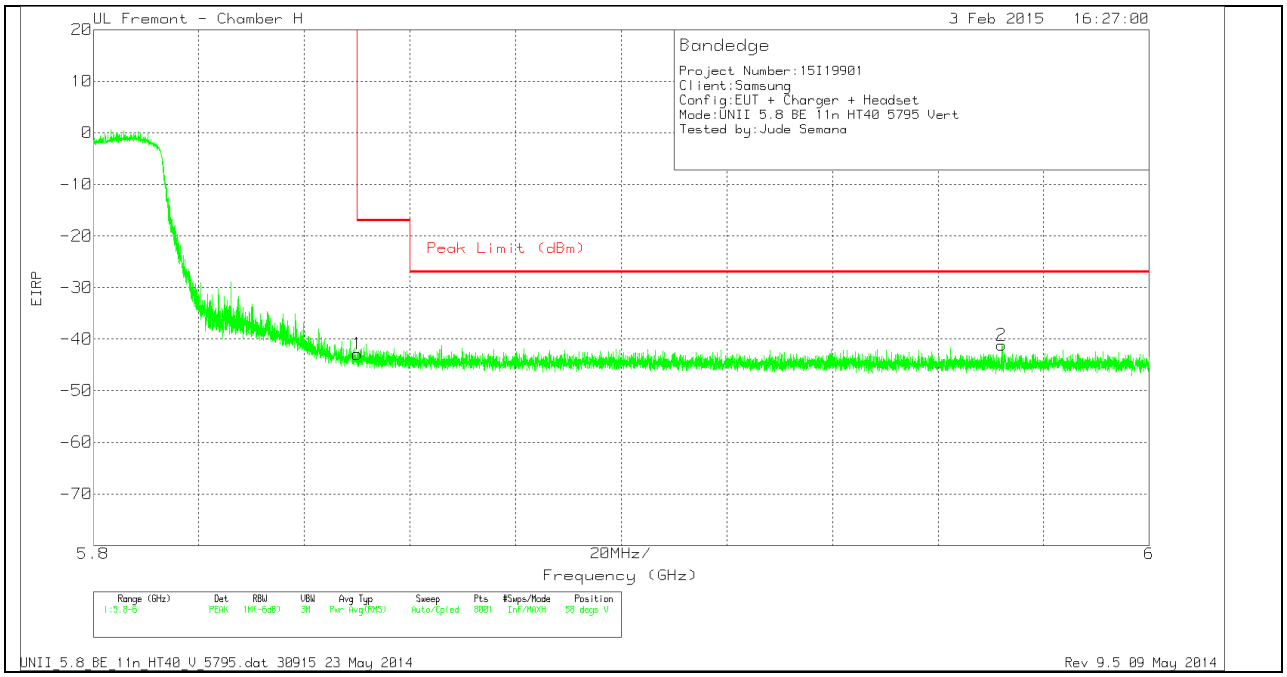
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-67.58	PK	35.1	-22.2	11.8	0	-42.88	-17	-25.88	58	282	V
2	5.972	-65.98	PK	35.2	-22.2	11.8	0	-41.18	-27	-14.18	58	282	V

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

PK - Peak detector

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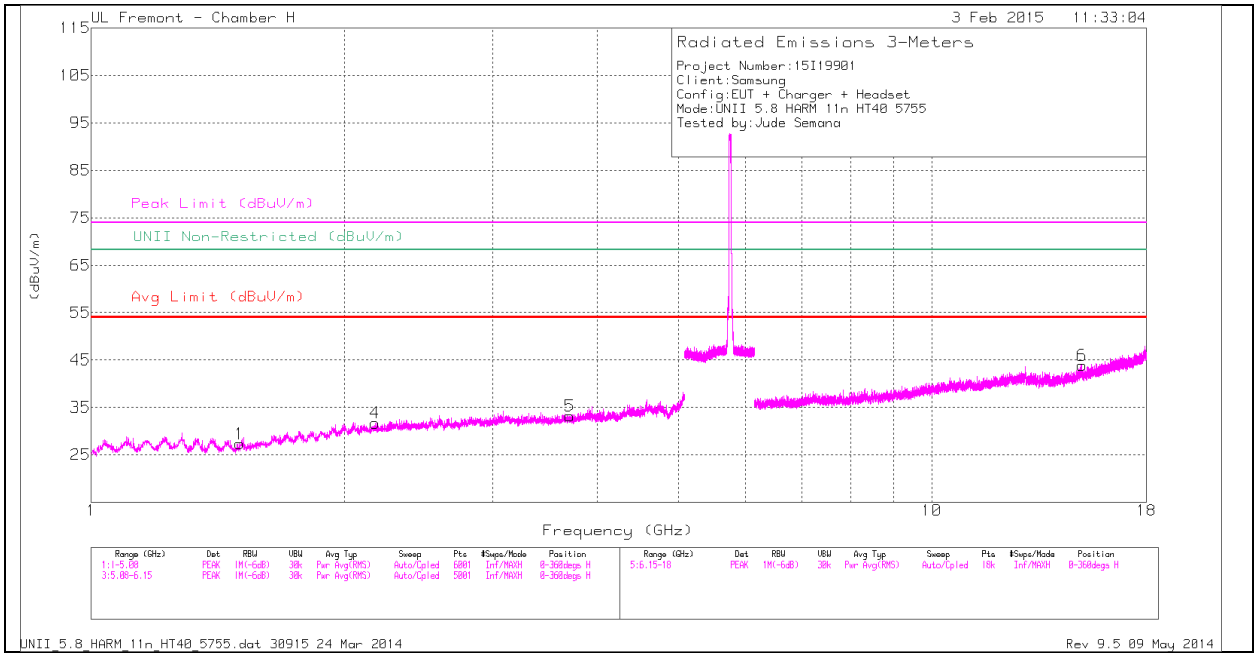
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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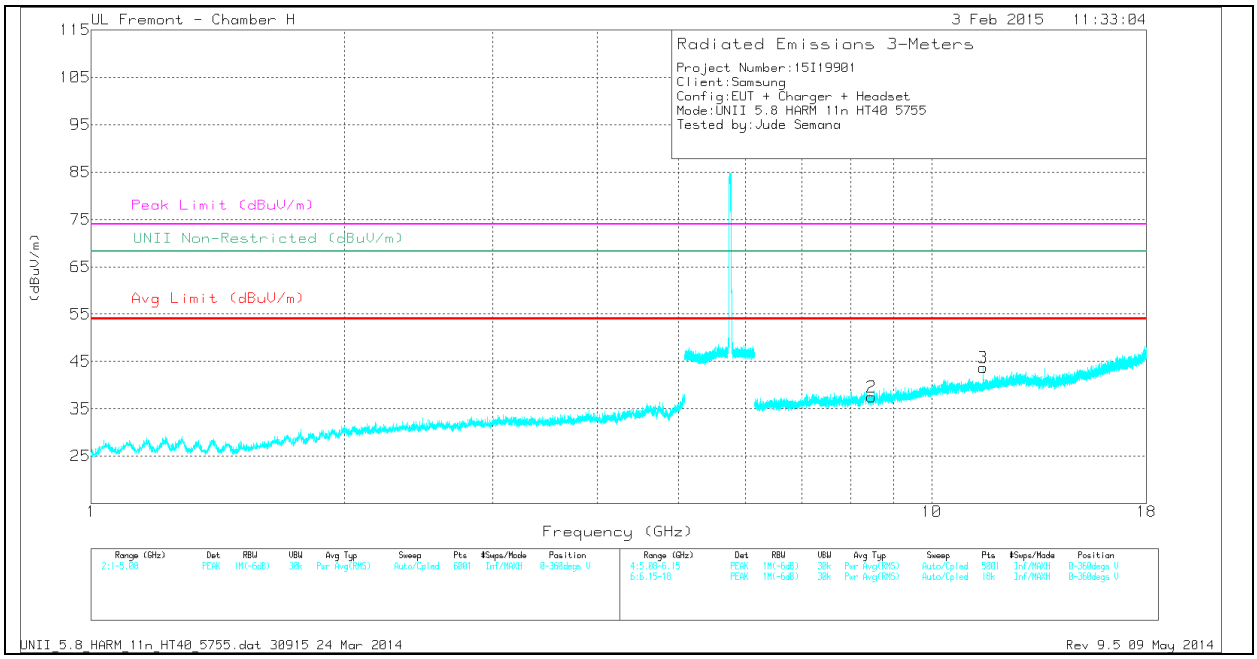
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.501	34.88	PK	27.7	-35.2	0	27.38	-	-	74	-46.62	-	-	0-360	201	H
5	* 3.708	32.6	PK	33.1	-32.5	0	33.2	-	-	74	-40.8	-	-	0-360	201	H
2	* 8.482	30.12	PK	36.1	-28.7	0	37.52	-	-	74	-36.48	-	-	0-360	100	V
3	* 11.51	31.42	PK	38.1	-25.8	0	43.72	-	-	74	-30.28	-	-	0-360	201	V
4	2.176	34.62	PK	31.6	-34.5	0	31.72	-	-	-	-	68.2	-36.48	0-360	201	H
6	15.078	29.11	PK	40.7	-25.9	0	43.91	-	-	-	-	68.2	-24.29	0-360	100	H

