FCC 47 CFR PART 15 SUBPART E

CLASS II PERMISSIVE CHANGE

FOR

802.11a/g/n/ac WLAN + BLUETOOTH PCI-E CUSTOM COMBINATION CARD

MODEL NUMBER: BCM94360CS

FCC ID: QDS-BRCM1069

REPORT NUMBER: 15U22131 – E1V2

ISSUE DATE: JANUARY 6, 2016

Prepared for
BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE
CA, 94086, USA

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

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	12/23/15	Initial Issue	H. Mustapha
V2	01/06/16	Updated Section 5.6	H. Mustapha

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.
EUT DESCRIPTION:	802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card
MODEL:	BCM94360CS
SERIAL NUMBER:	C8Y40240110FHD0AD
DATE TESTED:	OCTOBER 27 ~ NOVEMBER 12, 2015 DECEMBER 14, 2012 ~ JANUARY 7, 2013

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

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

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

Approved & Released For
UL Verification Services Inc. By:

Huda Mustapha

HUDA MUSTAPHA
PROJECT LEAD
UL Verification Services Inc.

Tested By:

roy zheng

ROY ZHENG
EMC ENGINEER
UL Verification Services Inc.

FRANK IBRAHIM
PROGRAM MANAGER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033 D02 v01 and ANSI C63.10-2013.

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	☐ Chamber D
☒ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11 a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination CARD.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Power, Chain 2 (dBm)	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 1TX						
5745-5825	802.11a HT20 CDD	19.95	N/A	N/A	19.95	98.86
5745-5825	802.11n HT20 CDD	19.50	N/A	N/A	19.50	89.13
5755-5795	802.11n HT40 CDD	19.20	N/A	N/A	19.20	83.18
5775	802.11ac VHT80 CDD	15.10	N/A	N/A	15.10	32.36
5.8 GHz band, 3TX						
5745-5825	802.11n HT20 CDD	19.25	20.07	19.95	24.54	284.62
5745-5825	802.11n HT20 TxBF	18.65	19.50	18.80	23.77	238.27
5755-5795	802.11n HT40 CDD	19.00	19.70	19.54	24.19	262.71
5755-5795	802.11n HT40 TxBF	18.40	19.00	18.30	23.35	216.22
5775	802.11ac VHT80 CDD	12.91	13.20	13.00	17.81	60.39
5775	802.11ac VHT80 TxBF	13.10	13.40	13.10	17.97	62.71

5.3. LIST OF TEST REDUCTION AND MODES COVERING OTHER MODES

List of test reduction (Non Beam-Forming modes)

Antenna Port Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a Legacy 1TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 3TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT40 1TX	802.11n HT40 CDD 3TX
5 GHz bands	802.11n HT40 CDD 2TX	802.11n HT40 CDD 3TX
5 GHz bands	802.11ac VHT80 1TX	802.11ac VHT80 CDD 3TX
5 GHz bands	802.11ac VHT80 CDD 2TX	802.11ac VHT80 CDD 3TX

Radiated Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a Legacy 1TX (Harmonics)	802.11n HT20 CDD 3TX (Harmonics)
5 GHz bands	802.11a CDD 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 3TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT20 CDD 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT40 1TX (Harmonics)	802.11n HT40 CDD 3TX (Harmonics)
5 GHz bands	802.11ac VHT80 1TX (Harmonics)	802.11ac VHT80 CDD 3TX (Harmonics)
5 GHz bands	802.11ac VHT80 CDD 2TX	802.11ac VHT80 CDD 3TX

List of test reduction (Beam-Forming modes)

Antenna Port Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11n HT40 BF 2Tx	802.11n HT40 BF 3Tx
5 GHz bands	802.11ac VHT80 BF 2Tx	802.11ac VHT80 BF 3Tx

Radiated Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a BF 2TX	802.11n HT20 BF 3Tx
5 GHz bands	802.11a BF 3TX	802.11n HT20 BF 3Tx
5 GHz bands	802.11n HT20 BF 2Tx	802.11n HT20 BF 3Tx
5 GHz bands	802.11n HT40 BF 2Tx	802.11n HT40 BF 3Tx
5 GHz bands	802.11ac VHT80 BF 2Tx	802.11ac VHT80 BF 3Tx

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The following antennas are utilized for this device:

No.	Antenna Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz,	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz	
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi1	0.12	7.04	7.09	5.03	2.66	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN/BT Antenna	613-1143 Wi-Fi2	5.3	6.7	7.06	6.66	5.93	Host2 antenna
1	Amphenol/Molex	802.11abgn WLAN Antenna	613-1143 Wi-Fi3 & Bluetooth	4.69	3.79	3.58	3.94	6.04	Host2 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi1	2.47	4.18	3.35	3.32	3.56	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi2	2.64	4.22	3.44	2.41	3.68	Host1 antenna
2	Amphenol/Molex	802.11abgn WLAN Antenna	613-1631 Wi-Fi3 & Bluetooth	4.82	4.63	3.01	4.63	4.31	Host1 antenna

Antenna mapping:

WiFi 3	WiFi 2	WiFi 1
Chain 1	Chain 0	Chain 2

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.118.23.

The test utility software used during testing was BCM Internal, rev. 6.30.RC118.23.

5.6. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The purpose of this C2PC is to upgrade the device described under section 5.1 of this report to the new rules per KDB 789033 D02 v01.

For UNII-1, UNII-2 and UNII-2C bands, we have reviewed the original test report (report no. 12U14668-2) and are hereby attesting that all the current technical requirements are still met and all applicable test procedures remain the same. Therefore, the original test report is still applicable and no additional testing is done.

5.7. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC.

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

For 5.8 GHz Band:
802.11a: 6 Mb/s.
802.11n 20MHz: MCS0.
802.11n 40MHz: MCS0.
802.11n 80MHz: MCS0.

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

For Radiated Band Edge measurements, preliminary testing showed that the worst case was horizontal polarization for all SISO modes. Therefore, all final measurements were performed with vertical polarization only for those modes. For 3Tx modes, preliminary testing showed that vertical polarization was the worst case for 11n HT20. Therefore, only vertical polarization was tested for this mode.

For all modes with single chain, chain 1 was selected per the software provided by the client. A preliminary investigation was performed on the three chains and chain 1 was found to be worst-case.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	G560	CBU4473193	DoC
AC Adapter	Lenovo	ADP-65KH B	11S36001646ZZ1001FKY6	DoC
Adapter Board	Catalyst	MINI2EXP	N/A	N/A
Adapter Board	Broadcom	N/A	N/A	N/A

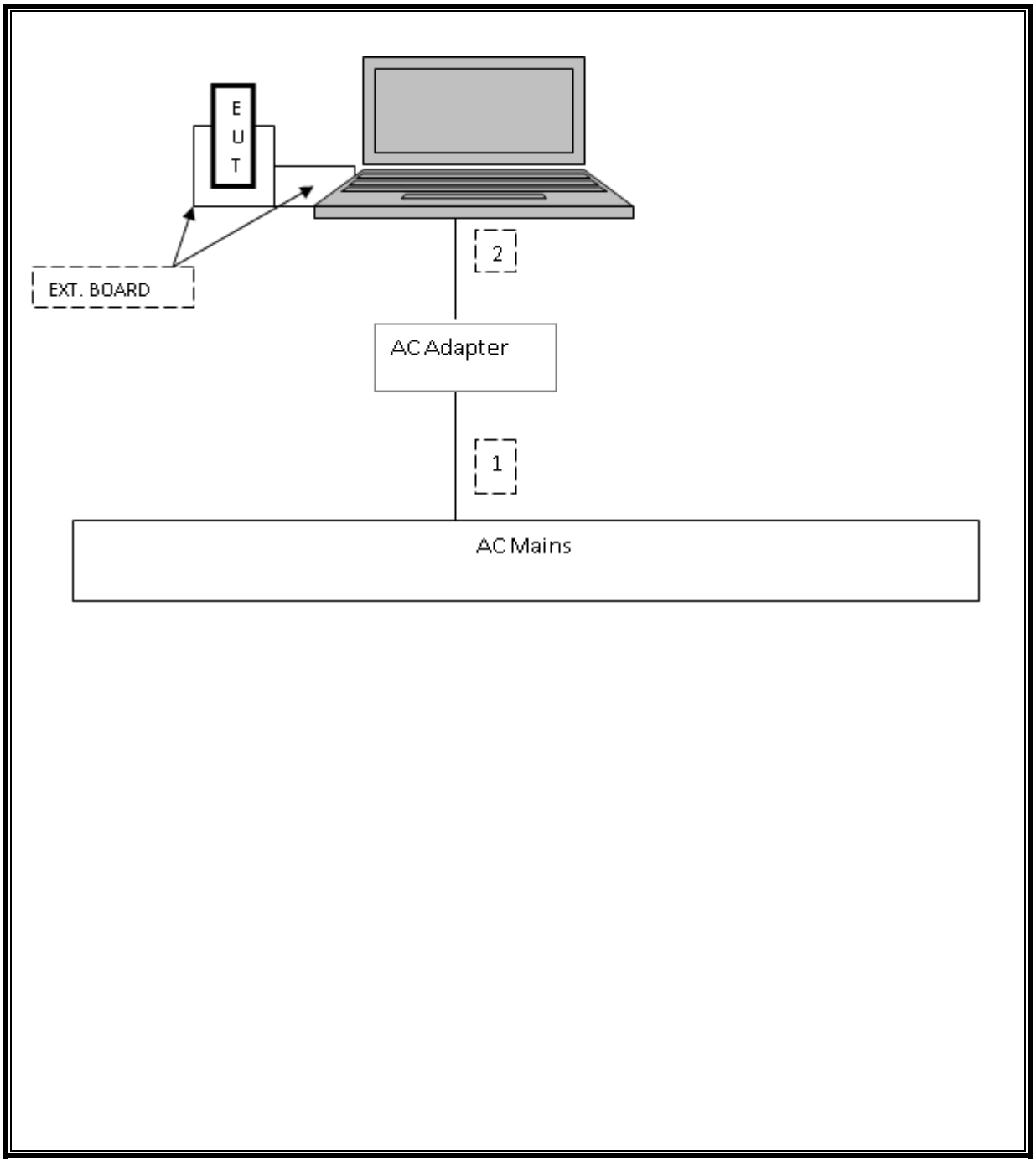
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	2	US 115V	Un-Shielded	1.0m	NA
2	DC	2	DC	Un-Shielded	1.8m	Ferrite at laptop's end

TEST SETUP

The EUT is attached to a jig board which is installed in the PCMCI slot of a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**T No.**	**Cal Date**	**Cal Due**
Radiated Software	UL	UL EMC	Ver 9.5, June 6, 2015		
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012		
Horn Antenna 1-18GHz	ETS	3117	136	01/15/15	01/15/16
Horn Antenna 18-26GHz	ARA	SWH-28	98	12/17/14	12/17/15
Horn Antenna 26.5- 40GHz	ARA	MWH-2640/B	90	07/28/15	07/28/16
Preamp 10kHz-1000MHz	HP	8447D	10	01/16/15	01/16/16
Preamp 1-8GHz	Miteq	AMF-4D-01000800-30-29P	782	10/22/15	10/22/16
Preamp 1-26.5GHz	Agilent	8449B	404	04/13/15	04/13/16
Amplifier, 26-40GHz	Miteq	NSP4000-SP2	88	04/07/15	04/07/16
Spectrum Analyzer 3kHz - 44GHz	Agilent	N9030A	907	05/15/15	05/15/16
3GHz HPF	Micro-Tronics	HPM17543	485	01/16/15	01/16/16
5GHz LPF	Micro-Tronics	LPS17541	482	01/16/15	01/16/16
6GHz HPF	Micro-Tronics	HPS17542	483	01/16/15	01/16/16
EMI Test Receiver	Rohde & Schwarz	ECSI 7	1124	09/30/15	09/30/16
Power Meter	Agilent	N1911A	T1268	06/07/15	06/07/16
Power Sensor	Agilent	N1921A	1223	06/07/15	02/06/16
LISN for Conducted Emission	FCC	50/250-25-2	24	01/16/15	01/16/16

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v01, Section B.

6 dB Emission BW: KDB 789033 D02 v01, Section C.2.

Conducted Output Power: KDB 789033 D02 v01, Section E.3.b (Method PM-G), and KDB 662911 D01 v02r01.

Power Spectral Density: KDB 789033 D02 v01, Section F, and KDB 662911 D01 v02r01.

Unwanted emissions in restricted bands: KDB 789033 D02 v01, Sections G.2, G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01, Sections G.2, G.3, G.4, and G.5.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

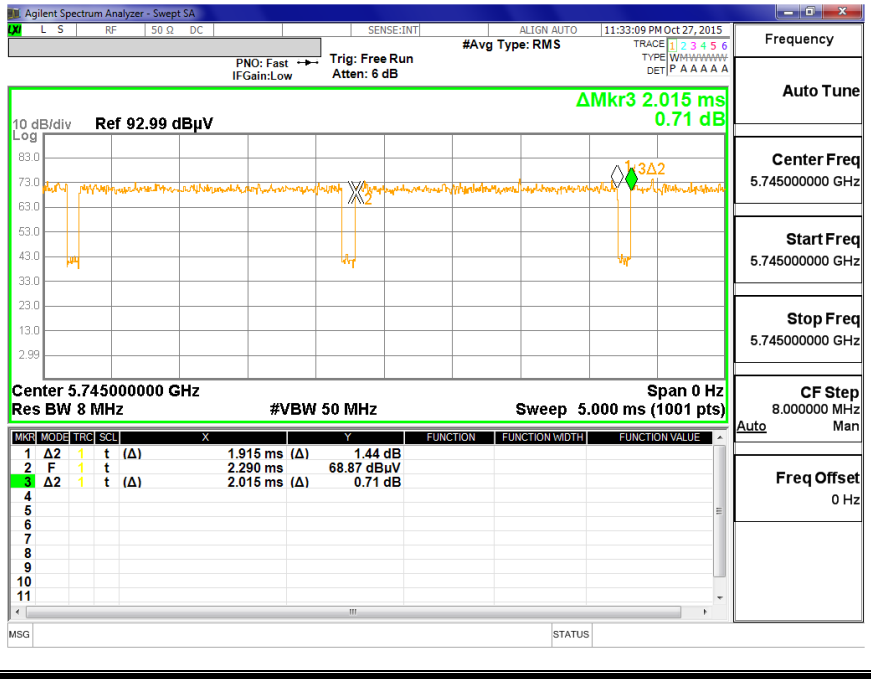
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a CDD	2.060	2.160	0.954	95.37%	0.21	0.485
802.11n HT20 CDD	1.915	2.015	0.950	95.04%	0.22	0.522
802.11n HT20 TxBF	23.400	26.610	0.879	87.94%	0.56	0.043
802.11n HT40 CDD	0.9430	1.0410	0.906	90.59%	0.43	1.060
802.11n HT40 TxBF	25.690	28.240	0.910	90.97%	0.41	0.039
802.11ac VHT80 CDD	0.4600	0.5581	0.824	82.42%	0.84	2.174
802.11ac VHT80 TxBF	12.3750	31.2800	0.396	39.56%	4.03	0.081

