TEST REPORT

Report Number : 11361969-E2V4

Applicant : SONOS INC.
614 CHAPALA STREET
SANTA BARBARA, CA 93101, U.S.A.

Model : S11

FCC ID : SBVRM011

IC ID : 5373A-RM011

TEST REPORT FOR SONOS MODEL NUMBER S11

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E (EXCEPT DFS)
INDUSTRY CANADA RSS-247 ISSUE 1 (EXCEPT DFS)
INDUSTRY CANADA RSS-GEN Issue 4

Date of Issue:
12/26/2016

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	10/14/16	Initial Issue	D. Coronia
V2	12/06/16	Updated Section 5.3, 5.5, 5.7 & 8.1	D. Coronia
V3	12/13/16	Updated Section 8.1 & 8.2.4	D. Coronia
V4	12/26/16	Updated Section 5.2, 7.3.2 & 7.4.3	D. Coronia

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONOS, INC.

PRODUCT DESCRIPTION: WIRELESS SMART SPEAKER

MODEL: S11

SERIAL NUMBER: B8-E9-37-40-13-24-4 (Conducted)
B8-E9-37-40-13-1E-F (Radiated)

DATE TESTED: AUGUST 22 – 30 – DECEMBER 21, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E (EXCEPT DFS)	Pass
INDUSTRY CANADA RSS-247 Issue 1 (EXCEPT DFS)	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

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

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

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 789033 D02 v01r03, KDB 662911, ANSI C63.10-2013, RSS-GEN Issue 4, RSS-247 Issue 1.

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)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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.

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

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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	3.84 dB
Radiated Disturbance, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	5.23 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 Wireless Smart Speaker.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11n HT20 MIMO	16.27	42.36
5260 - 5320	802.11n HT20 MIMO	21.11	129.12
5500 - 5700	802.11n HT20 MIMO	20.26	106.17
5745-5825	802.11n HT20 MIMO	23.17	207.49

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes cross-polarized antennas, with a maximum gain as below:

Location	Sonos Part Number	ID	Chain	Description	Gain dBi	
					5150 - 5350 MHz	5500 - 5850 MHz
Front Right	105-00094	Yellow	1	Horizontal Polarity, PCB dual-band IFA	5.7	6.2
Front Left	105-00090	Blue	0	Vertical Polarity, Dual-band stamped metal monopole on FR4 substrate	4.5	4.6

NOTE: All final tests were performed using the EUT highest antenna gain with same polarity as the test measurement setup.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was Atheros Radio Test 2 (ART2-GUI).

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5.5. WORST-CASE CONFIGURATION AND MODE

Above 1GHz Low/Middle/High channel were tested for radiated emissions. Below 1GHz, above 18GHz and conducted power line emissions, the channel with the highest output power was tested.

The manufacturer has recommended that the EUT only be used in the desktop (horizontal) orientation; therefore, all radiated testing was performed in desktop orientation.

Worst-case data rates as provided by the client were:

802.11n HT20 Mode: MCS0.

The EUT was placed on normal orientation and all radiated emissions were performed with the EUT shown on the setup photo.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	**Manufacturer**	**Model**	**Serial Number**
Laptop	Lenovo	X201	R9-6KTFV
AC/DC Adapter	Lenovo	ADLX90NCT2A	11S45N0311Z1ZLZ632KMOT

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC Power	1	AC	Unsheilded	1	AC Mains to AC/DC Adapter
2	DC Power	1	DC	Sheilded	1.2	AC/DC Adapter to Laptop
3	Ethernet	1	RJ45	Unsheilded	1.5	Laptop to EUT
4	AC Power	1	AC	Unsheilded	1.2	AC Mains to EUT

TEST SETUP

The EUT is a stand-alone unit, and the radio is exercised by Atheros Radio Test 2 (ART2-GUI) software, via USB cable.

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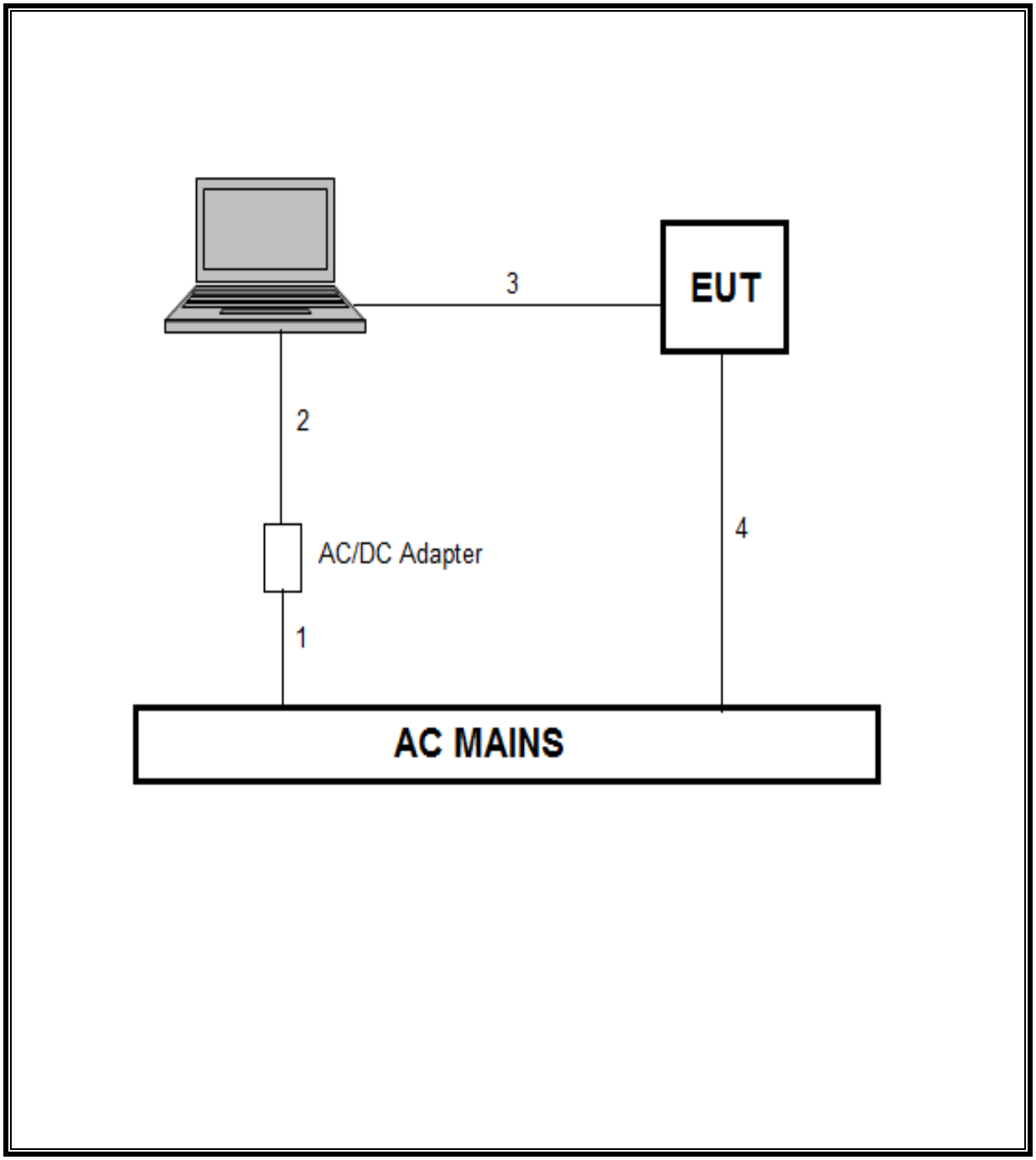
SETUP DIAGRAM FOR TESTS



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5.7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**T No.**	**Cal Date**	**Cal Due**
Amplifier, 1 - 18GHz	Miteq	AFS42	1165	08/01/16	08/01/17
Amplifier, 1 - 26.5GHz, 23.5dB	Agilent	8449B	404	07/05/16	07/05/17
Amplifier, 26 - 40GHz	Miteq	NSP 400 SP2	88	04/07/16	04/07/17
Amplifier, 10KHz to 1GHz, 32dB	HP	8447D	10	02/01/16	02/01/17
Antenna, Broadband Hybrid 30MHz to 2000MHz	Sunol Science	JB1	130	03/09/16	03/09/17
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	346	02/22/16	02/22/17
Antenna, Horn 18 - 26.5GHz	Seavey Division	MWH-1826/B	449	05/26/16	05/26/17
Antenna, Horn 26.5 - 40GHz	ARA	MWH-2640/B	446	05/25/16	05/25/17
EMI Test Receiver 9Khz-7GHz	R& S	ESCI7	1436	09/23/16	09/23/17
LISN for Conducted Emissions	Fischer	50/250-25-2	1310	06/08/16	06/08/17
Loop Antenna, 10KHz-30MHz	EMCO	6502	35	03/24/16	03/24/17
PSA Spectrum Analyzer 40GHz	Agilent	E4446A	146	07/13/16	07/13/17
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	908	04/13/16	04/13/17
USB RF Power Sensor, 10MHz to 6GHz	ETS-Lindgren	7002-006	1126	02/10/16	02/10/17
Filter, HPF 6HPF	Micro-Tronics	HPS17542	483	03/09/16	03/09/17
Filter, HPF 3GHz	Micro-Tronics	HPM17543	485	03/09/16	03/09/17

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016

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5.8. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v01r03, Section B.

6 dB Emission BW: KDB 789033 D02 v01r03, Section C.

26 dB Emission BW: KDB 789033 D02 v01r03, Section C.

99% Occupied BW: KDB 789033 D02 v01r03, Section D.

Conducted Output Power: KDB 789033 D02 v01r03, Section E.3.b (Method PM-G), and KDB 662911 D01 v02r01

Power Spectral Density: KDB 789033 D02 v01r03, Section F, and KDB 662911 D01 v02r01

Unwanted emissions in restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

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6. SUMMARY TABLE

FCC Part Section	RSS Section	Test Description	Test Limit	Test Condition	Test Result
§15.407 (a)	RSS-247	Occupied Band width (26dB)	N/A	Conducted	Pass
§15.407	RSS-247 6.2.4	6dB Band width (5.8Ghz)	>500KHz		Pass
§15.407 (a)(1)	RSS-247 6.2	TX Cond. Power5.15-5.25 GHz	<24dBm (FCC) / <23 dBm EIRP or <10+10Log(99% BW) EIRP (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	TX Cond. Power 5.25-5.35 & 5.47-5.725 GHz	<24dBm or <11+10log (OBW) (FCC) / <24 dBm or <11+10Log(99% BW) (IC)		Pass
§15.407 (a)(3)	RSS-247 6.2.4	TX Cond. Power 5.725-5.850 GHz	<30dBm		Pass
§15.407 (a)(1)	RSS-247 6.2	PSD (5.15-5.25 GHz)	<11dBm/MHz (FCC) <10 dBm/MHz EIRP (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	PSD (5.3,5.5GHz)	<11dBm/MHz		Pass
§15.407 (a)(3)	RSS-247 6.2.4	PSD (5.8GHz)	<30dBm per 500kHz		Pass
§15.207 (a) §15.407(b) (6)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10		Pass
§15.407 (b) & 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	<54dBuV/m	Radiated	Pass

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7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

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/B Minimum VBW (kHz)
802.11n HT20 CDD	1.887	1.932	0.977	97.67%	0.10	0.530

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DUTY CYCLE PLOTS

DUTY CYCLE 802.11n HT20 MODE

ID:	44350	**Date:**	08/23/16

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7.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

7.2.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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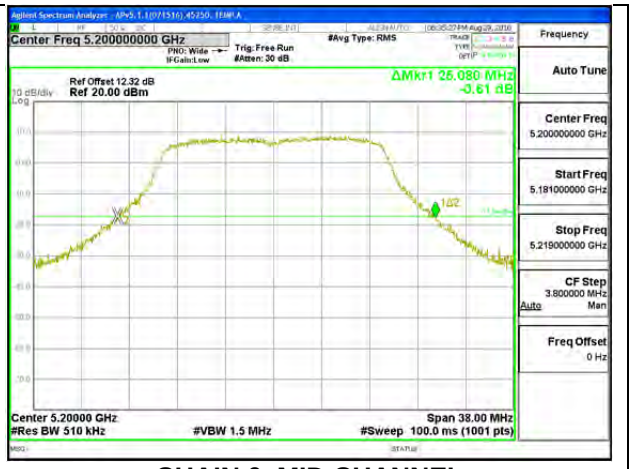
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	25.04	24.31
Mid	5200	25.08	24.27
High	5240	24.93	24.64

CHAIN 0, LOW CHANNEL



CHAIN 0, MID CHANNEL

CHAIN 0, HIGH CHANNEL

CHAIN 1, LOW CHANNEL

CHAIN 1, MID CHANNEL

CHAIN 1, HIGH CHANNEL

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7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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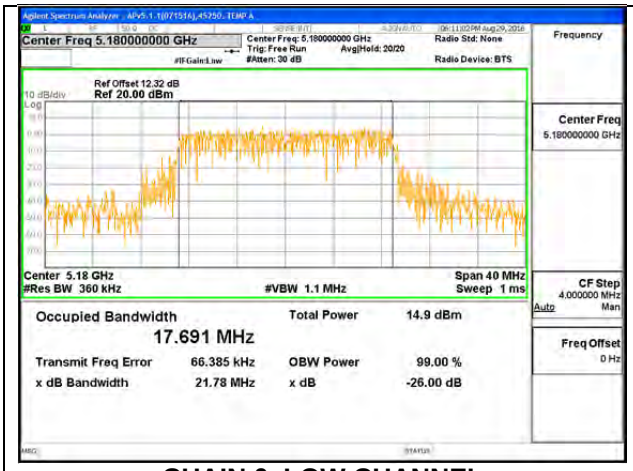
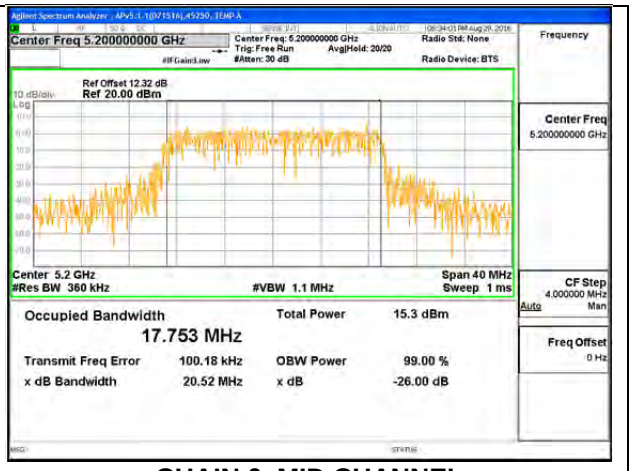
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.691	17.752
Mid	5200	17.753	17.836
High	5240	17.589	17.654

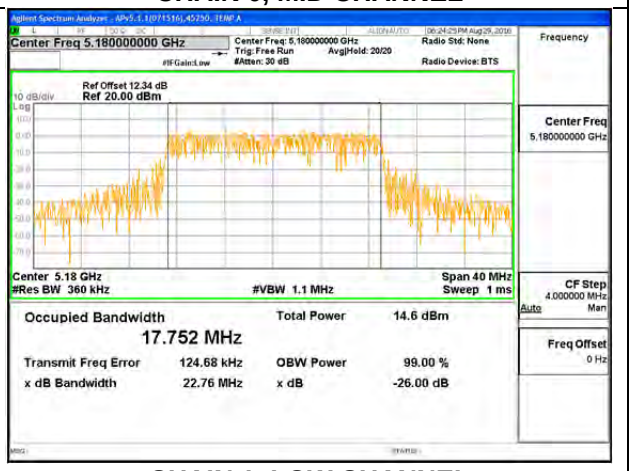


CHAIN 0, LOW CHANNEL



CHAIN 0, MID CHANNEL

CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL

CHAIN 1, MID CHANNEL

CHAIN 1, HIGH CHANNEL

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7.2.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 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 11 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.

Cross-polarized antennas. For a system in which the antennas have fixed orientations relative to one another that ensure that the antennas are cross-polarized regardless of any user actions, the directional gain is computed as follows.

(i) Cross-polarized antennas with NANT = 2. In the case of a transmitter with only two outputs driving a pair of antennas that are cross-polarized (e.g., vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna. If the two antennas have different gains, the larger gain applies.

IC RSS-247 6.2.1(1)

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

DIRECTIONAL ANTENNA GAIN

For Power, the TX chains are Cross-polarized antennas and the antenna gain is unequal among the chains. The directional gain is:

Vertical

Chain 0 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.50	4.50

Horizontal (Worst Case)

Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.70	5.70

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RESULTS

ID:	45250	Date:	08/29/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	25.0	17.6910	5.70	5.70
Mid	5200	25.1	17.7530	5.70	5.70
High	5240	24.9	17.5890	5.70	5.70

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	16.78	16.78	11.00	10.00	4.30
Mid	5200	24.00	22.49	16.79	16.79	11.00	10.00	4.30
High	5240	24.00	22.45	16.75	16.75	11.00	10.00	4.30

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.40	12.70	16.07	16.78	-0.70
Mid	5200	13.50	13.00	16.27	16.79	-0.53
High	5240	13.30	12.60	15.97	16.75	-0.78

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	1.23	1.02	4.14	4.30	-0.16
Mid	5200	1.26	1.04	4.16	4.30	-0.14
High	5240	1.47	0.79	4.15	4.30	-0.15

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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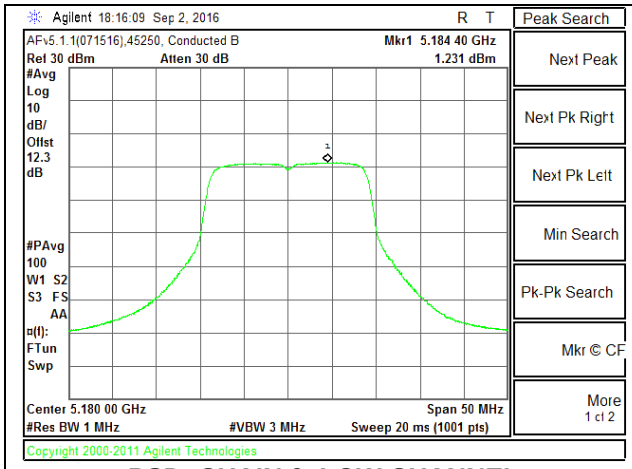
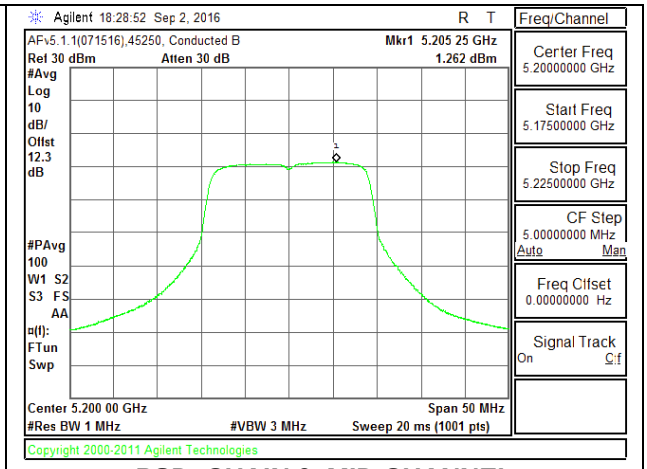
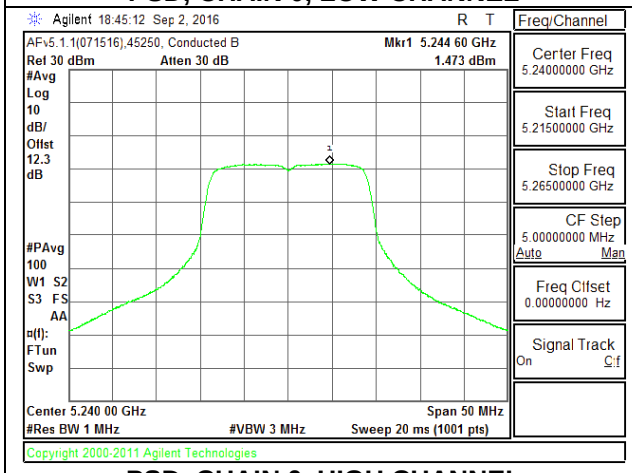


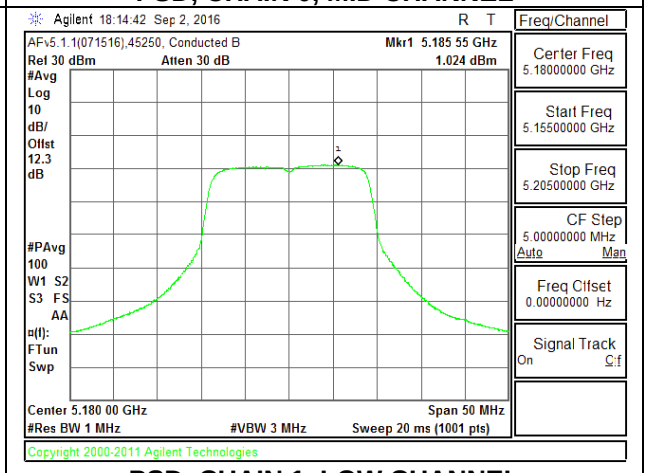
PSD, CHAIN 0, LOW CHANNEL



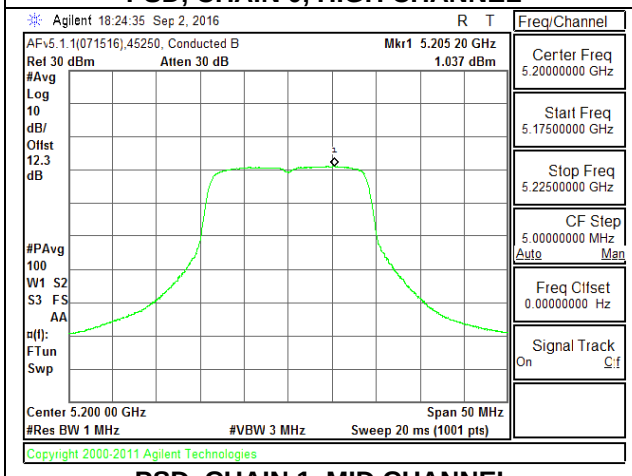
PSD, CHAIN 0, MID CHANNEL



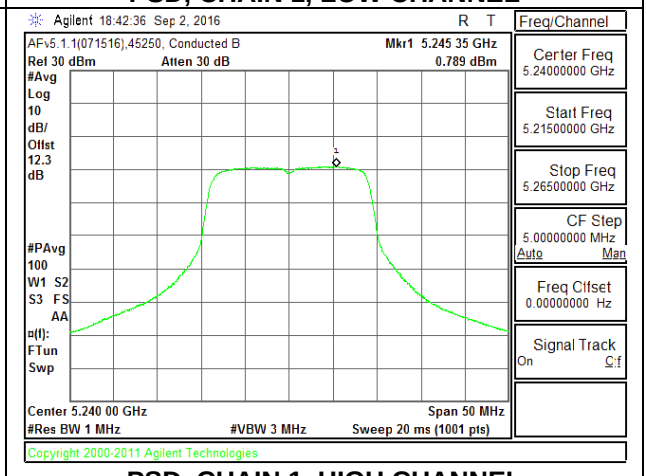
PSD, CHAIN 0, HIGH CHANNEL



PSD, CHAIN 1, LOW CHANNEL



PSD, CHAIN 1, MID CHANNEL



PSD, CHAIN 1, HIGH CHANNEL

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7.3. 802.11n HT20 MODE IN THE 5.3 GHz BAND

7.3.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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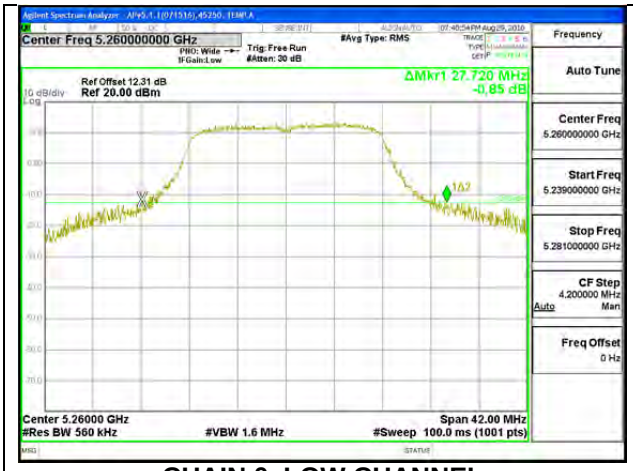
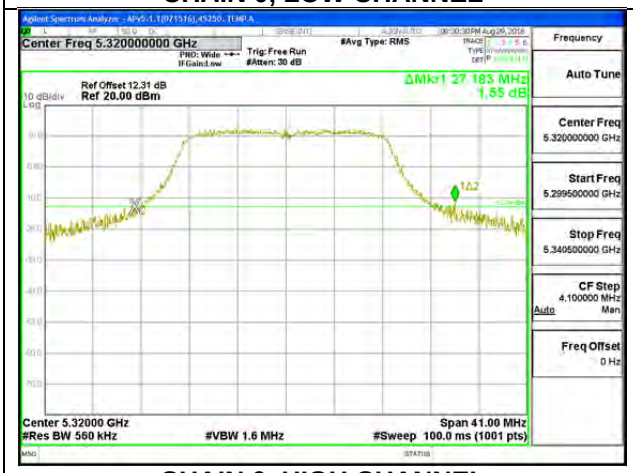
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	27.72	31.61
Mid	5300	30.36	34.16
High	5320	27.18	26.64



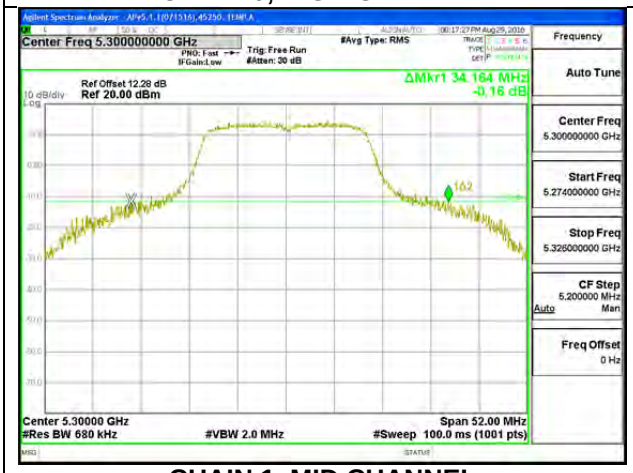
CHAIN 0, LOW CHANNEL

CHAIN 0, MID CHANNEL

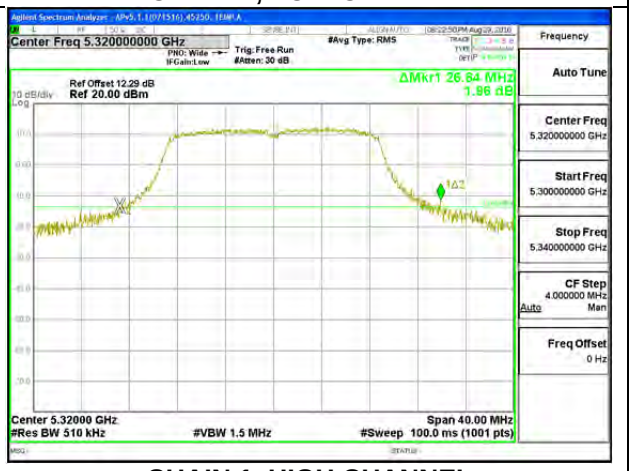


CHAIN 0, HIGH CHANNEL

CHAIN 1, LOW CHANNEL



CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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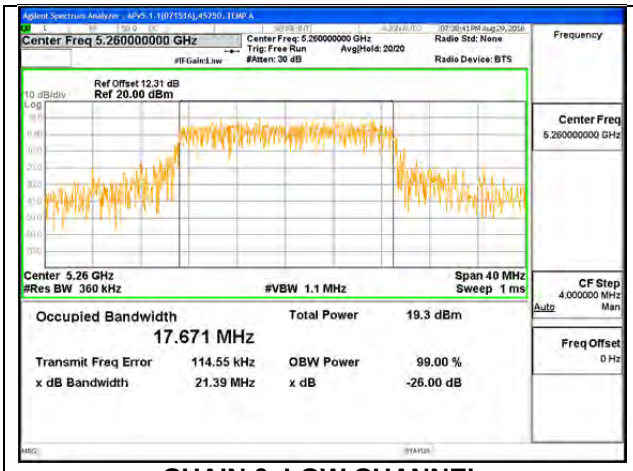
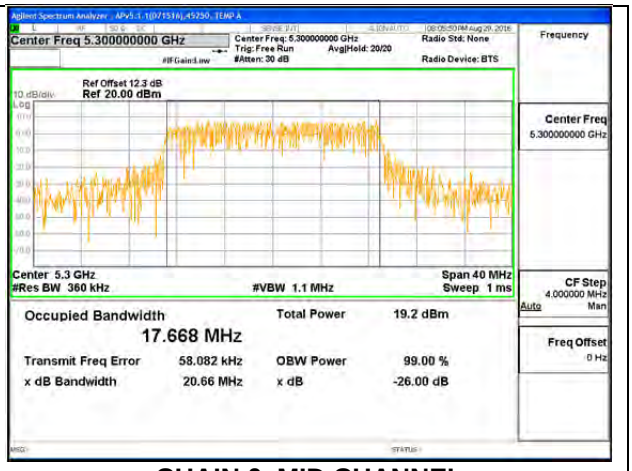
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.671	17.726
Mid	5300	17.668	17.705
High	5320	17.566	17.724

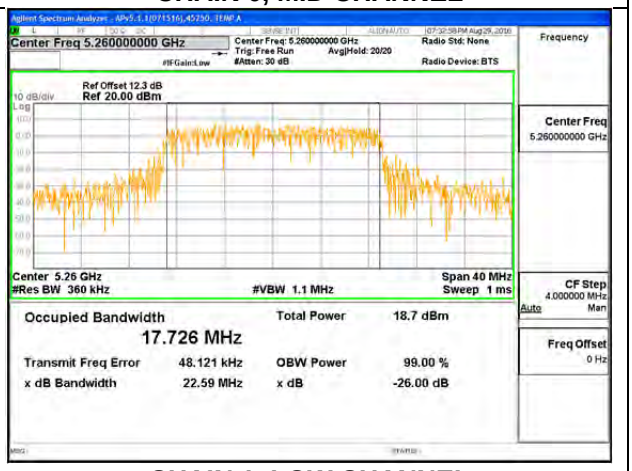


CHAIN 0, LOW CHANNEL



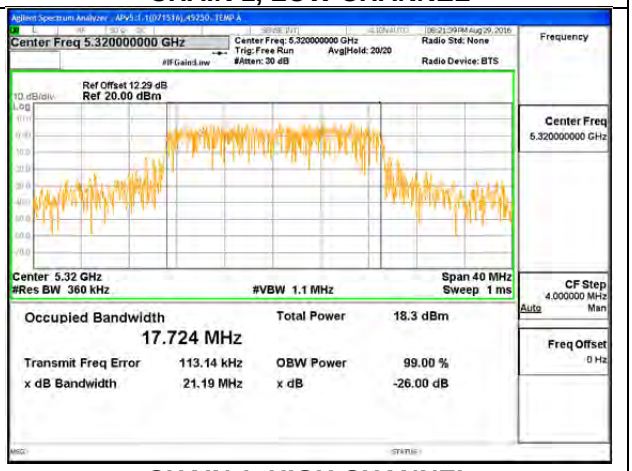
CHAIN 0, MID CHANNEL

CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL

CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.3.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 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 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-247 6.2.2 (1)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