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.51	38.87	PK1	38.1	-25.8	0	51.17	-	-	74	-22.83	-	-	271	234	V
* 11.51	32.14	AD1	38.1	-25.8	.64	45.14	54	-8.86	-	-	-	-	271	234	V

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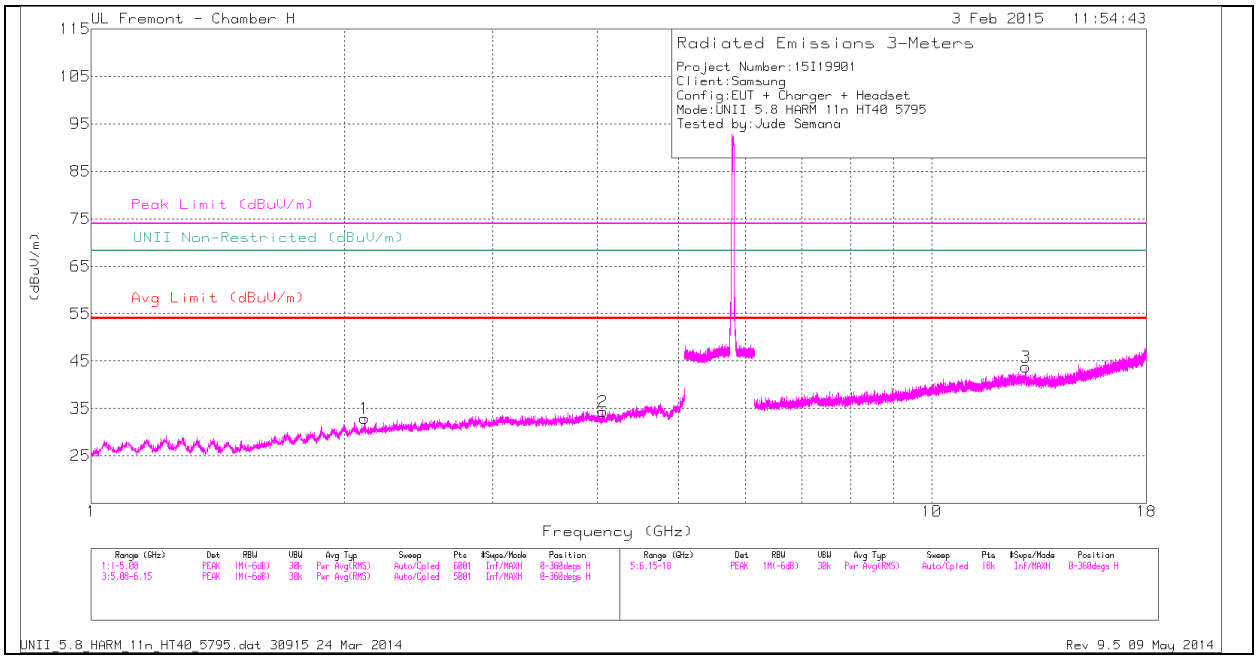
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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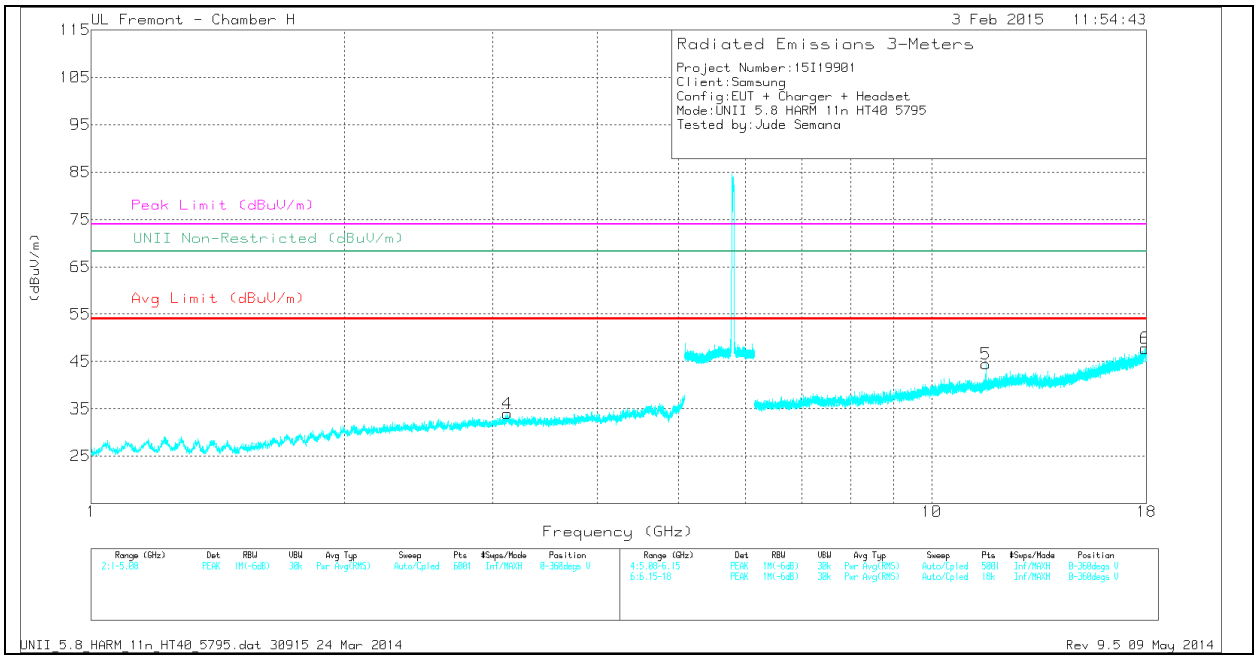
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.061	33.53	PK	33.5	-32.7	0	34.33	-	-	74	-39.67	-	-	0-360	100	H
5	* 11.59	31.35	PK	38.2	-25.1	0	44.45	-	-	74	-29.55	-	-	0-360	201	V
6	* 17.923	26.06	PK	42.5	-20.8	0	47.76	-	-	74	-26.24	-	-	0-360	201	V
1	2.114	35.84	PK	31.5	-34.4	0	32.94	-	-	-	-	68.2	-35.26	0-360	100	H
4	3.125	33.81	PK	32.9	-32.7	0	34.01	-	-	-	-	68.2	-34.19	0-360	100	V
3	12.928	29.26	PK	39.2	-24.7	0	43.76	-	-	-	-	68.2	-24.44	0-360	201	H

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.59	38.52	PK1	38.2	-25.1	0	51.62	-	-	74	-22.38	-	-	274	275	V
* 11.59	32.39	AD1	38.2	-25.1	.64	46.19	54	-7.81	-	-	-	-	274	275	V