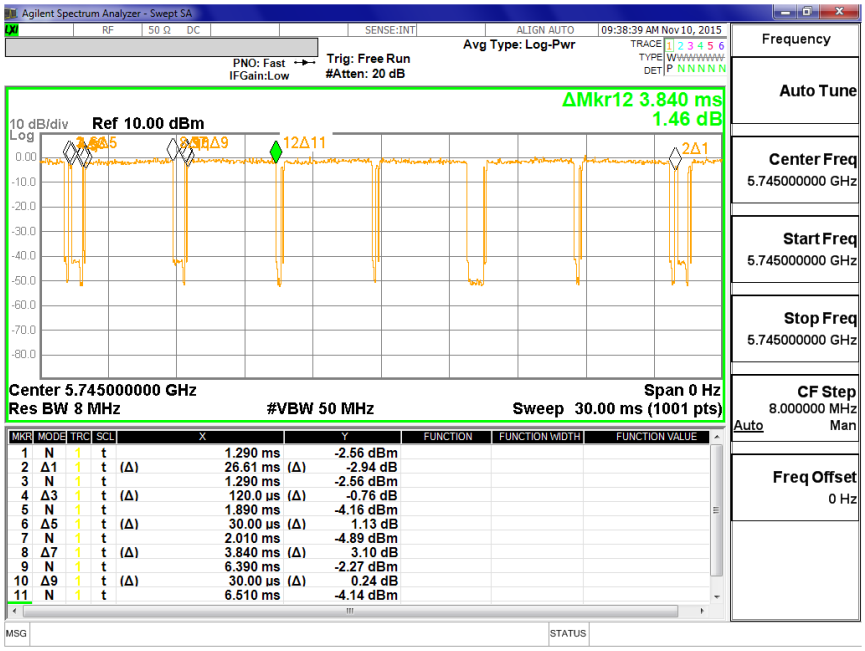
DUTY CYCLE PLOTS

DUTY CYCLE 802.11a MODE

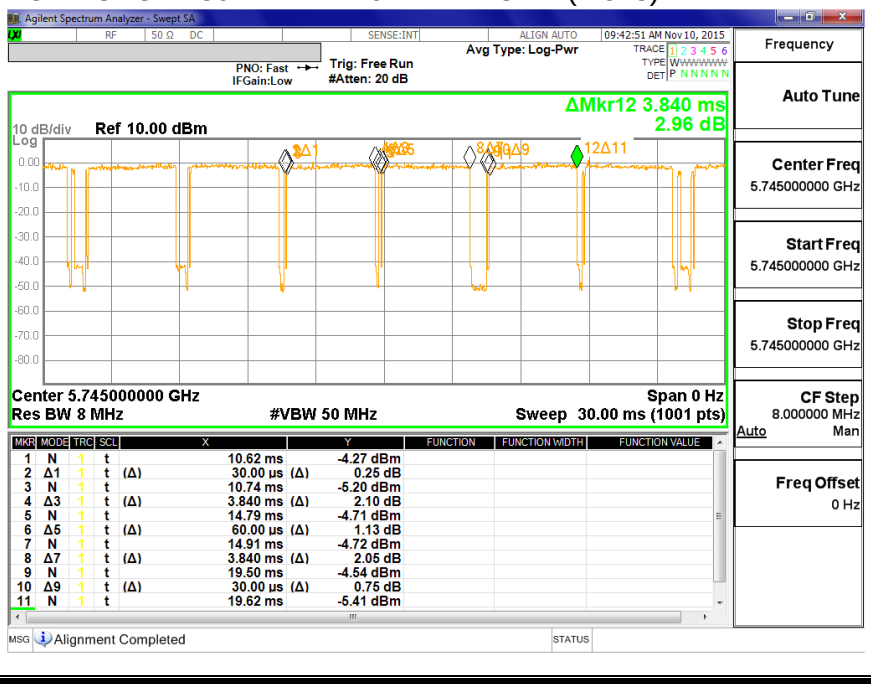
DUTY CYCLE 802.11n HT20 CDD MODE



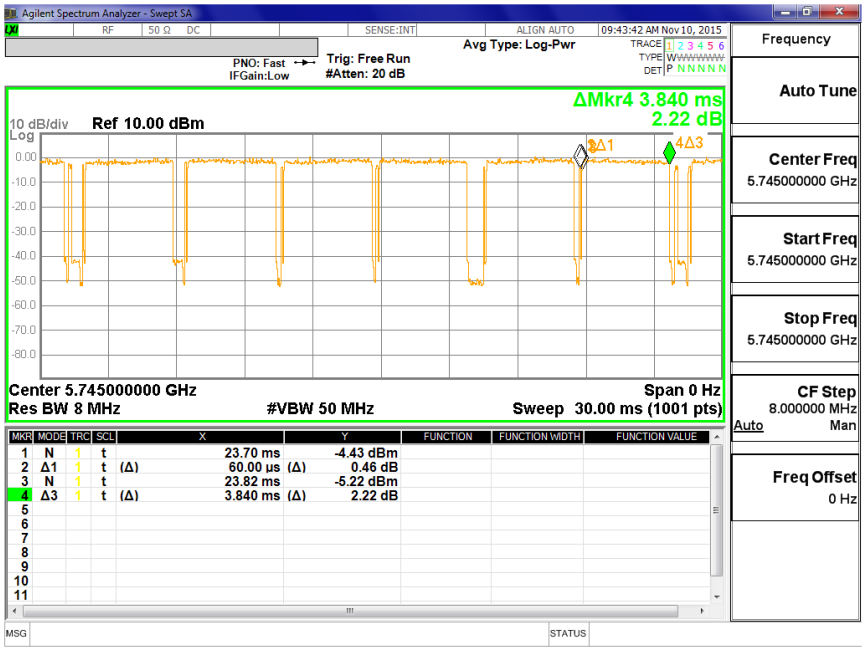
DUTY CYCLE 802.11n HT20 TxBF MODE (1 of 3)



DUTY CYCLE 802.11n HT20 TxBF MODE (2 of 3)

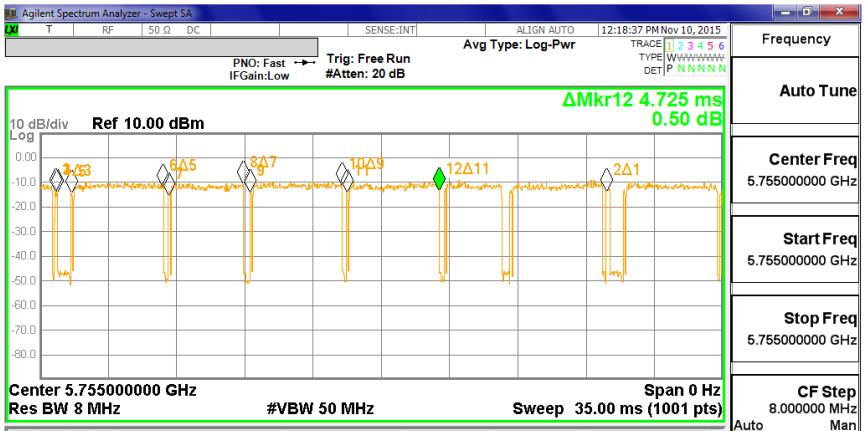


DUTY CYCLE 802.11n HT20 TxBF MODE (3 of 3)

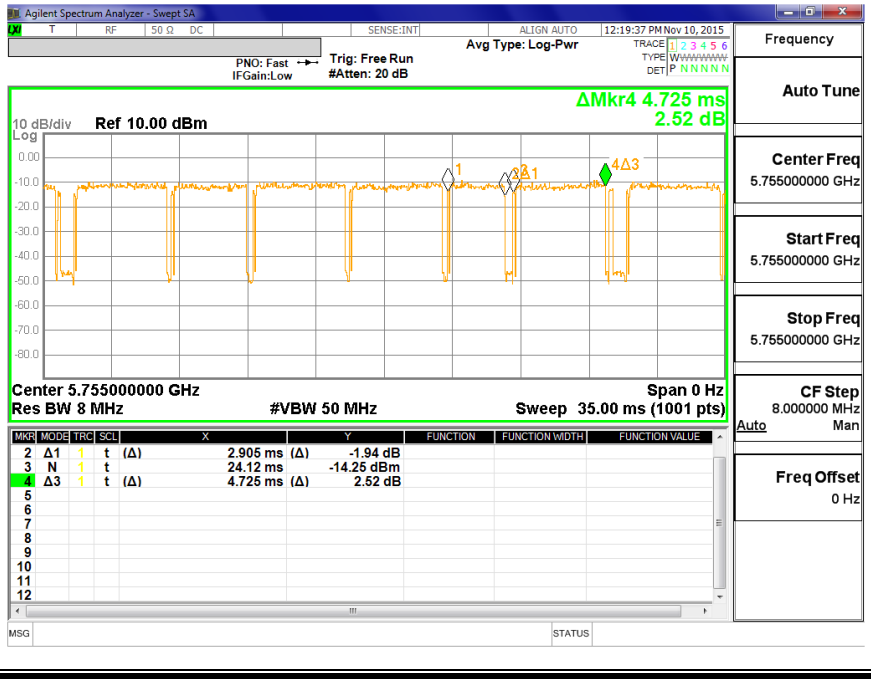


DUTY CYCLE 802.11n HT40 CDD MODE

DUTY CYCLE 802.11n HT40 TxBF MODE (1 of 2)

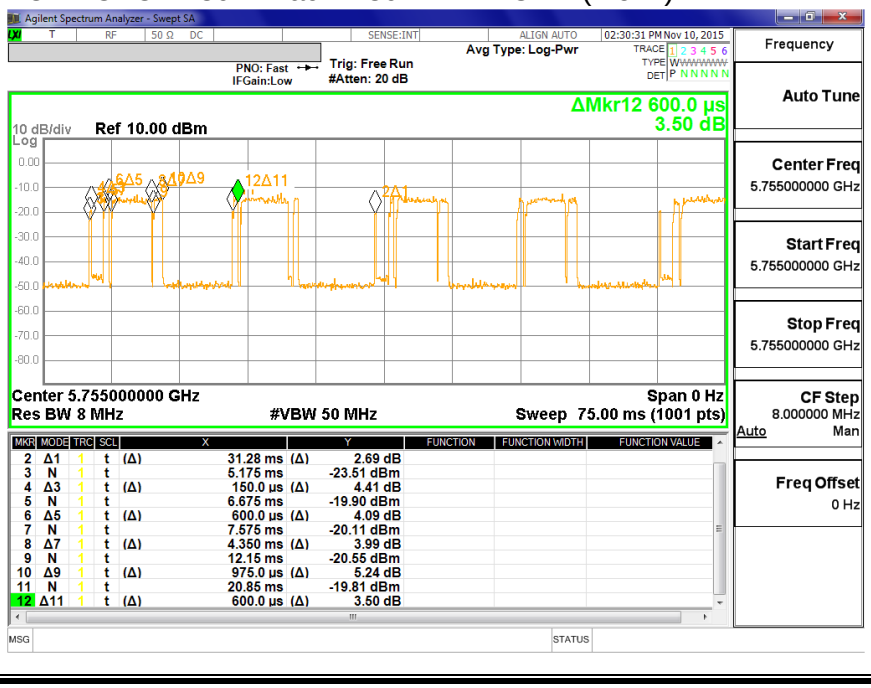


DUTY CYCLE 802.11n HT40 TxBF MODE (2 of 2)



DUTY CYCLE 802.11ac HT80 CDD MODE

DUTY CYCLE 802.11ac HT80 TxBF MODE (1 of 2)



DUTY CYCLE 802.11ac HT80 TxBF MODE (2 of 2)

8.2. 802.11a SISO MODE IN THE 5.8 GHz BAND

8.2.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

This is SISO mode, AG is the highest (worst-case) =6.04 dBi

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	6.04	29.96
Mid	5785	6.04	29.96
High	5825	6.04	29.96

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	18.50	18.50	29.96	-11.46
Mid	5785	19.80	19.80	29.96	-10.16
High	5825	19.95	19.95	29.96	-10.01

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.

8.3. 802.11n HT20 CDD SISO MODE IN THE 5.8 GHz BAND

8.3.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

This is SISO mode, AG is the highest (worst-case) =6.04 dBi

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	6.04	29.96
Mid	5785	6.04	29.96
High	5825	6.04	29.96

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	16.50	16.50	29.96	-13.46
High	5825	19.50	19.50	29.96	-10.46

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.

8.4. 802.11n HT20 CDD 3Tx MODE IN THE 5.8 GHz BAND

8.4.1. 6 dB BANDWIDTH

LIMITS

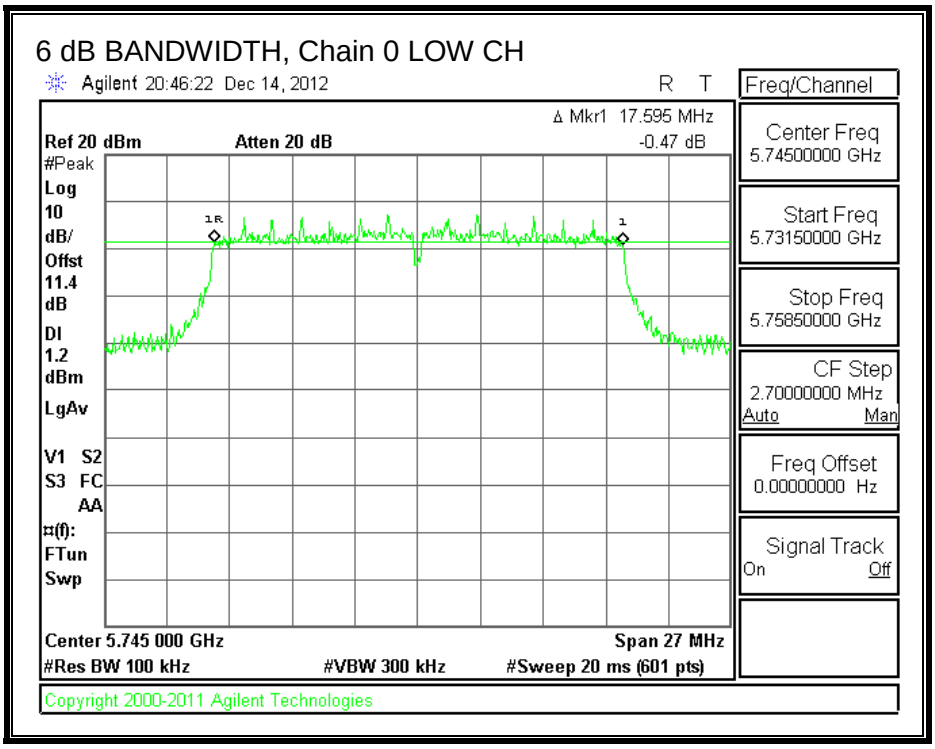
FCC §15.247 (a) (2)

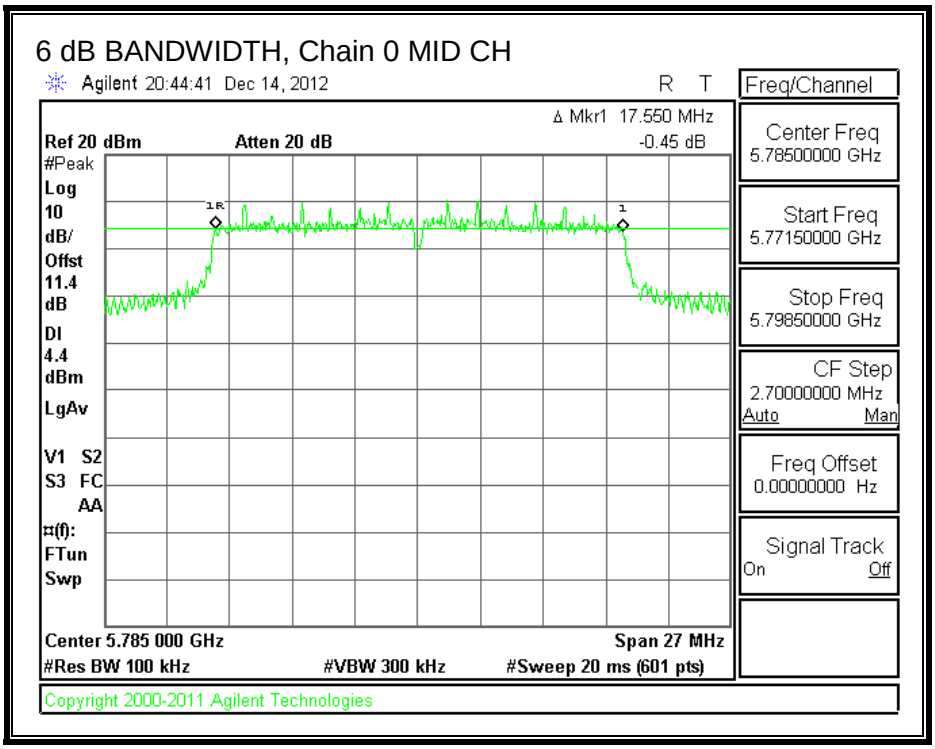
The minimum 6 dB bandwidth shall be at least 500 kHz.