DIRECTIONAL ANTENNA GAIN

For Power, the TX chains are Cross-polarized antennas and the antenna gain is unequal among the chains. The directional gain is:

Vertical

Chain 0 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.50	4.50

Horizontal (Worst Case)

Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.70	5.70

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RESULTS

ID:	45250	Date:	08/30/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5260	27.72	17.6710	5.70	5.70
Mid	5300	30.36	17.6680	5.70	5.70
High	5320	26.64	17.5660	5.70	5.70

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	23.47	27.00	21.30	11.00	11.00	11.00
Mid	5300	24.00	23.47	27.00	21.30	11.00	11.00	11.00
High	5320	24.00	23.45	27.00	21.30	11.00	11.00	11.00

Duty Cycle CF (dB)	0.10	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	17.80	18.30	21.07	21.30	-0.23
Mid	5300	18.00	18.20	21.11	21.30	-0.19
High	5320	17.90	17.90	20.91	21.30	-0.39

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	7.71	7.24	10.59	11.00	-0.41
Mid	5300	7.66	7.39	10.63	11.00	-0.37
High	5320	6.64	6.91	9.89	11.00	-1.11

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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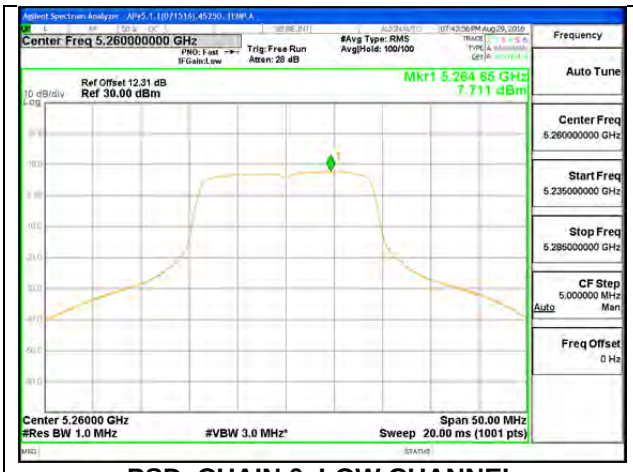
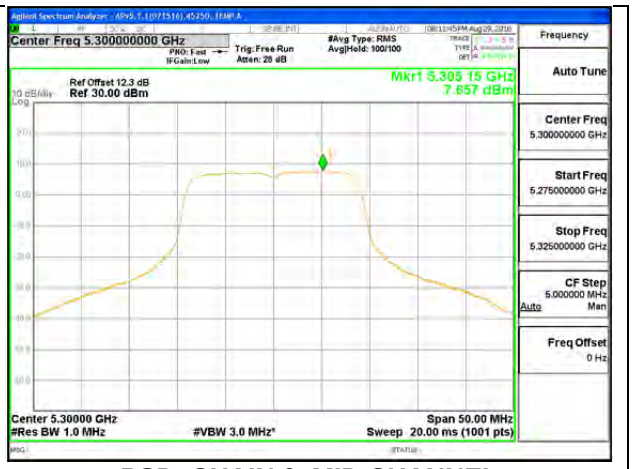
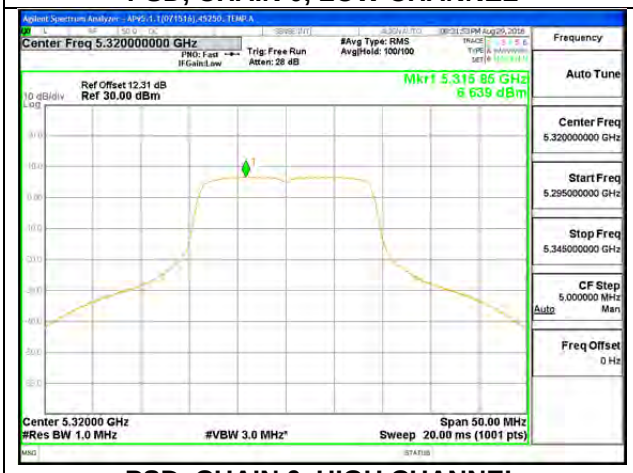


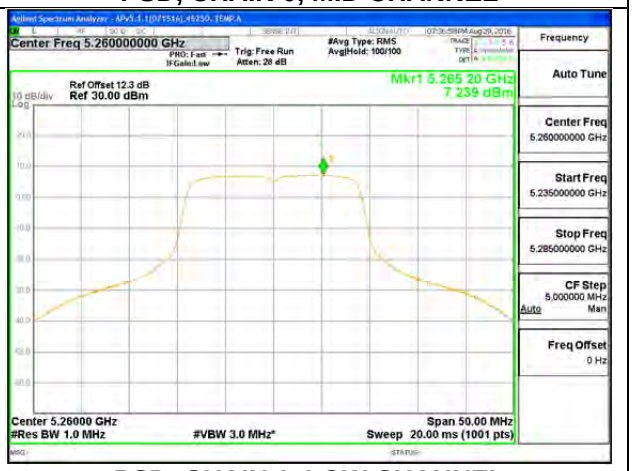
PSD, CHAIN 0, LOW CHANNEL



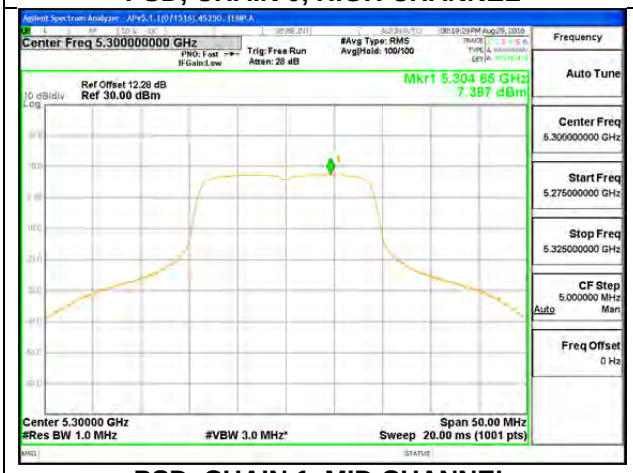
PSD, CHAIN 0, MID CHANNEL



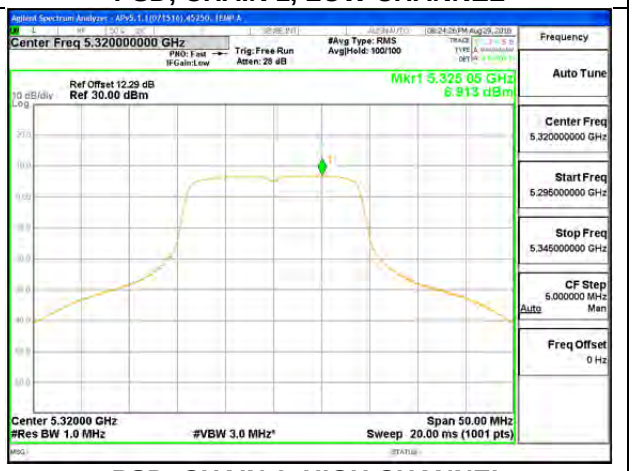
PSD, CHAIN 0, HIGH CHANNEL



PSD, CHAIN 1, LOW CHANNEL



PSD, CHAIN 1, MID CHANNEL



PSD, CHAIN 1, HIGH CHANNEL

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7.4. 802.11n HT20 MODE IN THE 5.5 GHz BAND

7.4.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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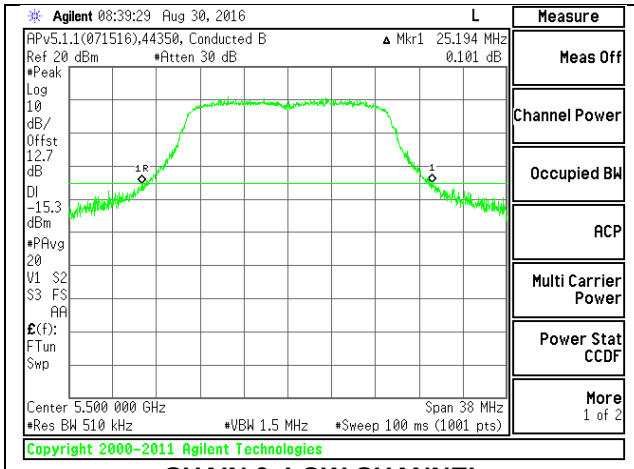
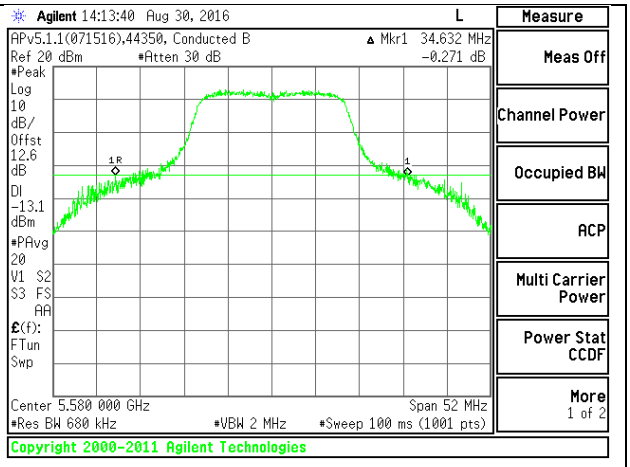
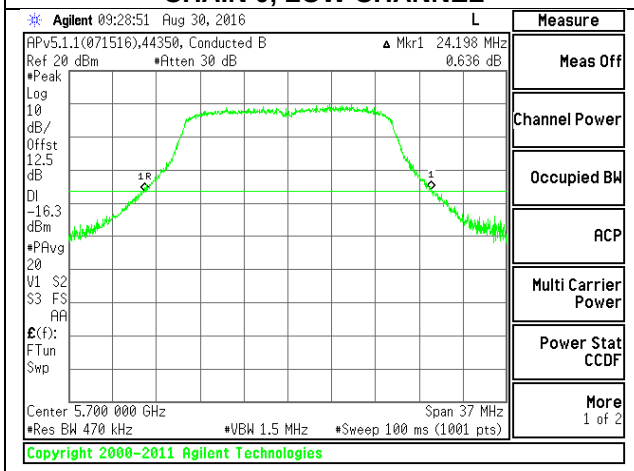
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	25.194	28.098
Mid	5580	34.632	37.820
High	5700	24.198	25.232



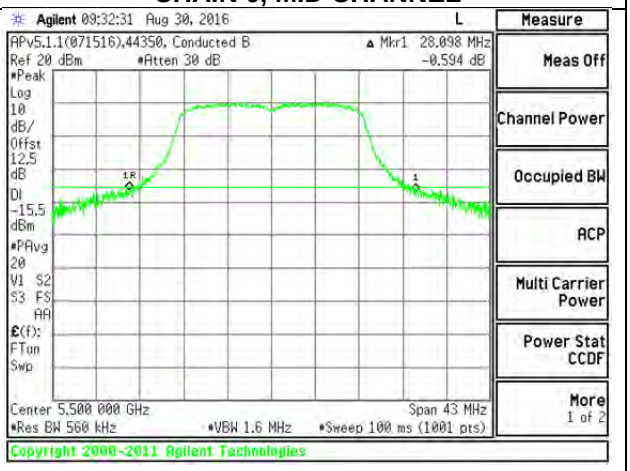
CHAIN 0, LOW CHANNEL



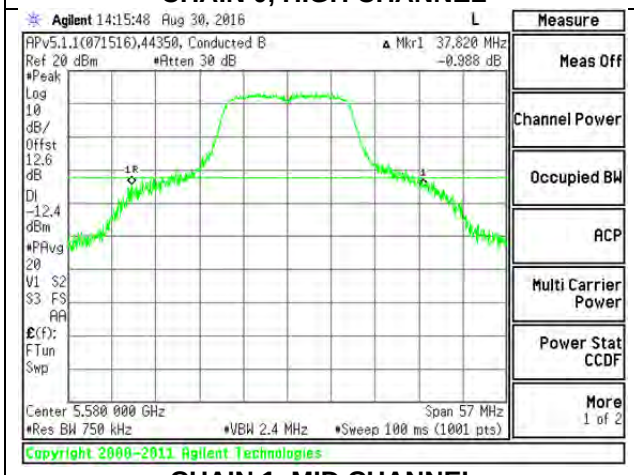
CHAIN 0, MID CHANNEL



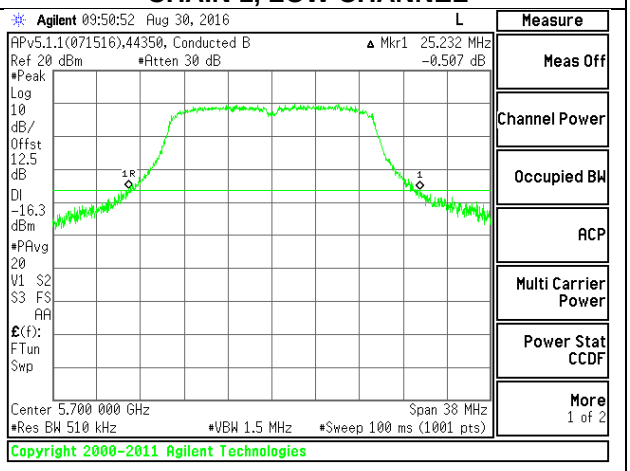
CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL



CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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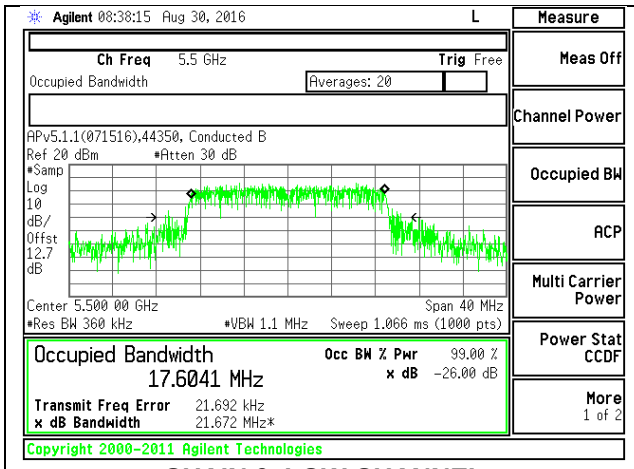
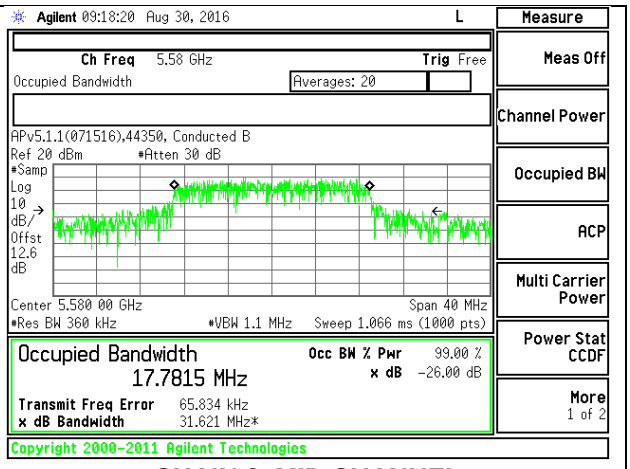
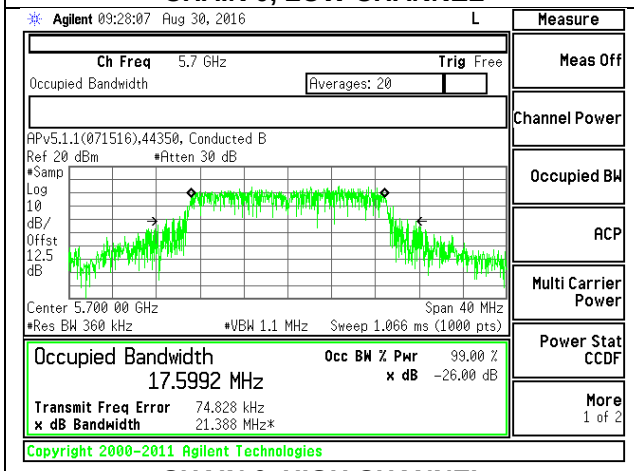
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.6041	17.3978
Mid	5580	17.7815	17.7371
High	5700	17.5992	17.5184



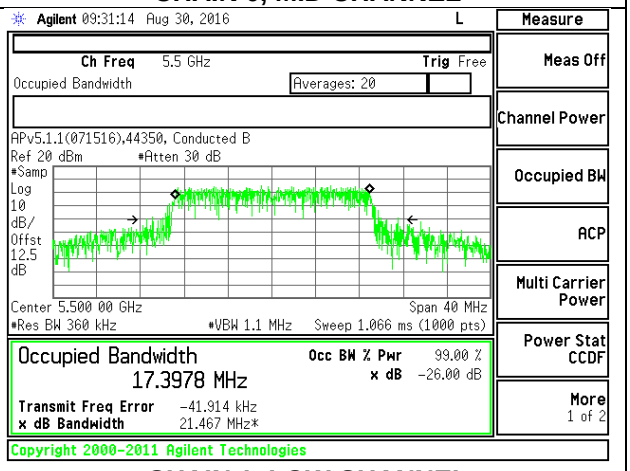
CHAIN 0, LOW CHANNEL



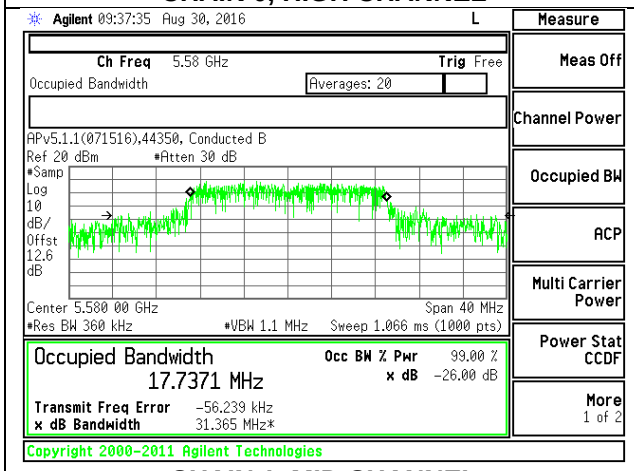
CHAIN 0, MID CHANNEL



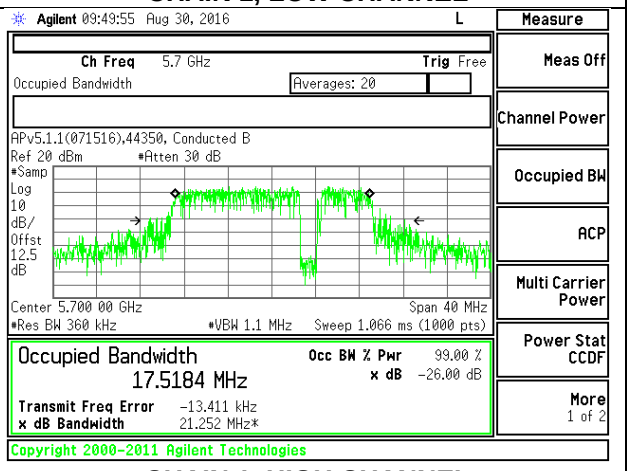
CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL



CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.4.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 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 maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-247 6.2.3 (1)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

DIRECTIONAL ANTENNA GAIN

For Power, the TX chains are Cross-polarized antennas and the antenna gain is unequal among the chains. The directional gain is:

Vertical

Chain 0 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.60	4.60

Horizontal (Worst Case)

Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.20	6.20

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RESULTS

ID:	44350	Date:	08/30/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5500	25.19	17.3978	6.20	6.20
Mid	5580	34.63	17.7371	6.20	6.20
High	5700	24.20	17.5184	6.20	6.20

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	23.80	23.40	27.00	20.80	10.80	11.00	10.80
Mid	5580	23.80	23.49	27.00	20.80	10.80	11.00	10.80
High	5700	23.80	23.43	27.00	20.80	10.80	11.00	10.80

Duty Cycle CF (dB)	0.10	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	17.10	17.00	20.06	20.80	-0.74
Mid	5580	17.30	17.20	20.26	20.80	-0.54
High	5700	16.00	15.90	18.96	20.80	-1.84

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	5.11	5.04	8.18	10.80	-2.62
Mid	5580	7.94	7.09	10.64	10.80	-0.16
High	5700	4.47	4.58	7.63	10.80	-3.17

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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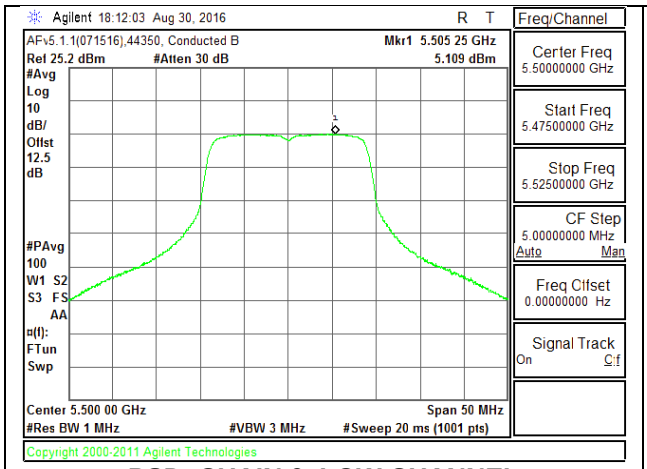
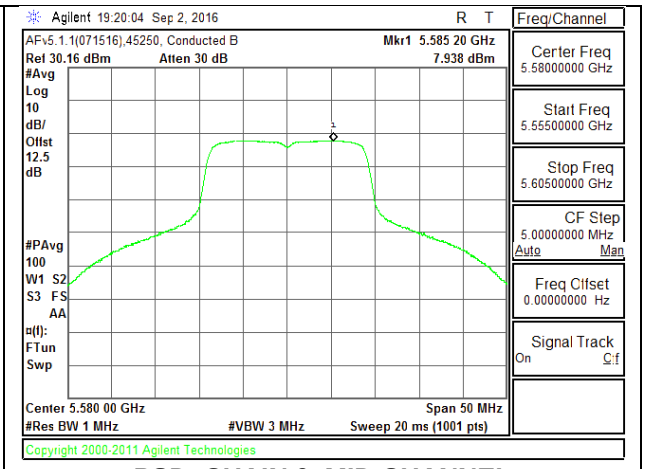
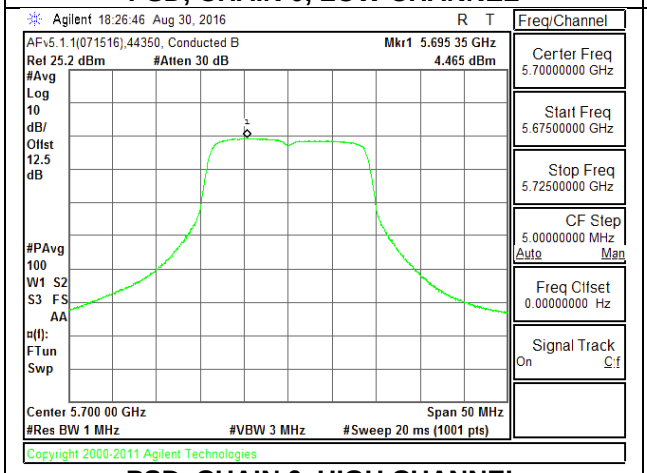


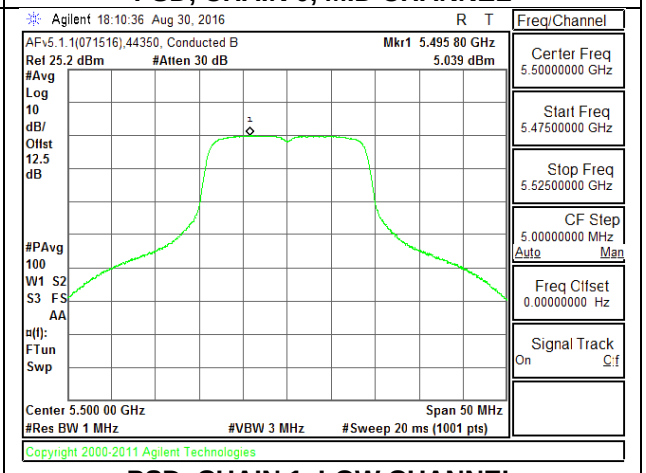
PSD, CHAIN 0, LOW CHANNEL



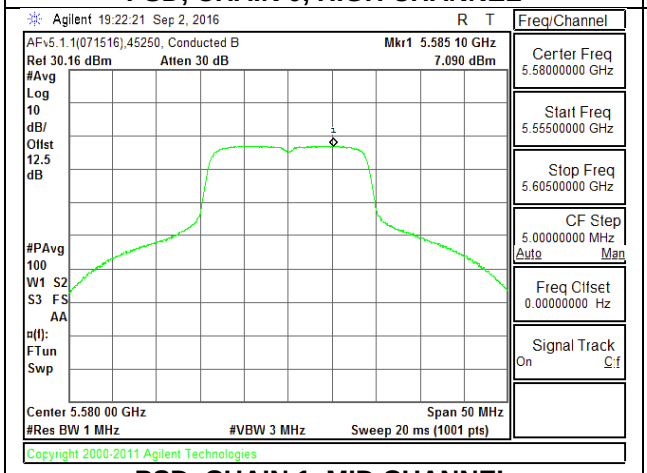
PSD, CHAIN 0, MID CHANNEL



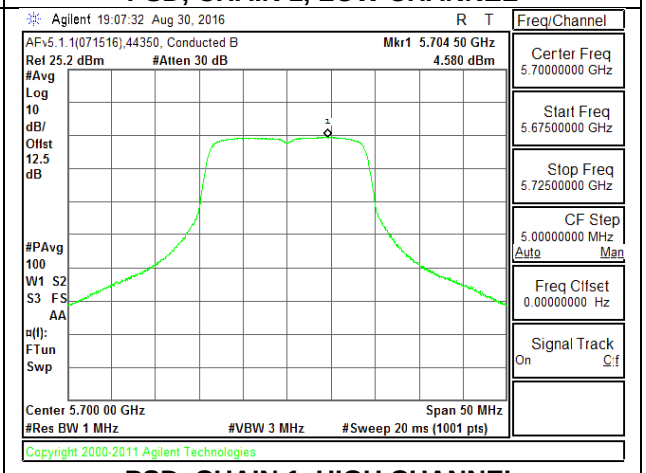
PSD, CHAIN 0, HIGH CHANNEL



PSD, CHAIN 1, LOW CHANNEL



PSD, CHAIN 1, MID CHANNEL



PSD, CHAIN 1, HIGH CHANNEL

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7.5. 802.11n HT20 MODE IN THE 5.8 GHz BAND

7.5.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

RESULTS

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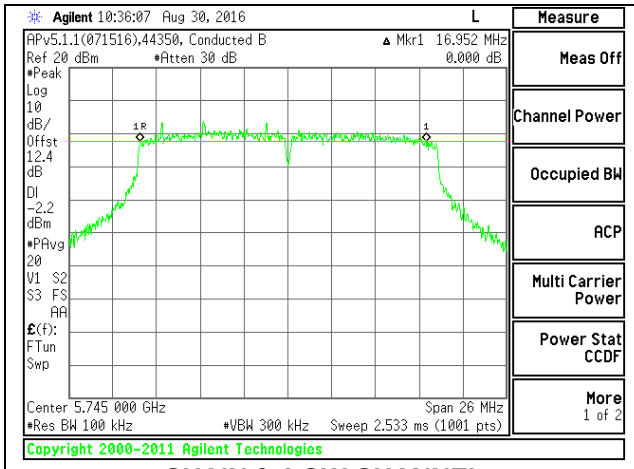
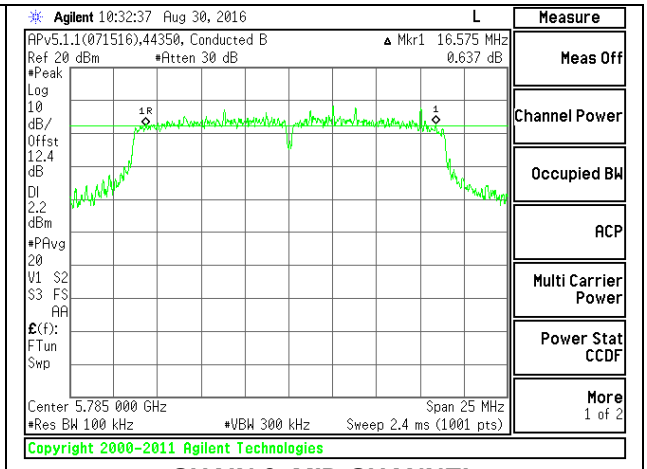
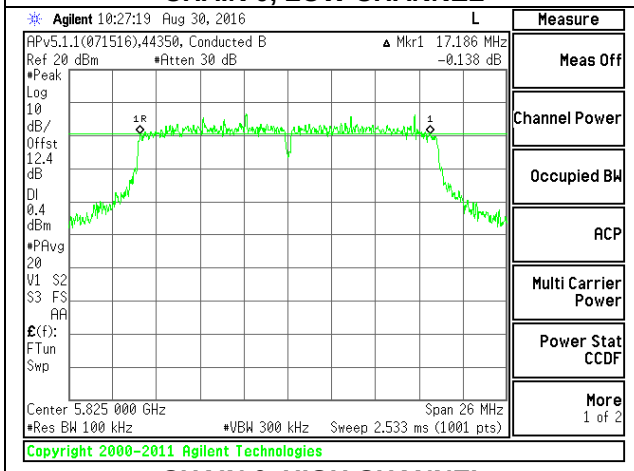
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	16.952	17.264	0.5
Mid	5785	16.575	16.175	0.5
High	5825	17.186	16.900	0.5