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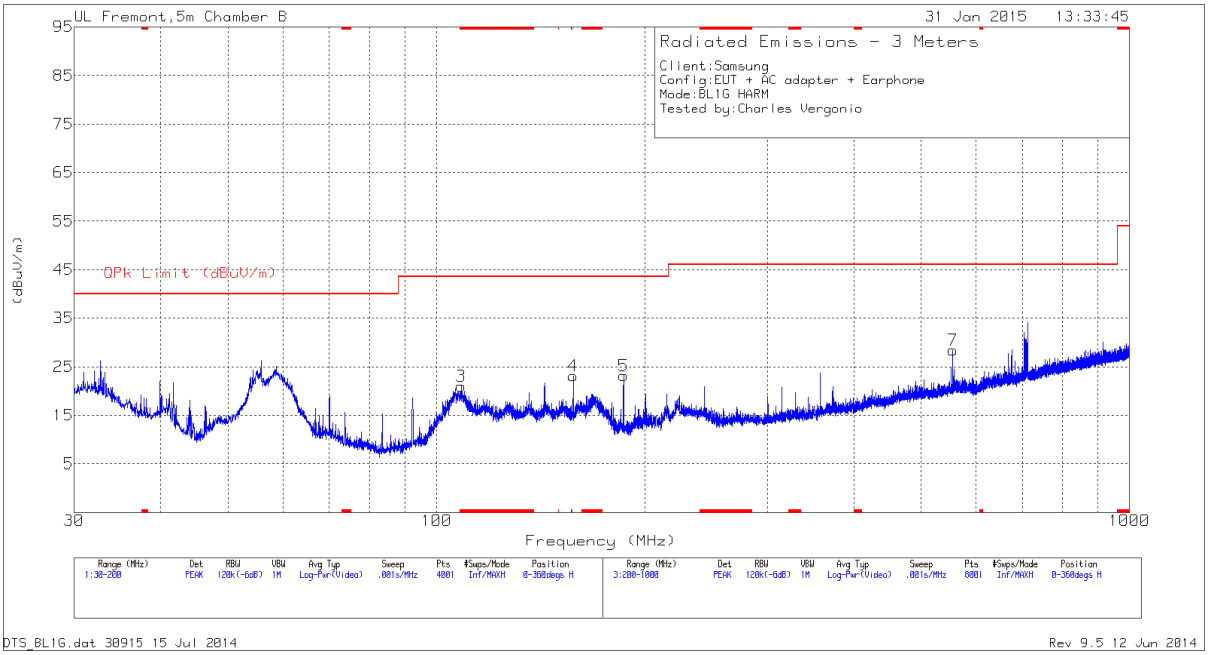
12. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band)

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



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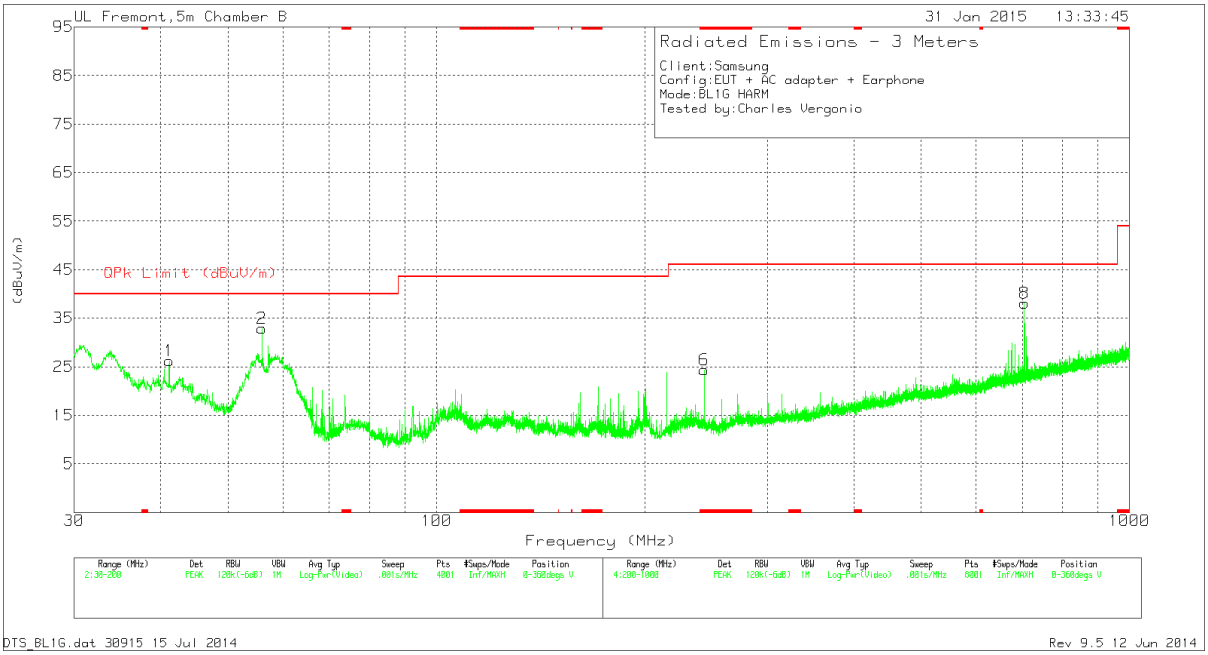
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



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Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 108.54	36.71	PK	12.3	-28	21.01	43.52	-22.51	0-360	300	H
6	* 243.4	39.27	PK	11.6	-26.5	24.37	46.02	-21.65	0-360	200	V
1	41.135	41.81	PK	13.2	-28.8	26.21	40	-13.79	0-360	101	V
2	56.01	54.22	PK	7.3	-28.6	32.92	40	-7.08	0-360	101	V
4	157.5	38.19	PK	12.3	-27.4	23.09	43.52	-20.43	0-360	100	H
5	186.145	38.95	PK	11.3	-27.1	23.15	43.52	-20.37	0-360	400	H
7	556	35.3	PK	18.6	-25.5	28.4	46.02	-17.62	0-360	200	H
8	705.2	42.4	PK	20.2	-24.5	38.1	46.02	-7.92	0-360	101	V

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13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

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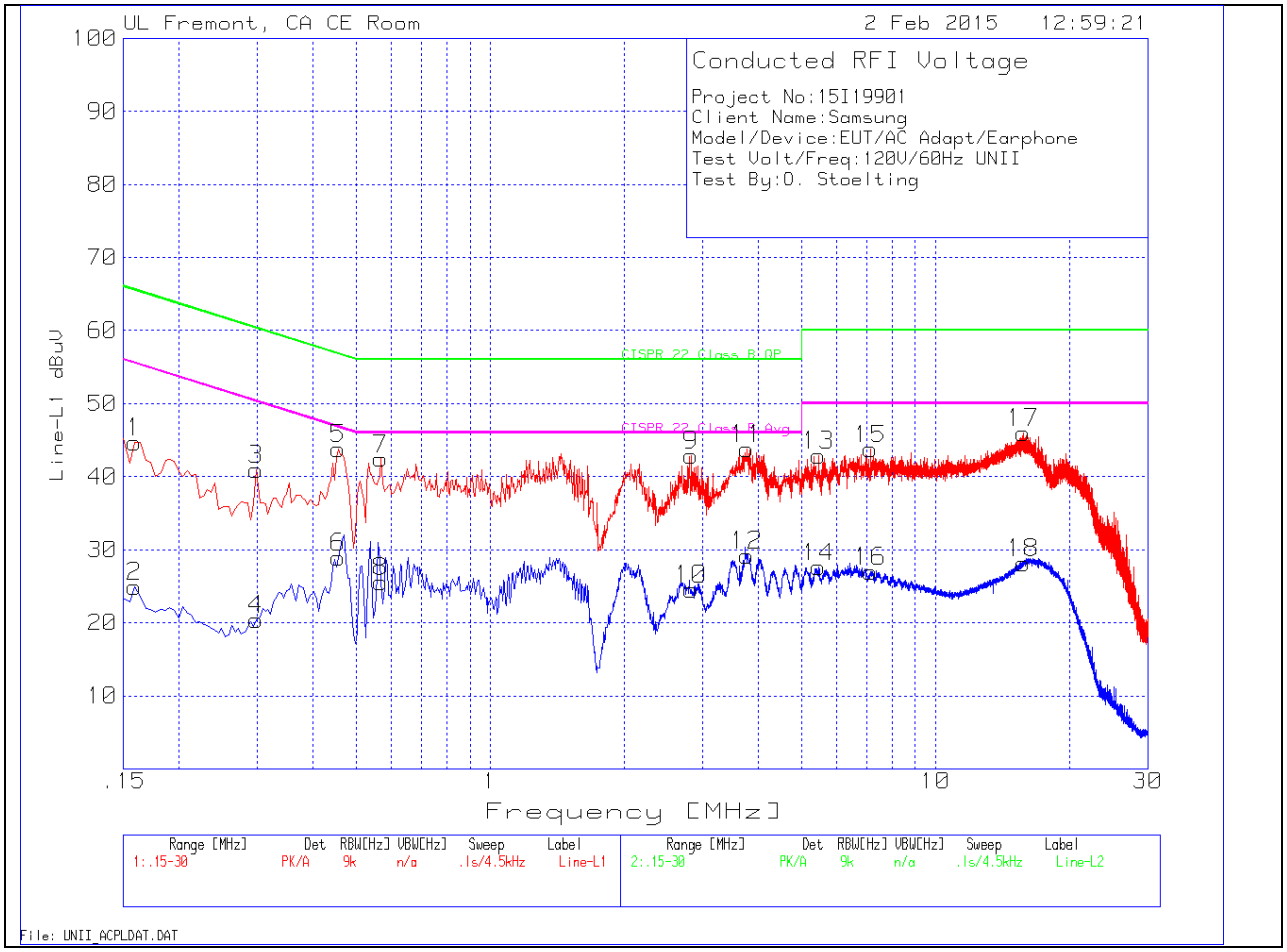
6 WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.159	43.38	PK	1.3	0	44.68	65.5	-20.82	-	-
2	.159	23.58	Av	1.3	0	24.88	-	-	55.5	-30.62
3	.2985	40.38	PK	.6	0	40.98	60.3	-19.32	-	-
4	.2985	19.81	Av	.6	0	20.41	-	-	50.3	-29.89
5	.456	43.42	PK	.4	0	43.82	56.8	-12.98	-	-
6	.456	28.54	Av	.4	0	28.94	-	-	46.8	-17.86
7	.5685	42.13	PK	.3	0	42.43	56	-13.57	-	-
8	.5685	25.32	Av	.3	0	25.62	-	-	46	-20.38
9	2.832	42.57	PK	.2	.1	42.87	56	-13.13	-	-
10	2.832	24.22	Av	.2	.1	24.52	-	-	46	-21.48
11	3.768	43.52	PK	.2	.1	43.82	56	-12.18	-	-
12	3.768	28.88	Av	.2	.1	29.18	-	-	46	-16.82
13	5.4555	42.59	PK	.2	.1	42.89	60	-17.11	-	-
14	5.4555	27.28	Av	.2	.1	27.58	-	-	50	-22.42
15	7.134	43.43	PK	.2	.1	43.73	60	-16.27	-	-
16	7.134	26.69	Av	.2	.1	26.99	-	-	50	-23.01
17	15.7695	45.49	PK	.3	.2	45.99	60	-14.01	-	-
18	15.7695	27.62	Av	.3	.2	28.12	-	-	50	-21.88