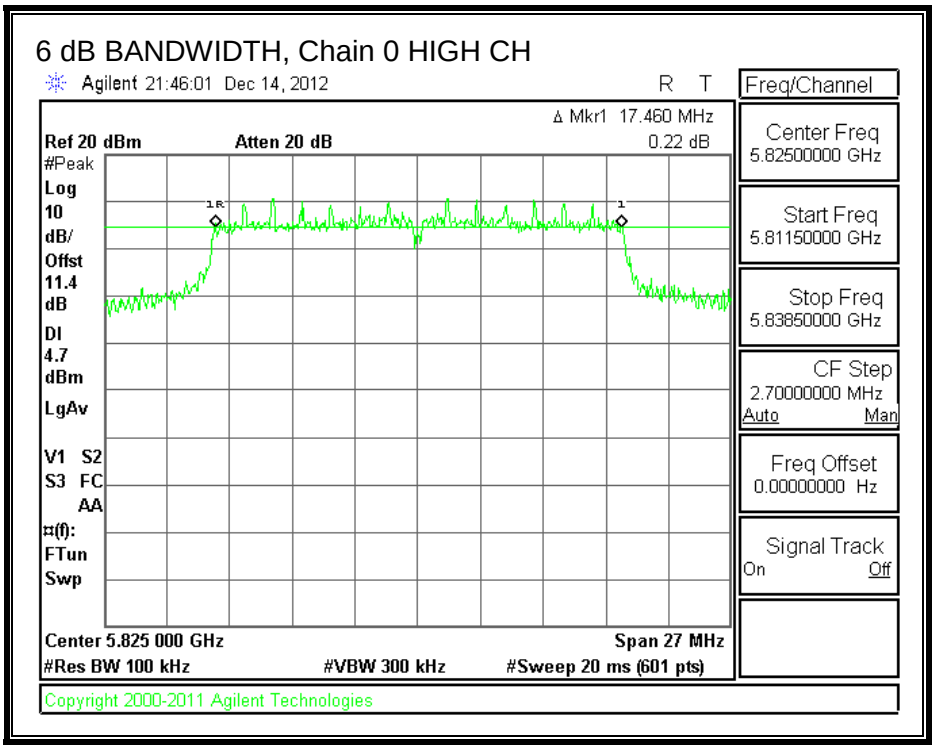
RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	6 dB BW Chain 2 (MHz)	Minimum Limit (MHz)
Low	5745	17.595	17.640	17.550	0.5
Mid	5785	17.550	17.595	17.595	0.5
High	5825	17.460	17.595	17.640	0.5

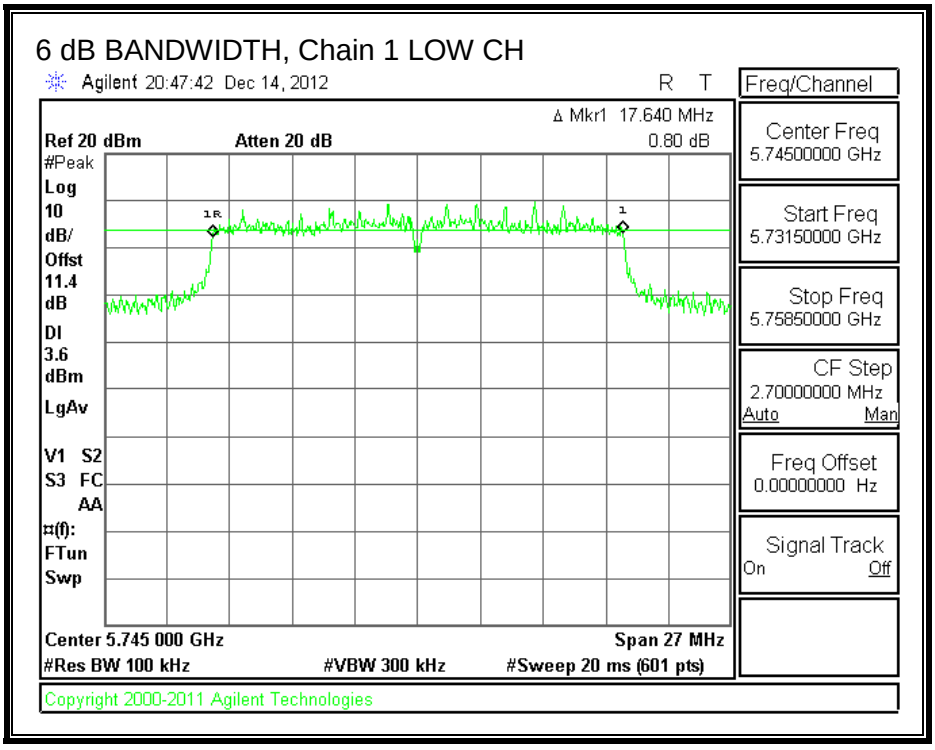
6 dB BANDWIDTH, Chain 0

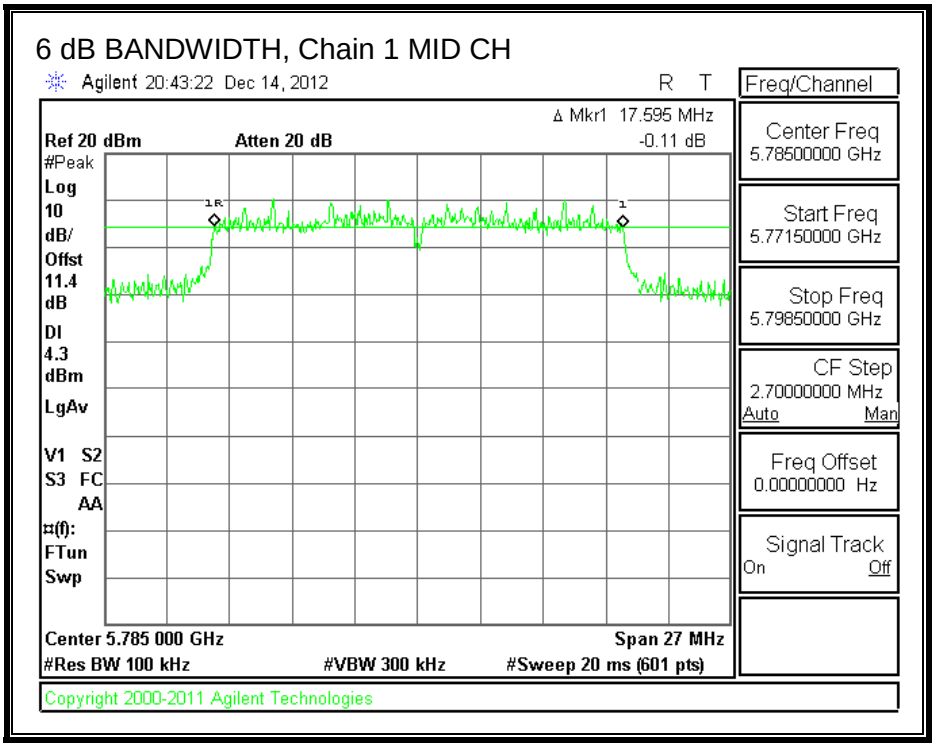


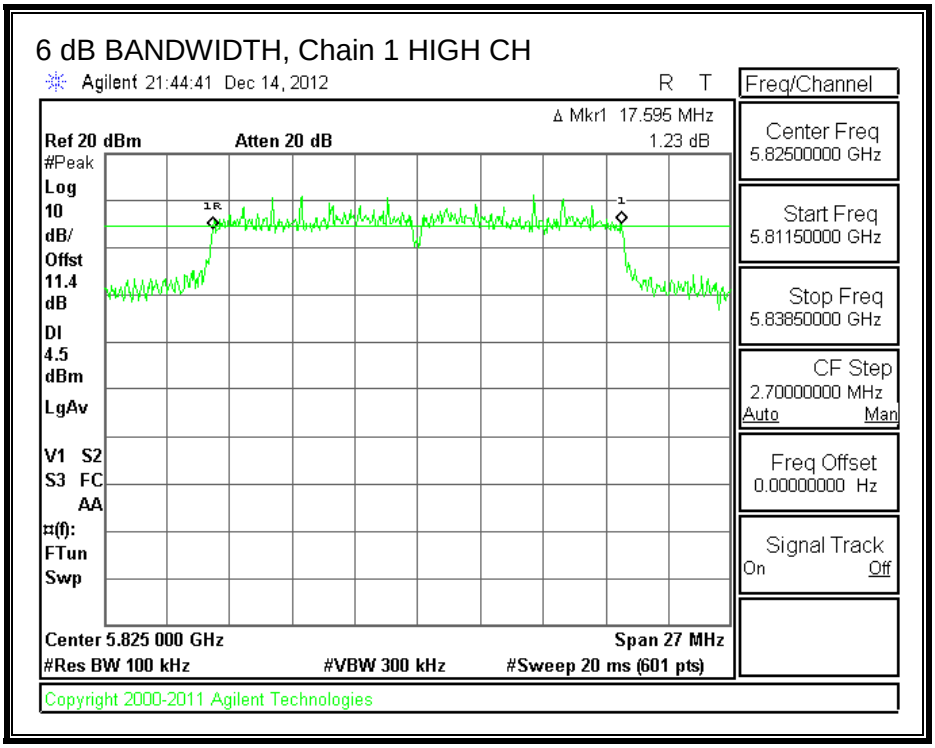




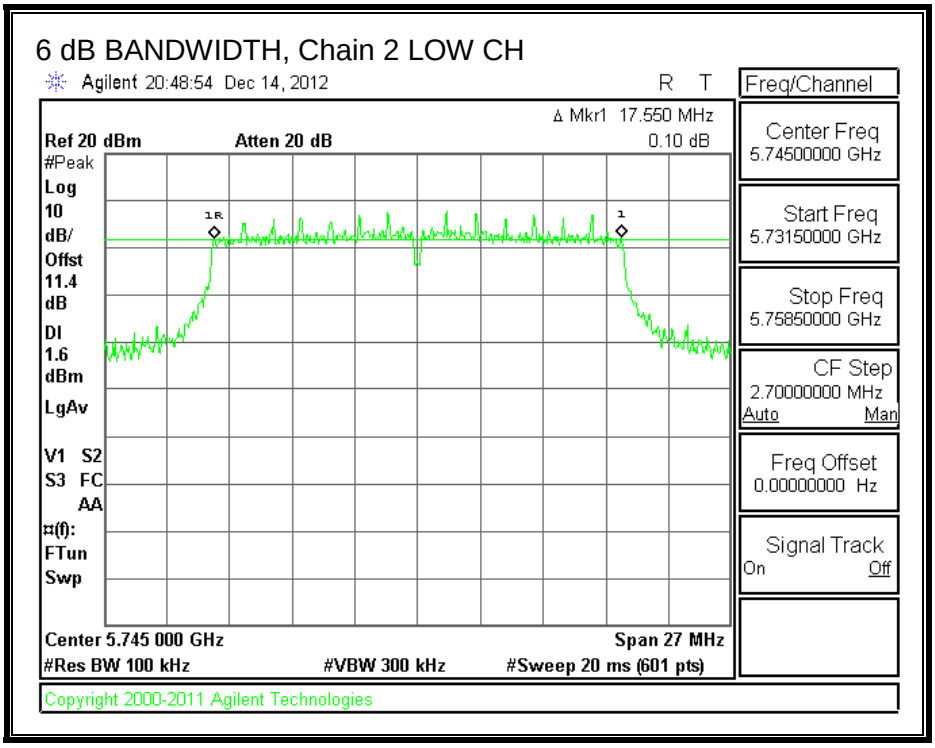
6 dB BANDWIDTH, Chain 1

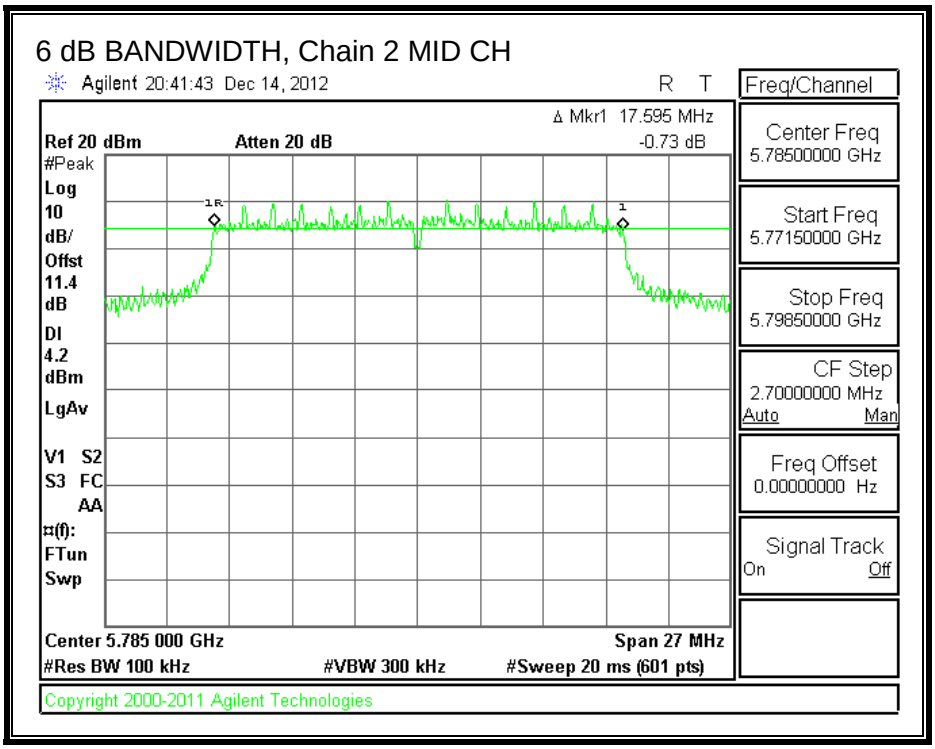




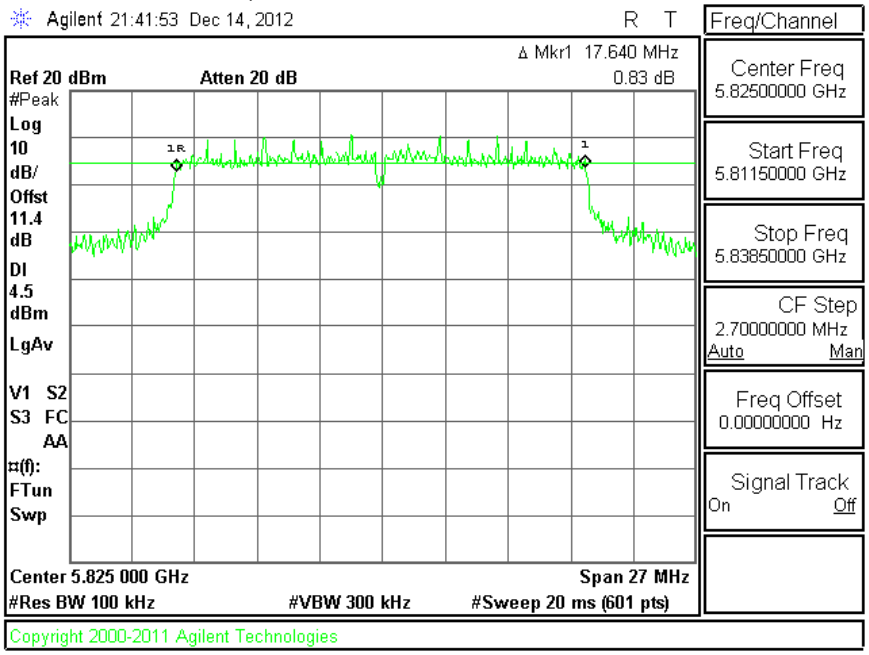


6 dB BANDWIDTH, Chain 2





6 dB BANDWIDTH, Chain 2 HIGH CH



8.4.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.66	5.93	6.04	5.13

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5745	5.13	30.00
Mid	5785	5.13	30.00
High	5825	5.13	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	16.80	17.30	16.90	21.78	30.00	-8.22
Mid	5785	19.25	20.07	19.95	24.54	30.00	-5.46
High	5825	19.00	19.50	19.40	24.08	30.00	-5.92

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.