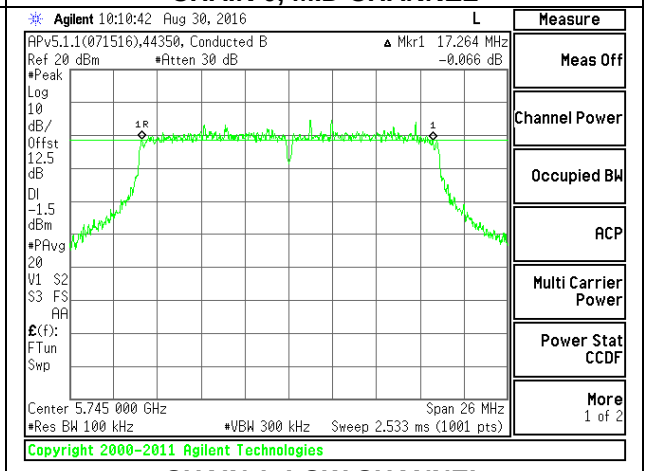
CHAIN 0, LOW CHANNEL



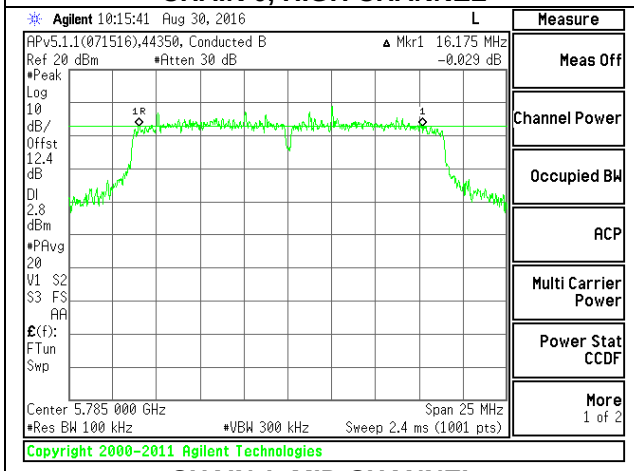
CHAIN 0, MID CHANNEL



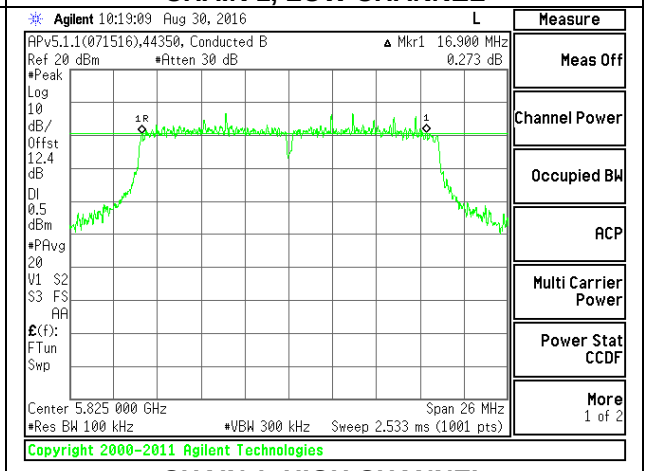
CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL



CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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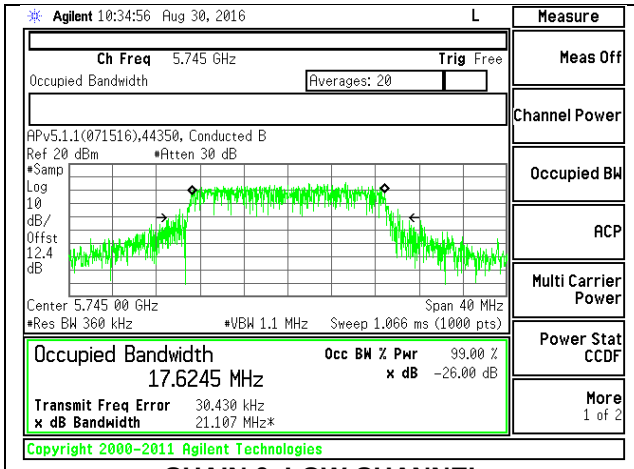
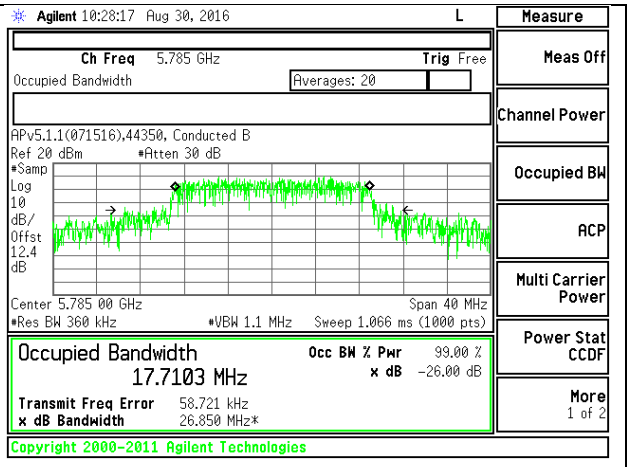
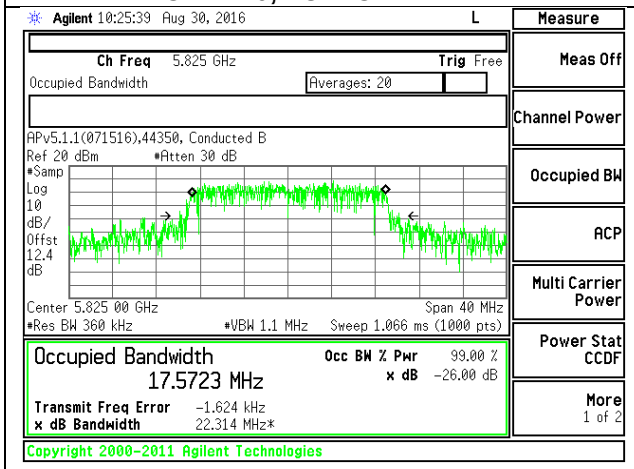
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	17.6245	17.6199
Mid	5785	17.7103	17.6775
High	5825	17.5723	17.6800



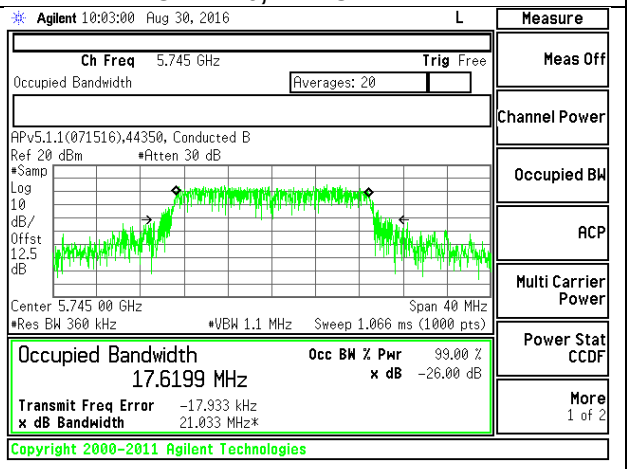
CHAIN 0, LOW CHANNEL



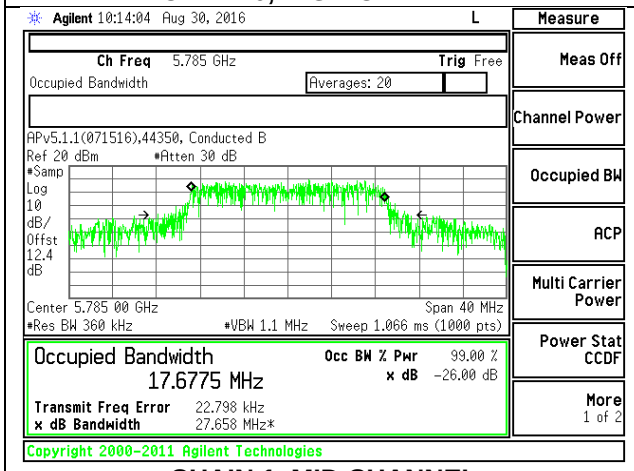
CHAIN 0, MID CHANNEL



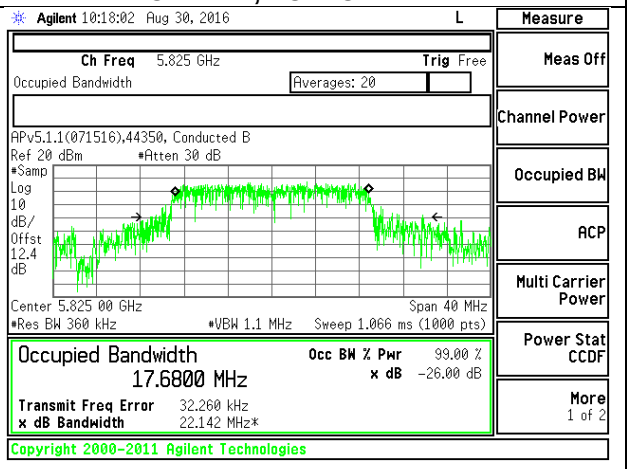
CHAIN 0, HIGH CHANNEL



CHAIN 1, LOW CHANNEL



CHAIN 1, MID CHANNEL



CHAIN 1, HIGH CHANNEL

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7.5.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3), IC RSS-247 6.2.4 (1)

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. 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.

DIRECTIONAL ANTENNA GAIN

For Power, the TX chains are Cross-polarized antennas and the antenna gain is unequal among the chains. The directional gain is:

Vertical

Chain 0 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.60	4.60

Horizontal (Worst Case)

Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.20	6.20

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RESULTS

ID:	44350	Date:	08/30/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5745	24.70	17.6199	6.20	6.20
Mid	5785	42.37	17.6775	6.20	6.20
High	5805	24.16	17.5723	6.20	6.20

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	29.80	29.46	35.46	29.26	29.80	29.80	29.80
Mid	5785	29.80	29.47	35.47	29.27	29.80	29.80	29.80
High	5805	29.80	29.45	35.45	29.25	29.80	29.80	29.80

Duty Cycle CF (dB)	0.10	Included in Calculations of PPSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	15.80	16.00	18.91	29.26	-10.35
Mid	5785	20.50	19.80	23.17	29.27	-6.10
High	5805	18.70	18.10	21.42	29.25	-7.83

PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	1.15	1.37	4.37	29.80	-25.43
Mid	5785	5.04	4.85	8.05	29.80	-21.75
High	5805	3.46	2.99	6.34	29.80	-23.46

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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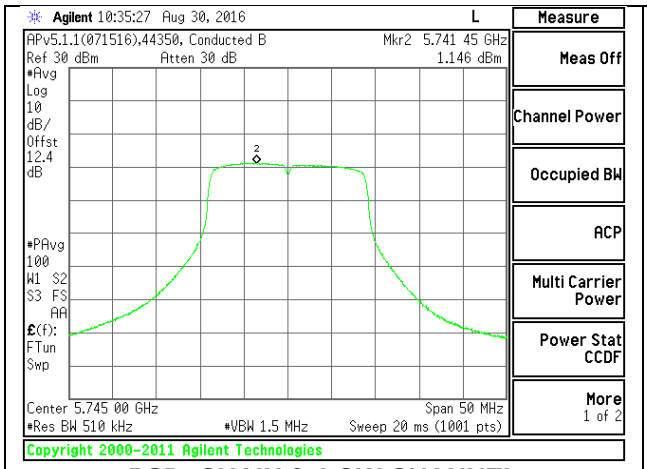
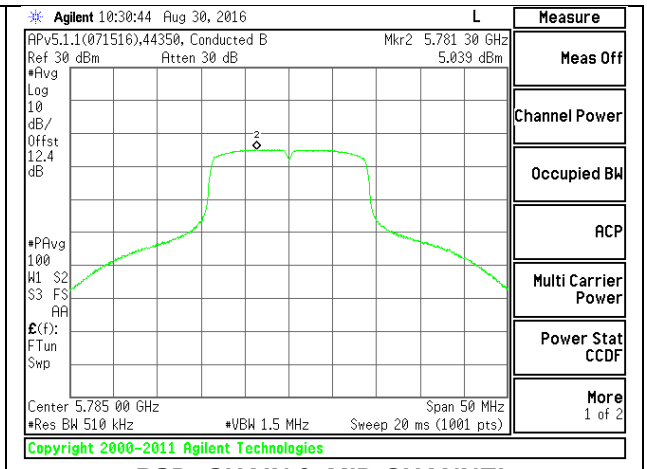
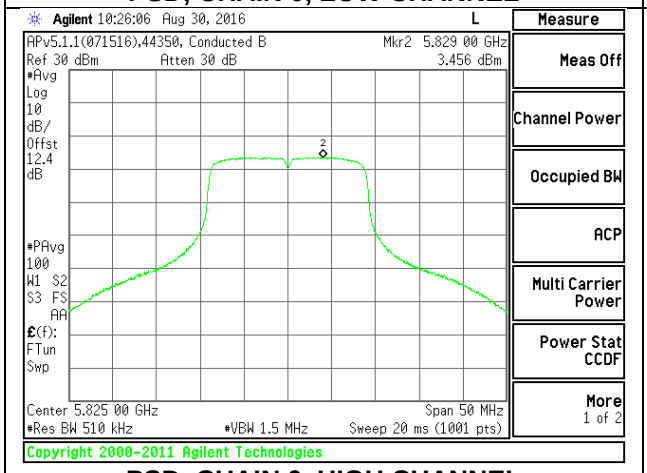


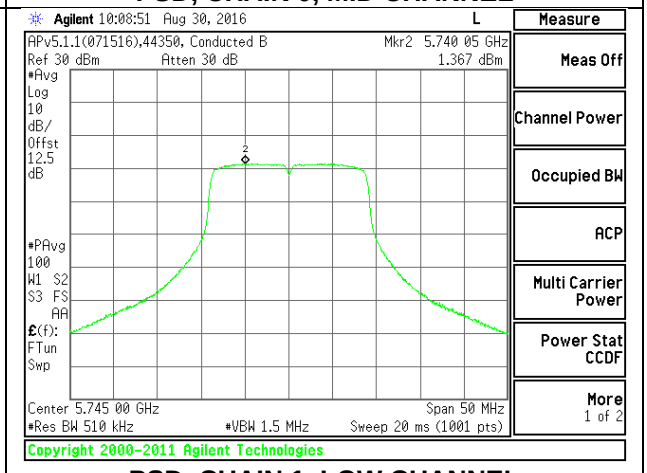
PSD, CHAIN 0, LOW CHANNEL



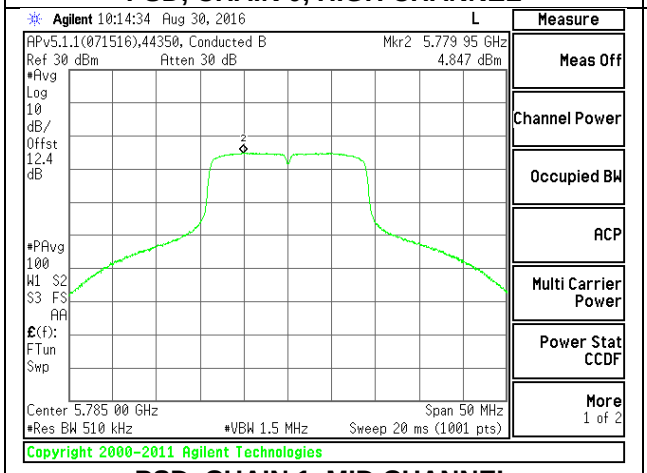
PSD, CHAIN 0, MID CHANNEL



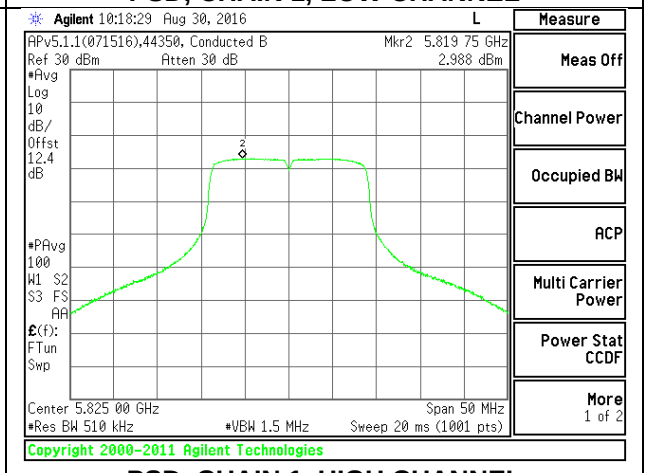
PSD, CHAIN 0, HIGH CHANNEL



PSD, CHAIN 1, LOW CHANNEL



PSD, CHAIN 1, MID CHANNEL



PSD, CHAIN 1, HIGH CHANNEL

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8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

FCC 15.407(b)(4)(i)

IC RSS-GEN Clause 8.9 (Transmitter)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300m	2400/F(kHz) @ 300m
0.490-1.705	24000/F(kHz) @ 30m	24000/F(kHz) @ 30m
1.705-30.0	30 @ 30m	30 @ 30m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE: KDB 937606 OATS and Chamber Correlation Justification

- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters.

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Please refer to test report section 4.1 for duty cycle factor information.

For 5GHz band, the spectrum from 9 kHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels for above 1GHz in each applicable band. Below and above 18GHz emissions, the channel with the highest output power was tested.

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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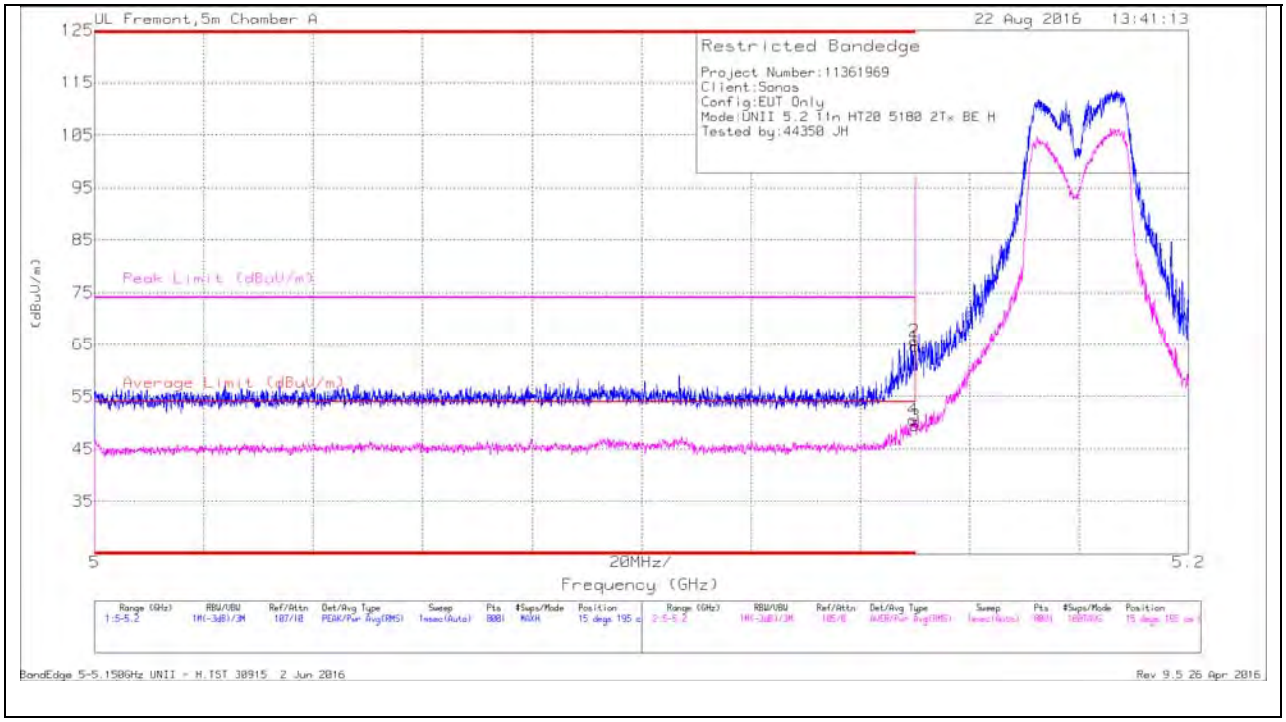
8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
2	* 5.15	49.87	Pk	34.5	-18.7	0	65.67	-	-	74	-8.33	15	195	H
4	* 5.15	34.68	RMS	34.5	-18.7	.1	50.58	54	-3.42	-	-	15	195	H
1	5.15	48.72	Pk	34.5	-18.7	0	64.52	-	-	74	-9.48	15	195	H
3	5.15	33.55	RMS	34.5	-18.7	.1	49.45	54	-4.55	-	-	15	195	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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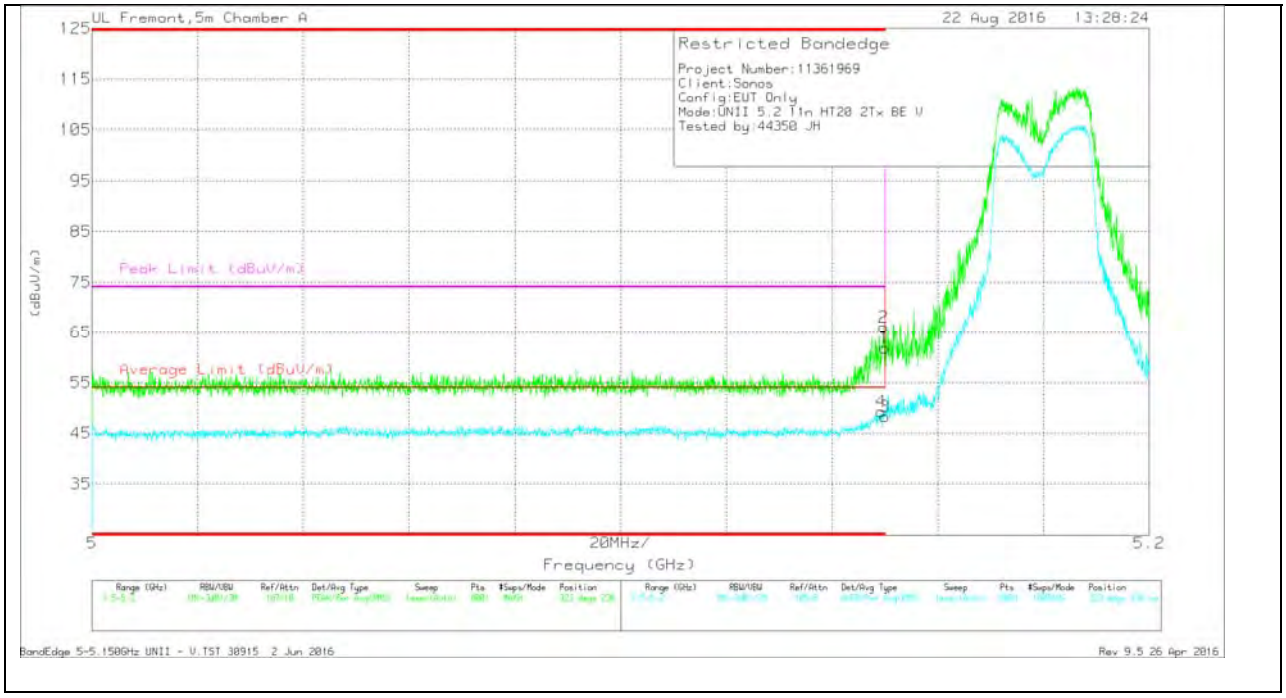
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
2	* 5.15	50.22	Pk	34.5	-18.7	0	66.02	-	-	74	-7.98	323	236	V
4	* 5.149	33.26	RMS	34.5	-18.6	.1	49.26	54	-4.74	-	-	323	236	V
1	5.15	46.02	Pk	34.5	-18.7	0	61.82	-	-	74	-12.18	323	236	V
3	5.15	32.39	RMS	34.5	-18.7	.1	48.29	54	-5.71	-	-	323	236	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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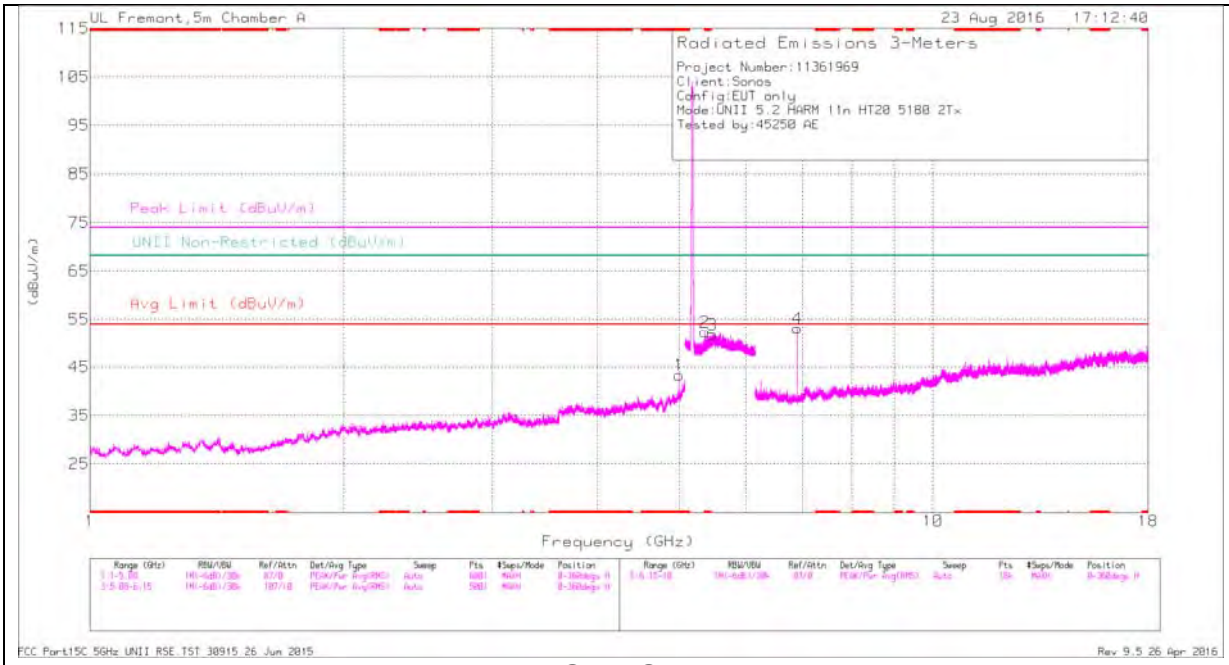
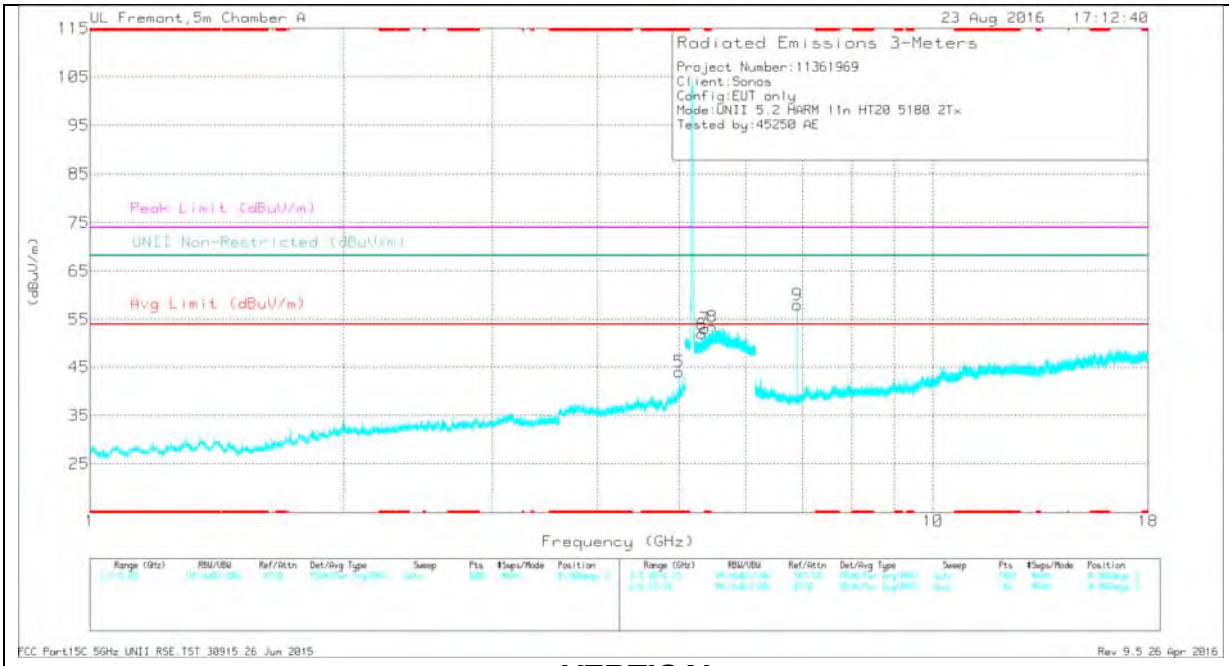
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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LOW CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	41.39	PK-U	34.3	-27.5	0	48.19	-	-	74	-25.81	-	-	54	106	H
* 5	34.07	ADR	34.3	-27.5	.1	40.97	54	-13.03	-	-	-	-	54	106	H
* 5	42.64	PK-U	34.3	-27.5	0	49.44	-	-	74	-24.56	-	-	4	202	V
* 5	35.57	ADR	34.3	-27.5	.1	42.47	54	-11.53	-	-	-	-	4	202	V
* 5.36	41.39	PK-U	34.8	-18.9	0	57.29	-	-	74	-16.71	-	-	66	159	H
* 5.36	30.99	ADR	34.8	-18.8	.1	47.09	54	-6.91	-	-	-	-	66	159	H
* 5.36	43.24	PK-U	34.8	-18.9	0	59.14	-	-	74	-14.86	-	-	110	185	V
* 5.36	33.37	ADR	34.8	-18.8	.1	49.47	54	-4.53	-	-	-	-	110	185	V
5.32	43.78	PK-U	34.7	-18.9	0	59.58	-	-	-	-	68.2	-8.62	107	179	V
5.32	35.02	ADR	34.7	-18.9	.1	50.92	-	-	-	-	-	-	107	179	V
5.48	40.11	PK-U	34.8	-18.8	0	56.11	-	-	-	-	68.2	-12.09	136	168	H
5.48	30.2	ADR	34.8	-18.8	.1	46.3	-	-	-	-	-	-	136	168	H
5.48	43.55	PK-U	34.8	-18.8	0	59.55	-	-	-	-	68.2	-8.65	111	248	V
5.48	34.35	ADR	34.8	-18.8	.1	50.45	-	-	-	-	-	-	111	248	V
6.907	45.84	PK-U	35.6	-25.6	0	55.84	-	-	-	-	68.2	-12.36	350	108	H
6.907	44.04	ADR	35.6	-25.6	.1	54.14	-	-	-	-	-	-	350	108	H
6.907	49.42	PK-U	35.6	-25.6	0	59.42	-	-	-	-	68.2	-8.78	2	103	V
6.907	48.16	ADR	35.6	-25.6	.1	58.26	-	-	-	-	-	-	2	103	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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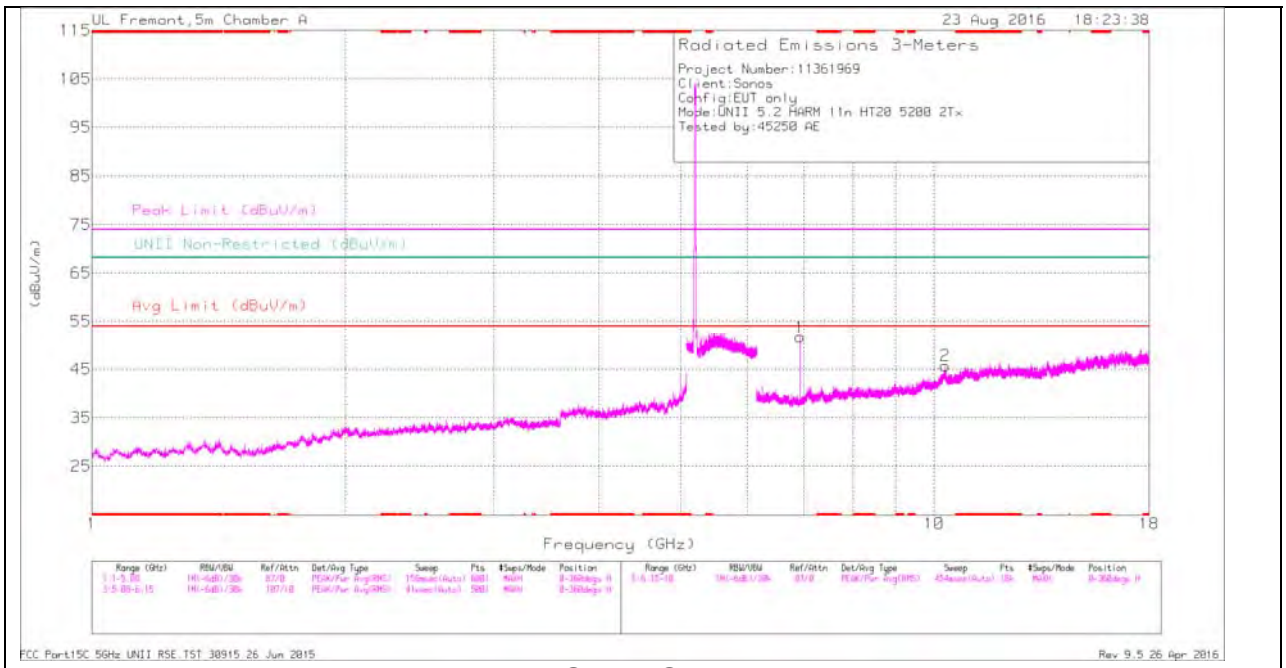
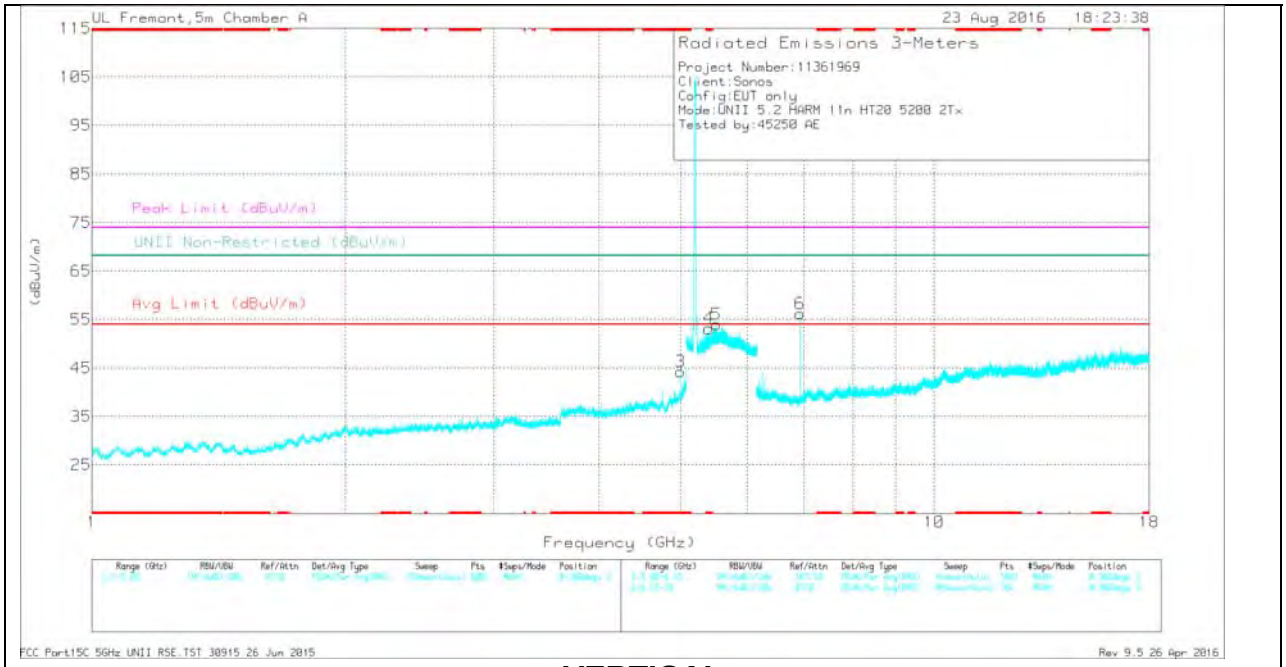
MID CHANNEL RESULTS