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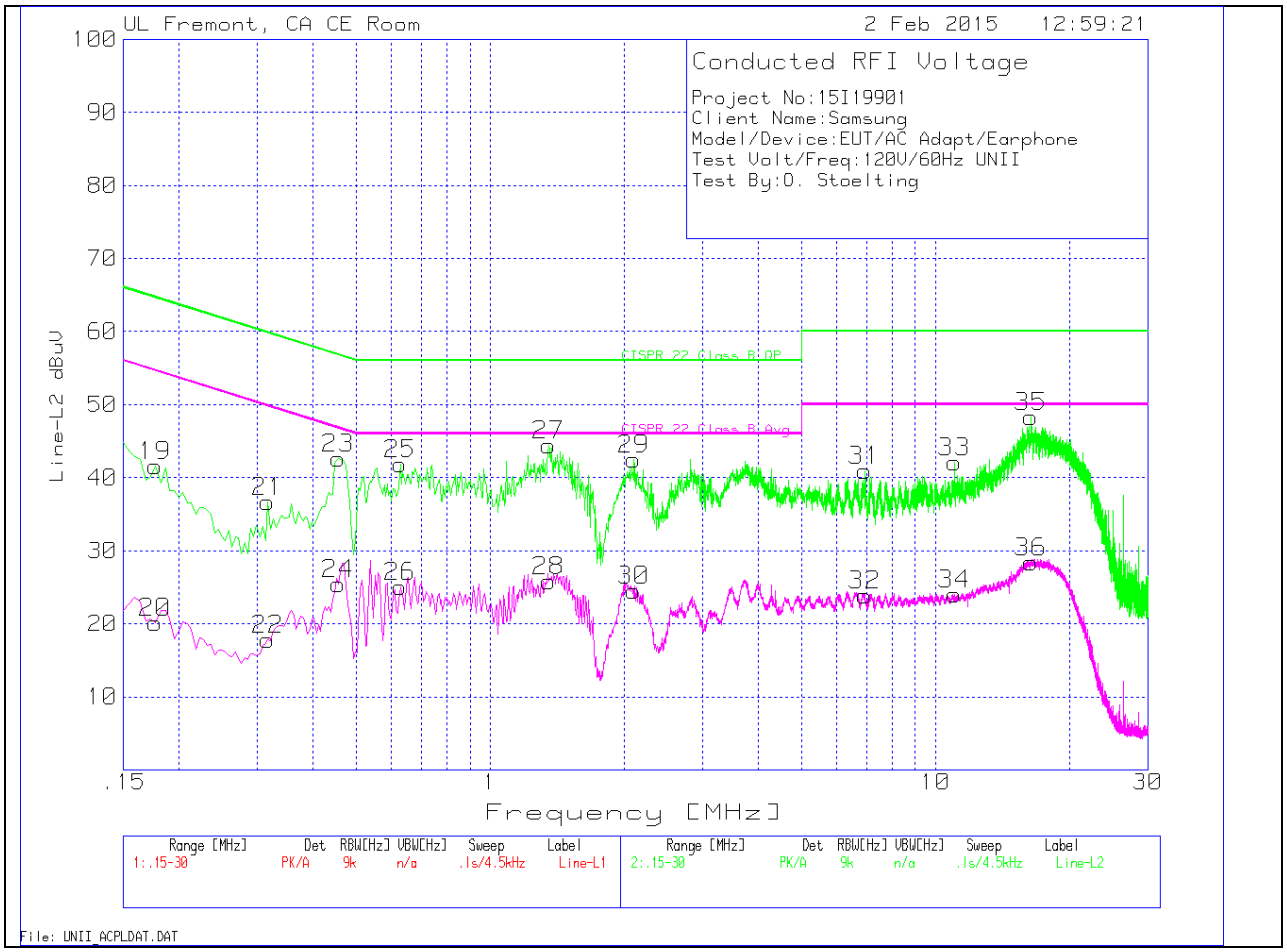
LINE 2 PLOT



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LINE 2 RESULTS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
19	.177	40.39	PK	1.2	0	41.59	64.6	-23.01	-	-
20	.177	18.95	Av	1.2	0	20.15	-	-	54.6	-34.45
21	.3165	36.1	PK	.6	0	36.7	59.8	-23.1	-	-
22	.3165	17.28	Av	.6	0	17.88	-	-	49.8	-31.92
23	.456	42.23	PK	.4	0	42.63	56.8	-14.17	-	-
24	.456	25.05	Av	.4	0	25.45	-	-	46.8	-21.35
25	.627	41.56	PK	.3	0	41.86	56	-14.14	-	-
26	.627	24.78	Av	.3	0	25.08	-	-	46	-20.92
27	1.3515	44.11	PK	.2	.1	44.41	56	-11.59	-	-
28	1.3515	25.52	Av	.2	.1	25.82	-	-	46	-20.18
29	2.103	42.15	PK	.2	.1	42.45	56	-13.55	-	-
30	2.103	24.24	Av	.2	.1	24.54	-	-	46	-21.46
31	6.9405	40.61	PK	.2	.1	40.91	60	-19.09	-	-
32	6.9405	23.55	Av	.2	.1	23.85	-	-	50	-26.15
33	11.0355	41.67	PK	.2	.2	42.07	60	-17.93	-	-
34	11.0355	23.66	Av	.2	.2	24.06	-	-	50	-25.94
35	16.359	47.83	PK	.3	.2	48.33	60	-11.67	-	-
36	16.359	27.9	Av	.3	.2	28.4	-	-	50	-21.6

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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 8 A9.3

Note: For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600–5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

FCC

§15.407 (h), FCC KDB 905462 D02 “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION” and KDB 905462 D03 “U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY”.

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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
U-NII Detection Bandwidth	Yes	Not required	Yes

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
U-NII Detection Bandwidth	Yes	Not required	Yes

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)

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U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.		

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

Maximum Transmit Power	Value (see notes)
E.I.R.P. ≥ 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-64 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. **Note 3:** E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period.