8.4.3. Maximum Power Spectral Density (PSD)

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

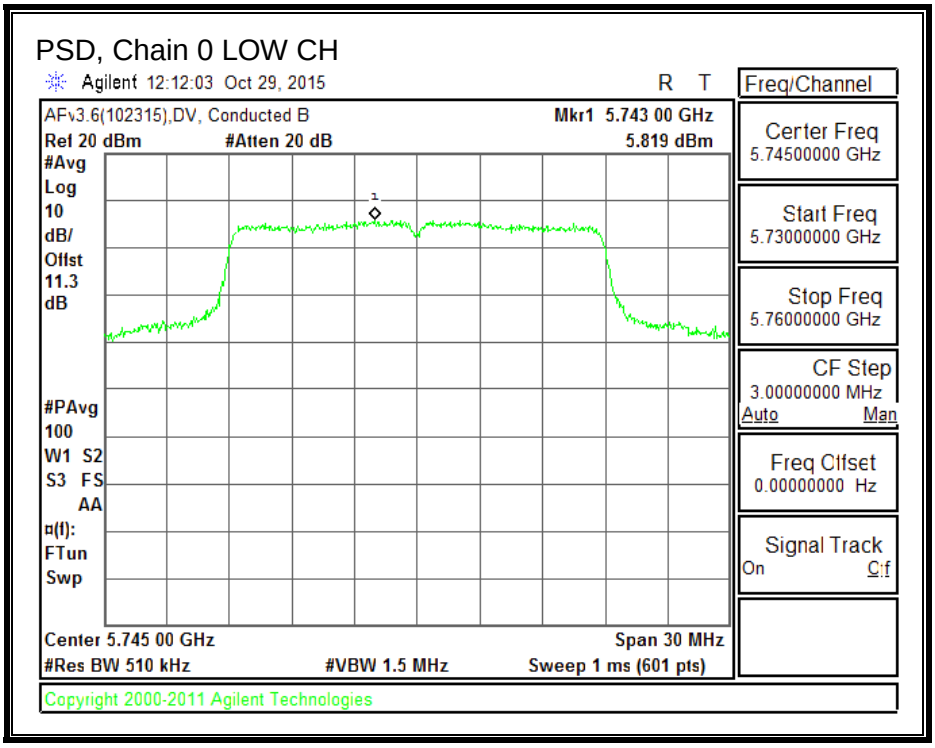
Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	9.78	26.22
Mid	5785	9.78	26.22
High	5825	9.78	26.22

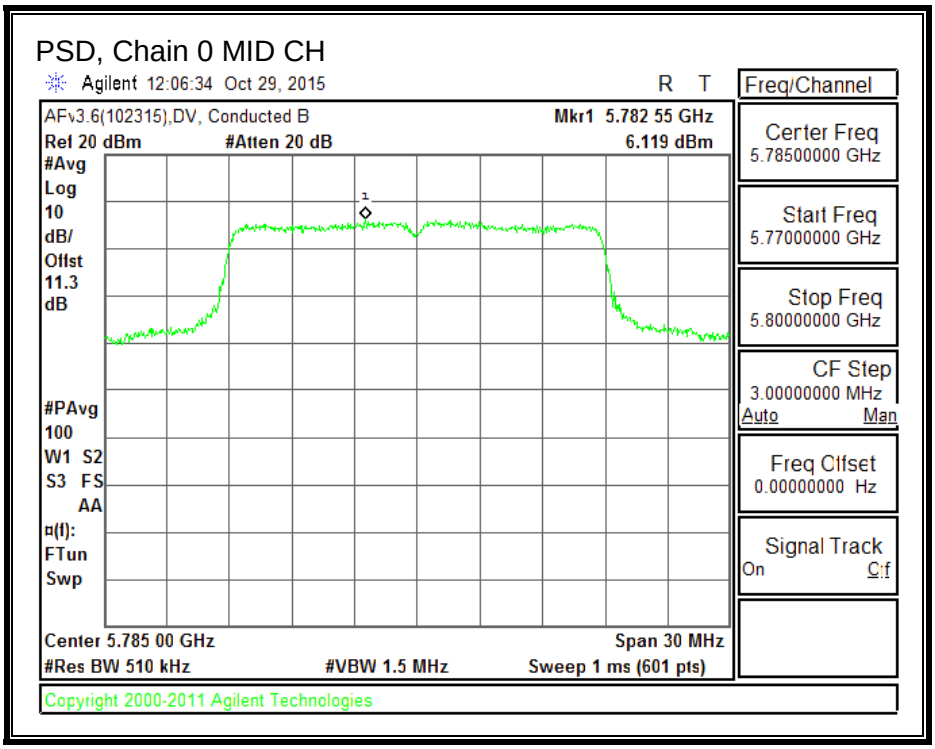
Duty Cycle CF (dB)	0.22	**Included in Calculations of Corr'd PSD**

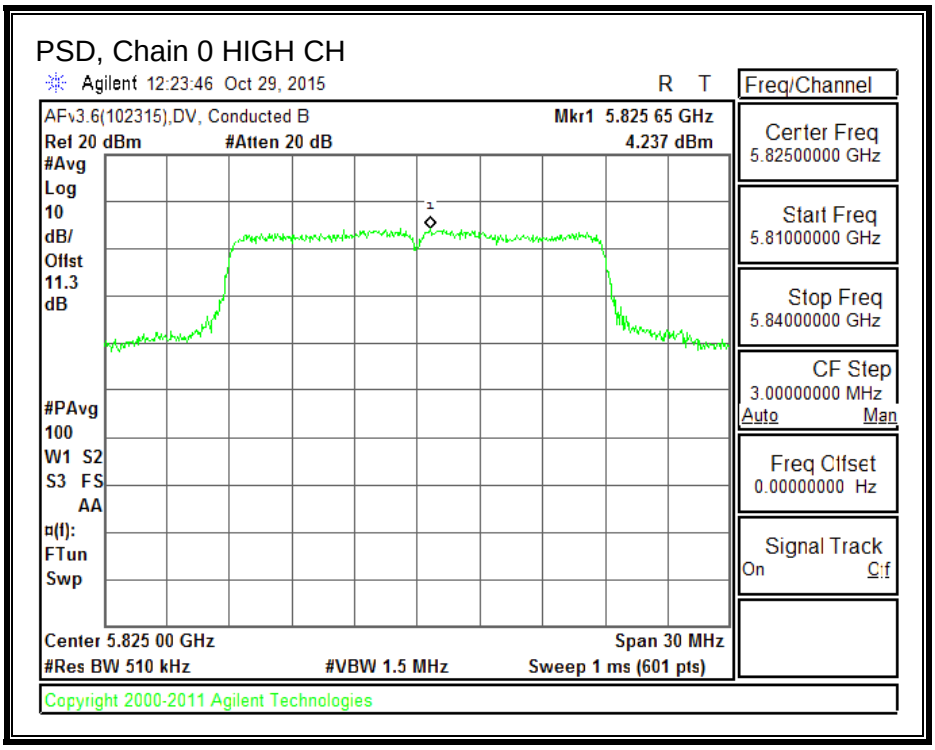
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	5.82	7.10	6.52	11.50	26.22	-14.71
Mid	5785	6.12	6.78	6.55	11.48	26.22	-14.73
High	5825	4.24	6.54	7.00	11.07	26.22	-15.14