HORIZTONAL



VERTICAL

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MID CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	41.87	PK-U	34.3	-27.5	0	48.67	-	-	74	-25.33	-	-	17	106	V
* 5	35.62	ADR	34.3	-27.5	.1	42.52	54	-11.48	-	-	-	-	17	106	V
* 5.4	44.15	PK-U	34.8	-18.9	0	60.05	-	-	74	-13.95	-	-	111	191	V
* 5.4	36.1	ADR	34.8	-18.9	.1	52.1	54	-1.9	-	-	-	-	111	191	V
5.515	42.64	PK-U	34.8	-19.1	0	58.34	-	-	-	-	68.2	-9.86	84	228	V
5.516	32.01	ADR	34.8	-19.1	.1	47.81	-	-	-	-	-	-	84	228	V
6.933	44.01	PK-U	35.6	-25.6	0	54.01	-	-	-	-	68.2	-14.19	268	295	H
6.933	41.5	ADR	35.6	-25.6	.1	51.6	-	-	-	-	-	-	268	295	H
6.933	47.22	PK-U	35.6	-25.6	0	57.22	-	-	-	-	68.2	-10.98	0	191	V
6.933	45.59	ADR	35.6	-25.6	.1	55.69	-	-	-	-	-	-	0	191	V
10.311	31.82	PK-U	37.3	-19.8	0	49.32	-	-	-	-	68.2	-18.88	349	249	H
10.312	22.42	ADR	37.3	-19.8	.1	40.02	-	-	-	-	-	-	349	249	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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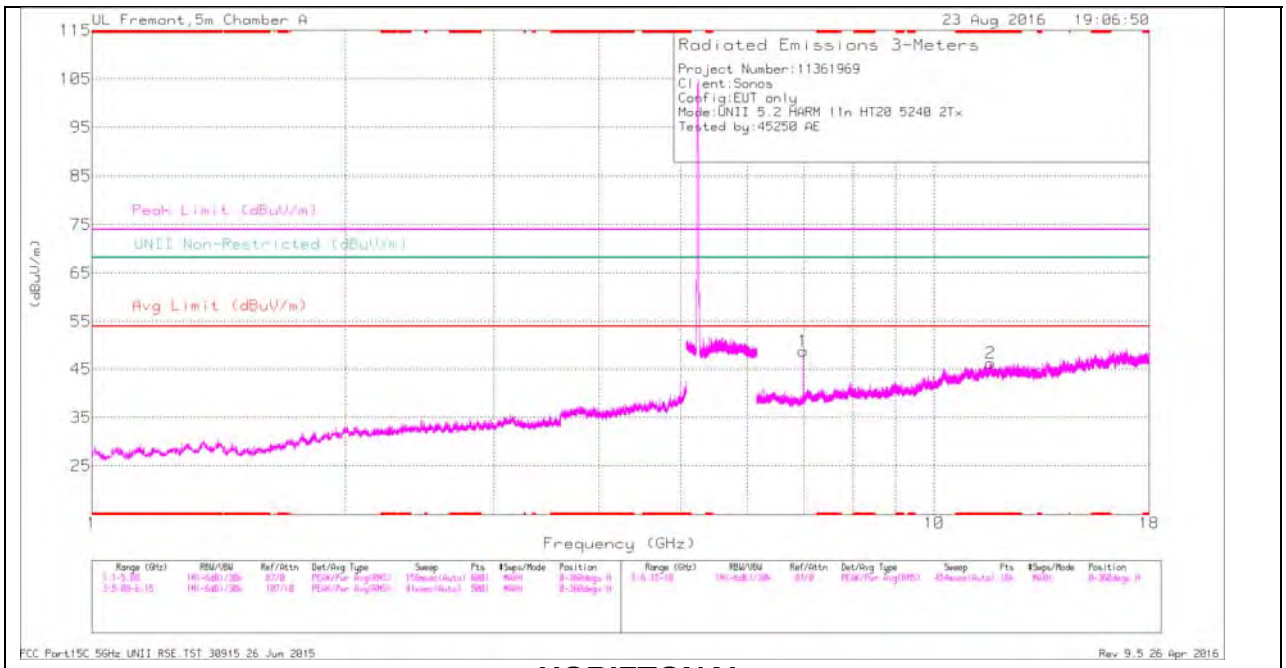
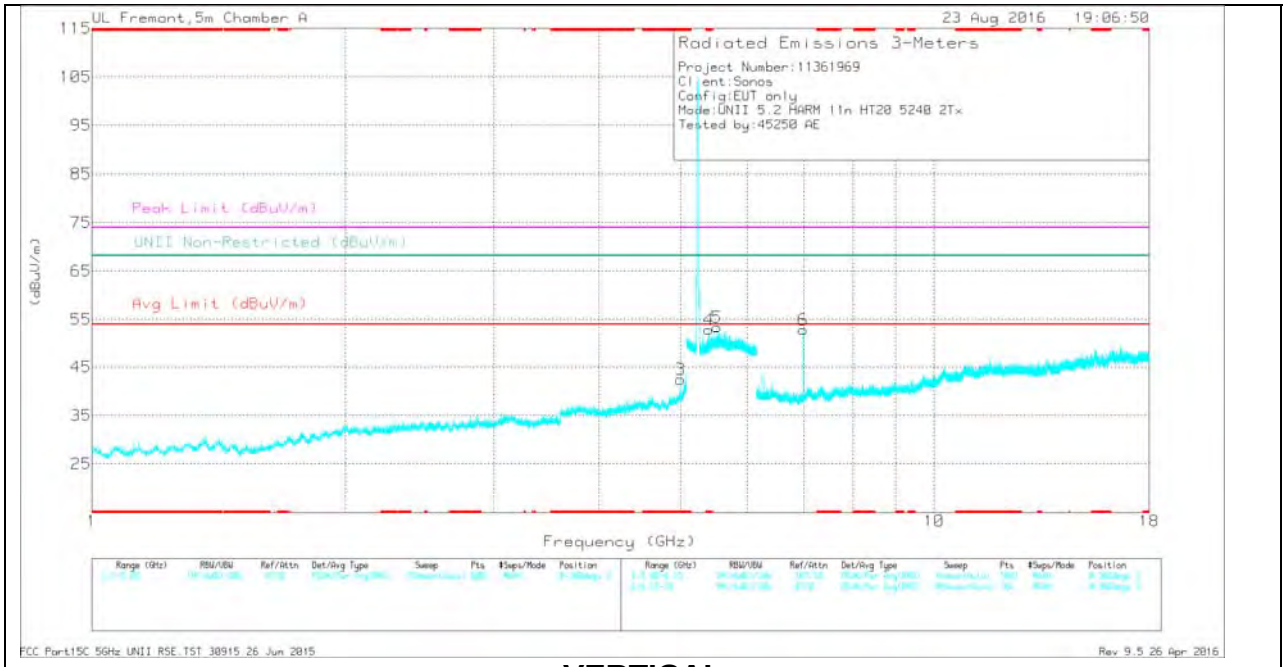
HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

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HIGH CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	41.97	PK-U	34.3	-27.5	0	48.77	-	-	74	-25.23	-	-	4	174	V
* 5	34.4	ADR	34.3	-27.5	.1	41.3	54	-12.7	-	-	-	-	4	174	V
* 5.4	42.16	PK-U	34.8	-18.9	0	58.06	-	-	74	-15.94	-	-	111	163	V
* 5.4	33.92	ADR	34.8	-18.9	.1	49.92	54	-4.08	-	-	-	-	111	163	V
* 11.66	32.9	PK-U	38.4	-19.3	0	52	-	-	74	-22	-	-	58	234	H
* 11.661	22.36	ADR	38.4	-19.4	.1	41.46	54	-12.54	-	-	-	-	58	234	H
5.52	40.71	PK-U	34.8	-19	0	56.51	-	-	-	-	68.2	-11.69	139	314	V
5.52	30.55	ADR	34.8	-19	.1	46.45	-	-	-	-	-	-	139	314	V
6.987	42.65	PK-U	35.7	-25.2	0	53.15	-	-	-	-	68.2	-15.05	26	202	H
6.987	39.48	ADR	35.7	-25.2	.1	50.08	-	-	-	-	-	-	26	202	H
6.987	43.18	PK-U	35.7	-25.2	0	53.68	-	-	-	-	68.2	-14.52	6	163	V
6.987	40.45	ADR	35.7	-25.2	.1	51.05	-	-	-	-	-	-	6	163	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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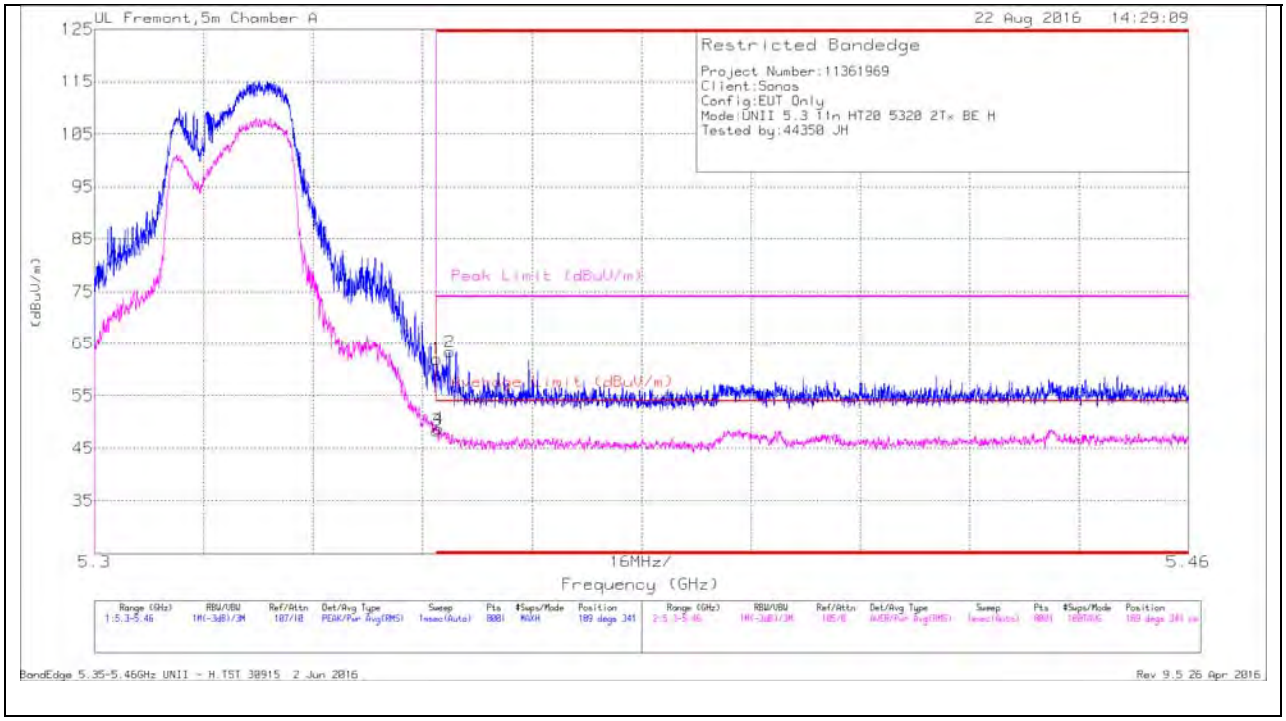
8.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	* 5.35	46.08	Pk	34.8	-18.9	0	61.98	-	-	74	-12.02	189	341	H
3	* 5.35	32.27	RMS	34.8	-18.9	.1	48.27	54	-5.73	-	-	189	341	H
4	* 5.35	32.73	RMS	34.8	-18.9	.1	48.73	54	-5.27	-	-	189	341	H
2	* 5.352	47.48	Pk	34.8	-18.9	0	63.38	-	-	74	-10.62	189	341	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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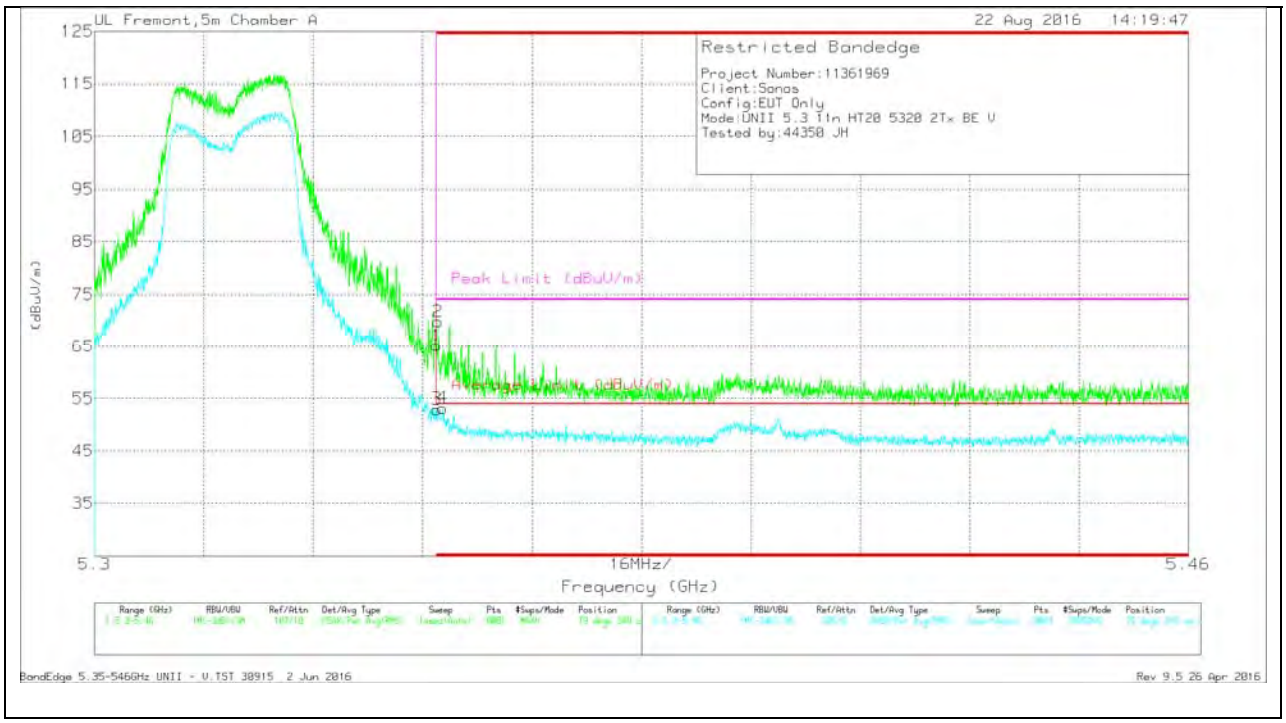
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	* 5.35	49.29	Pk	34.8	-18.9	0	65.19	-	-	74	-8.81	79	349	V
2	* 5.35	53.91	Pk	34.8	-18.9	0	69.81	-	-	74	-4.19	79	349	V
3	* 5.35	36.96	RMS	34.8	-18.9	.1	52.96	54	-1.04	-	-	79	349	V
4	* 5.351	37.15	RMS	34.8	-18.9	.1	53.15	54	-.85	-	-	79	349	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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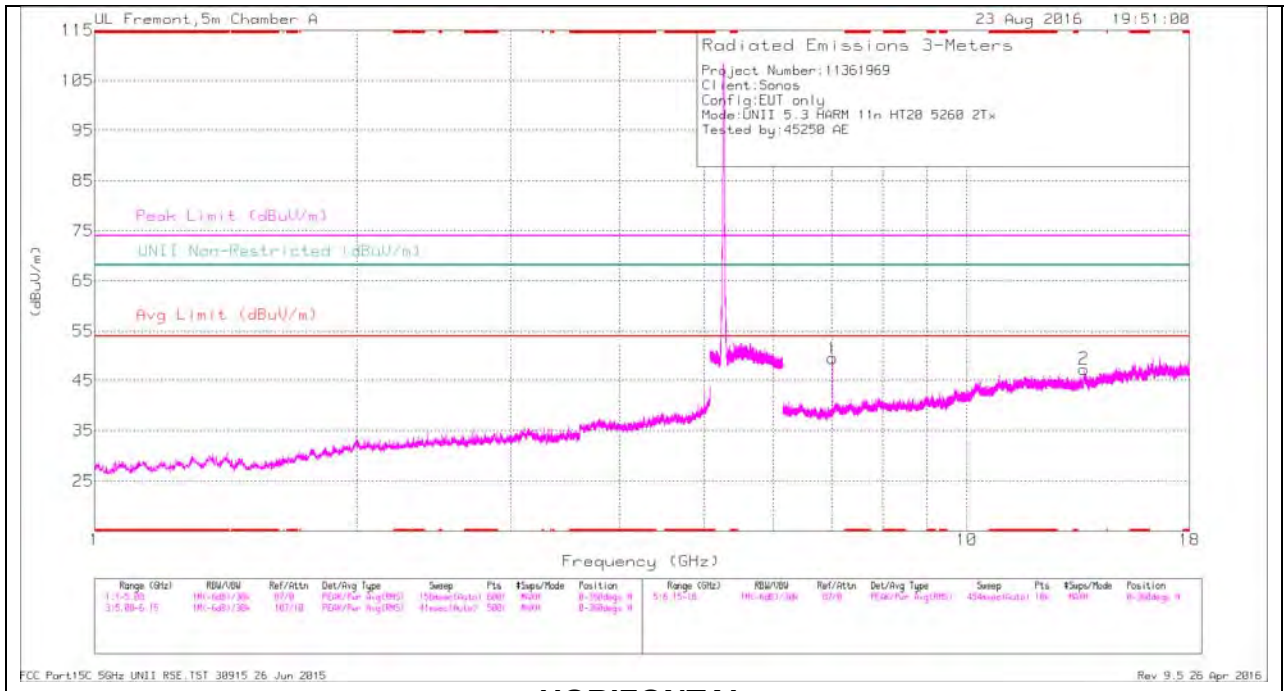
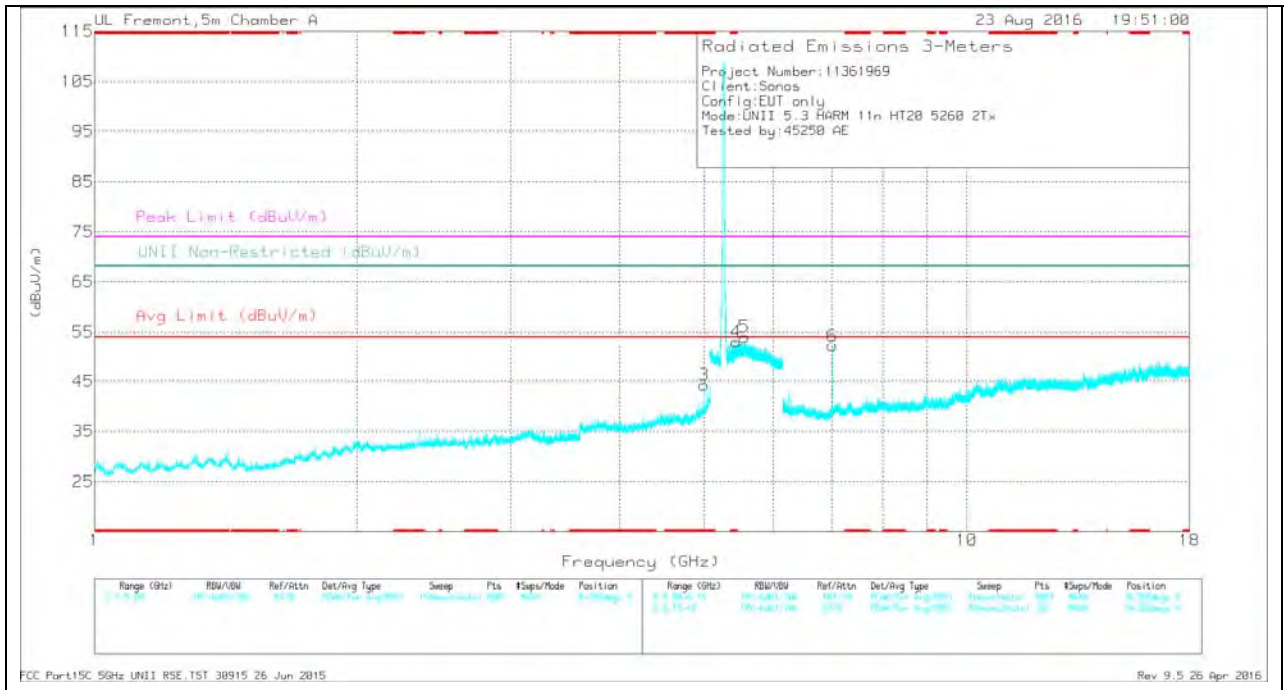
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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LOW CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 4.999	42.54	PK-U	34.3	-27.5	0	49.34	-	-	74	-24.66	-	-	6	110	V
* 5	35.34	ADR	34.3	-27.5	.1	42.24	54	-11.76	-	-	-	-	6	110	V
* 5.438	44.64	PK-U	34.8	-18.7	0	60.74	-	-	74	-13.26	-	-	112	195	V
* 5.44	34.74	ADR	34.8	-18.7	.1	50.94	54	-3.06	-	-	-	-	112	195	V
5.56	34.88	ADR	34.7	-19.1	.1	50.58	-	-	-	-	-	-	129	178	V
5.562	44.56	PK-U	34.7	-19	0	60.26	-	-	-	-	68.2	-7.94	129	178	V
7.013	41.76	PK-U	35.7	-24.8	0	52.66	-	-	-	-	68.2	-15.54	26	214	H
7.013	38.82	ADR	35.7	-24.8	.1	49.82	-	-	-	-	-	-	26	214	H
7.013	43.59	PK-U	35.7	-24.8	0	54.49	-	-	-	-	68.2	-13.71	360	175	V
7.013	40.93	ADR	35.7	-24.8	.1	51.93	-	-	-	-	-	-	360	175	V
13.621	34	PK-U	39	-20.5	0	52.5	-	-	-	-	68.2	-15.7	64	180	H
13.621	23.52	ADR	39	-20.5	.1	42.12	-	-	-	-	-	-	64	180	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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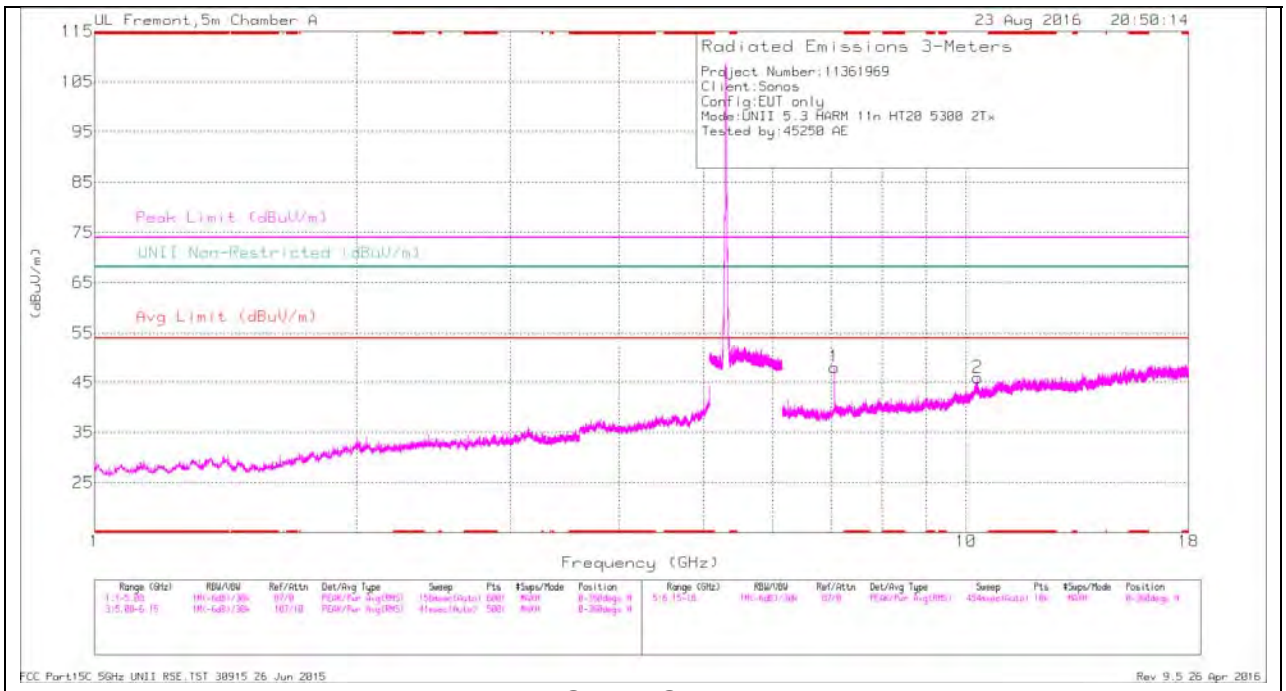
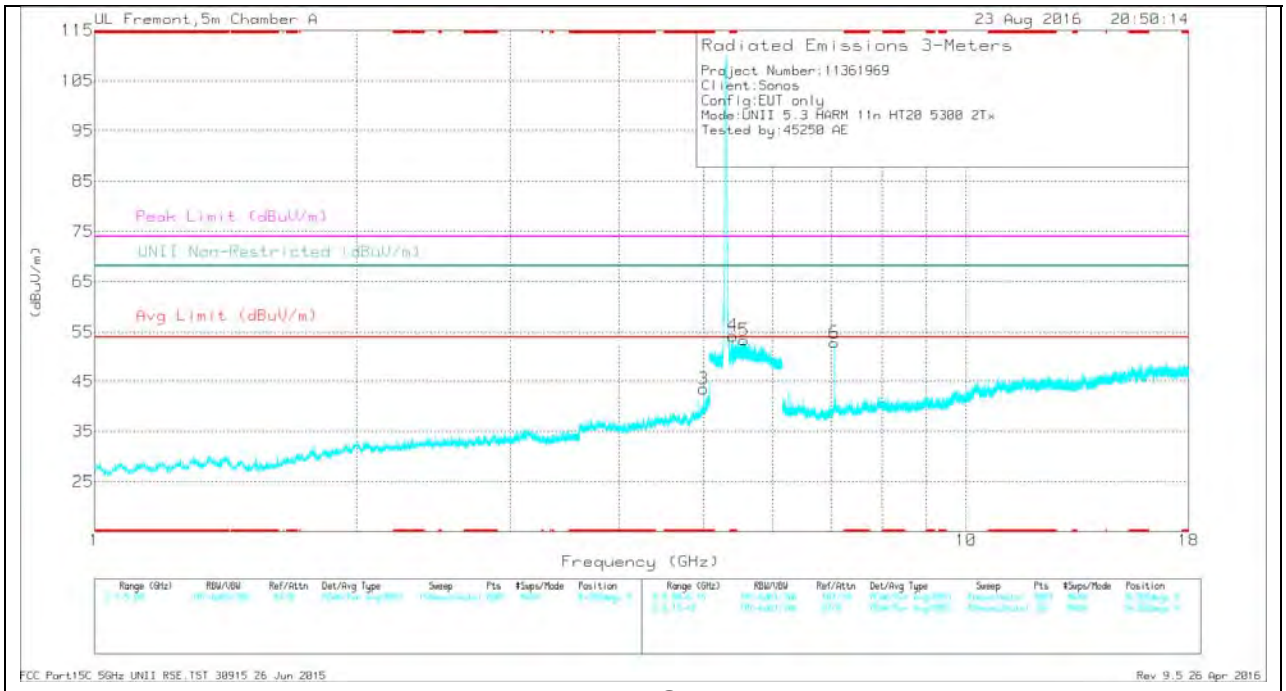
MID CHANNEL RESULTS