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	(See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. (See Note 3)

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: 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 a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

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Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: $\{(1/360) \times (19 \times 10^6\ PRI_{usec})\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
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

Note 1: Short Pulse Radar Type 0 should be used for the *Detection Bandwidth* test, *Channel Move Time*, and *Channel Closing Time* tests.

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Table 6 – Long Pulse Radar Test Signal

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

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

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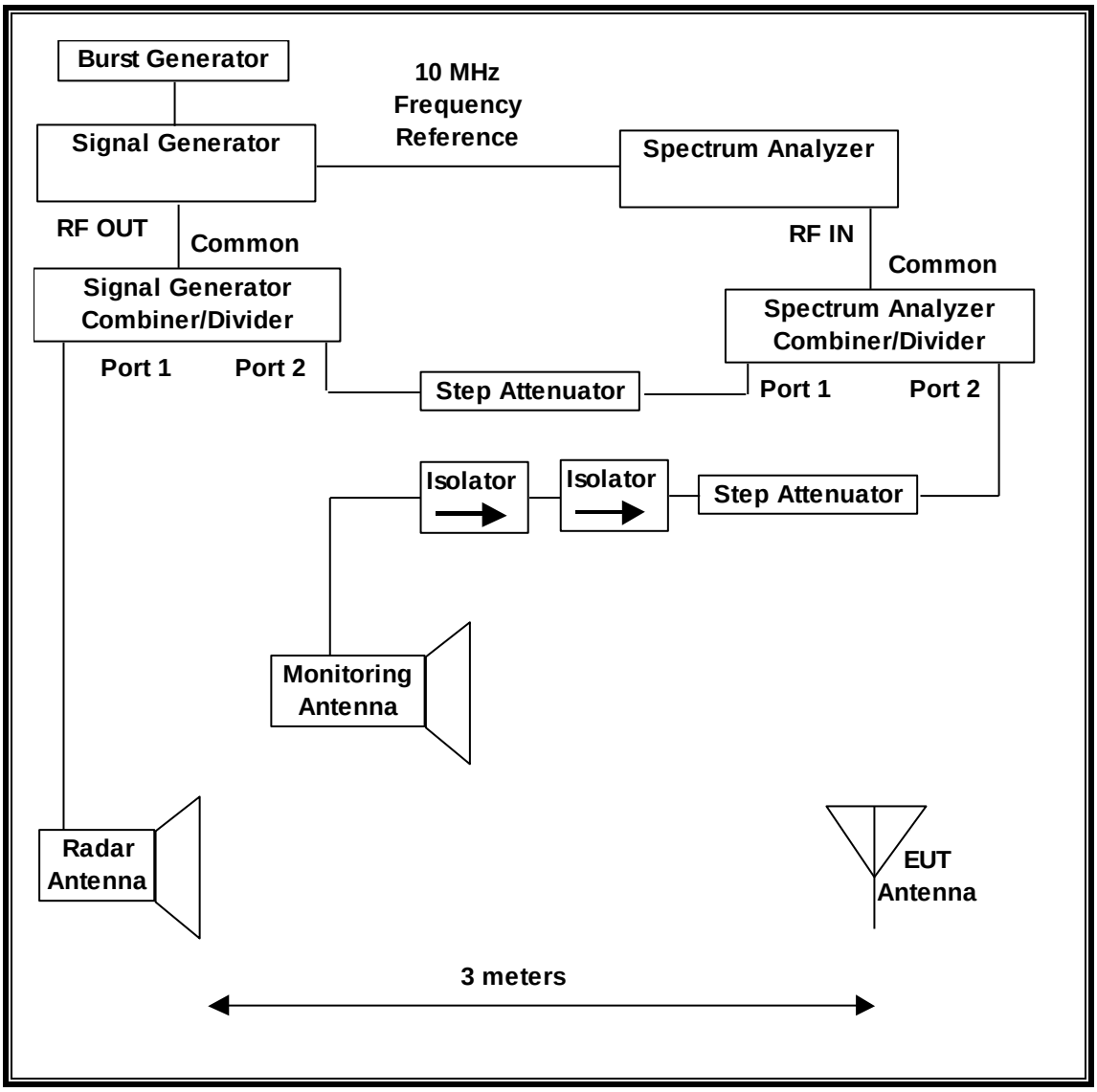
14.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



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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 1, 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 Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. 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.

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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.

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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**	**Asset Number**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/05/15
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/03/15

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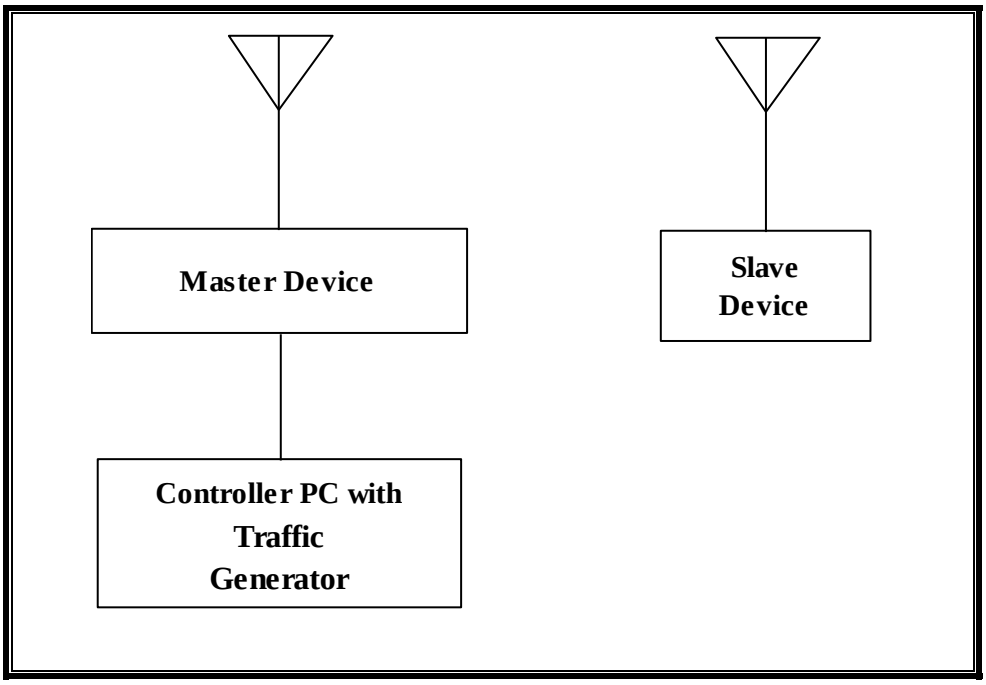
14.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

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PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
802.11ac Access Point	Cisco	AIR-CAP3702E-A-K9	FTX181570A6	LDK102087
P.O.E. Injector	Phihong	POE30U-560(G)	PHI170102N2	DoC
Notebook PC (Controller)	Lenovo	Type 20B7-S0A200	PF-02JN9J 14/06	DoC
AC Adapter (Controller PC)	Lenovo	ADLX65NLC2A	11S45N0259Z1ZS97	DoC

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14.1.4. DESCRIPTION OF EUT

For FCC and IC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 11.34 dBm EIRP in the 5250-5350 MHz band and 11.26 dBm EIRP in the 5470-5725 MHz band.

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 a margin to the limit.

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

WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the controller/server PC to the EUT using iPerf version 2.0.5 software package.

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

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is AP3G2-K9W7-M version 15.2(4)JB4.

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UNIFORM CHANNEL SPREADING

This is requirement not applicable to Slave Devices.

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

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 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 a margin to the limit.