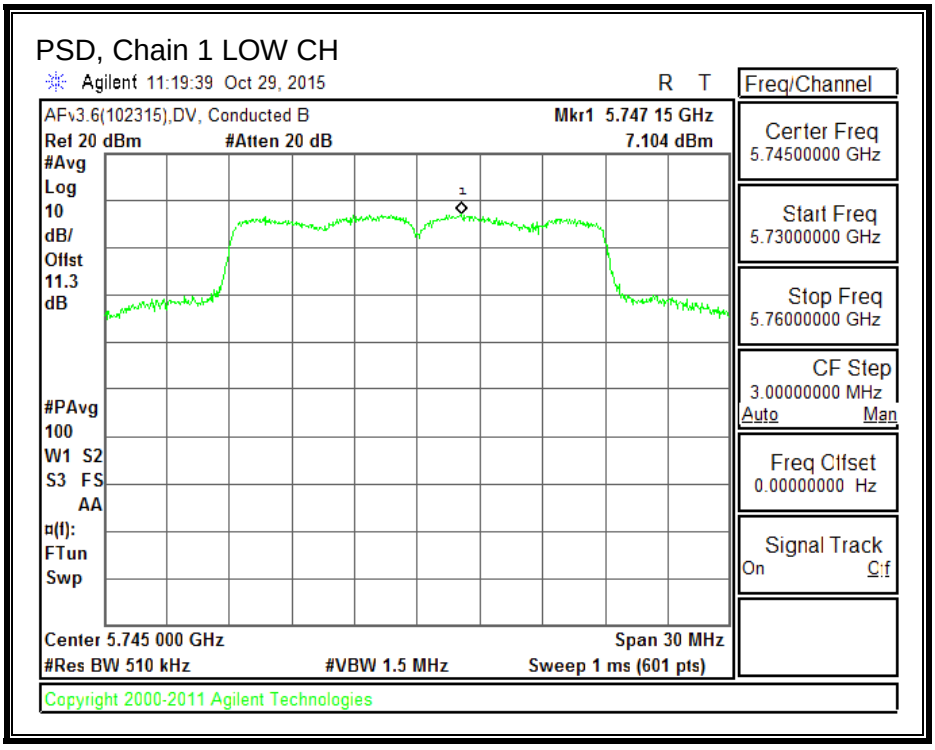
PSD, Chain 0



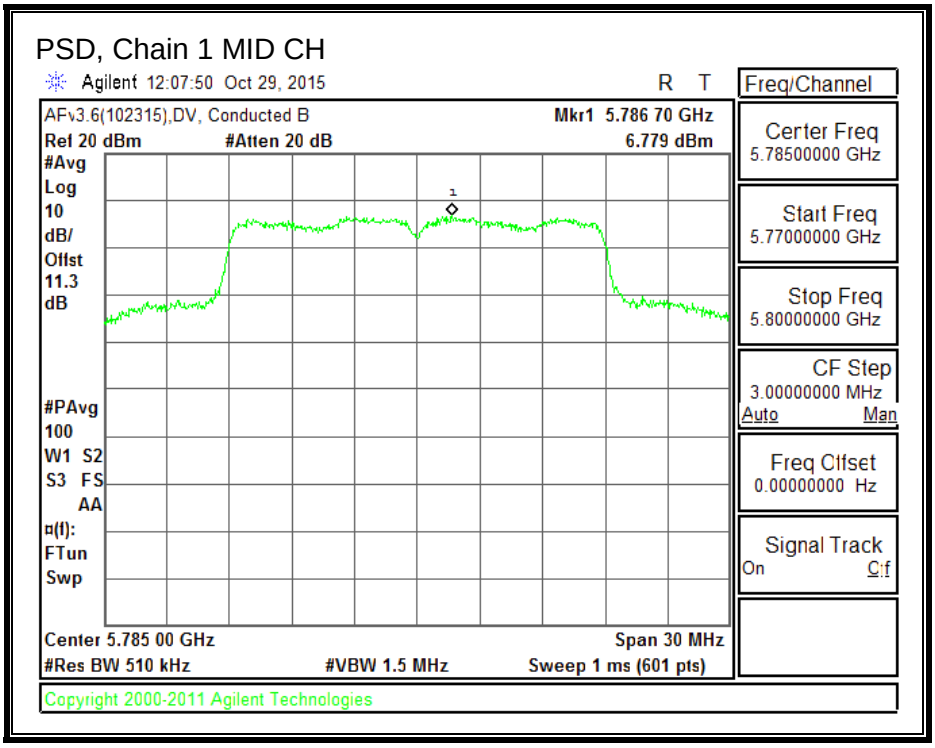




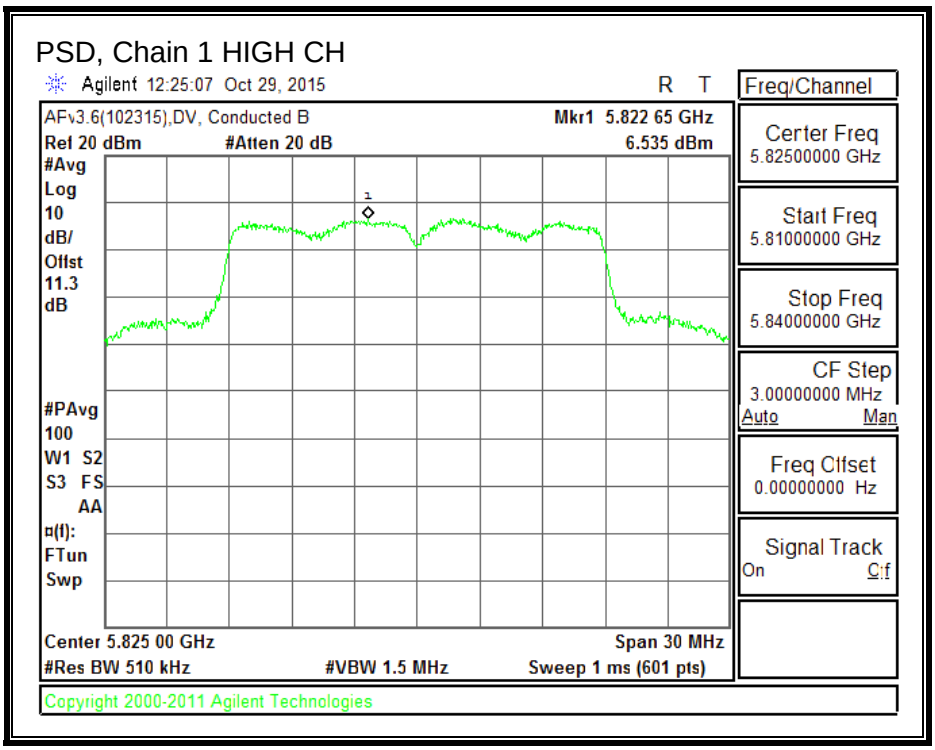
PSD, Chain 1



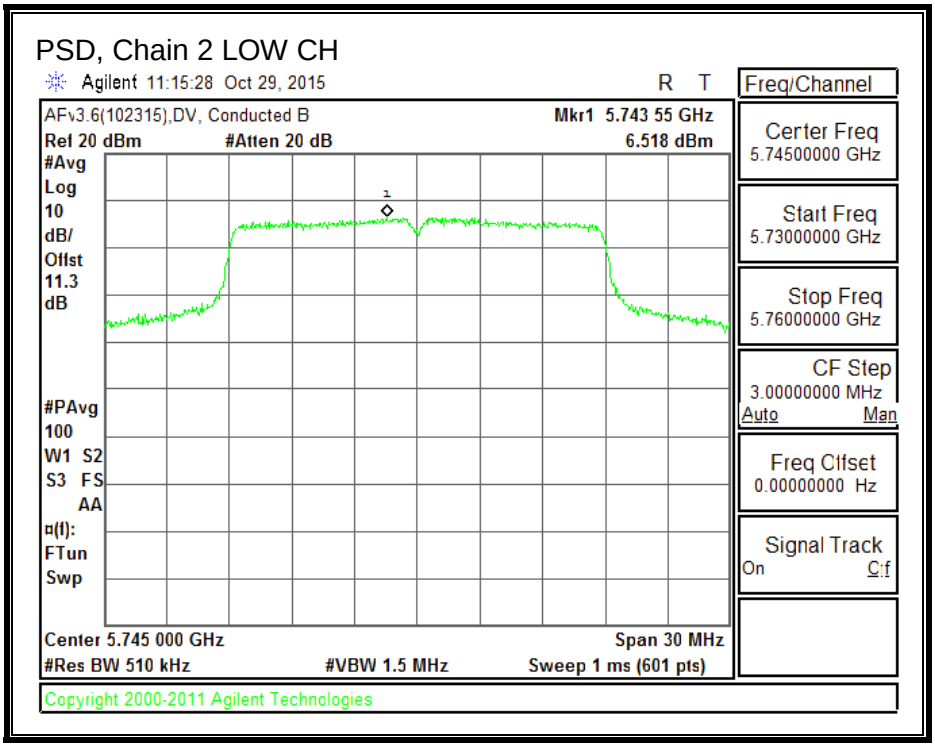
PSD, Chain 1 MID CH

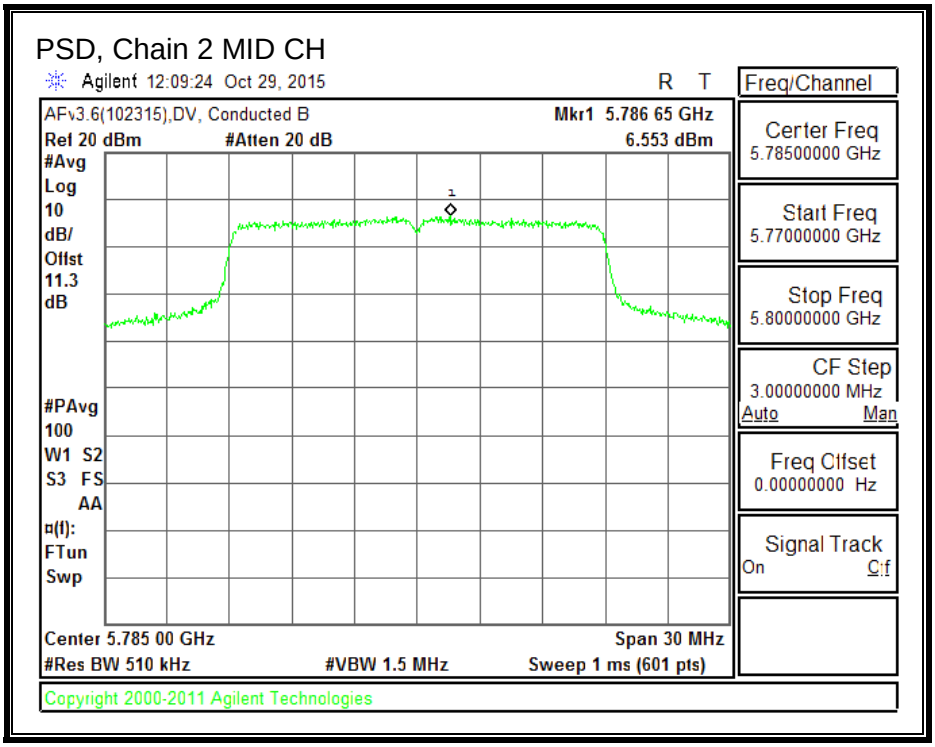


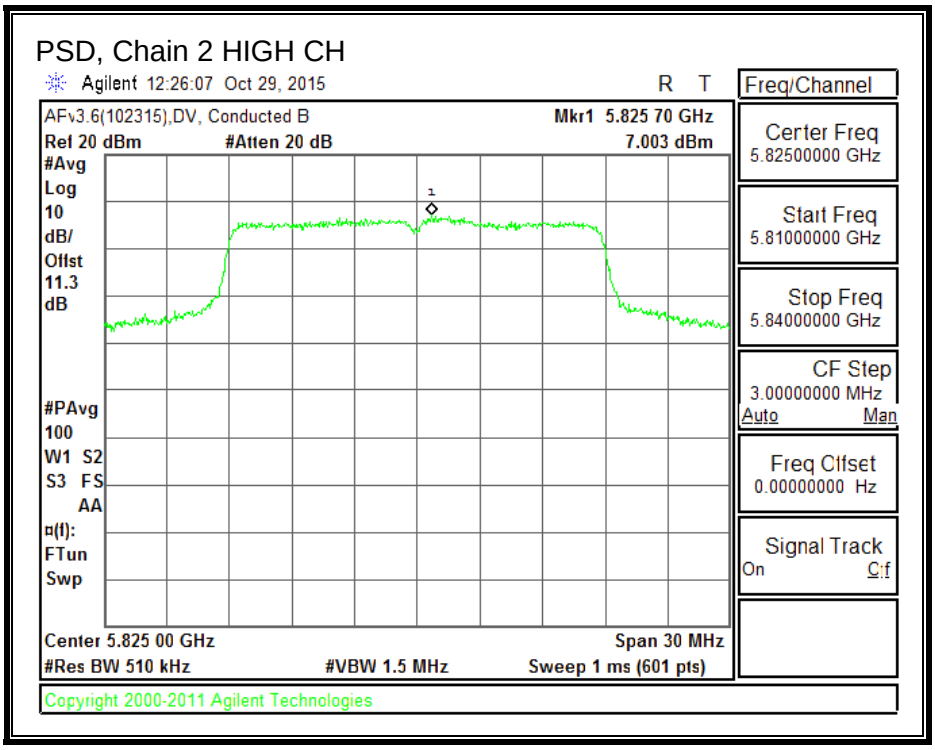
PSD, Chain 1 HIGH CH



PSD, Chain 2







8.5.802.11n HT20 TxBF 3TX MODE IN THE 5.8 GHz BAND

8.5.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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 correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5745	9.78	26.22
Mid	5785	9.78	26.22
High	5825	9.78	26.22

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.90	15.20	14.80	19.74	26.22	-6.48
Mid	5785	18.65	19.50	18.80	23.77	26.22	-2.45
High	5825	17.10	17.45	17.00	21.96	26.22	-4.26

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.

8.6. 802.11n HT40 SISO MODE IN THE 5.8 GHz BAND

8.6.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

This is SISO mode, AG is the highest (worst-case) =6.04 dBi

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	6.04	29.96
High	5795	6.04	29.96

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	15.30	15.30	29.96	-14.66
High	5795	19.20	19.20	29.96	-10.76

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.

8.7. 802.11n HT40 CDD 3Tx MODE IN THE 5.8 GHz BAND

8.7.1. 6 dB BANDWIDTH

LIMITS

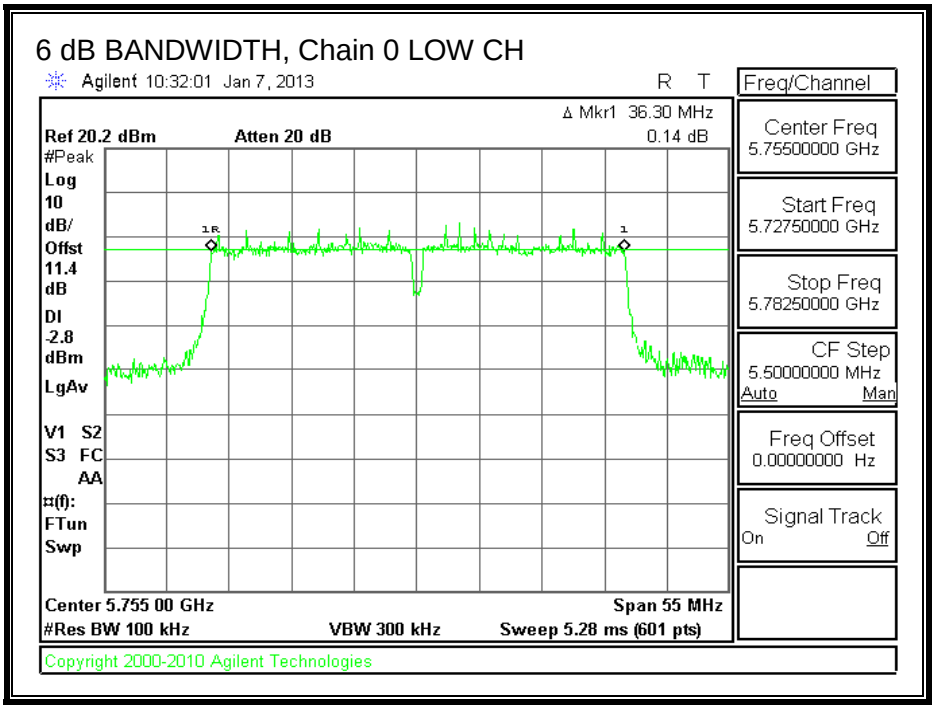
FCC §15.247 (a) (2)

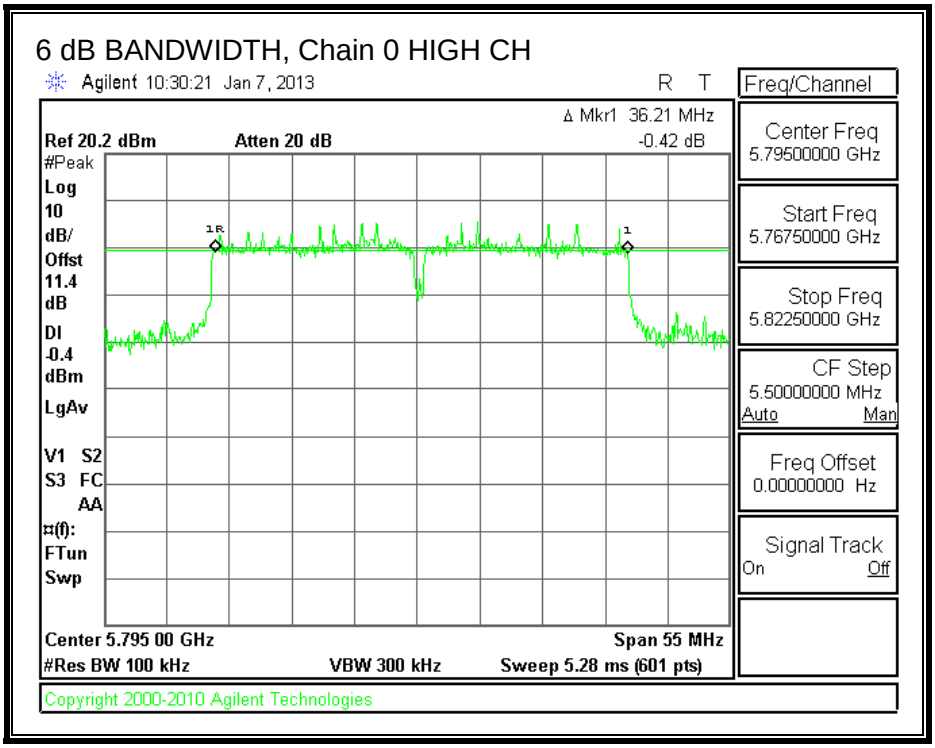
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

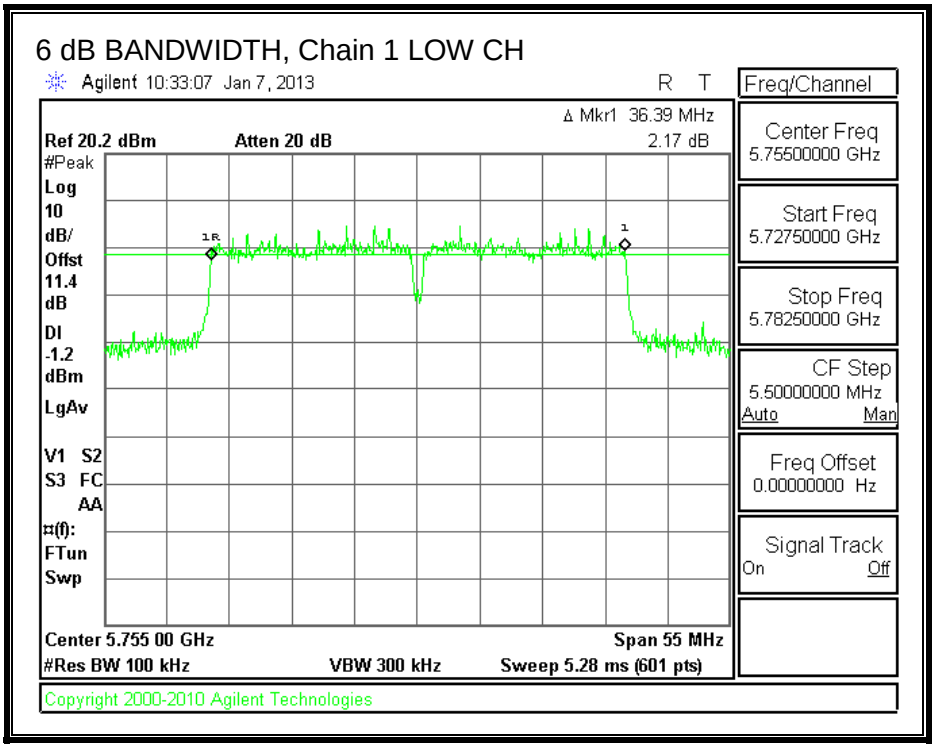
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	6 dB BW Chain 2 (MHz)	Minimum Limit (MHz)
Low	5755	36.30	36.39	36.39	0.5
High	5795	36.21	36.39	36.48	0.5

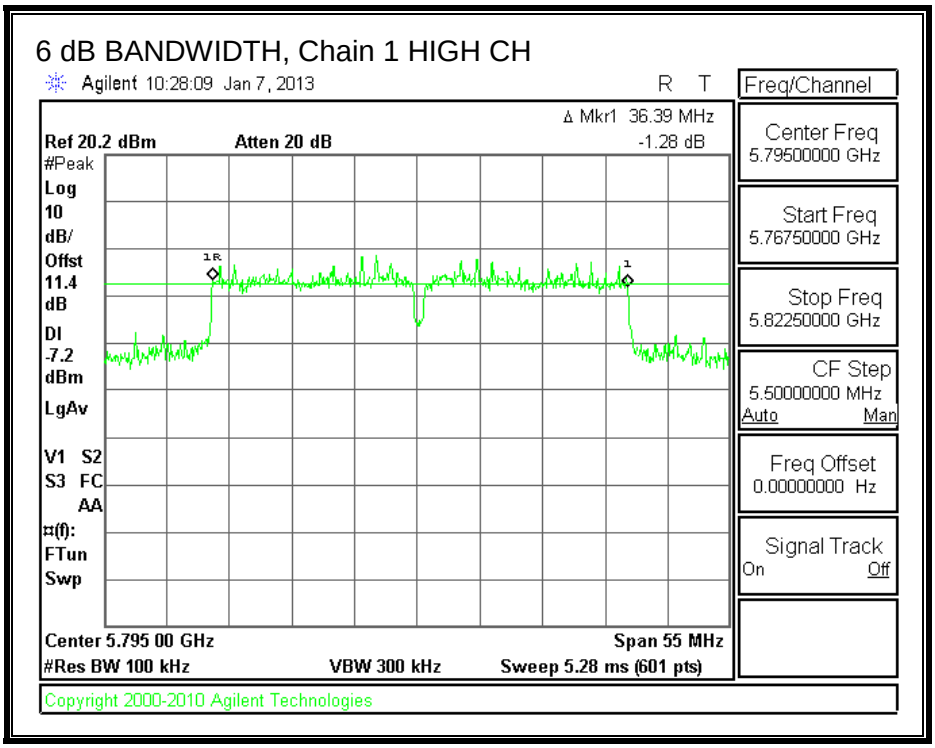
6 dB BANDWIDTH, Chain 0





6 dB BANDWIDTH, Chain 1





8.7.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.66	5.93	6.04	5.13

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	5.13	30.00
High	5795	5.13	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	15.28	15.67	15.60	20.29	30.00	-9.71
High	5795	19.00	19.70	19.54	24.19	30.00	-5.81

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.