HORIZTONAL



VERTICAL

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MID CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	41.47	PK-U	34.3	-27.5	0	48.27	-	-	74	-25.73	-	-	355	232	V
* 5	33.52	ADR	34.3	-27.5	.1	40.42	54	-13.58	-	-	-	-	355	232	V
* 5.401	42.73	PK-U	34.8	-18.9	0	58.63	-	-	74	-15.37	-	-	107	194	V
* 5.4	34.43	ADR	34.8	-18.9	.1	50.43	54	-3.57	-	-	-	-	107	194	V
5.56	43.82	PK-U	34.7	-19.1	0	59.42	-	-	-	-	68.2	-8.78	116	206	V
5.56	34.74	ADR	34.7	-19.1	.1	50.44	-	-	-	-	-	-	116	206	V
7.067	39.95	PK-U	35.7	-23.3	0	52.35	-	-	-	-	68.2	-15.85	131	103	H
7.067	35.65	ADR	35.7	-23.3	.1	48.15	-	-	-	-	-	-	131	103	H
7.067	43.95	PK-U	35.7	-23.3	0	56.35	-	-	-	-	68.2	-11.85	131	175	V
7.067	41.44	ADR	35.7	-23.3	.1	53.94	-	-	-	-	-	-	131	175	V
10.303	21.98	ADR	37.3	-19.7	.1	39.68	-	-	-	-	-	-	2	242	H
10.304	31.63	PK-U	37.3	-19.7	0	49.23	-	-	-	-	68.2	-18.97	2	242	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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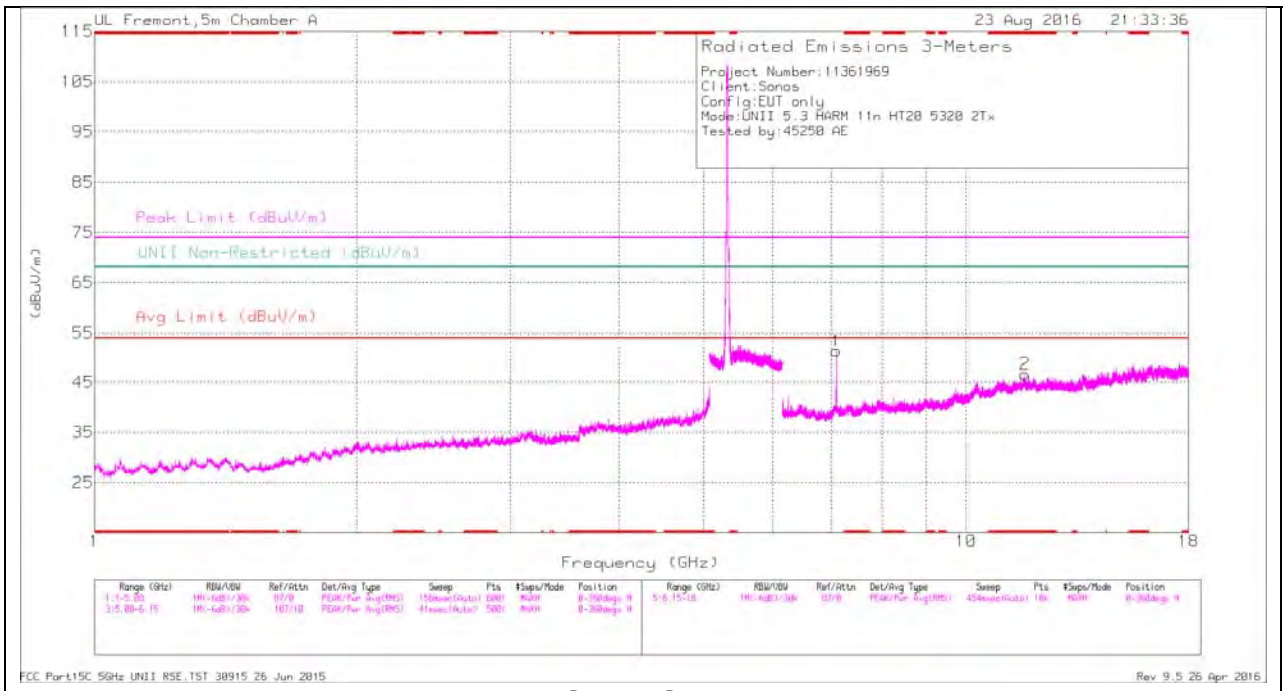
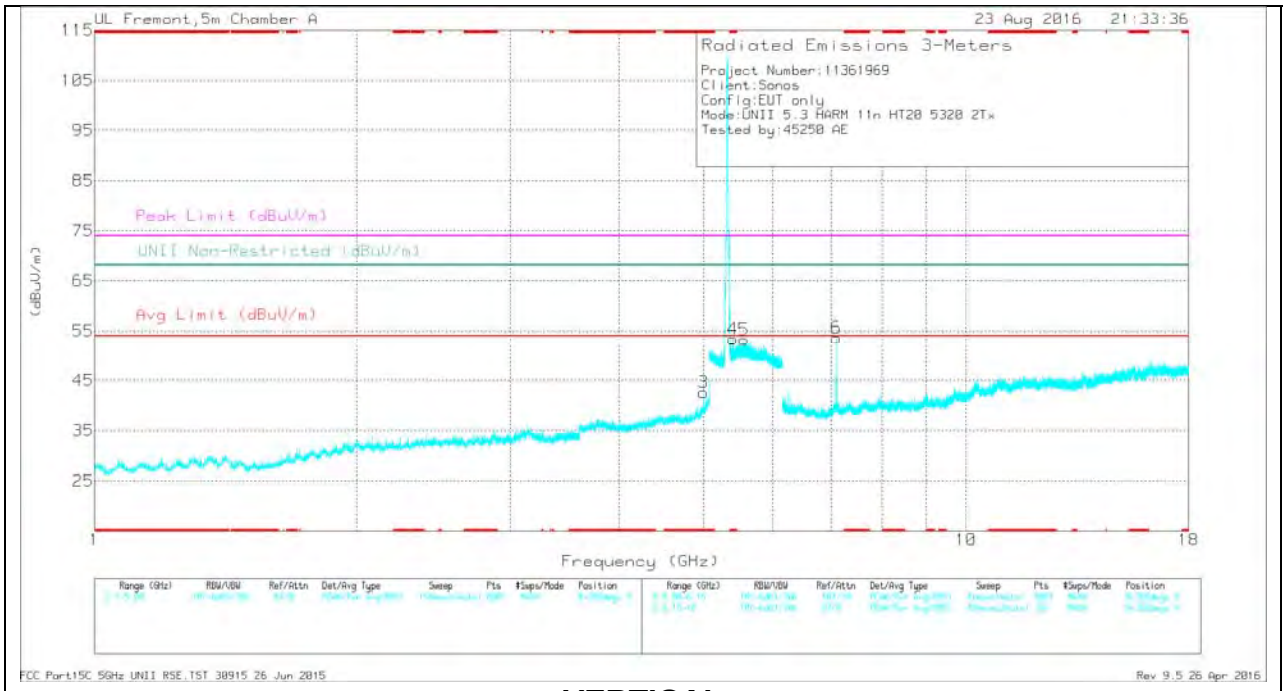
HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

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HIGH CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	41.79	PK-U	34.3	-27.5	0	48.59	-	-	74	-25.41	-	-	4	196	V
* 5	34.05	ADR	34.3	-27.5	.1	40.95	54	-13.05	-	-	-	-	4	196	V
* 5.4	45.22	PK-U	34.8	-18.9	0	61.12	-	-	74	-12.88	-	-	110	169	V
* 5.4	36.17	ADR	34.8	-18.9	.1	52.17	54	-1.83	-	-	-	-	110	169	V
* 11.687	32.25	PK-U	38.5	-19.7	0	51.05	-	-	74	-22.95	-	-	3	146	H
* 11.688	22.2	ADR	38.5	-19.7	.1	41.1	54	-12.9	-	-	-	-	3	146	H
5.56	43.01	PK-U	34.7	-19.1	0	58.61	-	-	-	-	68.2	-9.59	116	332	V
5.56	34.41	ADR	34.7	-19.1	.1	50.11	-	-	-	-	-	-	116	332	V
7.093	42.26	PK-U	35.7	-23.8	0	54.16	-	-	-	-	68.2	-14.04	26	235	H
7.093	39.05	ADR	35.7	-23.8	.1	51.05	-	-	-	-	-	-	26	235	H
7.093	44.24	PK-U	35.7	-23.8	0	56.14	-	-	-	-	68.2	-12.06	132	163	V
7.093	41.64	ADR	35.7	-23.8	.1	53.64	-	-	-	-	-	-	132	163	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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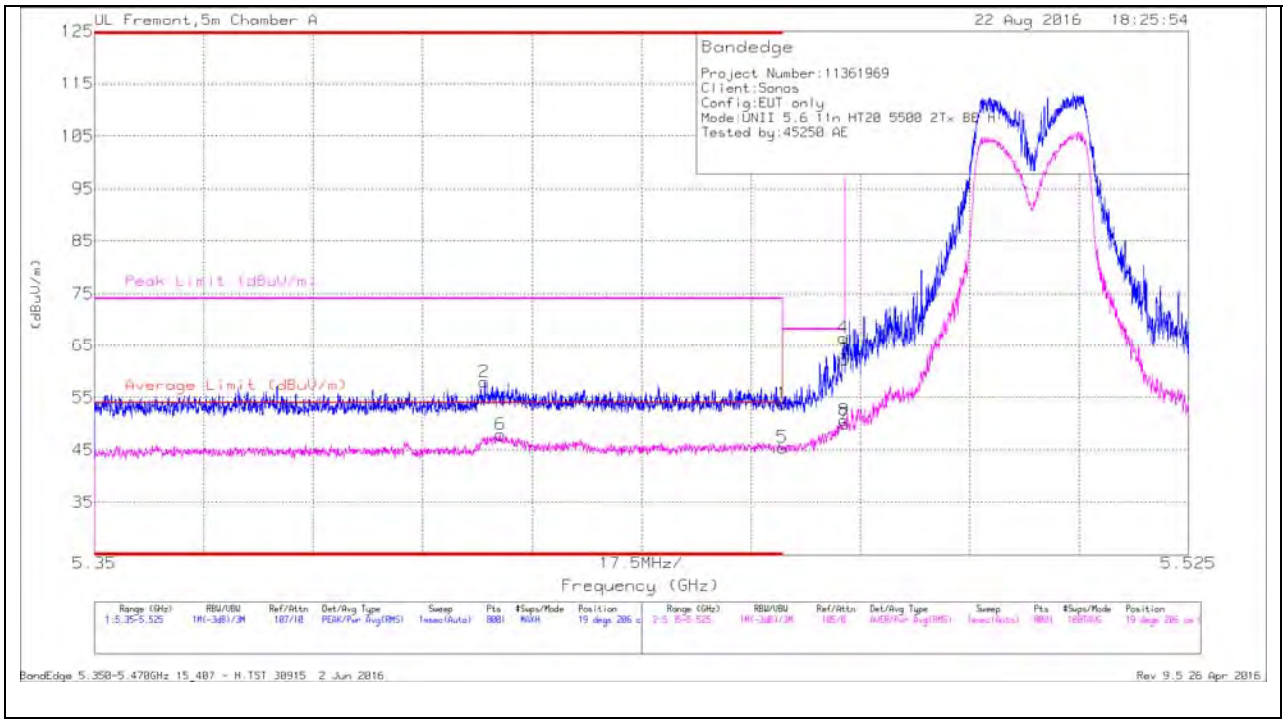
8.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
2	* 5.412	42.05	Pk	34.8	-18.9	0	57.95	-	-	74	-16.05	19	206	H
6	* 5.415	31.87	RMS	34.8	-18.8	.1	47.97	54	-6.03	-	-	19	206	H
1	* 5.46	37.87	Pk	34.8	-18.9	0	53.77	-	-	74	-20.23	19	206	H
5	* 5.46	29.48	RMS	34.8	-18.9	.1	45.48	54	-8.52	-	-	19	206	H
3	5.47	46.07	Pk	34.8	-18.7	0	62.17	-	-	68.2	-6.03	19	206	H
4	5.47	50.45	Pk	34.8	-18.7	0	66.55	-	-	68.2	-1.65	19	206	H
7	5.47	33.67	RMS	34.8	-18.7	.1	49.87	-	-	-	-	19	206	H
8	5.47	34.44	RMS	34.8	-18.7	.1	50.64	-	-	-	-	19	206	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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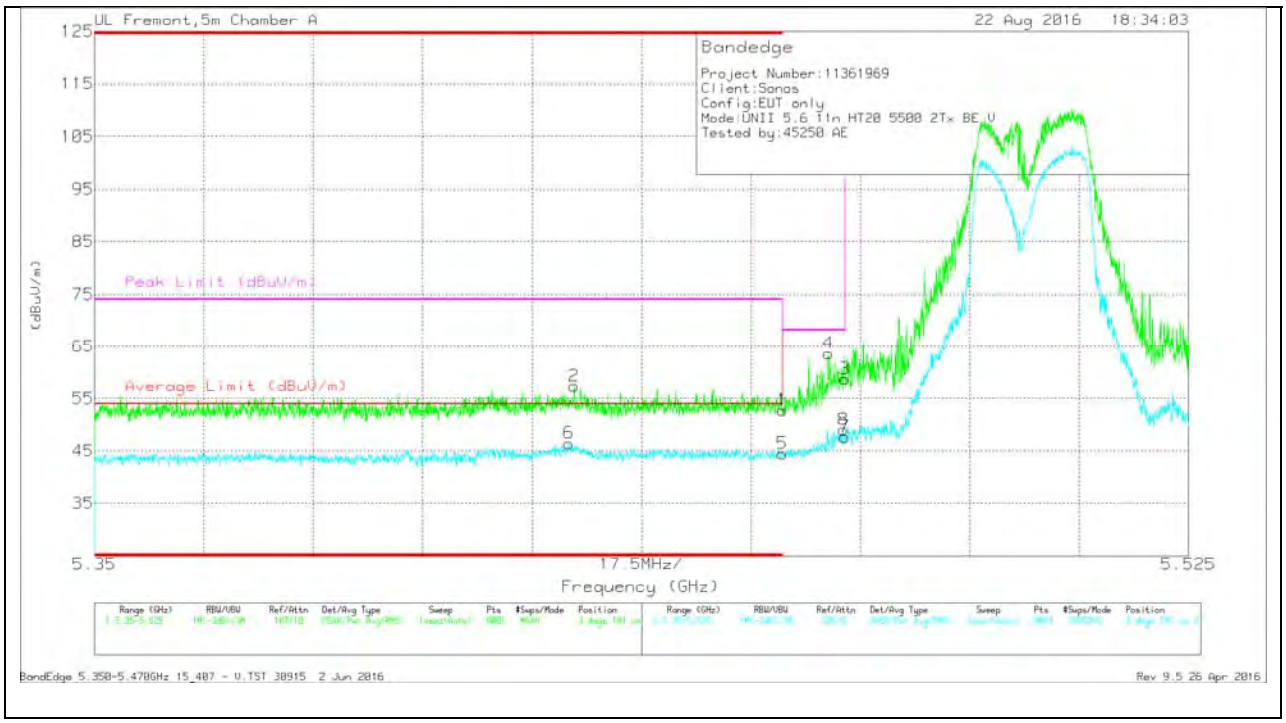
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
6	* 5.426	30.32	RMS	34.8	-18.8	.1	46.42	54	-7.58	-	-	4	181	V
2	* 5.427	41.37	Pk	34.8	-18.8	0	57.37	-	-	74	-16.63	4	181	V
1	* 5.46	36.86	Pk	34.8	-18.9	0	52.76	-	-	74	-21.24	4	181	V
5	* 5.46	28.48	RMS	34.8	-18.9	.1	44.48	54	-9.52	-	-	4	181	V
4	5.467	47.44	Pk	34.8	-18.6	0	63.64	-	-	68.2	-4.56	4	181	V
3	5.47	42.64	Pk	34.8	-18.7	0	58.74	-	-	68.2	-9.46	4	181	V
7	5.47	31.53	RMS	34.8	-18.7	.1	47.73	-	-	-	-	4	181	V
8	5.47	32.81	RMS	34.8	-18.7	.1	49.01	-	-	-	-	4	181	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector
RMS - RMS detection

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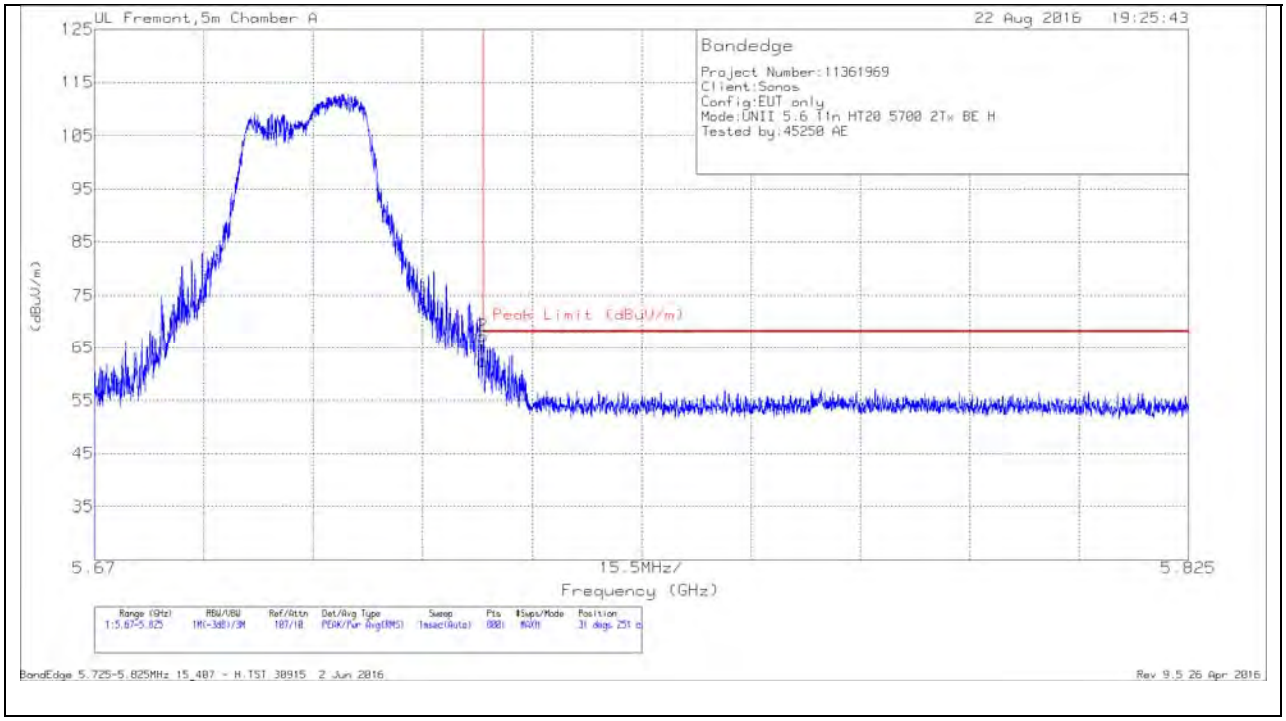
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	46.54	Pk	34.9	-19	0	62.44	68.2	-5.76	31	251	H
2	5.725	51.44	Pk	34.9	-19	0	67.34	68.2	-.86	31	251	H

Pk - Peak detector

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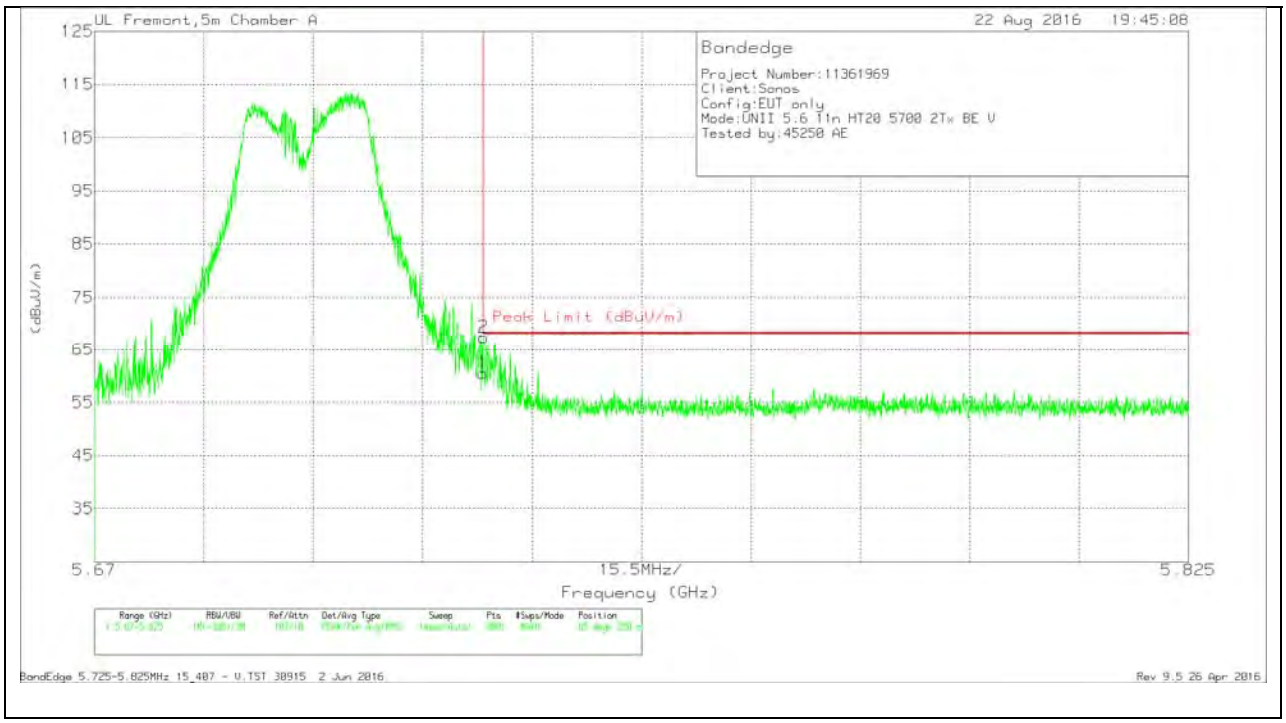
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	44.65	Pk	34.9	-19	0	60.55	68.2	-7.65	65	250	V
2	5.725	51.48	Pk	34.9	-19	0	67.38	68.2	-.82	65	250	V