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14.2. RESULTS FOR 20 MHz BANDWIDTH

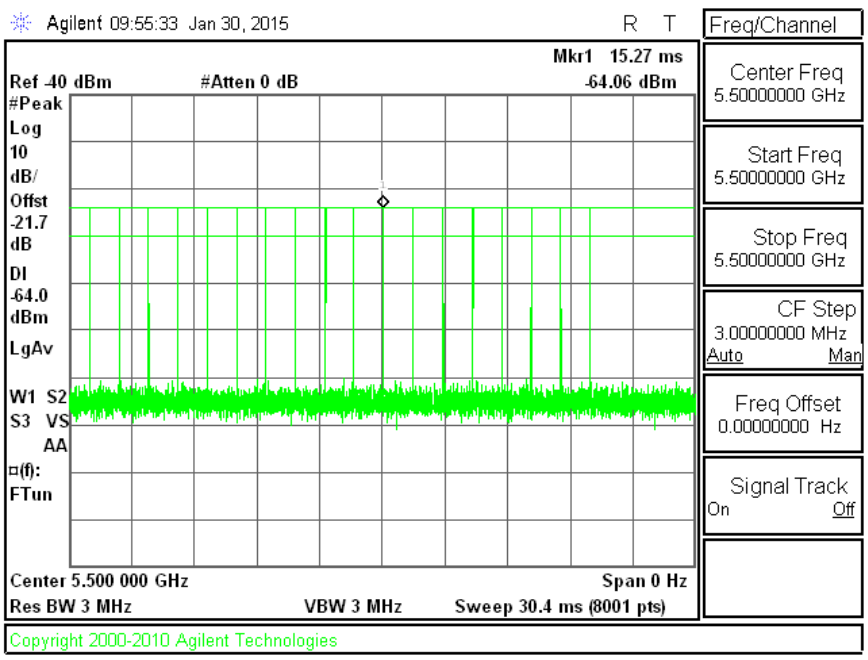
14.2.1. TEST CHANNEL

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

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM

SHORT PULSE RADAR TYPE 0 AT MASTER



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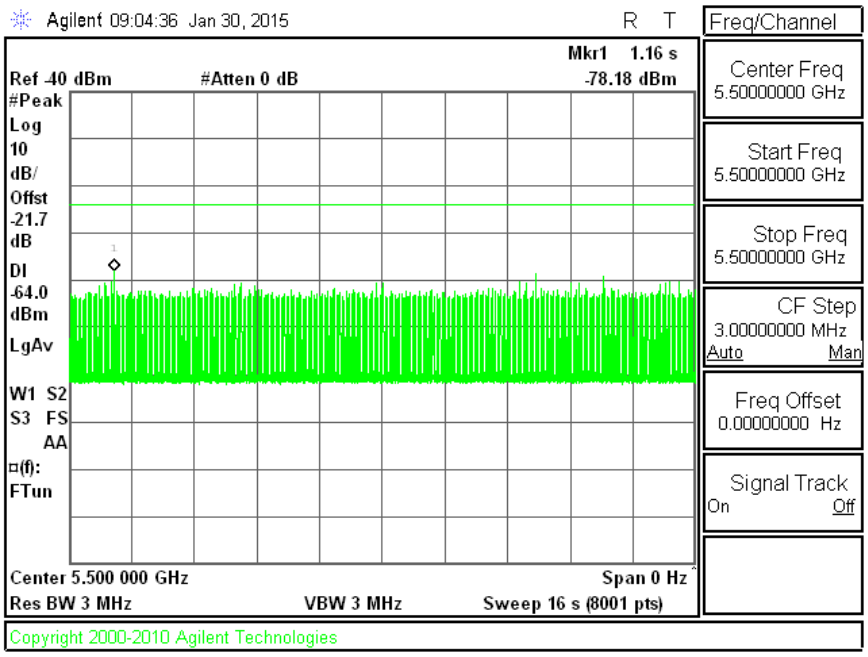
TRAFFIC

SLAVE TRAFFIC



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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 aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

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RESULTS

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

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

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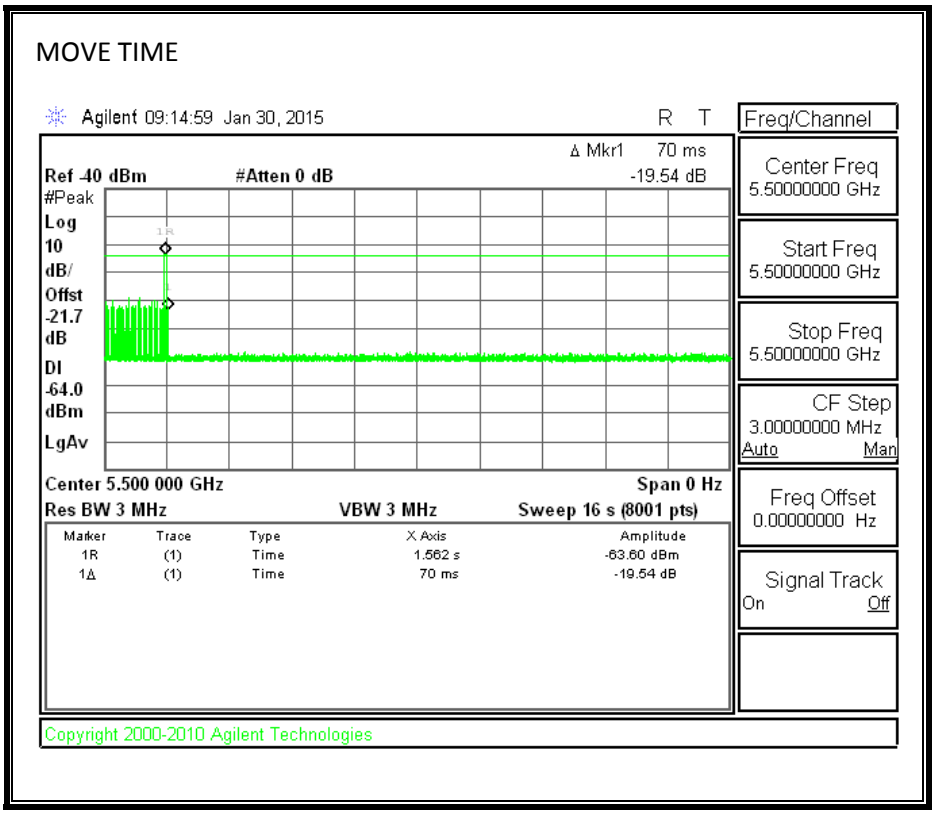
MOVE TIME



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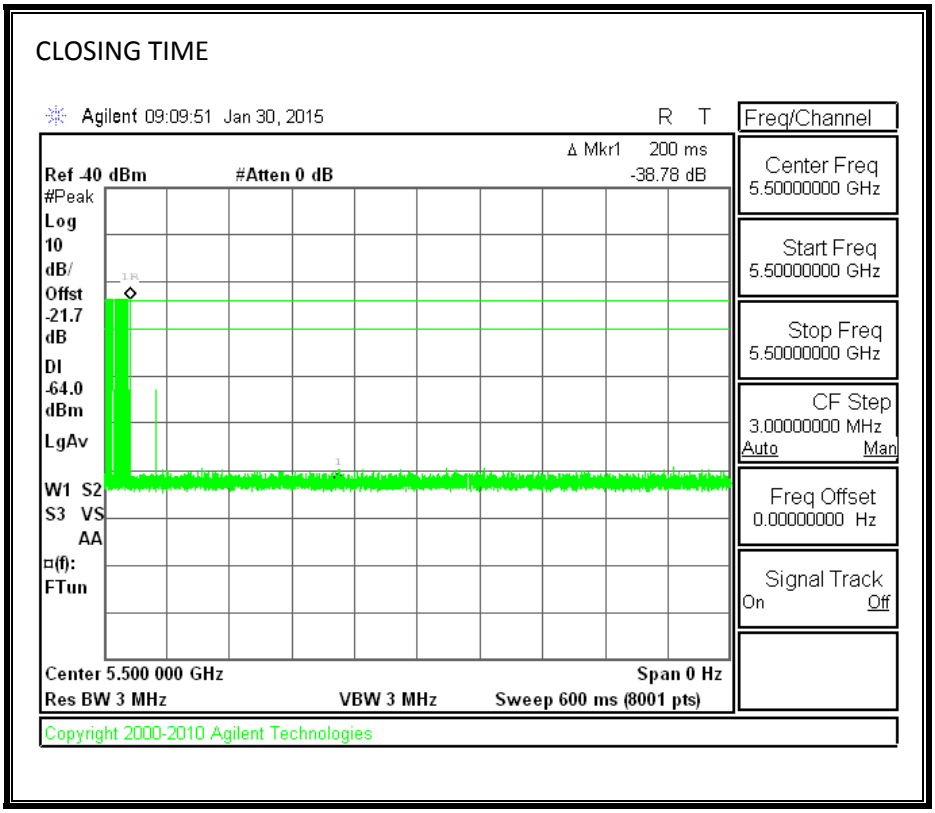
CHANNEL CLOSING TIME