8.7.3. Maximum Power Spectral Density (PSD)

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

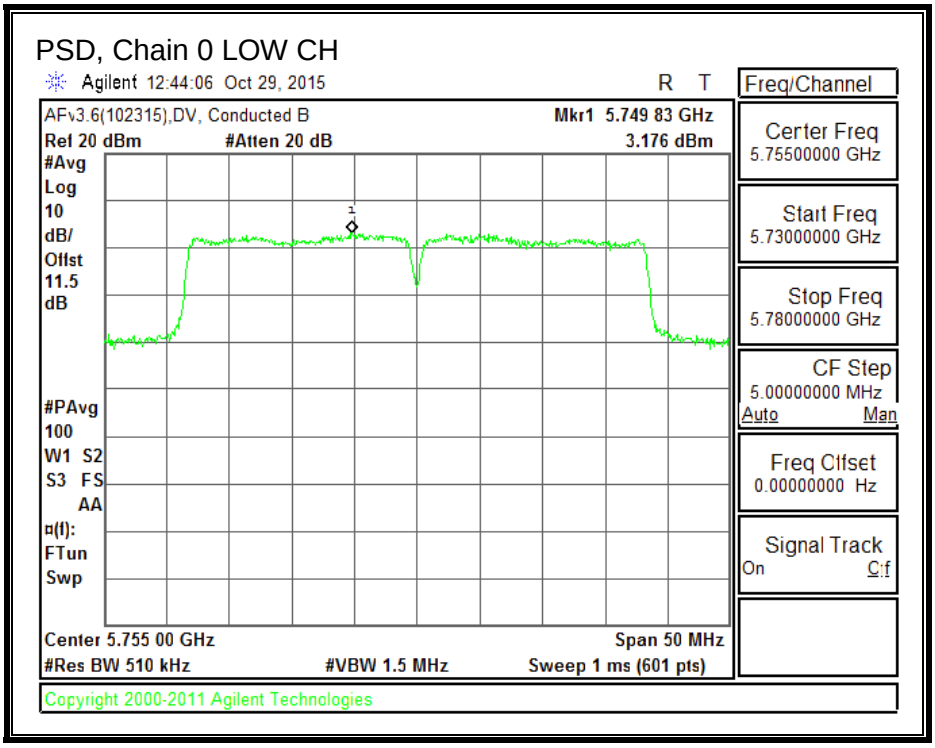
Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5755	9.78	26.22
High	5795	9.78	26.22

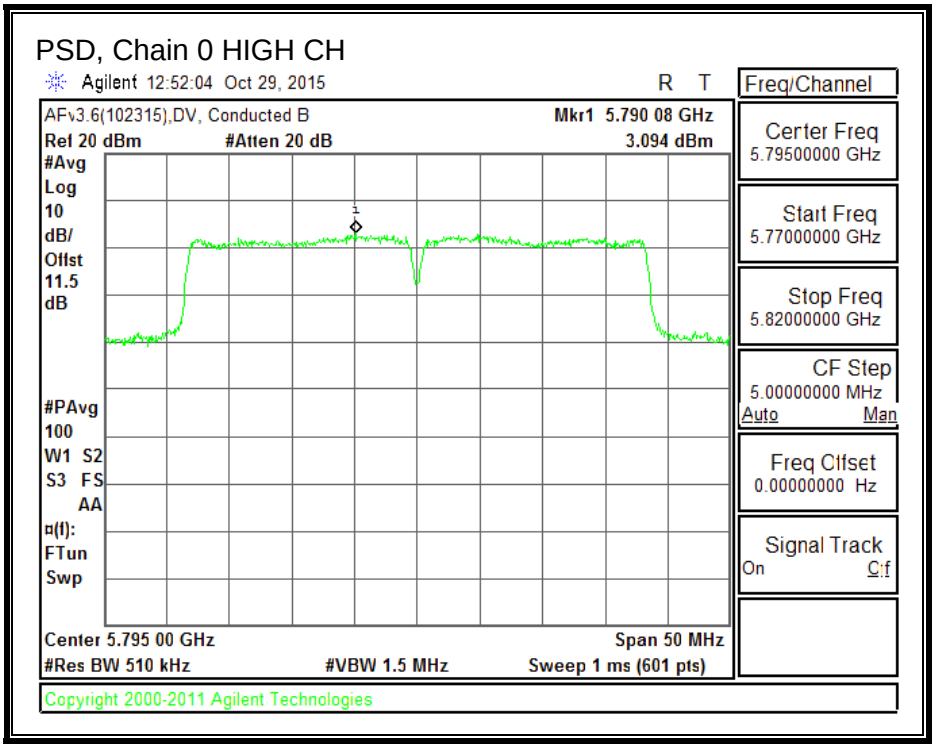
Duty Cycle CF (dB)	0.43	Included in Calculations of Corr'd PSD

PPSD Results

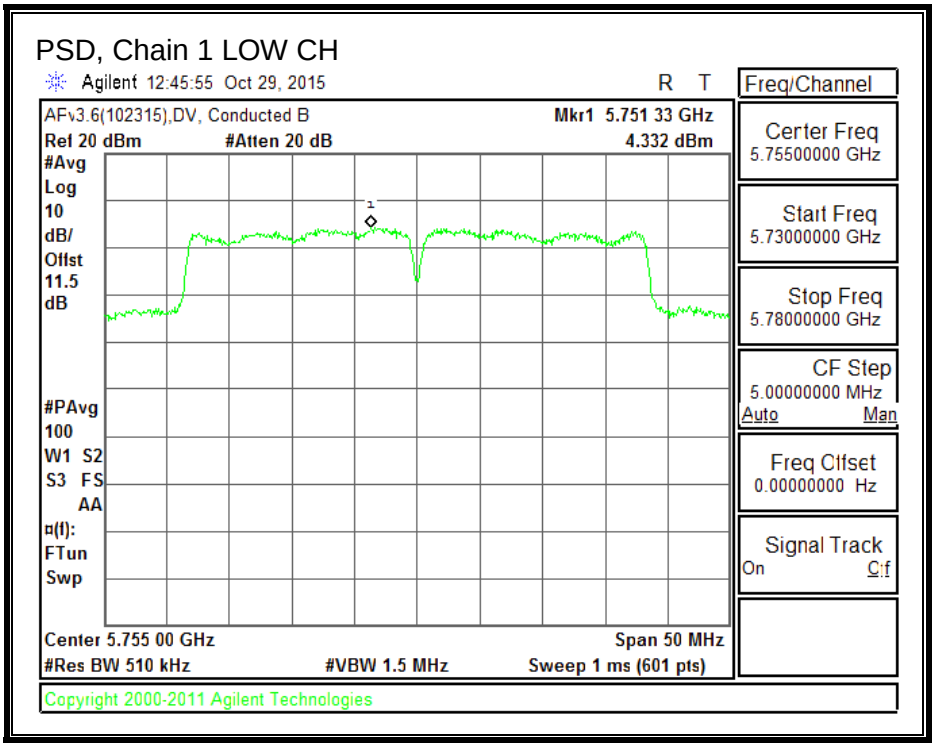
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	3.18	4.33	3.67	8.95	26.22	-17.27
High	5795	3.09	4.45	3.69	8.98	26.22	-17.24

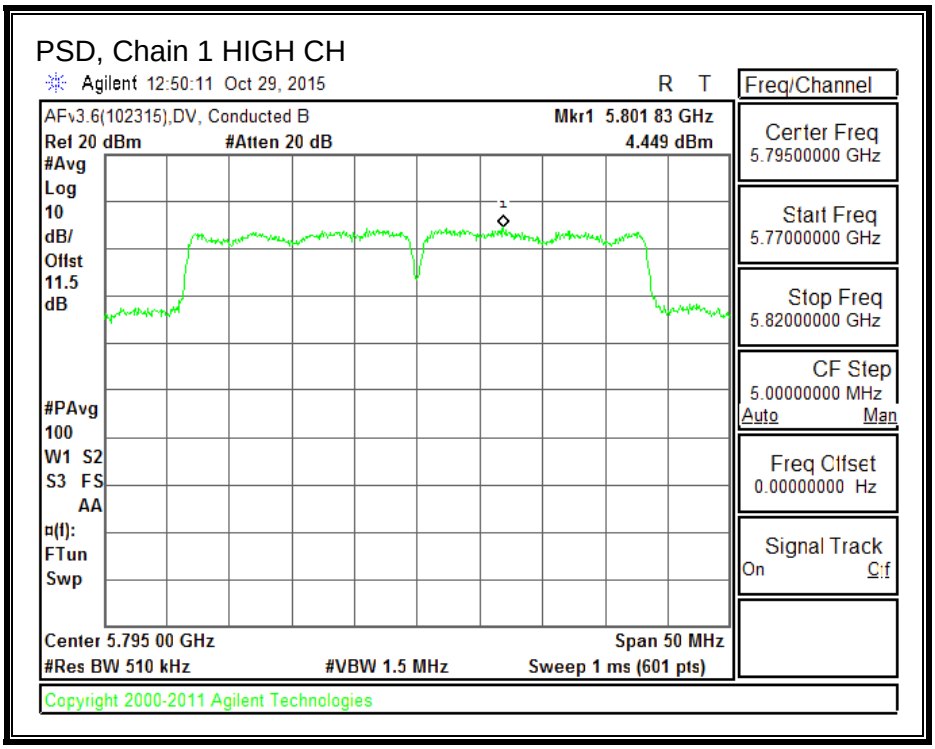
PSD, Chain 0



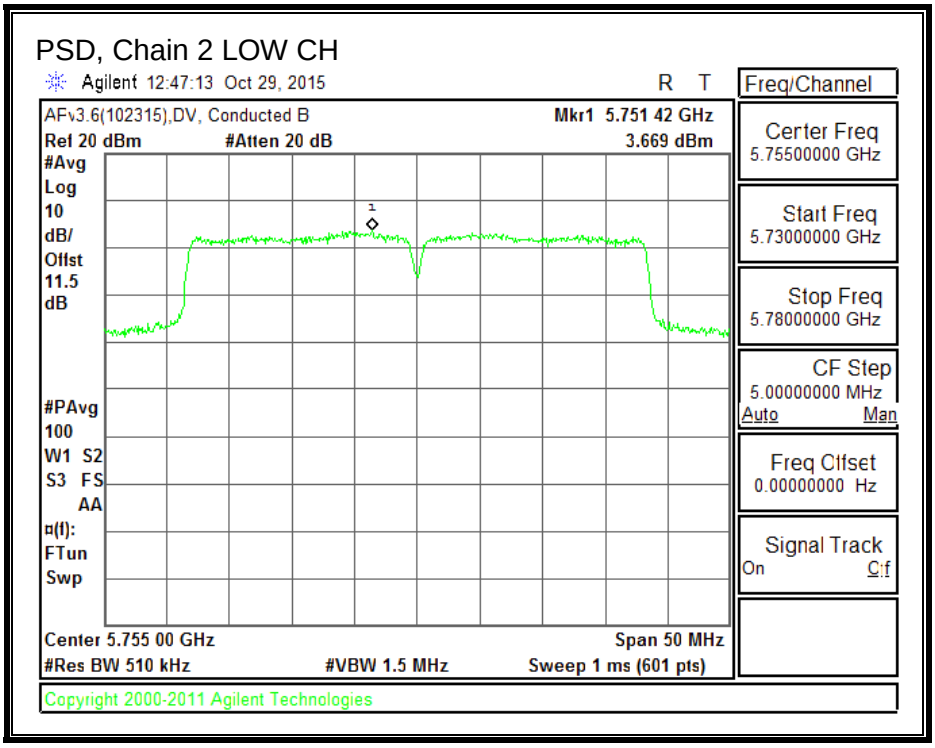


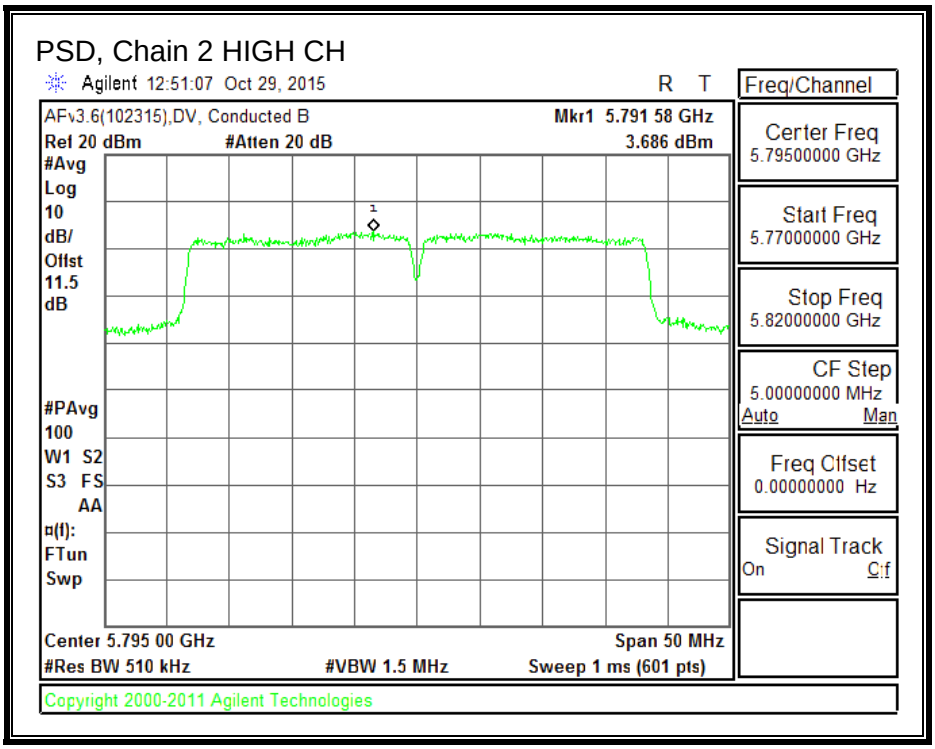
PSD, Chain 1





PSD, Chain 2





8.8. 802.11n HT40 TxBF 3TX MODE IN THE 5.8 GHz BAND

8.8.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	9.78	26.22
High	5795	9.78	26.22

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	14.80	15.20	14.65	19.66	26.22	-6.56
High	5795	18.40	19.00	18.30	23.35	26.22	-2.87

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.