Pk - Peak detector

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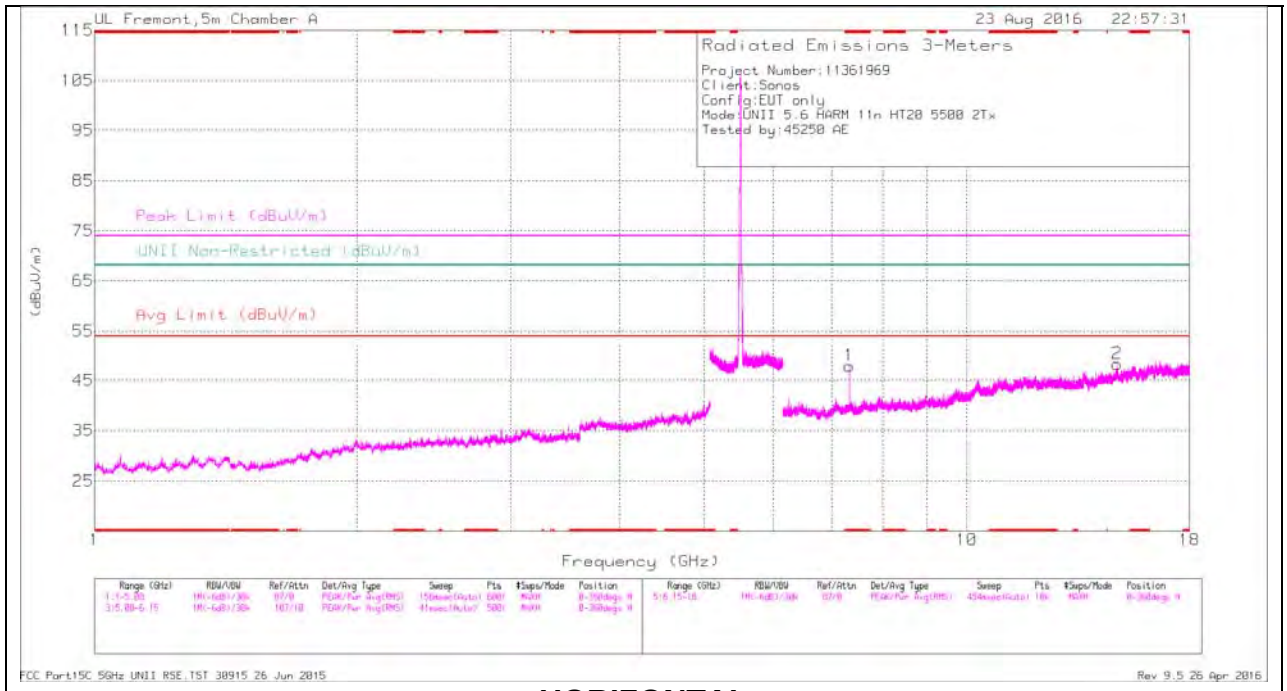
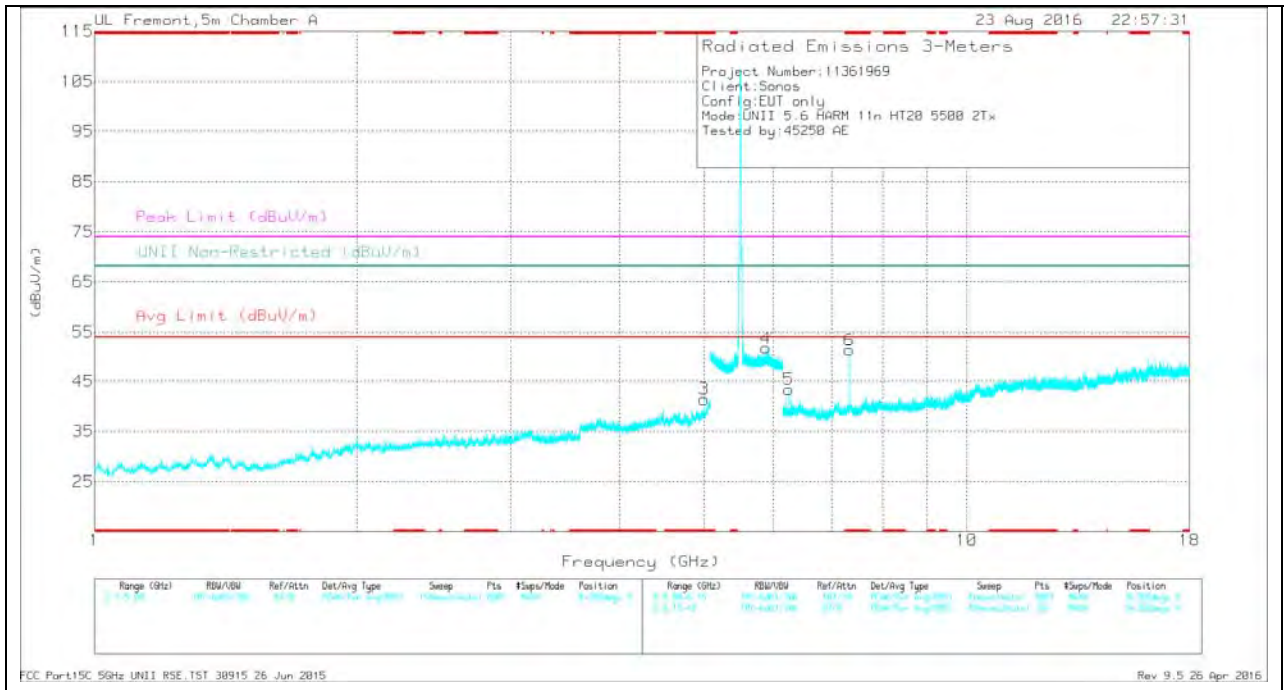
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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LOW CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	39.32	PK-U	34.3	-27.5	0	46.12	-	-	74	-27.88	-	-	24	161	V
* 5	31.01	ADR	34.3	-27.5	.1	37.91	54	-16.09	-	-	-	-	24	161	V
* 7.334	39.44	PK-U	35.7	-23.7	0	51.44	-	-	74	-22.56	-	-	34	213	H
* 7.333	35.26	ADR	35.7	-23.7	.1	47.36	54	-6.64	-	-	-	-	34	213	H
* 7.333	41.43	PK-U	35.7	-23.7	0	53.43	-	-	74	-20.57	-	-	143	148	V
* 7.333	38.16	ADR	35.7	-23.7	.1	50.26	54	-3.74	-	-	-	-	143	148	V
5.89	28.94	ADR	35.2	-18.7	.1	45.54	-	-	-	-	-	-	69	119	V
5.891	38.63	PK-U	35.2	-18.7	0	55.13	-	-	-	-	68.2	-13.07	69	119	V
6.25	39.99	PK-U	35.5	-26.2	0	49.29	-	-	-	-	68.2	-18.91	124	258	V
6.25	33.76	ADR	35.5	-26.2	.1	43.16	-	-	-	-	-	-	124	258	V
14.865	32.96	PK-U	39.8	-20.3	0	52.46	-	-	-	-	68.2	-15.74	82	187	H
14.866	23.14	ADR	39.8	-20.3	.1	42.74	-	-	-	-	-	-	82	187	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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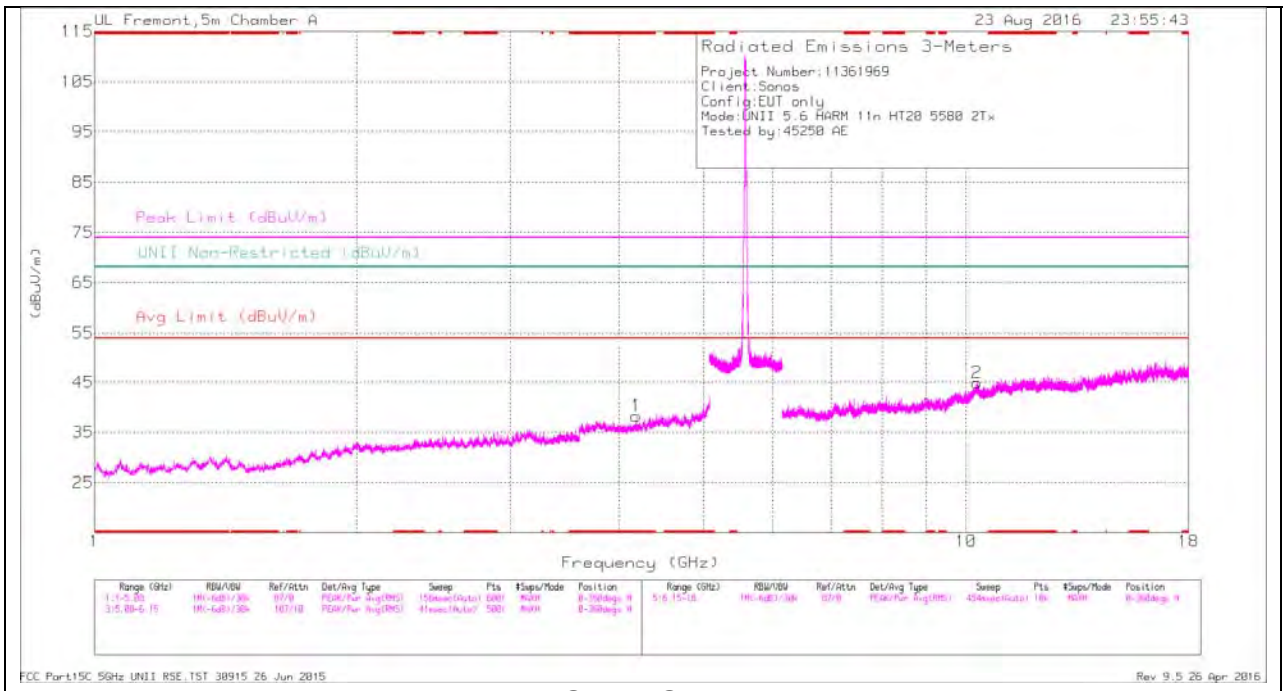
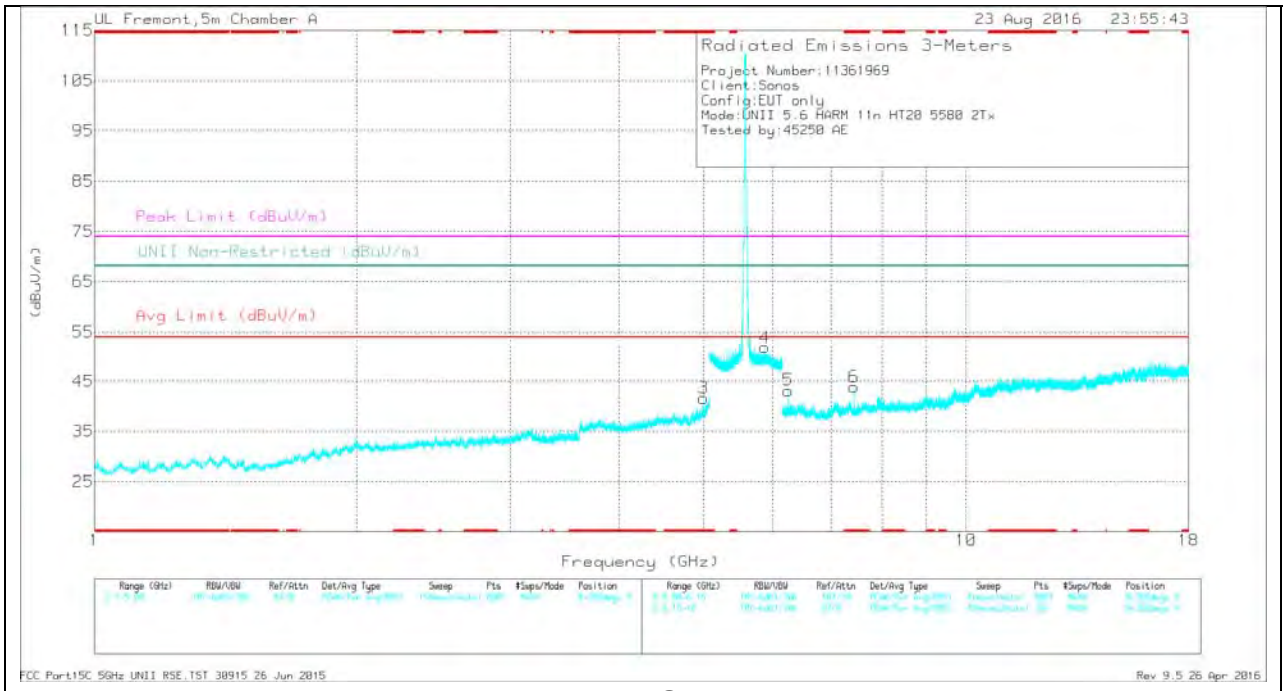
MID CHANNEL RESULTS



HORIZTONAL



VERTICAL

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MID CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 4.184	38.51	PK-U	33.6	-29.5	0	42.61	-	-	74	-31.39	-	-	46	220	H
* 4.184	27.98	ADR	33.6	-29.5	.1	32.18	54	-21.82	-	-	-	-	46	220	H
* 5	39.35	PK-U	34.3	-27.5	0	46.15	-	-	74	-27.85	-	-	26	221	V
* 5	30.7	ADR	34.3	-27.5	.1	37.6	54	-16.4	-	-	-	-	26	221	V
* 7.44	37.78	PK-U	35.8	-24.5	0	49.08	-	-	74	-24.92	-	-	142	178	V
* 7.44	31.34	ADR	35.8	-24.5	.1	42.74	54	-11.26	-	-	-	-	142	178	V
5.88	29.64	ADR	35.2	-18.6	.1	46.34	-	-	-	-	-	-	41	186	V
5.881	39.21	PK-U	35.2	-18.6	0	55.81	-	-	-	-	68.2	-12.39	41	186	V
6.25	40.45	PK-U	35.5	-26.2	0	49.75	-	-	-	-	68.2	-18.45	126	255	V
6.25	33.77	ADR	35.5	-26.2	.1	43.17	-	-	-	-	-	-	126	255	V
10.286	32.31	PK-U	37.3	-19.5	0	50.11	-	-	-	-	68.2	-18.09	3	238	H
10.286	22.41	ADR	37.3	-19.5	.1	40.31	-	-	-	-	-	-	3	238	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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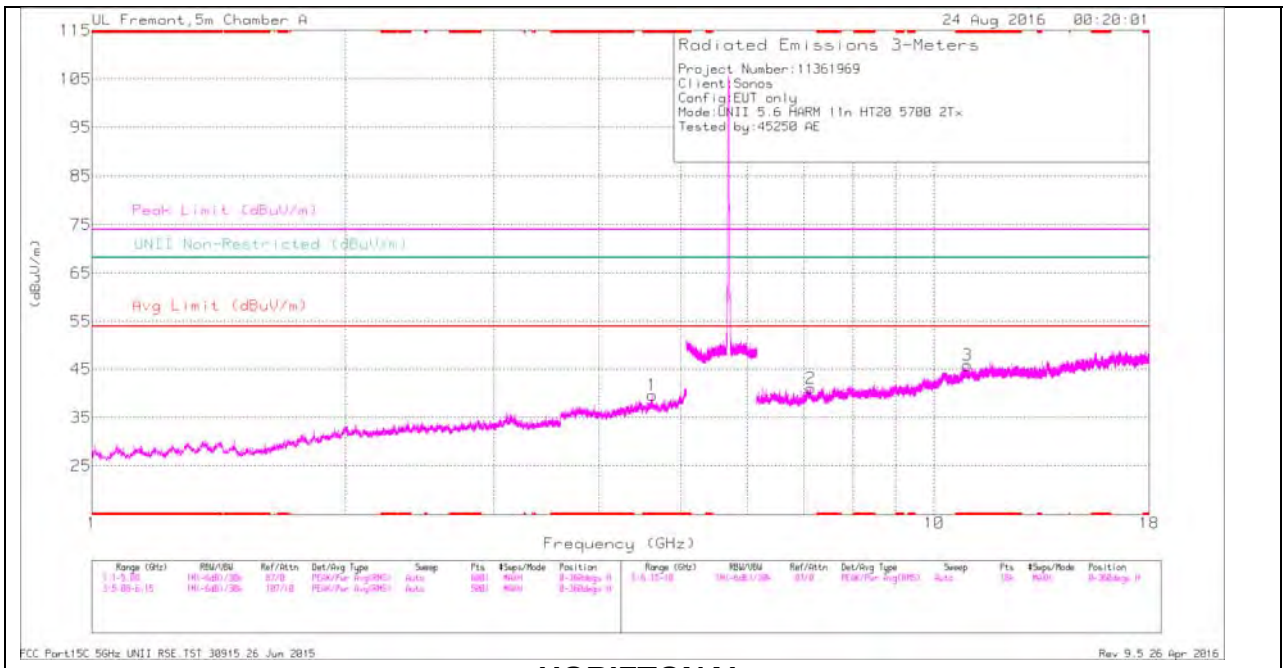
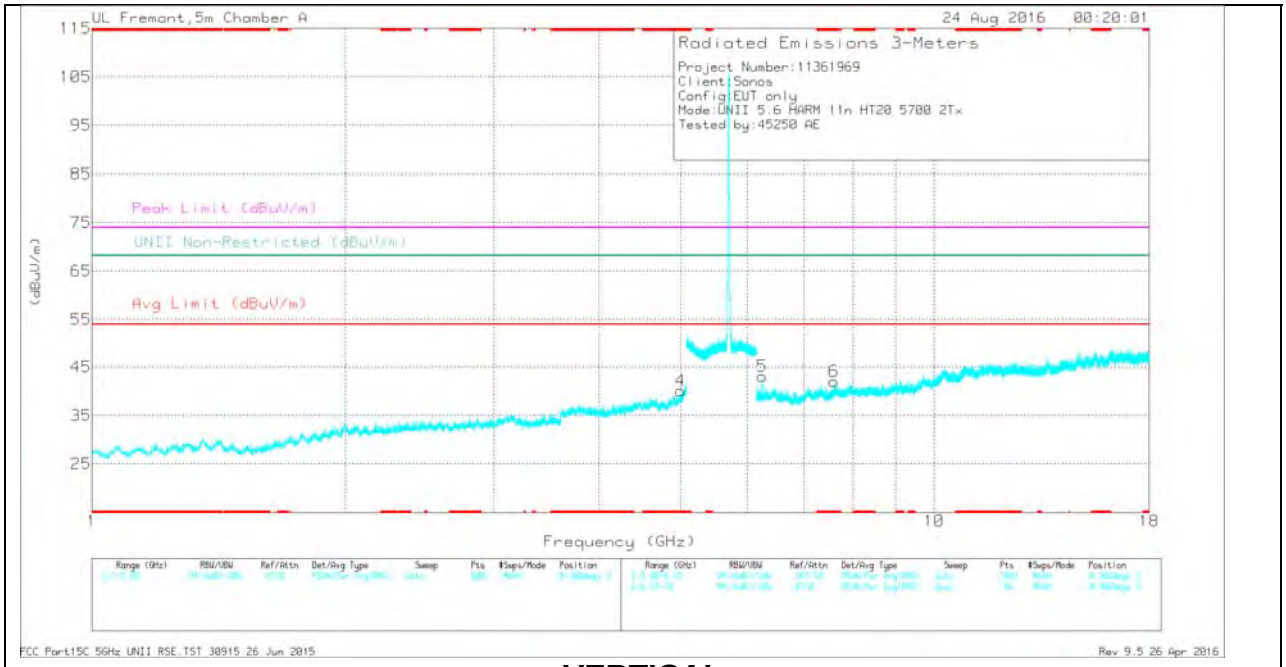
HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

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HIGH CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 4.624	37.29	PK-U	34.4	-28.3	0	43.39	-	-	74	-30.61	-	-	40	119	H
* 4.622	27.49	ADR	34.4	-28.3	.1	33.69	54	-20.31	-	-	-	-	40	119	H
* 5	39.62	PK-U	34.3	-27.5	0	46.42	-	-	74	-27.58	-	-	25	190	V
* 5	31	ADR	34.3	-27.5	.1	37.9	54	-16.1	-	-	-	-	25	190	V
* 10.943	32.61	PK-U	37.8	-19.8	0	50.61	-	-	74	-23.39	-	-	1	249	H
* 10.946	22.67	ADR	37.8	-19.8	.1	40.77	54	-13.23	-	-	-	-	1	249	H
* 7.6	34.53	PK-U	35.9	-23.5	0	46.93	-	-	74	-27.07	-	-	94	167	V
* 7.6	25.3	ADR	35.9	-23.5	.1	37.8	54	-16.2	-	-	-	-	94	167	V
6.25	40.63	PK-U	35.5	-26.2	0	49.93	-	-	-	-	68.2	-18.27	125	256	V
6.25	34.16	ADR	35.5	-26.2	.1	43.56	-	-	-	-	-	-	125	256	V
7.138	35.5	PK-U	35.7	-24.2	0	47	-	-	-	-	68.2	-21.2	59	231	H
7.139	24.33	ADR	35.7	-24.2	.1	35.93	-	-	-	-	-	-	59	231	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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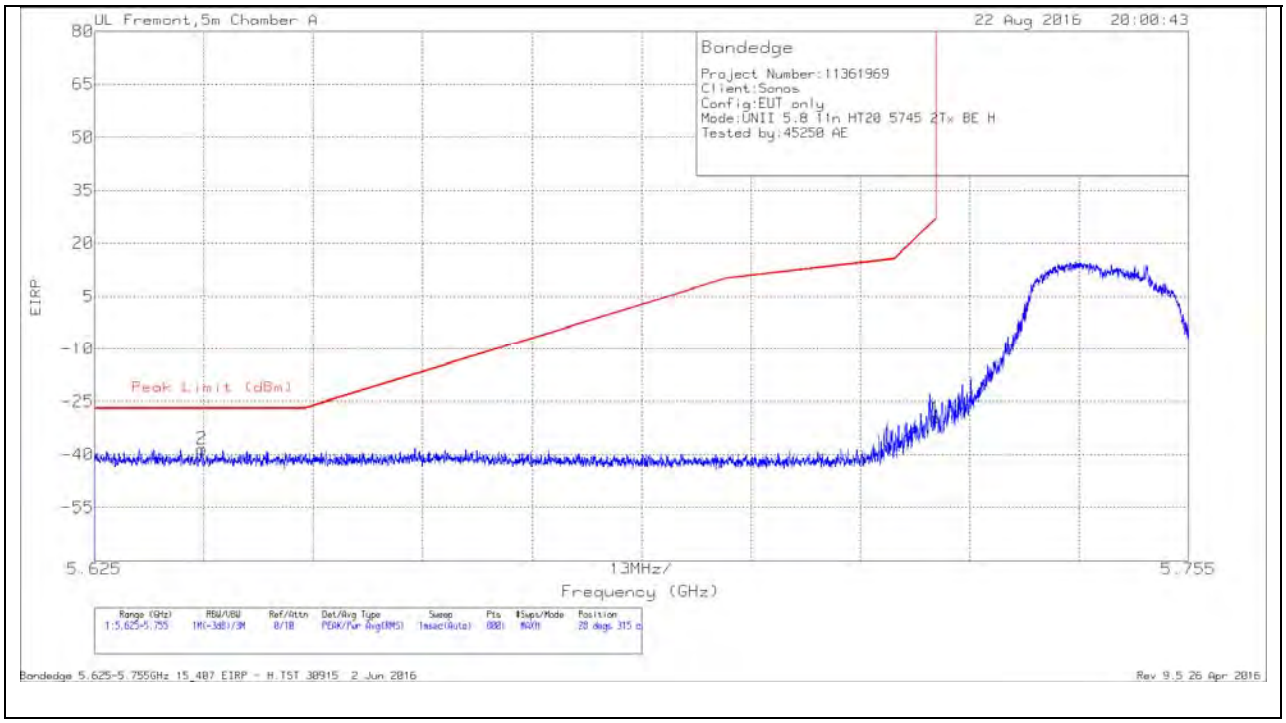
8.2.4. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

FCC

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	5.638	-66.03	Pk	34.8	-19	11.8	0	-38.43	-27	-11.43	28	315	H
1	5.725	-57.25	Pk	34.9	-19	11.8	0	-29.55	26.97	-56.52	28	315	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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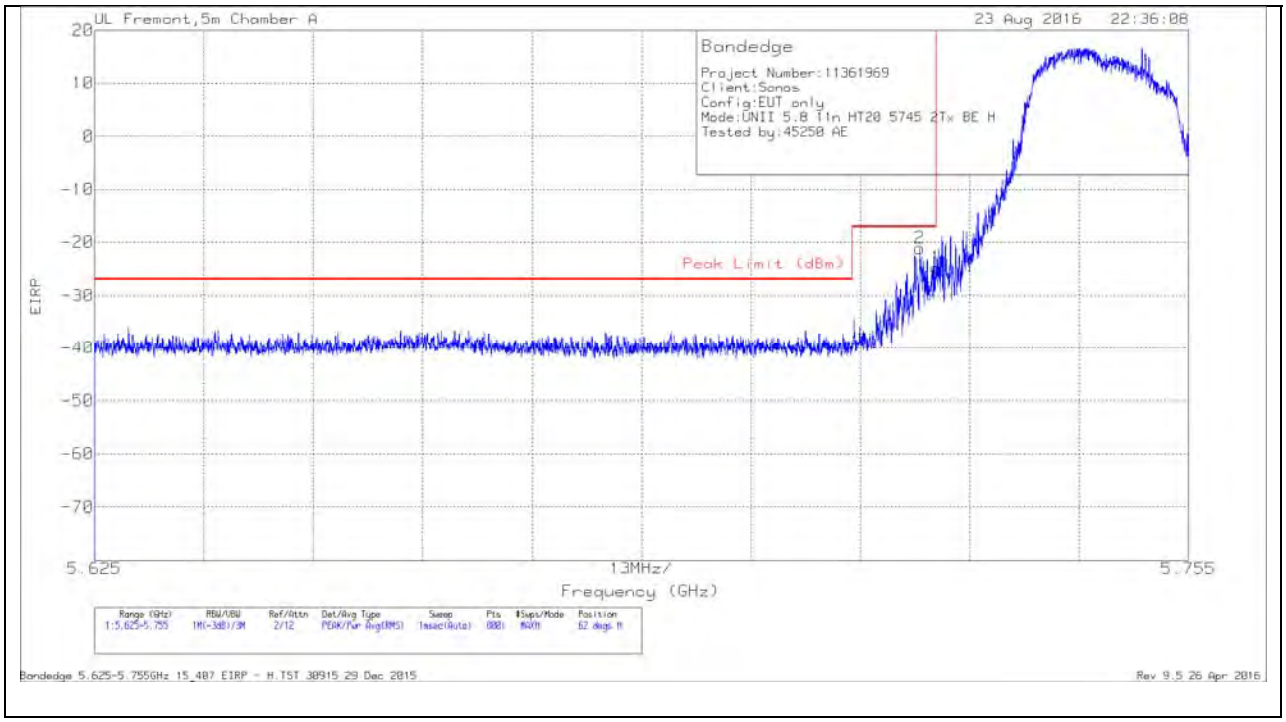
IC

HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-48.83	Pk	34.9	-19	11.8	0	-21.13	-17	-4.13	62	272	H
1	5.725	-52.52	Pk	34.9	-19	11.8	0	-24.82	-17	-7.82	62	272	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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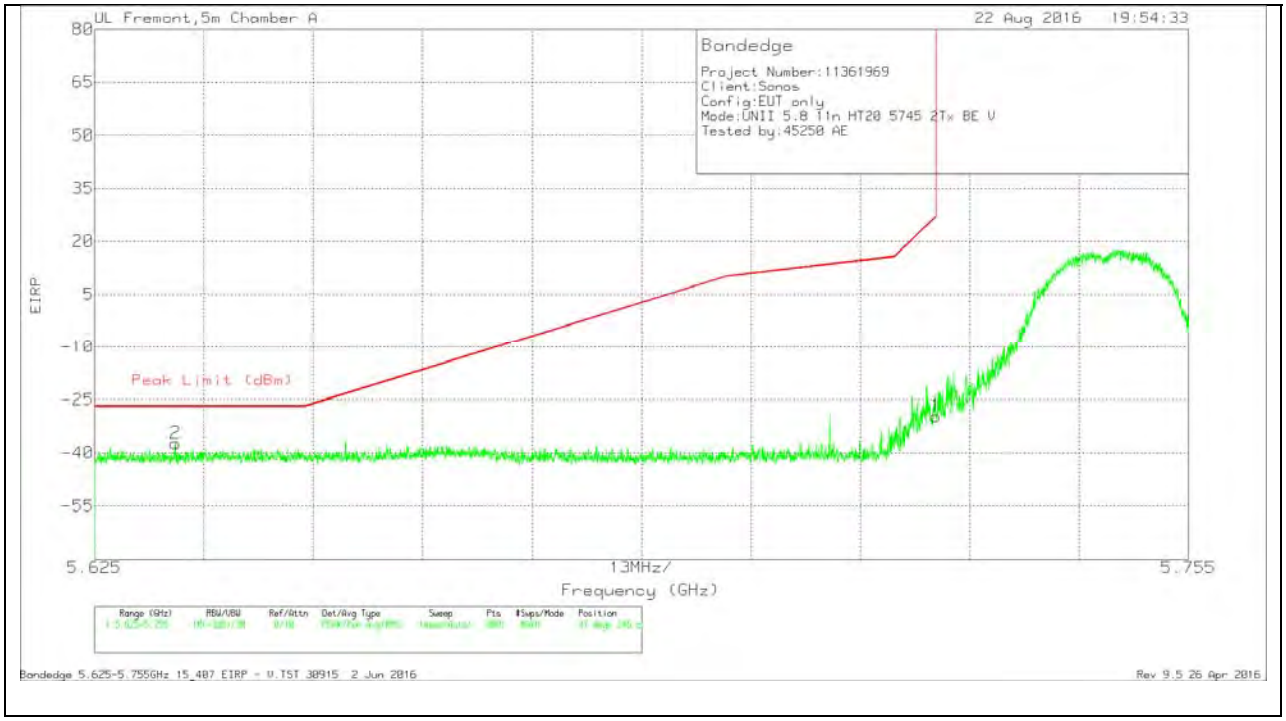
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	5.635	-64.97	Pk	34.8	-19	11.8	0	-37.37	-27	-10.37	47	246	V
1	5.725	-57.35	Pk	34.9	-19	11.8	0	-29.65	26.97	-56.62	47	246	V

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Pk - Peak detector

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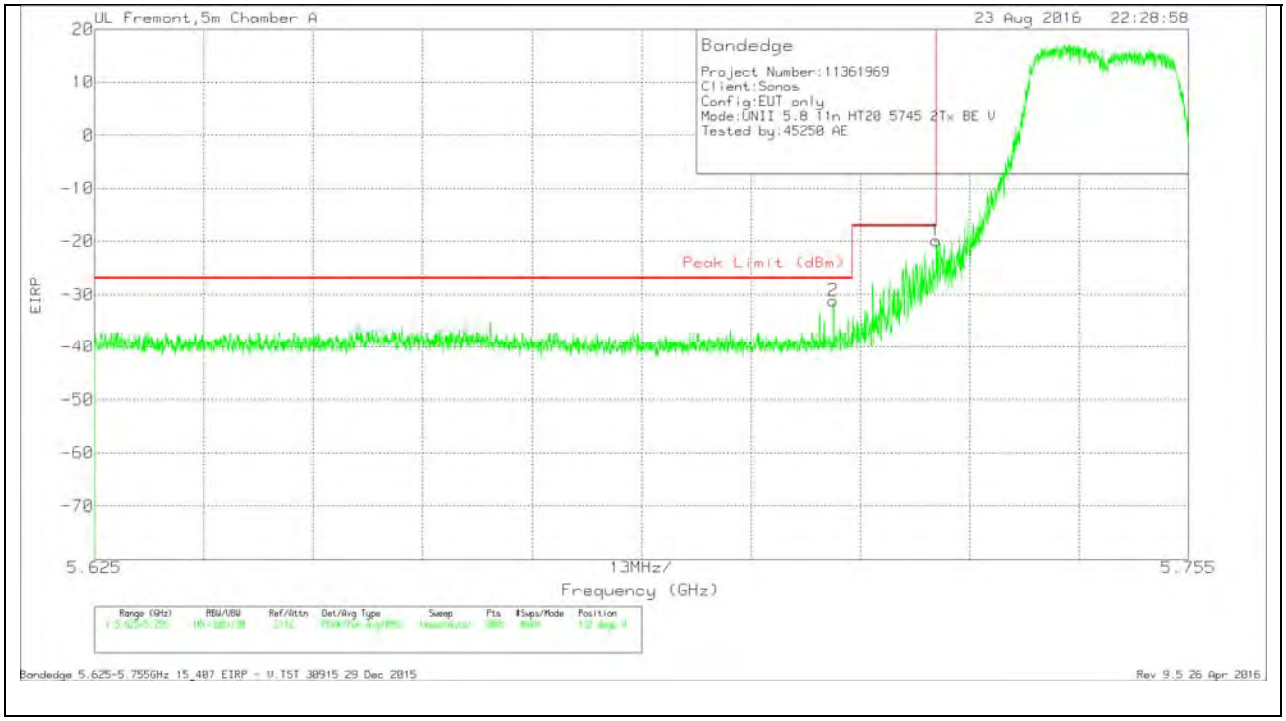
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-58.84	Pk	34.9	-19	11.8	0	-31.14	-27	-4.14	132	151	V
1	5.725	-47.61	Pk	34.9	-19	11.8	0	-19.91	-17	-2.91	132	151	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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AUTHORIZED BANDEDGE (HIGH CHANNEL)