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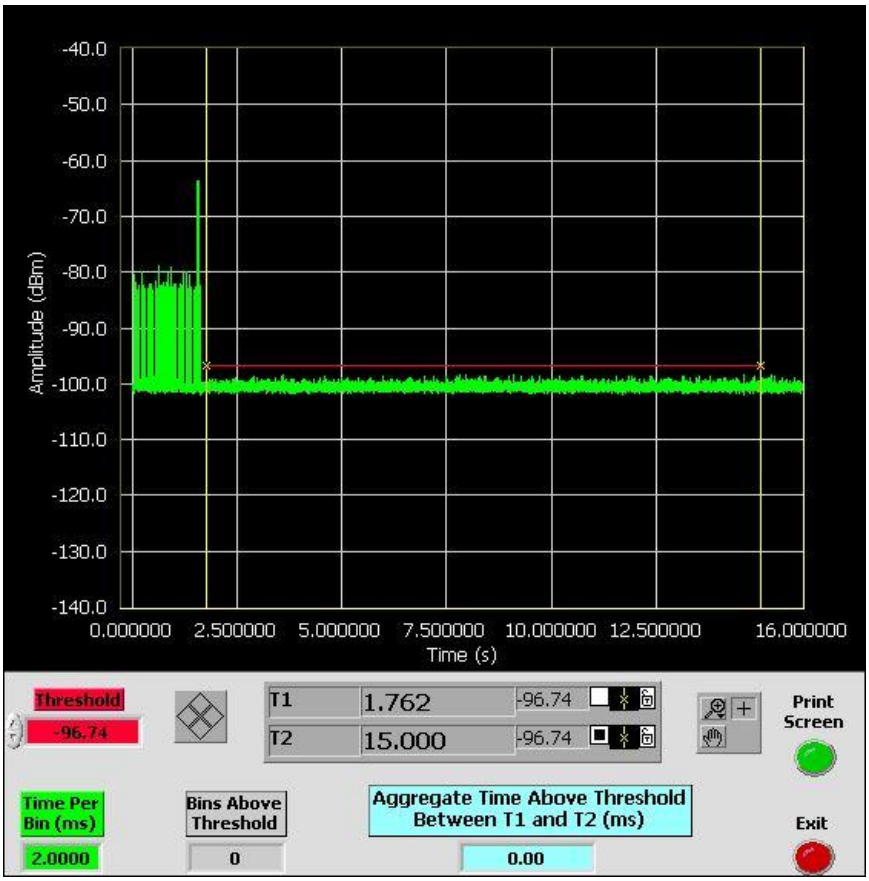
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



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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

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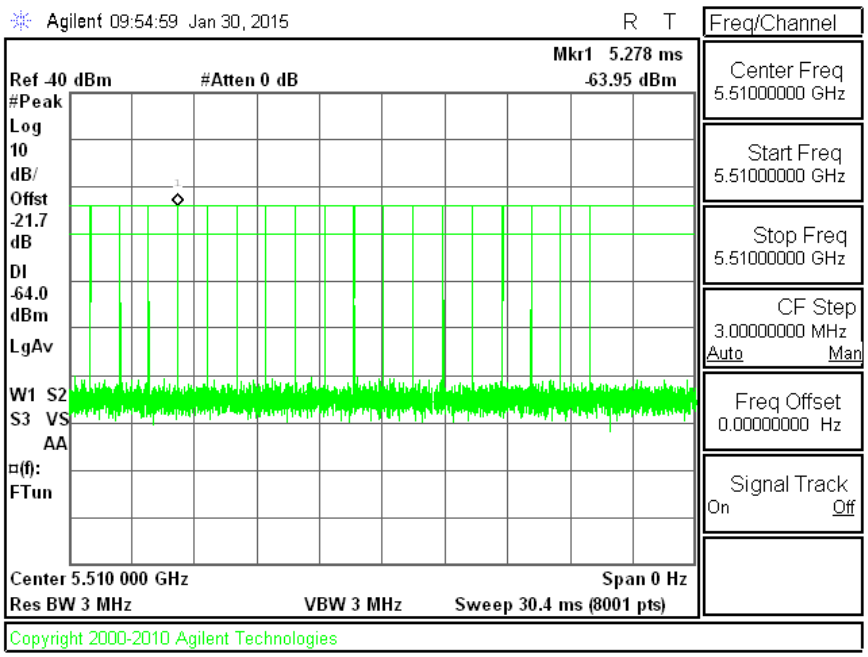
SHORT PULSE RADAR TYPE 0 AT MASTER



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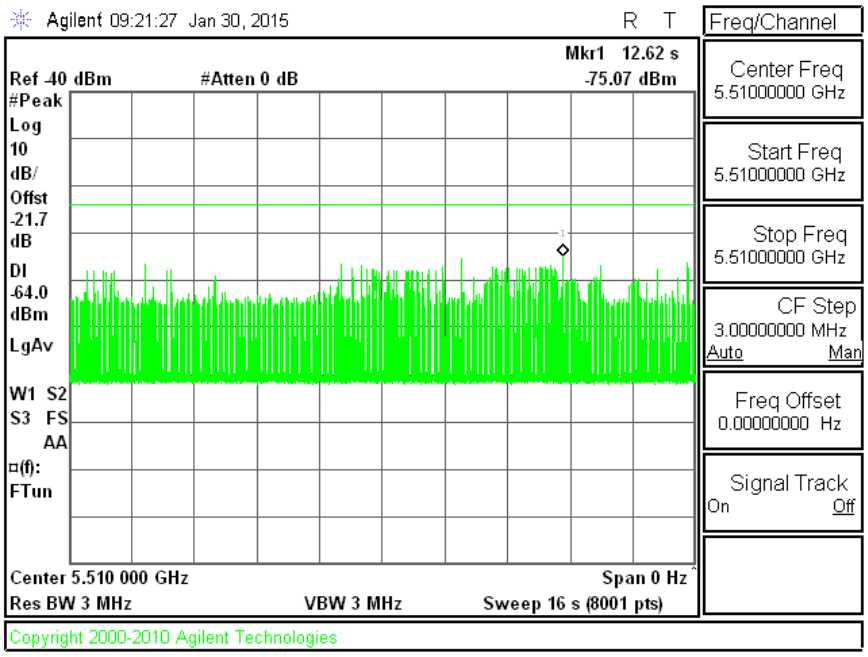
TRAFFIC

SLAVE TRAFFIC



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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 aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

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RESULTS

Channel Move Time (sec)	Limit (sec)
0.066	10

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

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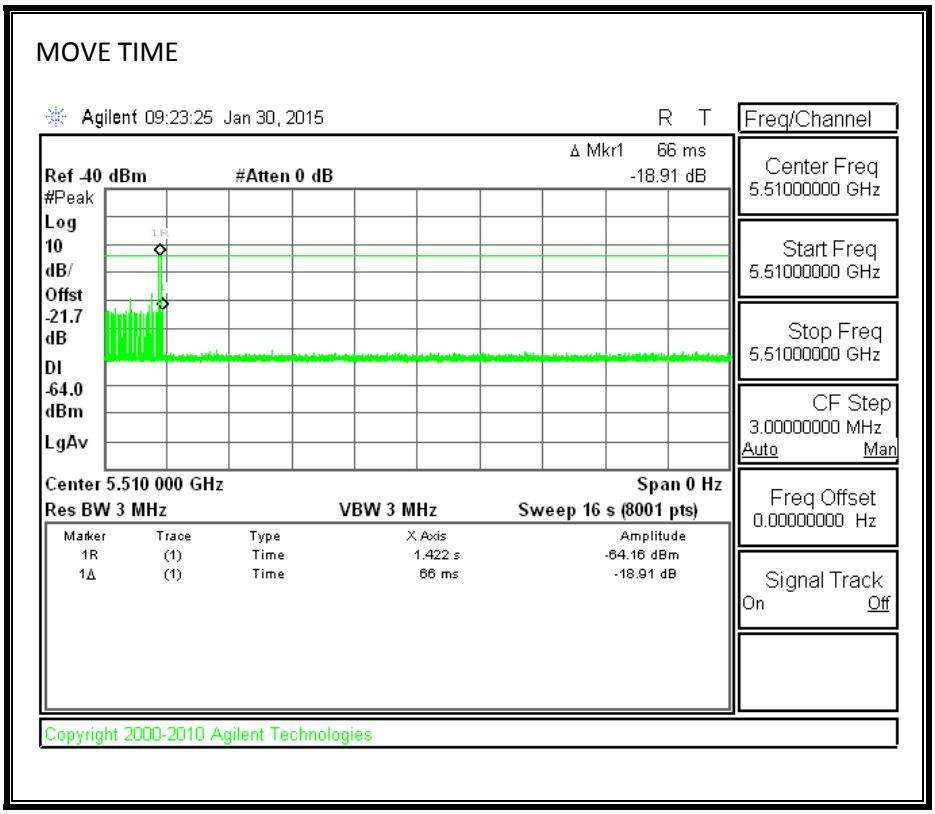
MOVE TIME