8.8.2. Maximum Power Spectral Density (PSD)

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5755	9.78	26.22
High	5795	9.78	26.22

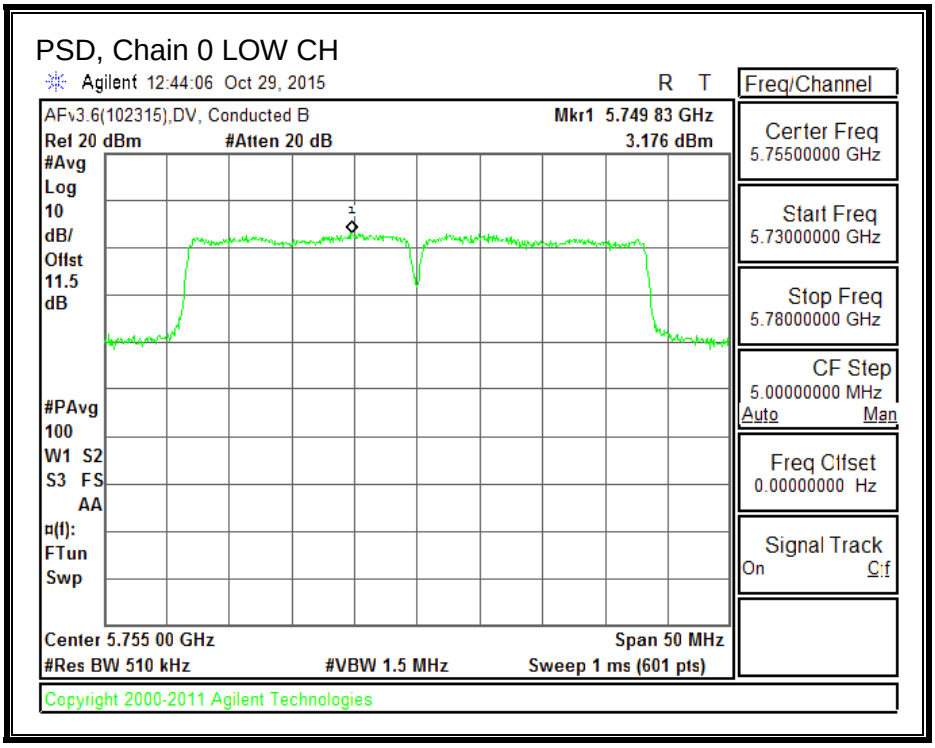
Duty Cycle CF (dB)	0.43	Included in Calculations of Corr'd PSD

PPSD Results

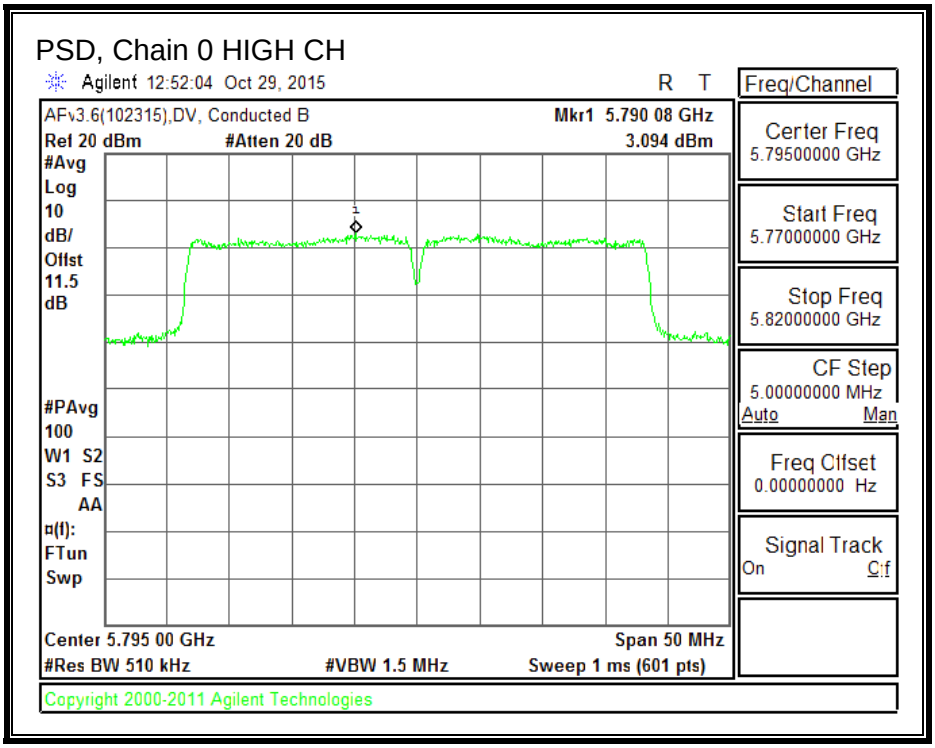
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	3.18	4.33	3.67	8.95	26.22	-17.27
High	5795	3.09	4.45	3.69	8.98	26.22	-17.24

PSD, Chain 0

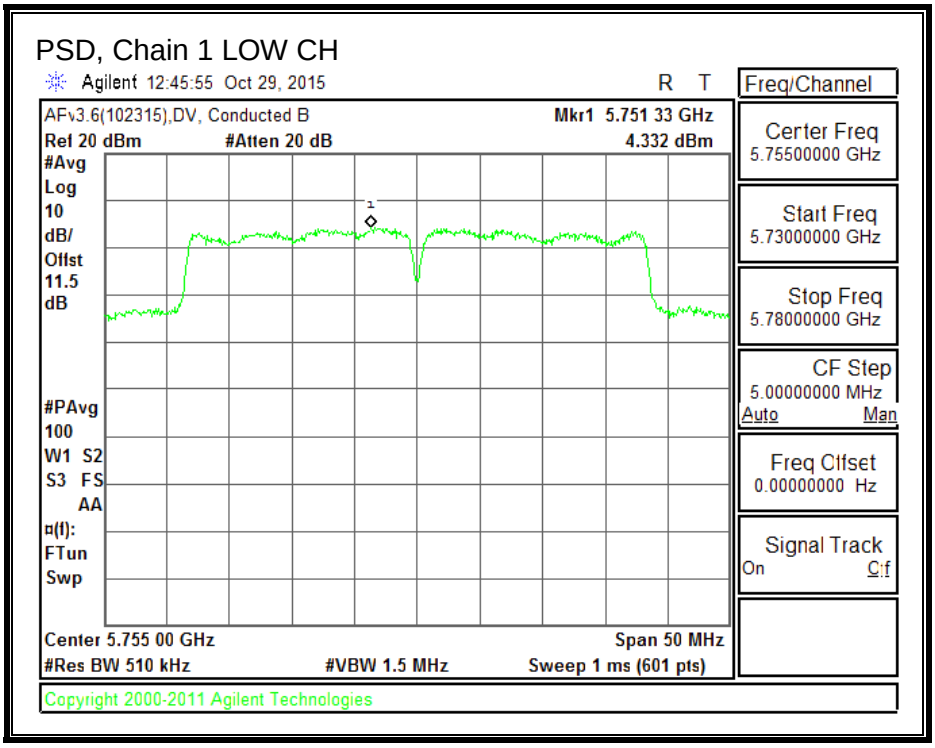
PSD, Chain 0 LOW CH

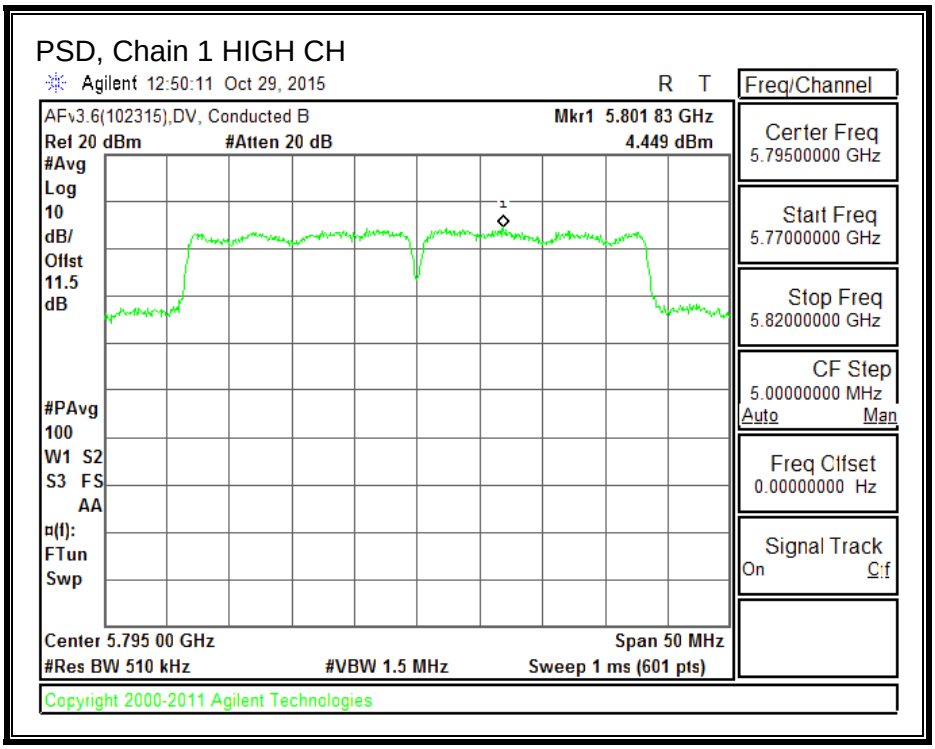


PSD, Chain 0 HIGH CH

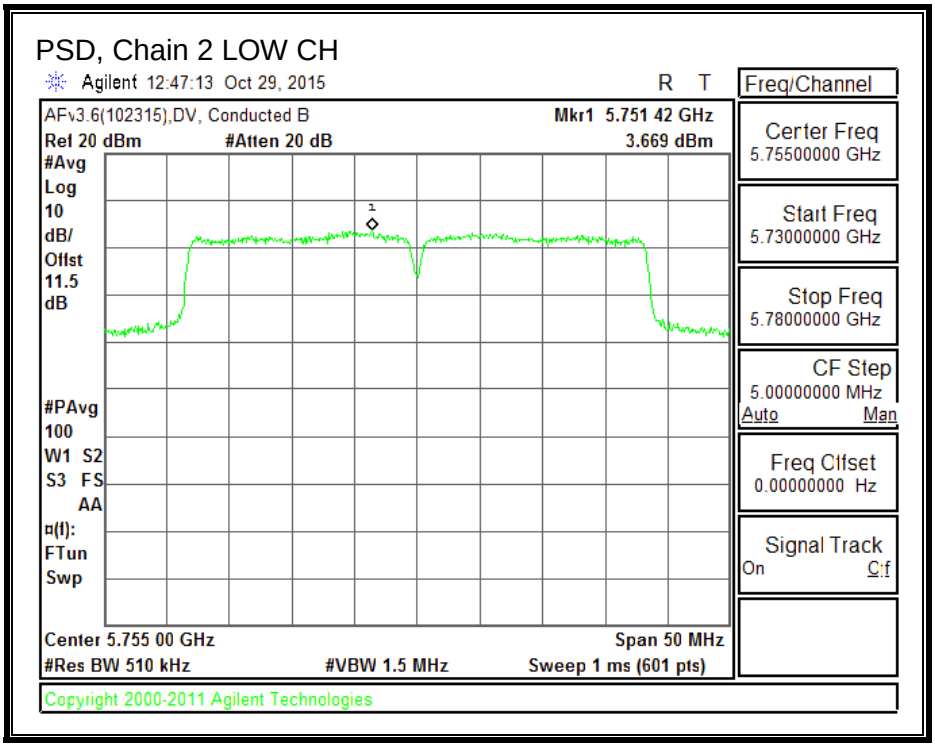


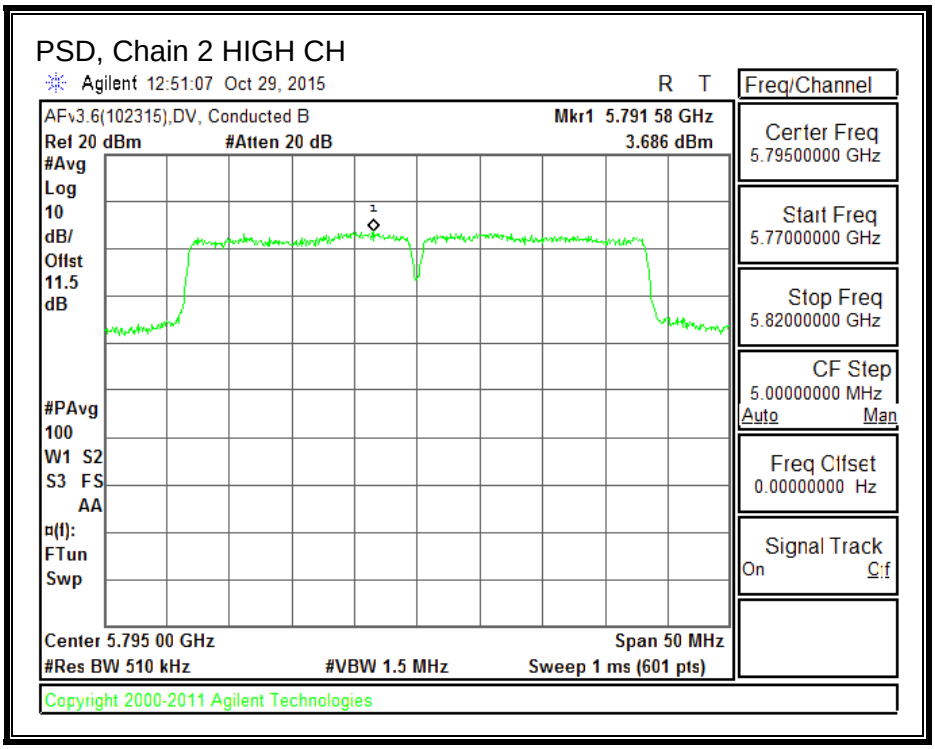
PSD, Chain 1





PSD, Chain 2





8.9. 802.11ac HT80 SISO MODE IN THE 5.8 GHz BAND

8.9.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

This is SISO mode, AG is the highest (worst-case) =6.04 dBi

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	6.04	29.96

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	15.10	15.10	29.96	-14.86

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.

8.10. 802.11ac HT80 CDD 3Tx MODE IN THE 5.8 GHz BAND

8.10.1. 6 dB BANDWIDTH

LIMITS

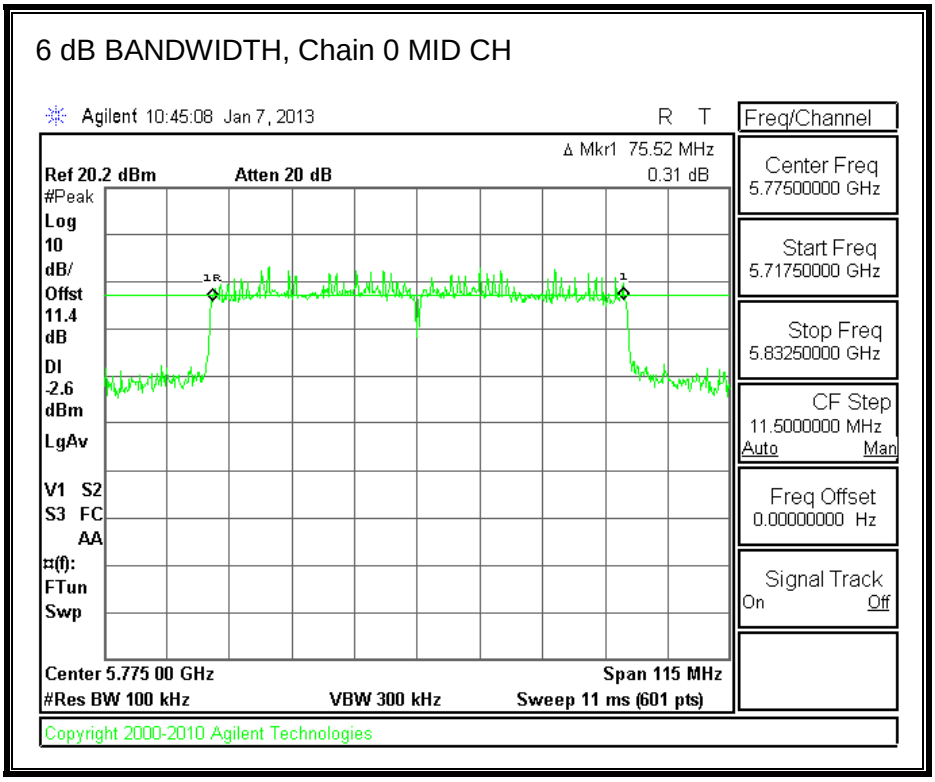
FCC §15.247 (a) (2)