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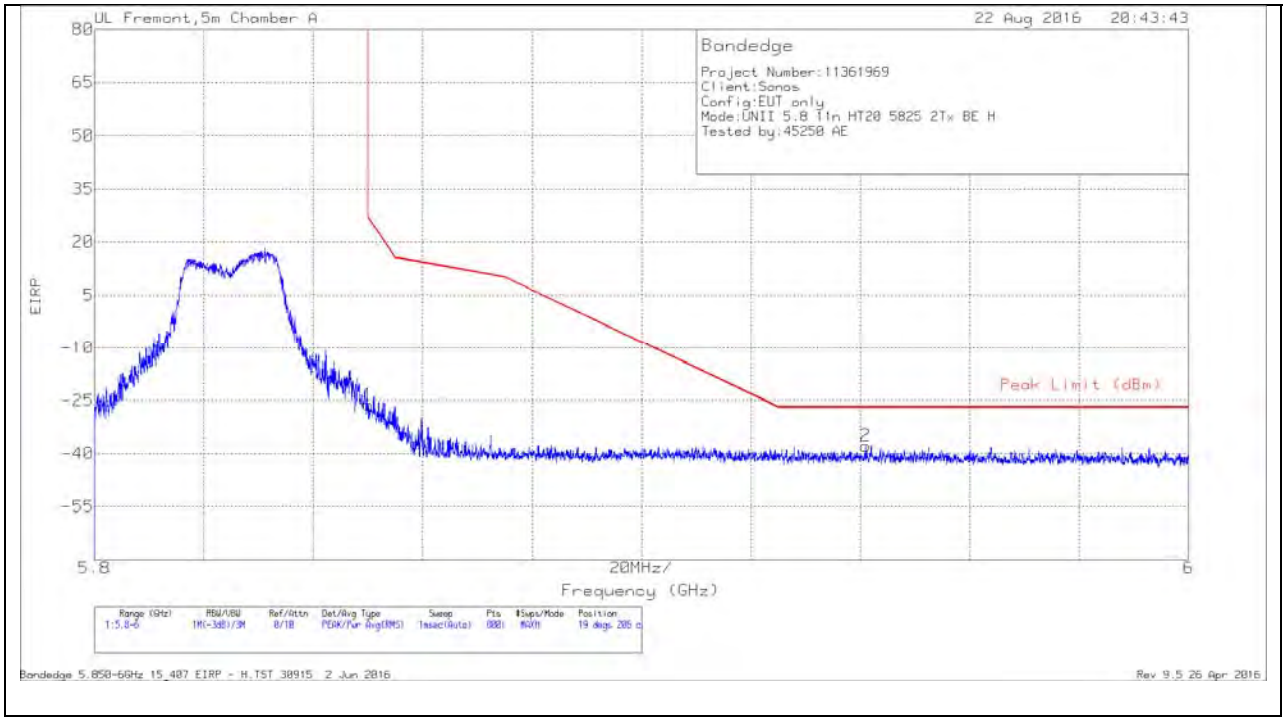
HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-54.38	Pk	35.1	-18.8	11.8	0	-26.28	26.94	-53.22	19	206	H
2	5.941	-66.19	Pk	35.2	-18.6	11.8	0	-37.79	-27	-10.79	19	206	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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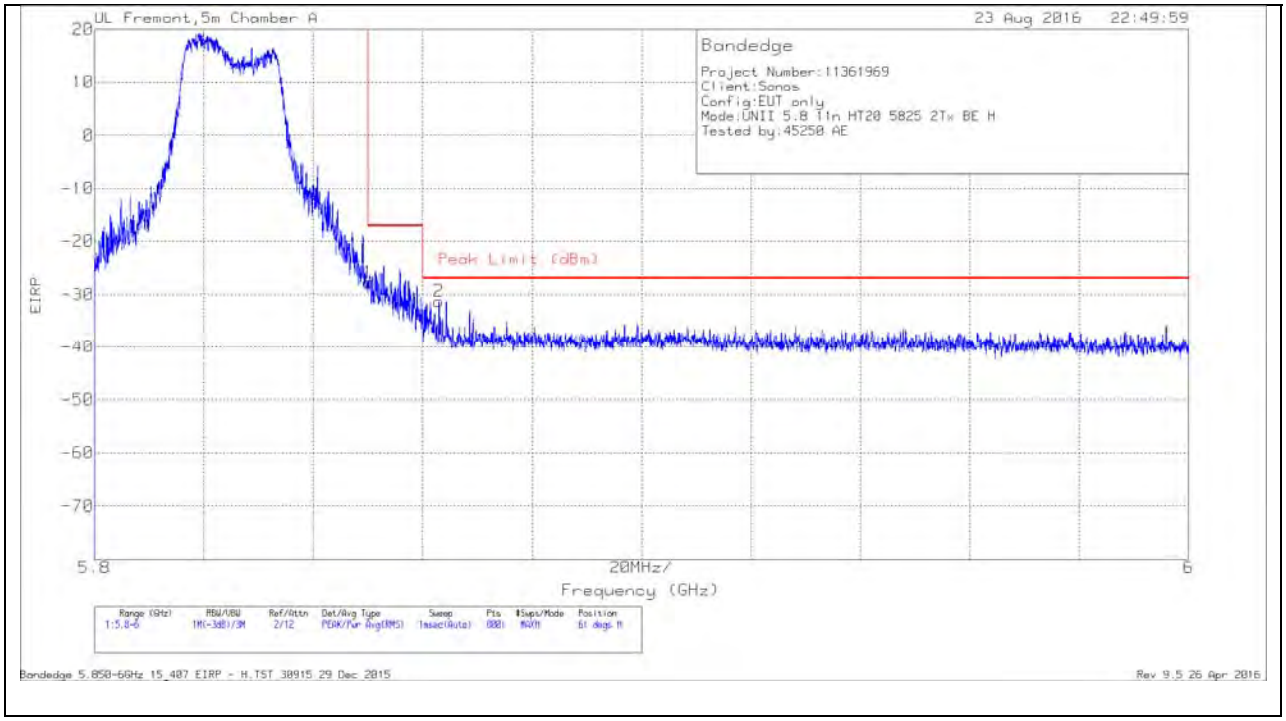
HORIZONTAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-55.81	Pk	35.1	-18.8	11.8	0	-27.71	-17	-10.71	61	199	H
2	5.863	-59.53	Pk	35.1	-18.7	11.8	0	-31.33	-27	-4.33	61	199	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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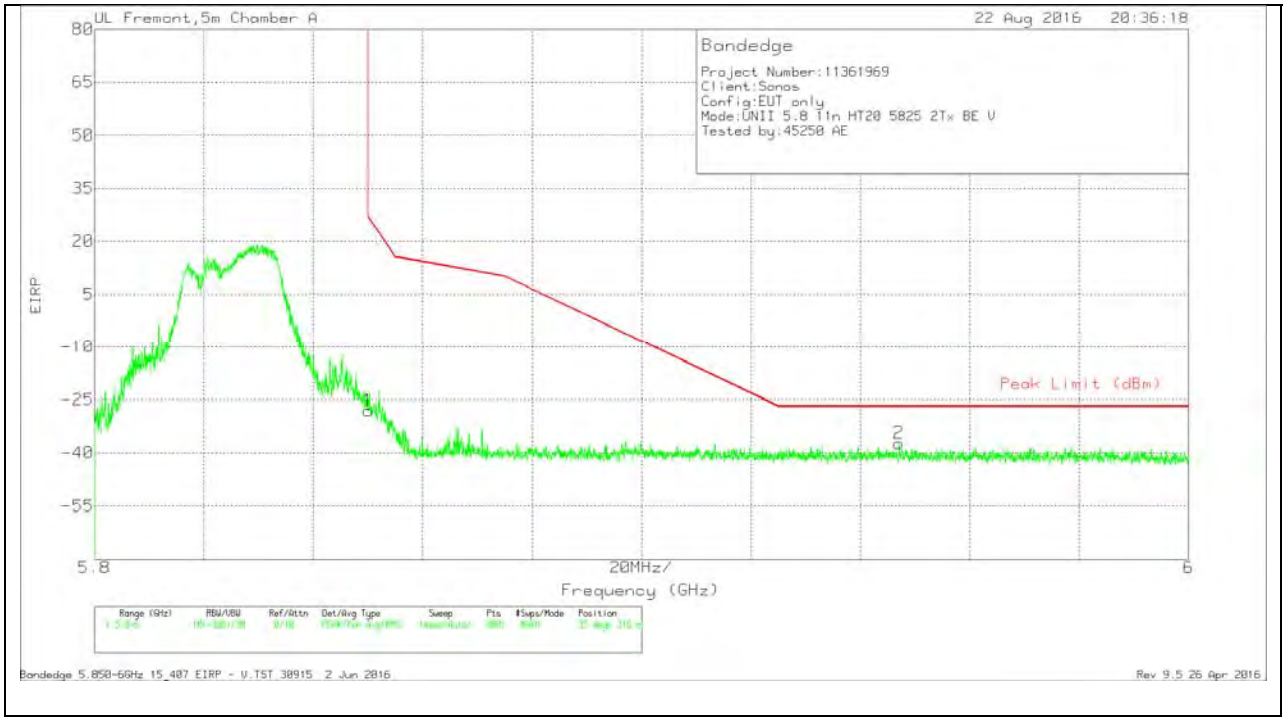
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-56.18	Pk	35.1	-18.8	11.8	0	-28.08	26.94	-55.02	35	316	V
2	5.947	-65.79	Pk	35.2	-18.5	11.8	0	-37.29	-27	-10.29	35	316	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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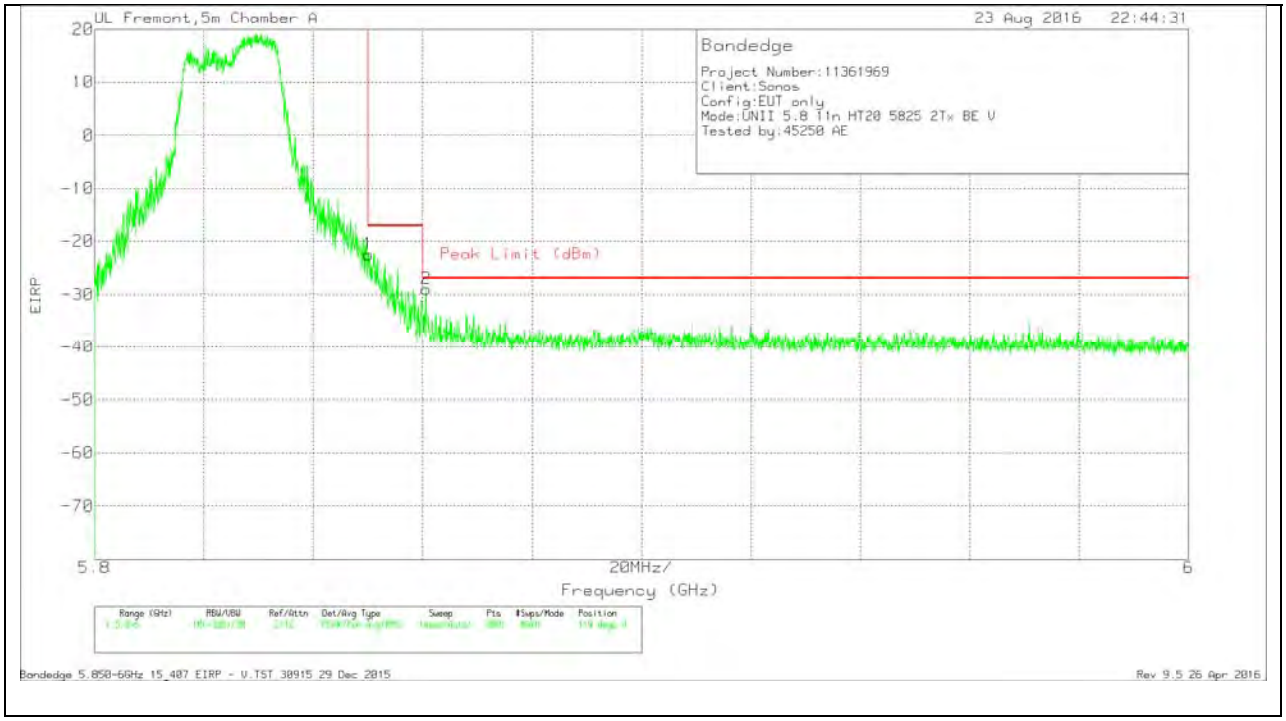
VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (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	-50.55	Pk	35.1	-18.8	11.8	0	-22.45	-17	-5.45	119	273	V
2	5.861	-57.21	Pk	35.1	-18.7	11.8	0	-29.01	-27	-2.01	119	273	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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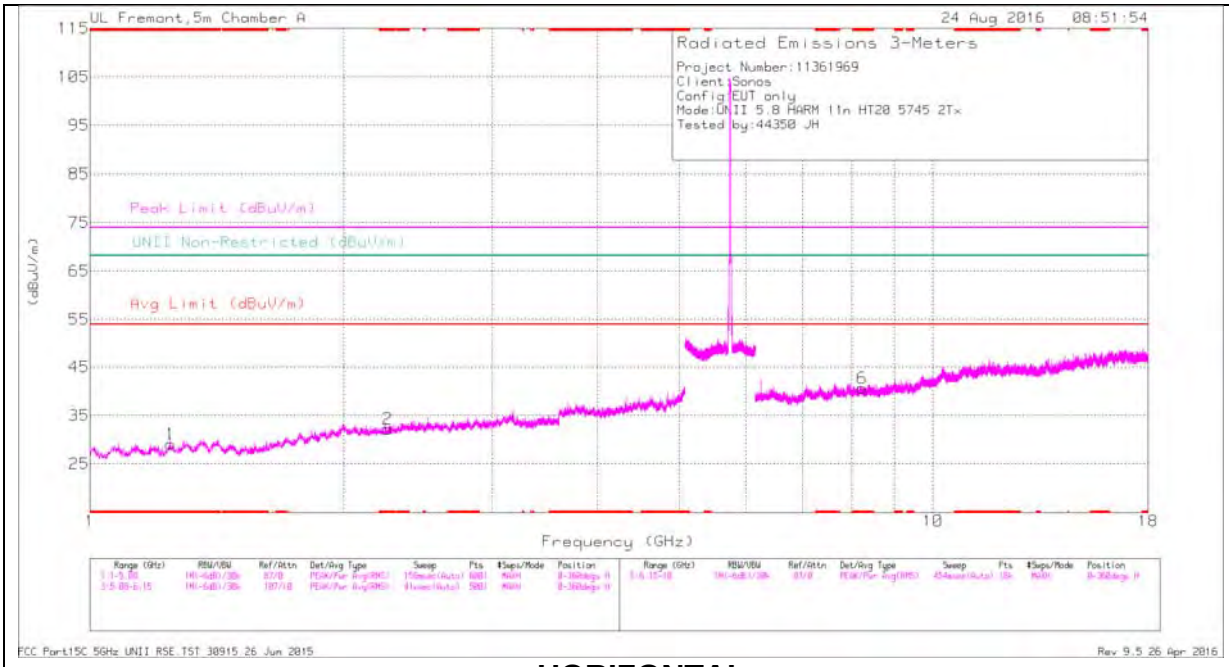
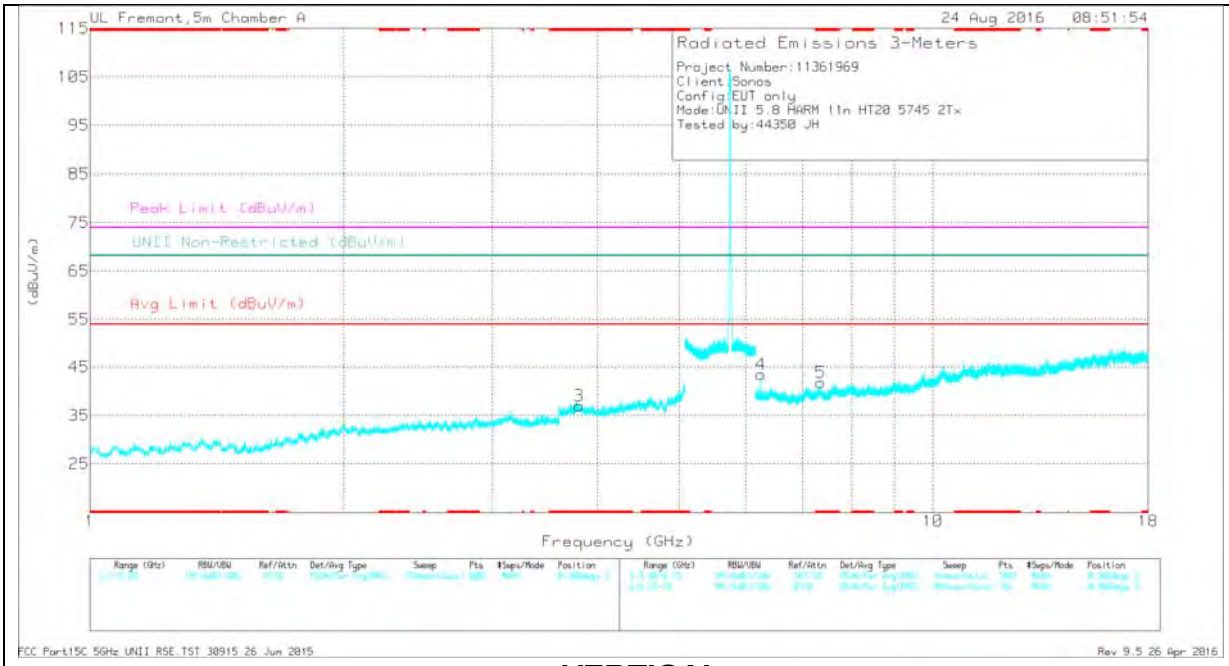
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



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LOW CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 1.244	40.71	PK-U	28.6	-34.4	0	34.91	-	-	74	-39.09	-	-	360	100	H
* 1.244	30.48	ADR	28.6	-34.4	.1	24.78	54	-29.22	-	-	-	-	360	100	H
* 2.252	40.2	PK-U	31.8	-33	0	39	-	-	74	-35	-	-	360	100	H
* 2.252	29.67	ADR	31.8	-33	.1	28.57	54	-25.43	-	-	-	-	360	100	H
* 3.803	38.62	PK-U	33.6	-29.5	0	42.72	-	-	74	-31.28	-	-	360	100	V
* 3.802	28.67	ADR	33.6	-29.5	.1	32.87	54	-21.13	-	-	-	-	360	100	V
* 8.244	33.02	PK-U	35.9	-23.4	0	45.52	-	-	74	-28.48	-	-	360	100	H
* 8.246	23.9	ADR	35.9	-23.4	.1	36.5	54	-17.5	-	-	-	-	360	100	H
* 7.36	34.21	PK-U	35.7	-23.1	0	46.81	-	-	74	-27.19	-	-	0	101	V
* 7.362	23.68	ADR	35.7	-23.1	.1	36.38	54	-17.62	-	-	-	-	0	101	V
6.25	39.3	PK-U	35.5	-26.2	0	48.6	-	-	-	-	68.2	-19.6	0	101	V
6.25	31.21	ADR	35.5	-26.2	.1	40.61	-	-	-	-	-	-	0	101	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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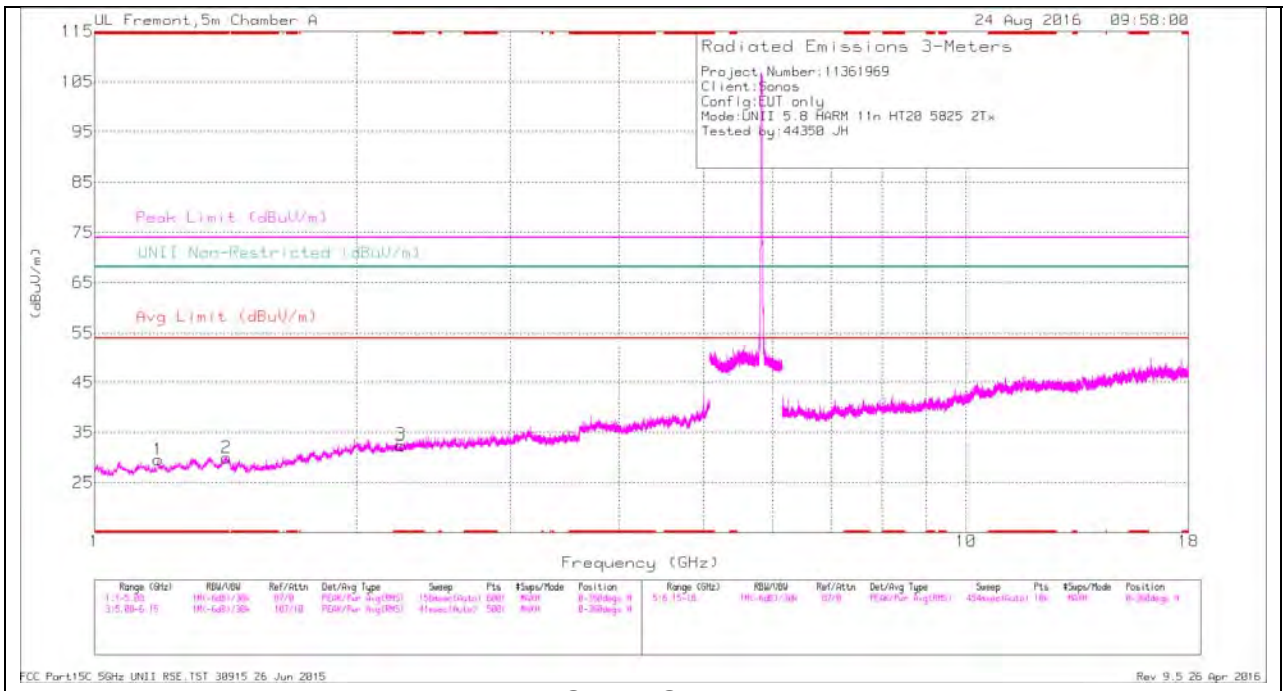
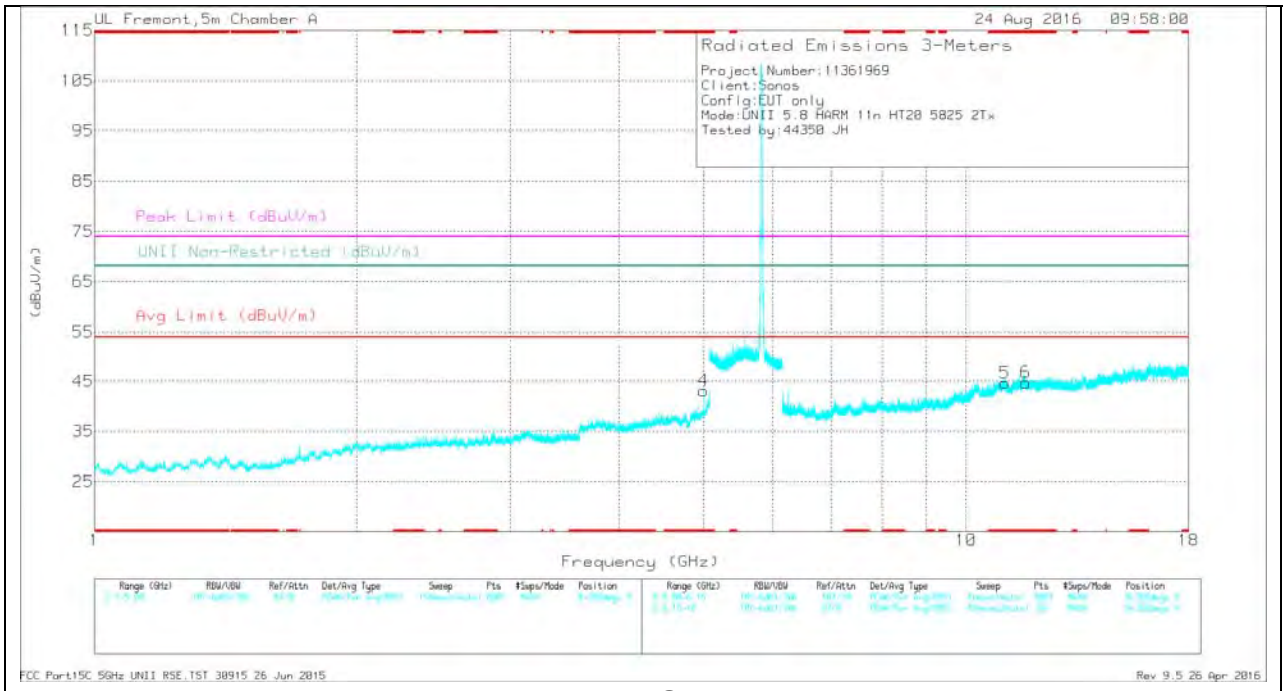
MID CHANNEL RESULTS



HORIZTONAL



VERTICAL

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MID CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 1.185	41.42	PK-U	28.2	-34.3	0	35.32	-	-	74	-38.68	-	-	1	100	H
* 1.182	30.37	ADR	28.2	-34.3	.1	24.37	54	-29.63	-	-	-	-	1	100	H
* 1.416	40.89	PK-U	28.8	-33.4	0	36.29	-	-	74	-37.71	-	-	1	100	H
* 1.419	30.57	ADR	28.8	-33.4	.1	26.07	54	-27.93	-	-	-	-	1	100	H
* 2.244	39.8	PK-U	31.8	-33	0	38.6	-	-	74	-35.4	-	-	1	100	H
* 2.246	29.53	ADR	31.8	-33	.1	28.43	54	-25.57	-	-	-	-	1	100	H
* 5	41.12	PK-U	34.3	-27.5	0	47.92	-	-	74	-26.08	-	-	51	252	V
* 5	34.25	ADR	34.3	-27.5	.1	41.15	54	-12.85	-	-	-	-	51	252	V
* 11.084	32.47	PK-U	37.9	-19.8	0	50.57	-	-	74	-23.43	-	-	51	252	V
* 11.084	22.55	ADR	37.9	-19.8	.1	40.75	54	-13.25	-	-	-	-	51	252	V
* 11.712	31.92	PK-U	38.5	-20.1	0	50.32	-	-	74	-23.68	-	-	51	252	V
* 11.712	22.41	ADR	38.5	-20	.1	41.01	54	-12.99	-	-	-	-	51	252	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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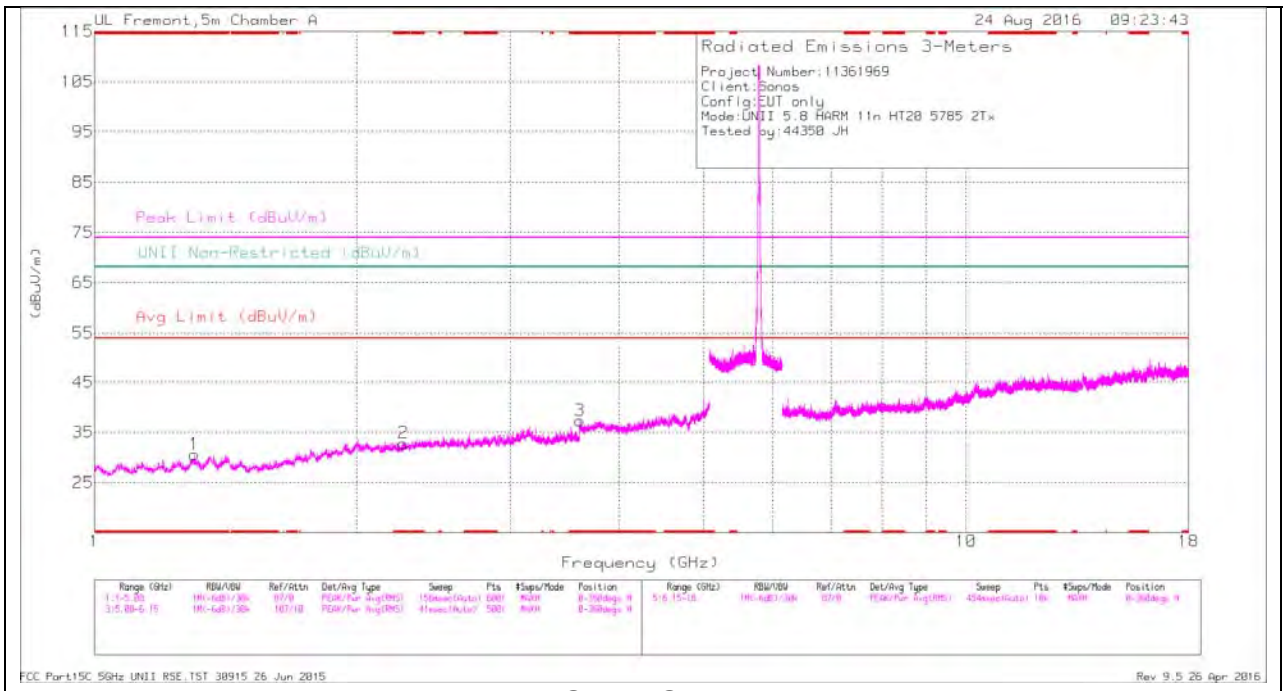
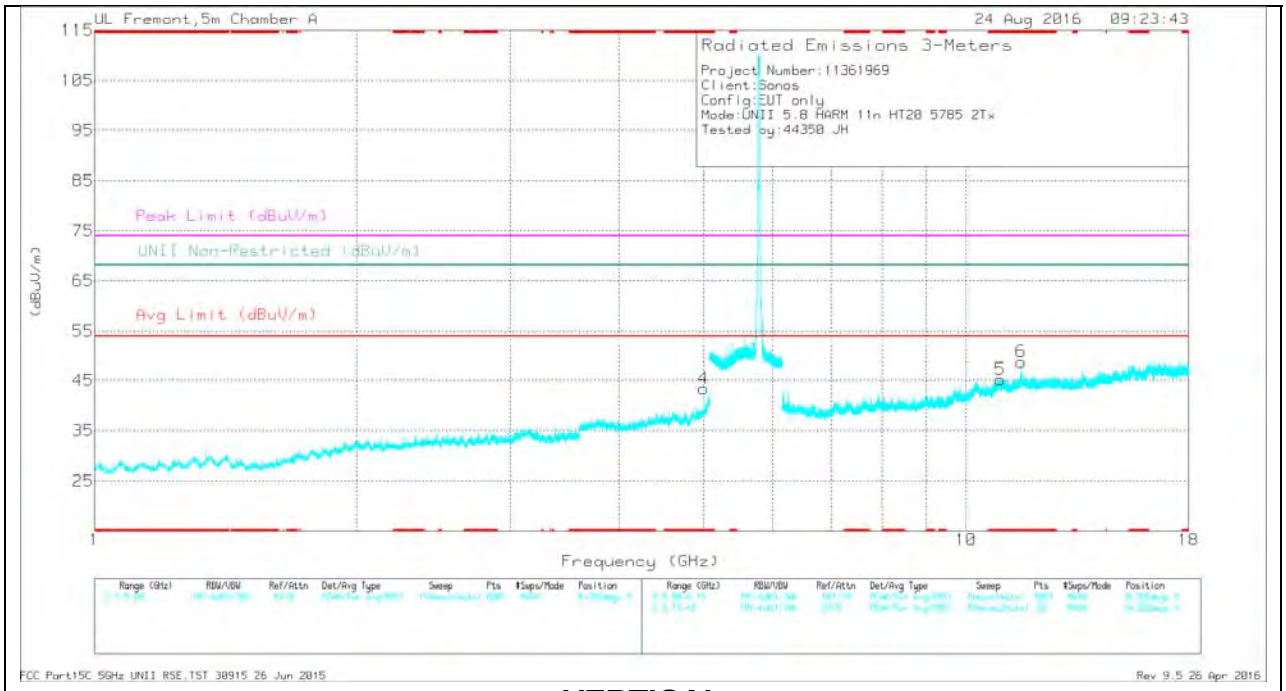
HIGH CHANNEL RESULTS