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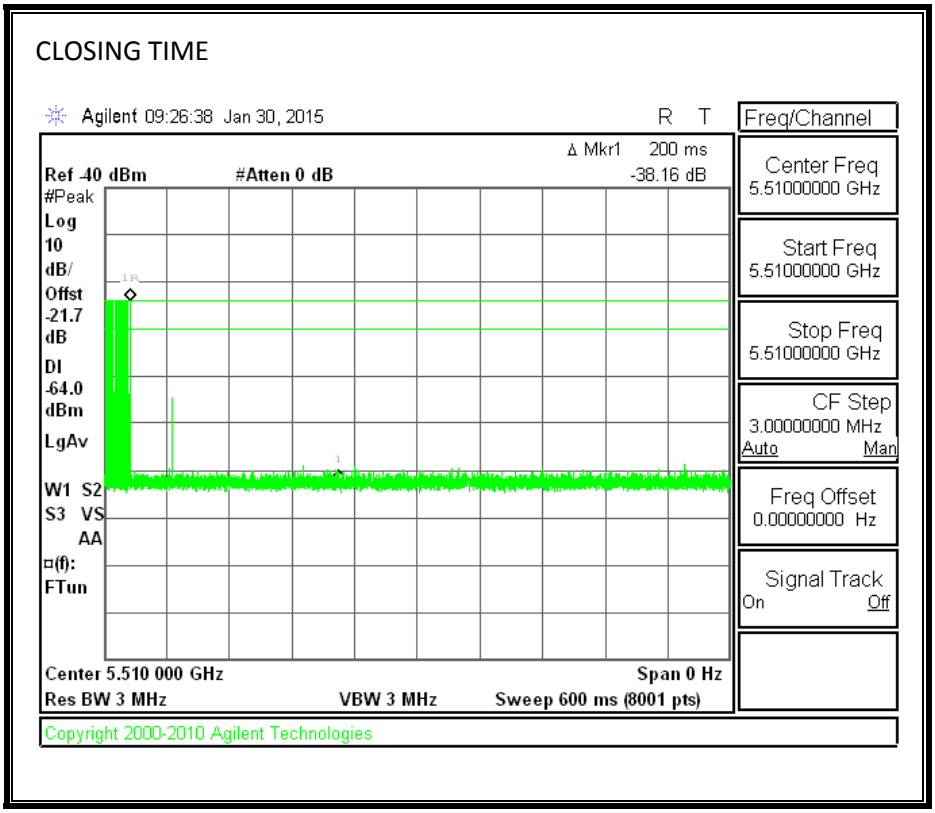
CHANNEL CLOSING TIME



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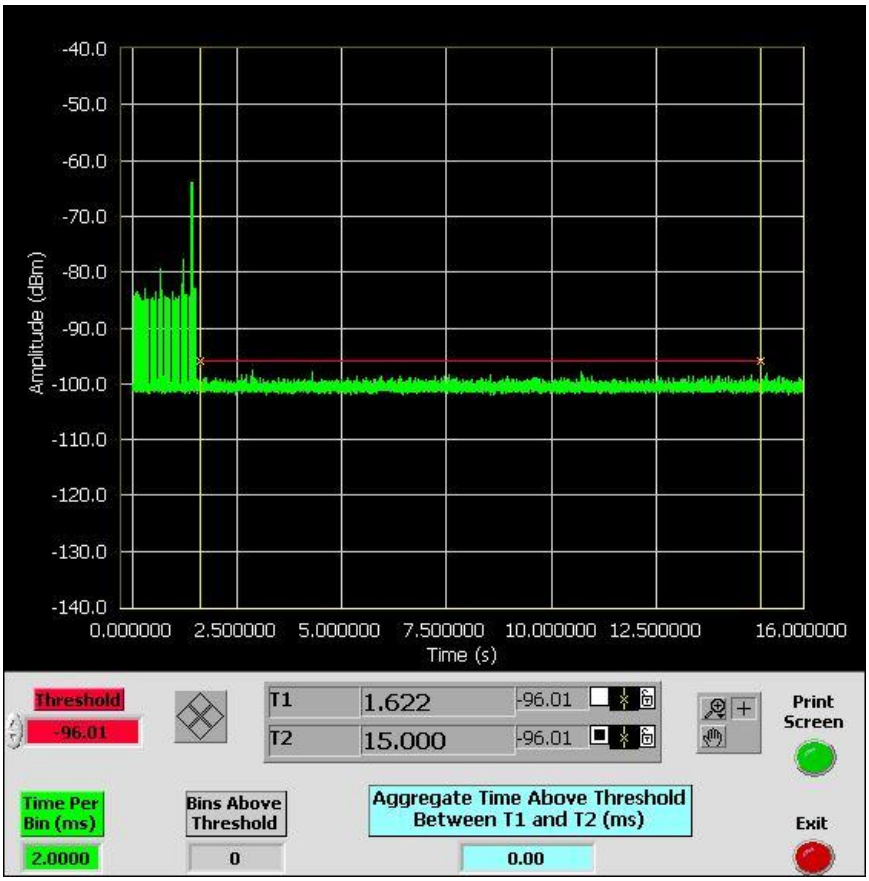
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



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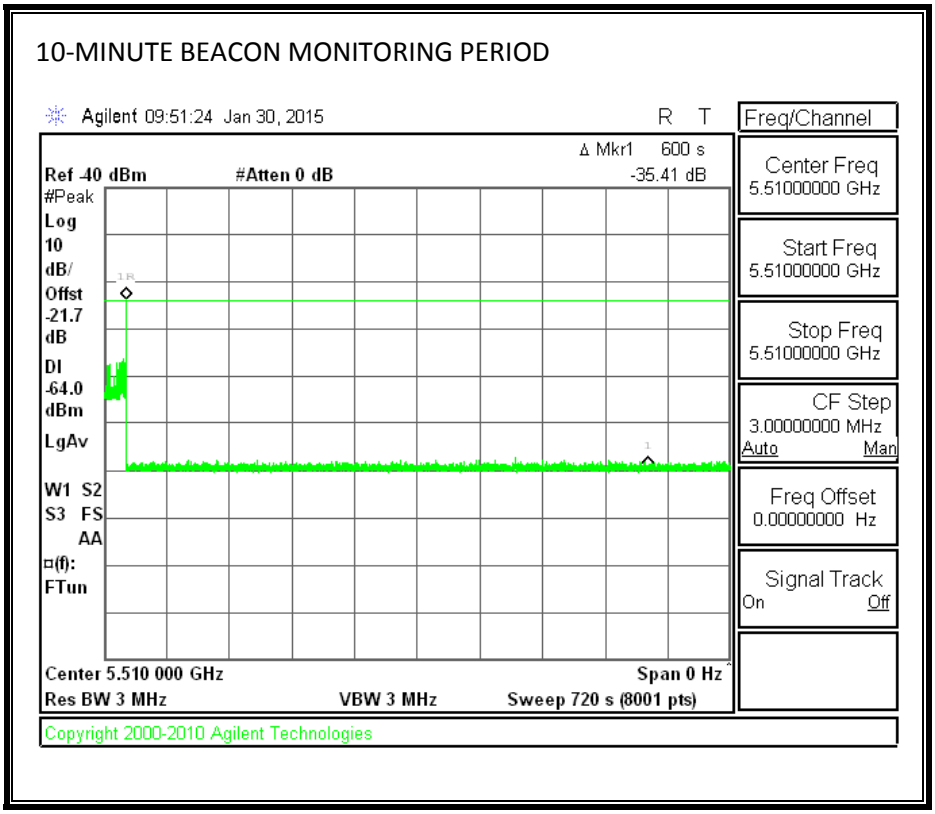
14.3.5. 10-MINUTE BEACON MONITORING PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



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