HORIZTONAL



VERTICAL

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HIGH CHANNEL DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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
* 1.303	41.4	PK-U	28.9	-33.9	0	36.4	-	-	74	-37.6	-	-	1	101	H
* 1.306	30.35	ADR	28.9	-33.9	.1	25.45	54	-28.55	-	-	-	-	1	101	H
* 2.26	39.81	PK-U	31.8	-32.9	0	38.71	-	-	74	-35.29	-	-	1	101	H
* 2.261	29.59	ADR	31.8	-32.9	.1	28.59	54	-25.41	-	-	-	-	1	101	H
* 3.606	39.07	PK-U	33.1	-30.8	0	41.37	-	-	74	-32.63	-	-	1	101	H
* 3.606	29.02	ADR	33.1	-30.8	.1	31.42	54	-22.58	-	-	-	-	1	101	H
* 5	41.74	PK-U	34.3	-27.5	0	48.54	-	-	74	-25.46	-	-	12	101	V
* 5	34.09	ADR	34.3	-27.5	.1	40.99	54	-13.01	-	-	-	-	12	101	V
* 10.941	32.34	PK-U	37.8	-19.7	0	50.44	-	-	74	-23.56	-	-	12	101	V
* 10.942	22.67	ADR	37.8	-19.7	.1	40.87	54	-13.13	-	-	-	-	12	101	V
* 11.574	36.66	PK-U	38.3	-20.2	0	54.76	-	-	74	-19.24	-	-	130	191	V
* 11.574	25.38	ADR	38.3	-20.2	.1	43.58	54	-10.42	-	-	-	-	130	191	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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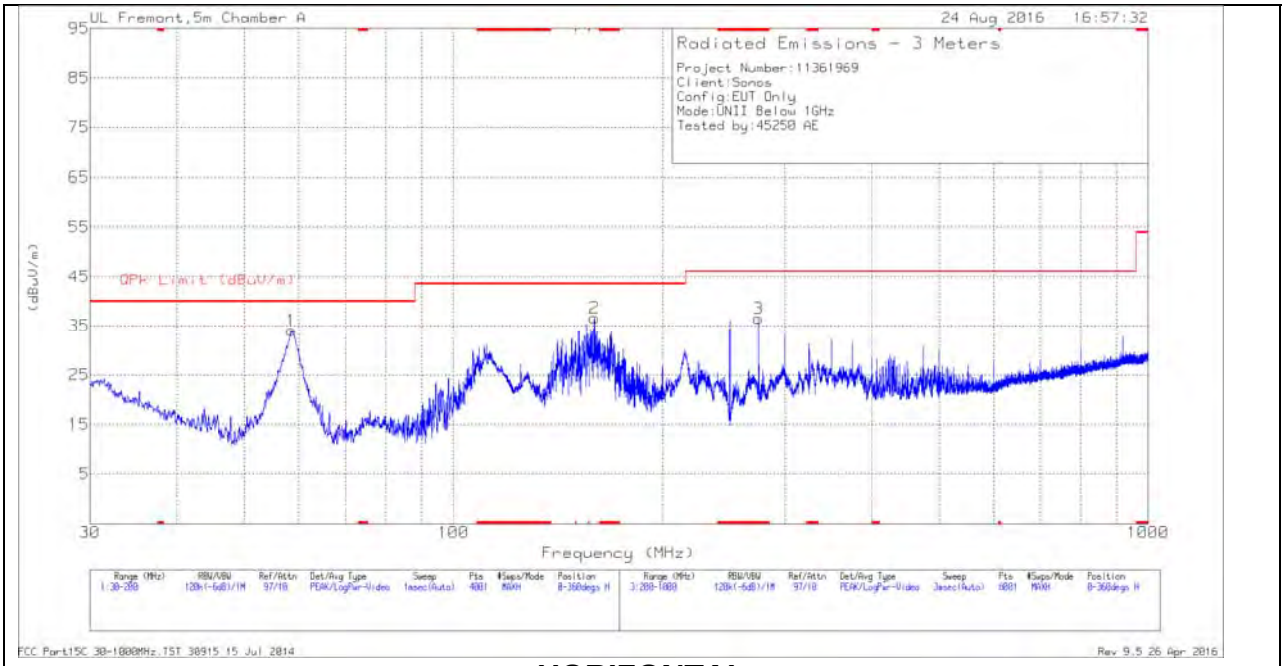
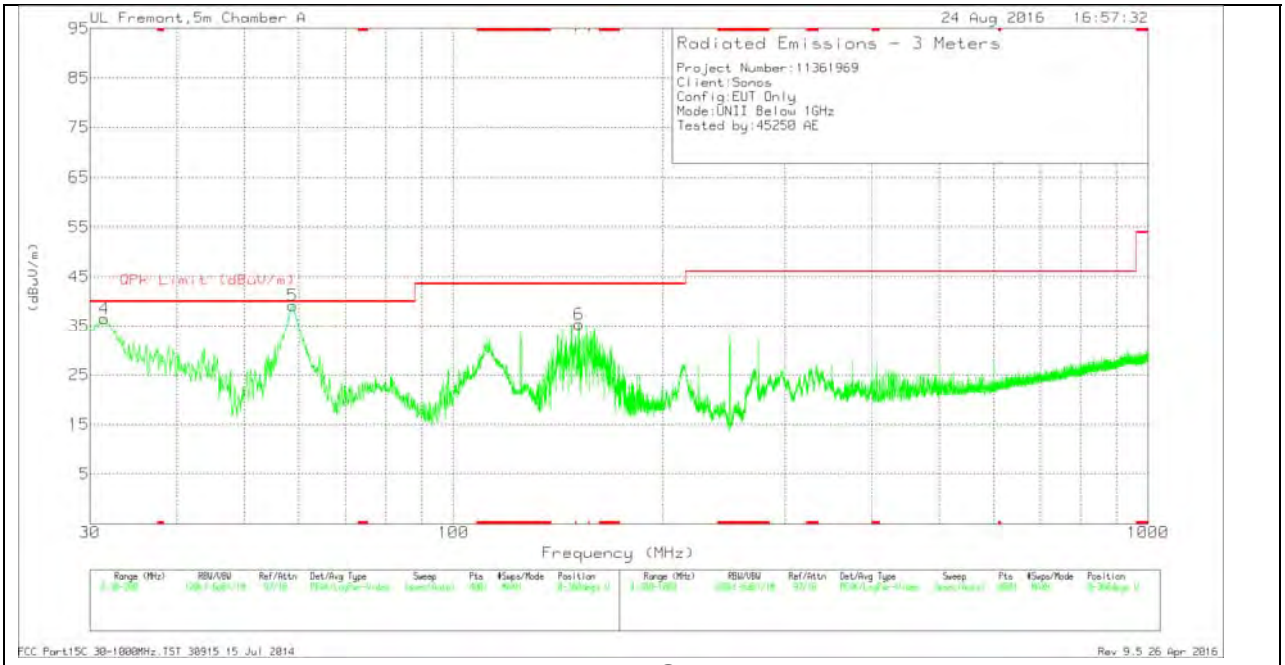
8.3. WORST-CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

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Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 275	48.67	Pk	17.4	-29.5	36.57	46.02	-9.45	0-360	100	H
4	31.445	43.42	Pk	24.3	-31.2	36.52	40	-3.48	0-360	100	V
1	58.475	53.5	Pk	11.5	-30.9	34.1	40	-5.9	0-360	400	H
5	58.73	58.53	Pk	11.5	-30.9	39.13	40	-.87	0-360	100	V
6	151.55	49.29	Pk	16.3	-30.2	35.39	43.52	-8.13	0-360	100	V
2	159.625	50.94	Pk	15.9	-30.2	36.64	43.52	-6.88	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
31.4162	41.08	Qp	24.4	-31.2	34.28	40	-5.72	297	101	V
58.4193	50.48	Qp	11.5	-30.9	31.08	40	-8.92	84	395	H
58.6782	55.31	Qp	11.5	-30.9	35.91	40	-4.09	31	104	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Qp - Quasi-Peak detector

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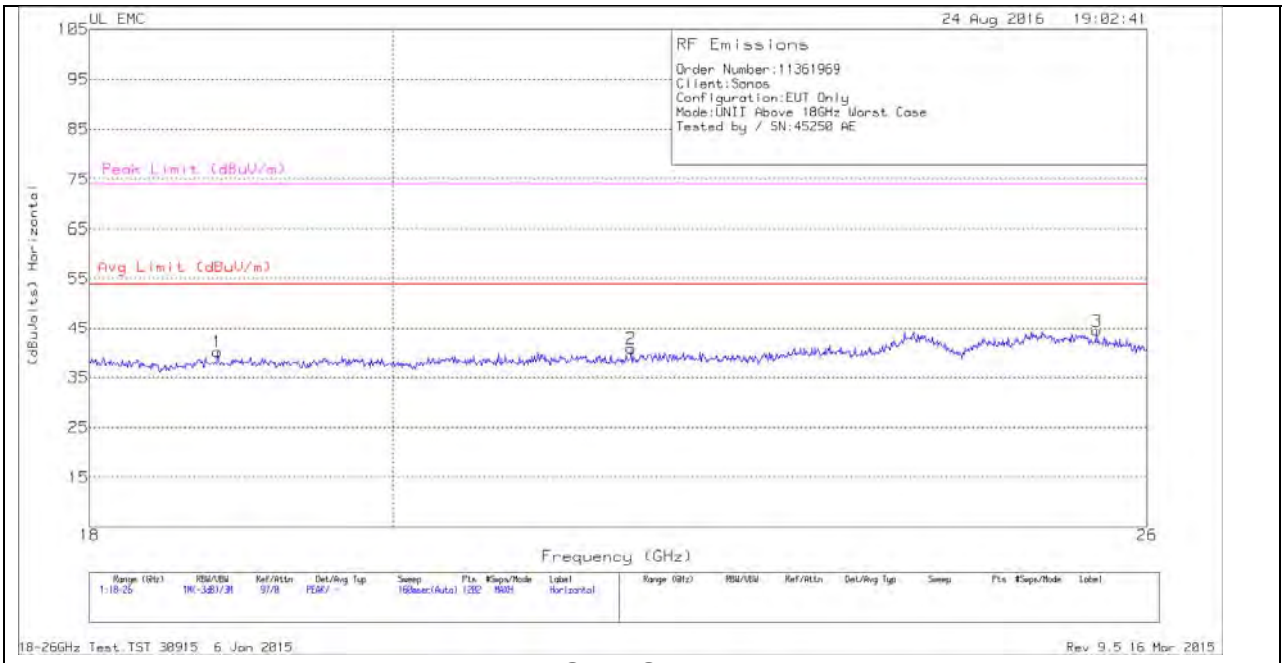
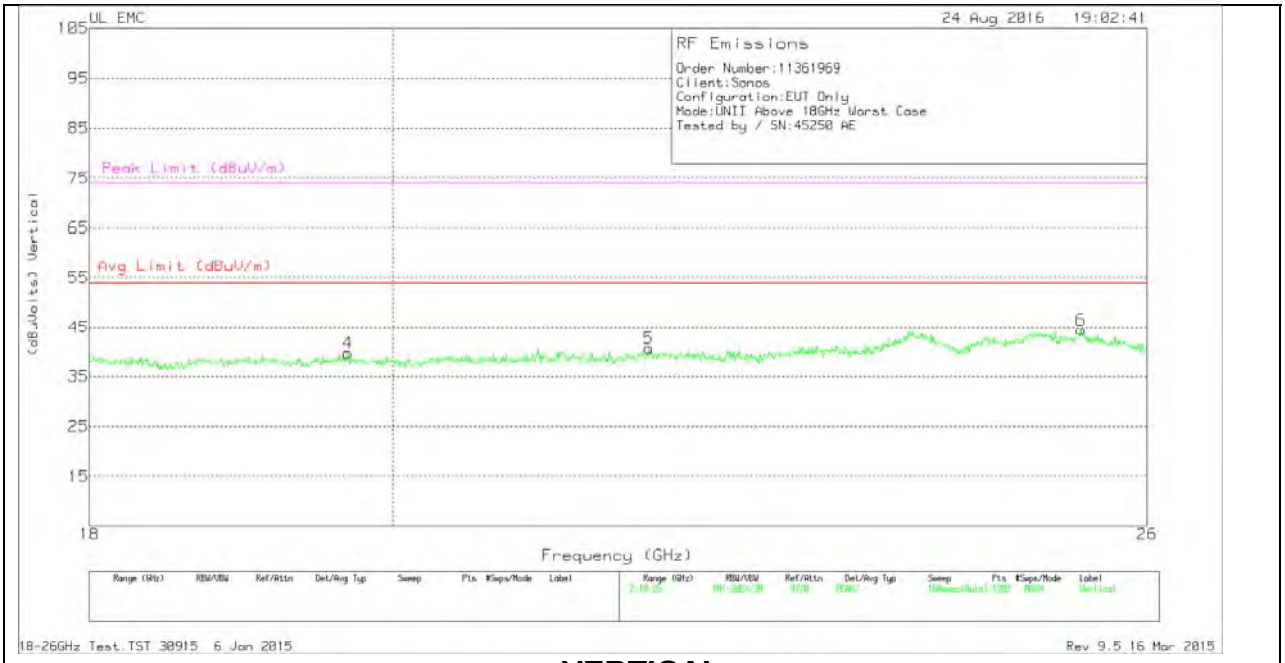
8.4. WORST-CASE 18 GHz – 26 GHz

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



HORIZONTAL



VERTICAL

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Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T449 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.819	42.07	Pk	32.5	-24.9	-9.5	40.167	54	-13.833	74	-33.833
2	21.730	41.93	Pk	33.2	-24.8	-9.5	40.833	54	-13.1667	74	-33.167
3	25.547	44.40	Pk	34.4	-24.8	-9.5	44.500	54	-9.500	74	-29.500
4	19.692	41.67	Pk	32.7	-25.2	-9.5	39.667	54	-14.333	74	-34.333
5	21.863	41.47	Pk	33.3	-24.6	-9.5	40.667	54	-13.333	74	-33.333
6	25.407	44.10	Pk	34.3	-24.4	-9.5	44.500	54	-9.500	74	-29.500

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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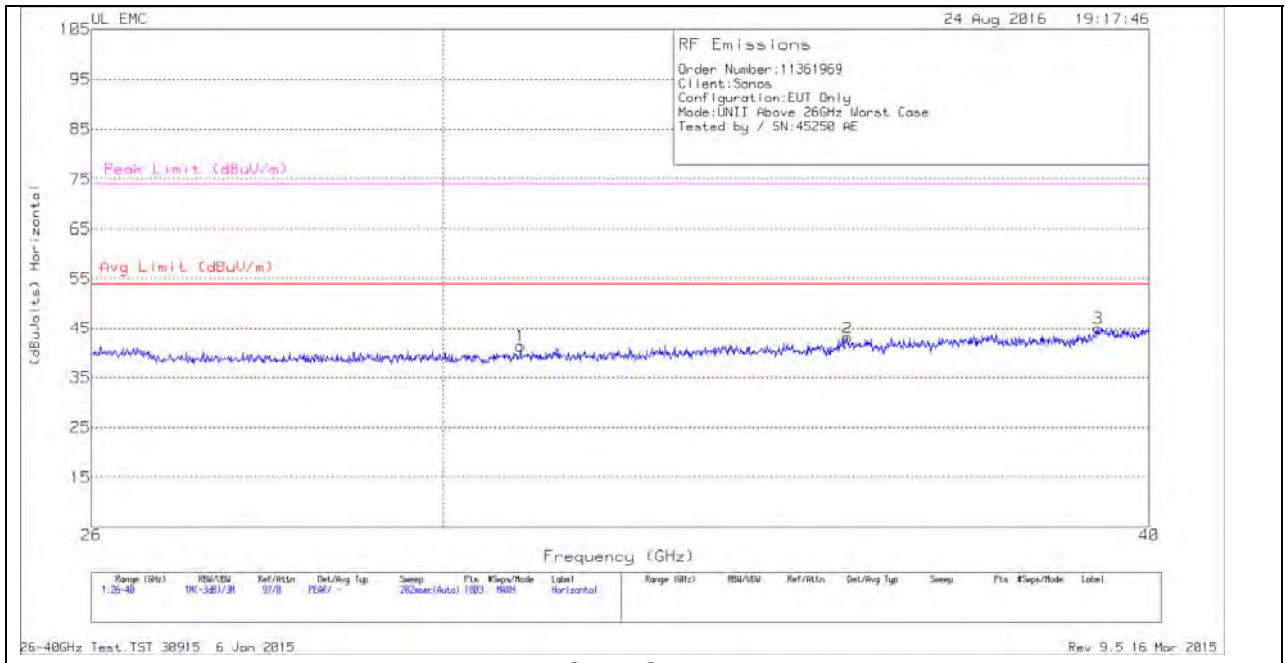
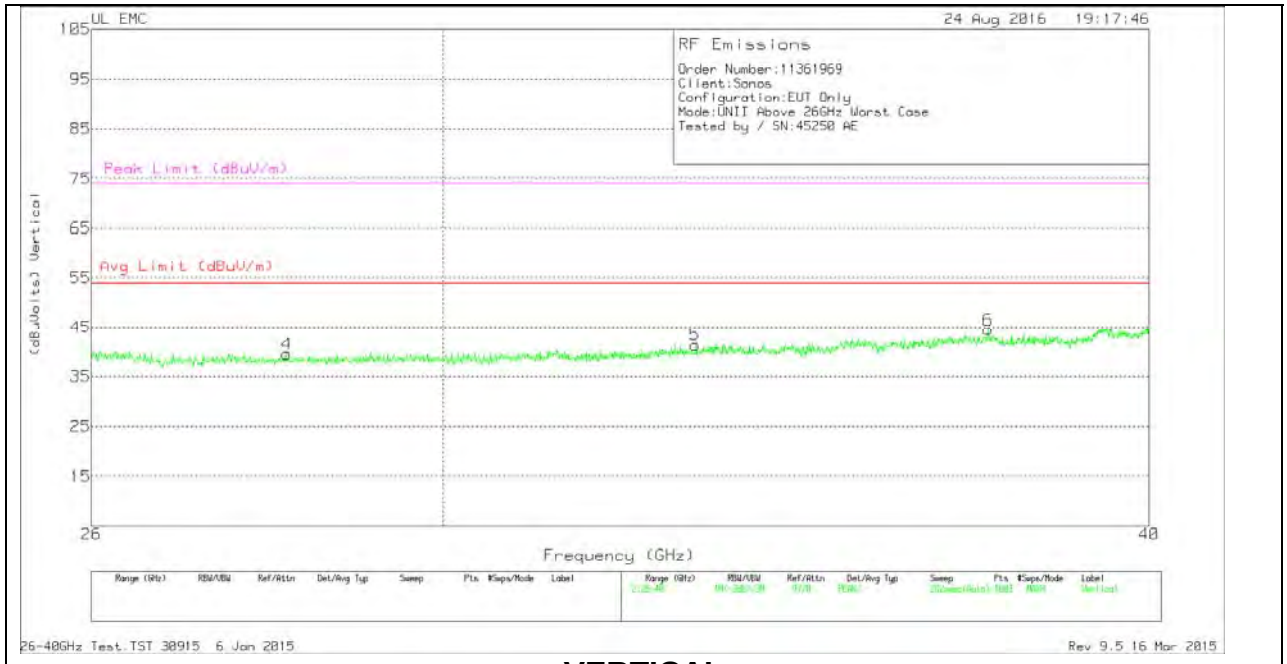
8.5. WORST-CASE 26 GHz – 40 GHz

SPURIOUS EMISSIONS 26-40 GHz (WORST-CASE CONFIGURATION)



HORIZONTAL



VERTICAL

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Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	30.964	48.33	Pk	35.9	-33.4	-9.5	41.333	54	-12.667	74	-32.667
2	35.370	48.60	Pk	37.8	-33.9	-9.5	43.000	54	-11.000	74	-31.000
3	39.176	48.90	Pk	38.2	-32.6	-9.5	45.000	54	-9.000	74	-29.000
4	28.152	45.20	Pk	35.8	-32.0	-9.5	39.500	54	-14.500	74	-34.500
5	33.249	47.43	Pk	36.9	-33.5	-9.5	41.333	54	-12.667	74	-32.667
6	37.459	51.20	Pk	37.3	-34.5	-9.5	44.500	54	-9.500	74	-29.500

* - indicates frequency in CFR15.205/IC8.10 Restricted Band
Pk - Peak detector

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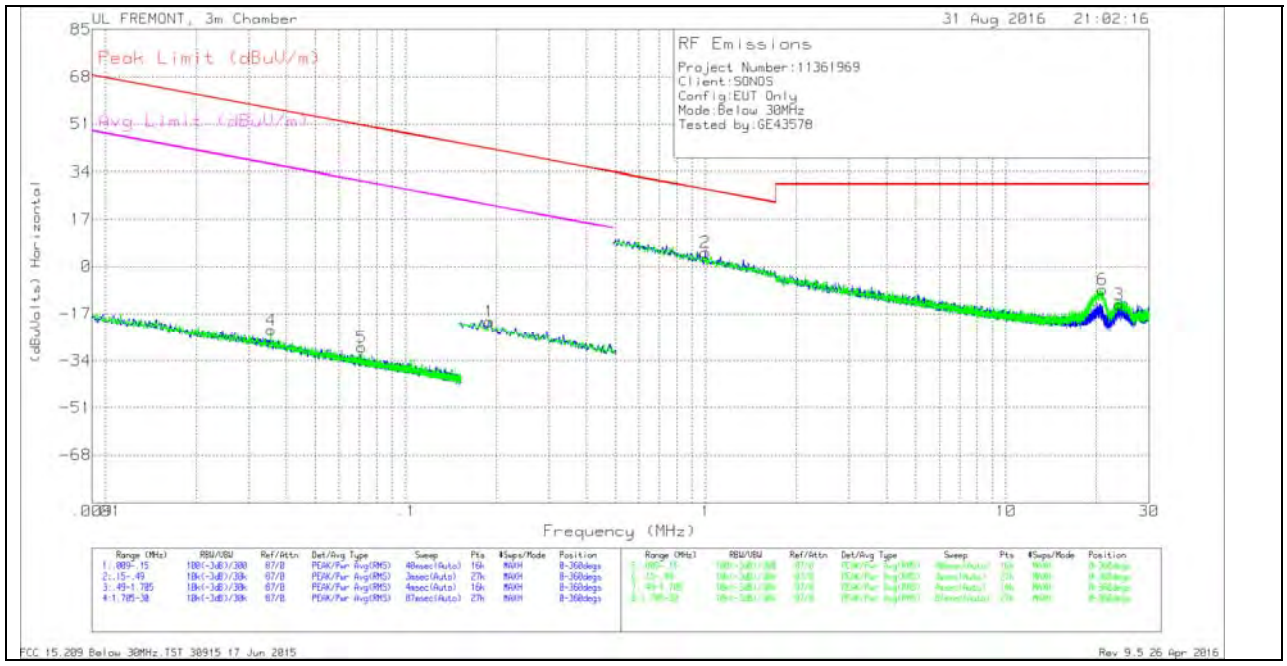
8.6. WORST-CASE BELOW 30 MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
4	.03551	43.25	Pk	12.5	1.4	-80	-22.85	56.6	-79.45	36.6	-59.45	0-360
5	.07123	38.44	Pk	11	1.4	-80	-29.16	50.55	-79.71	30.55	-59.71	0-360
1	.1901	48	Pk	10.8	1.5	-80	-19.7	42.02	-61.72	22.02	-41.72	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	.99616	32.85	Pk	10.7	1.5	-40	5.05	27.64	-22.59	-	-	0-360
6	20.95362	20.22	Pk	9.9	1.7	-40	-8.18	29.54	-37.72	-	-	0-360
3	23.7785	15.19	Pk	9.4	1.7	-40	-13.71	29.54	-43.25	-	-	0-360

Pk - Peak detector

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9. CONDUCTED OUTPUT POWER Q VALUE SETTING

Q-Value Settings						
Band	**Mode**	**Channel**	**Frequency (MHz)**	**Power Setting**	**Chain 0 Output Power (dBm)**	**Chain 1 Output Power (dBm)**
5.2	11n HT20	36	5180	13.5	13.4	12.7
		40	5200	13.5	13.5	13.0
		48	5240	12.5	13.3	12.6
5.3	11n HT20	52	5260	17.5	17.8	18.3
		60	5300	17.5	18.0	18.2
		64	5320	17.0	17.9	17.9
5.6	11n HT20	100	5500	17.5	17.1	17.0
		116	5580	17.5	17.3	17.2
		140	5700	15.0	16.0	15.9
5.8	11n HT20	149	5745	15.0	15.8	16.0
		157	5785	20.0	20.5	19.8
		165	5825	18.0	18.7	18.1

Note: the Q-Values in the report per client requested are for future reference.

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

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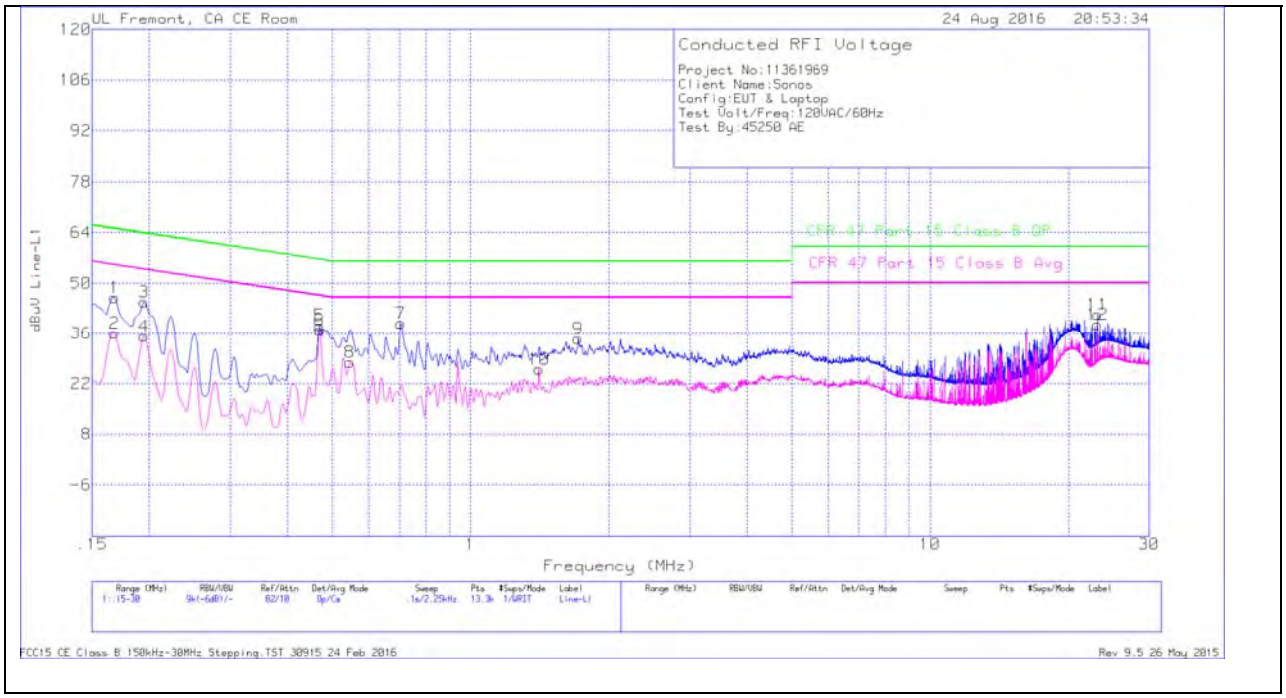
LINE 1 RESULTS



DATA

Trace Markers

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.168	35.97	Qp	0	0	10.1	46.07	65.06	-18.99	-	-
2	.168	25.99	Ca	0	0	10.1	36.09	-	-	55.06	-18.97
3	.195	34.72	Qp	0	0	10.1	44.82	63.82	-19	-	-
4	.195	25.05	Ca	0	0	10.1	35.15	-	-	53.82	-18.67
5	.4695	28.16	Qp	0	0	10.1	38.26	56.52	-18.26	-	-
6	.4695	26.94	Ca	0	0	10.1	37.04	-	-	46.52	-9.48
7	.70575	28.74	Qp	0	0	10.1	38.84	56	-17.16	-	-
8	.546	17.79	Ca	0	0	10.1	27.89	-	-	46	-18.11
9	1.716	24.28	Qp	0	.1	10.1	34.48	56	-21.52	-	-
10	1.40775	15.88	Ca	0	0	10.1	25.98	-	-	46	-20.02
11	23.12925	30.53	Qp	.1	.2	10.4	41.23	60	-18.77	-	-
12	23.12925	27.78	Ca	.1	.2	10.4	38.48	-	-	50	-11.52

Qp - Quasi-Peak detector
Ca - CISPR average detection

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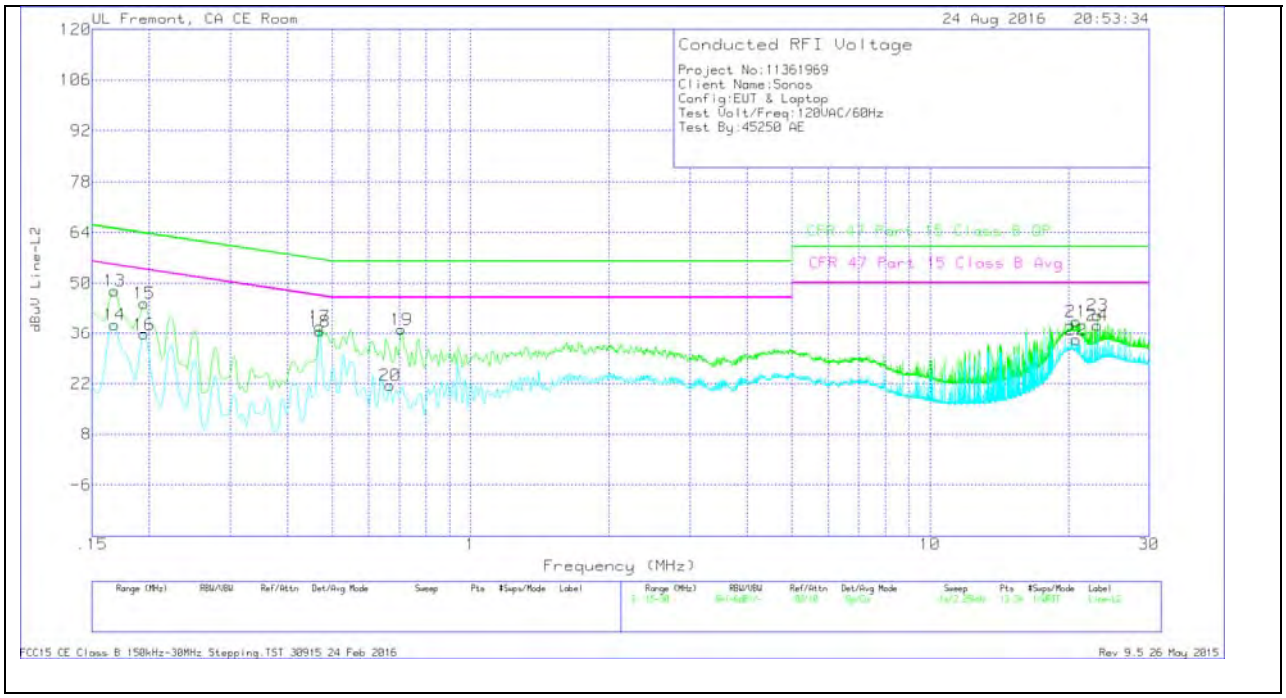
LINE 2 RESULTS



DATA

Trace Markers

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.168	37.74	Qp	0	0	10.1	47.84	65.06	-17.22	-	-
14	.168	28.38	Ca	0	0	10.1	38.48	-	-	55.06	-16.58
15	.195	34.38	Qp	0	0	10.1	44.48	63.82	-19.34	-	-
16	.195	25.63	Ca	0	0	10.1	35.73	-	-	53.82	-18.09
17	.4695	27.85	Qp	0	0	10.1	37.95	56.52	-18.57	-	-
18	.4695	26.5	Ca	0	0	10.1	36.6	-	-	46.52	-9.92
19	.708	27.06	Qp	0	0	10.1	37.16	56	-18.84	-	-
20	.6675	11.45	Ca	0	0	10.1	21.55	-	-	46	-24.45
21	20.80725	28.74	Qp	0	.2	10.4	39.34	60	-20.66	-	-
22	20.80725	23.52	Ca	0	.2	10.4	34.12	-	-	50	-15.88
23	23.12925	30.48	Qp	.1	.2	10.4	41.18	60	-18.82	-	-
24	23.12925	27.6	Ca	.1	.2	10.4	38.3	-	-	50	-11.7

Qp - Quasi-Peak detector
Ca - CISPR average detection

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