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

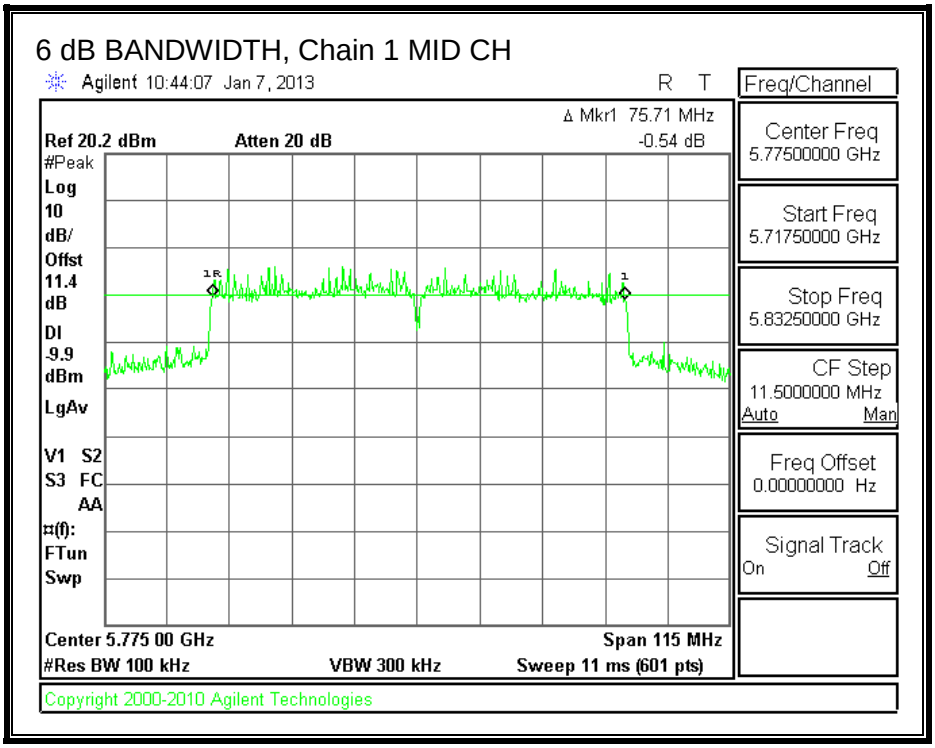
RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	6 dB BW Chain 2 (MHz)	Minimum Limit (MHz)
Mid	5775	75.520	75.710	75.520	0.5

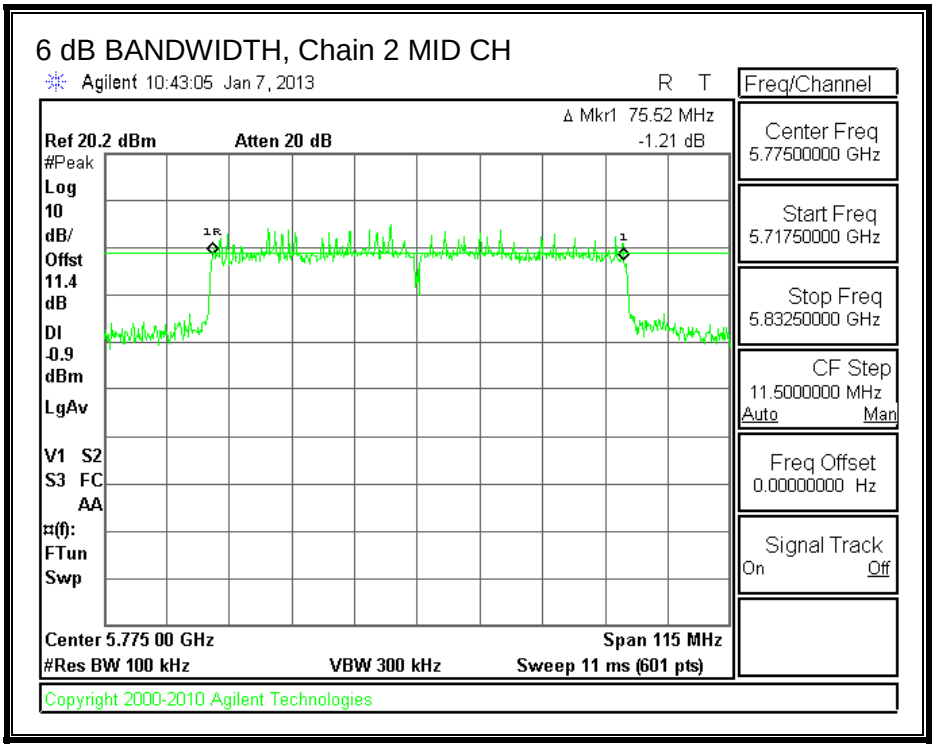
6 dB BANDWIDTH, Chain 0



6 dB BANDWIDTH, Chain 1



6 dB BANDWIDTH, Chain 2



8.10.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.66	5.93	6.04	5.13

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	5.13	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	12.91	13.20	13.00	17.81	30.00	-12.19

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.

8.10.3. Maximum Power Spectral Density (PSD)

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

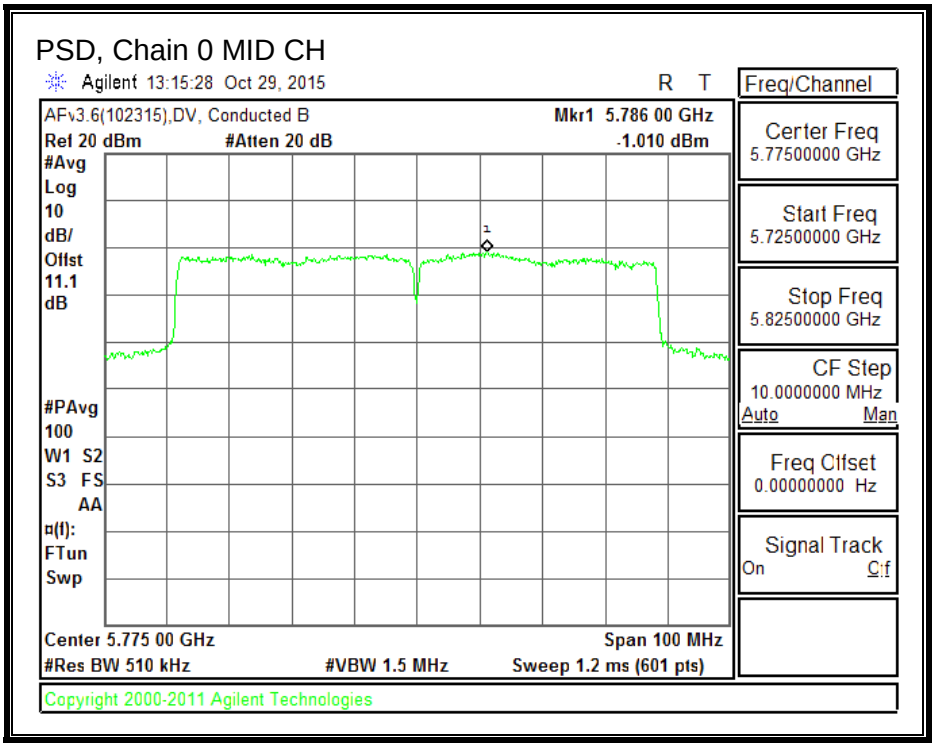
Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Mid	5775	9.78	26.22

Duty Cycle CF (dB)	0.84	**Included in Calculations of Corr'd PSD**

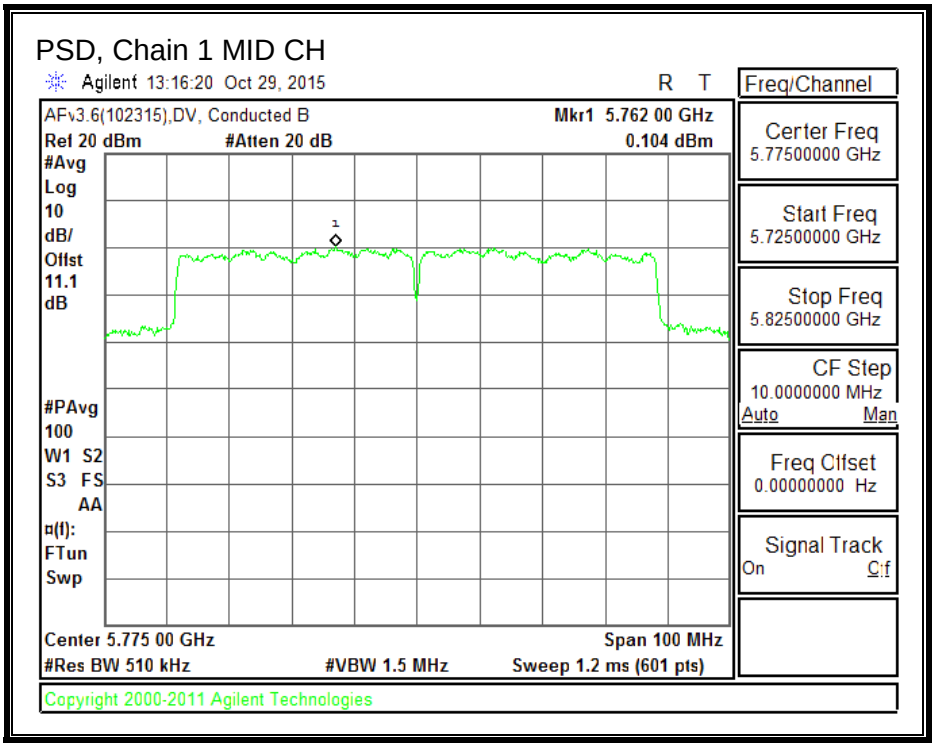
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5775	-1.01	0.10	-0.88	5.05	26.22	-21.17

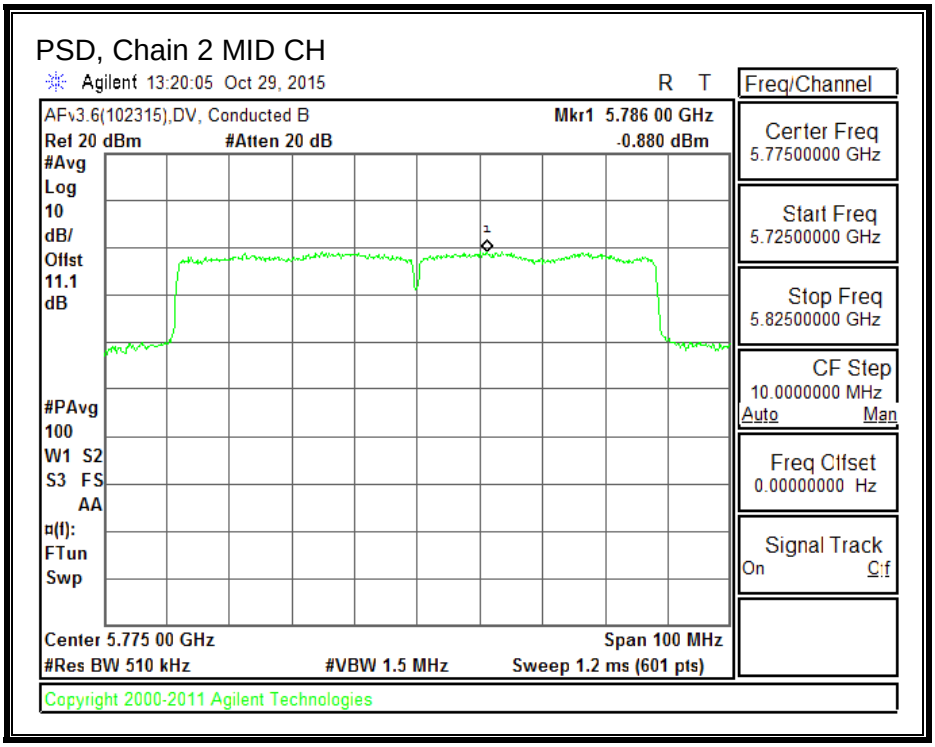
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.11. 802.11ac HT80 CDD TxBF MODE IN THE 5.8 GHz BAND

8.11.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	9.78	26.22

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	13.10	13.40	13.10	17.97	26.22	-8.25

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.

8.11.2. Maximum Power Spectral Density (PSD)

LIMITS

FCC §15.407 (a) (3)

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

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.66	5.93	6.04	9.78

RESULTS

Antenna Gain and Limit

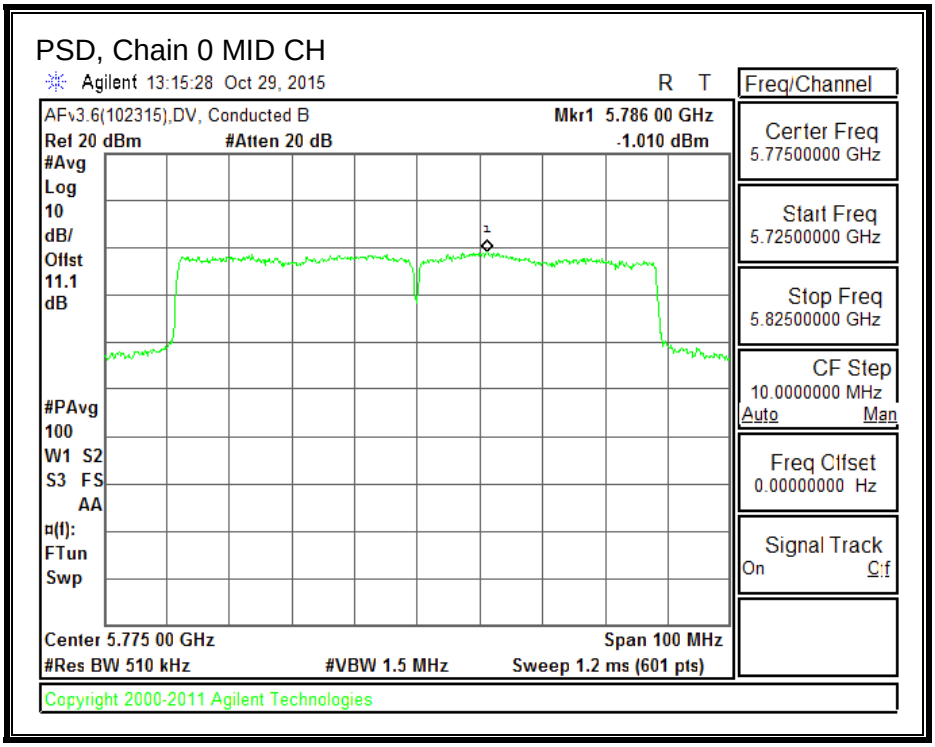
Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Mid	5775	9.78	26.22

Duty Cycle CF (dB)	0.84	**Included in Calculations of Corr'd PSD**

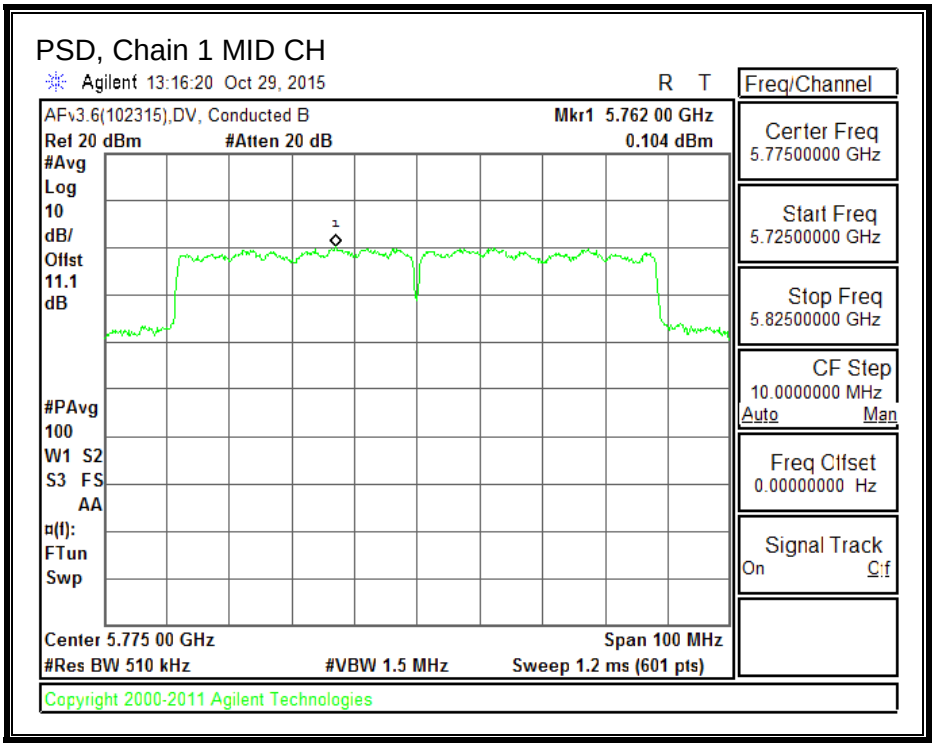
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5775	-1.01	0.10	-0.88	5.05	26.22	-21.17

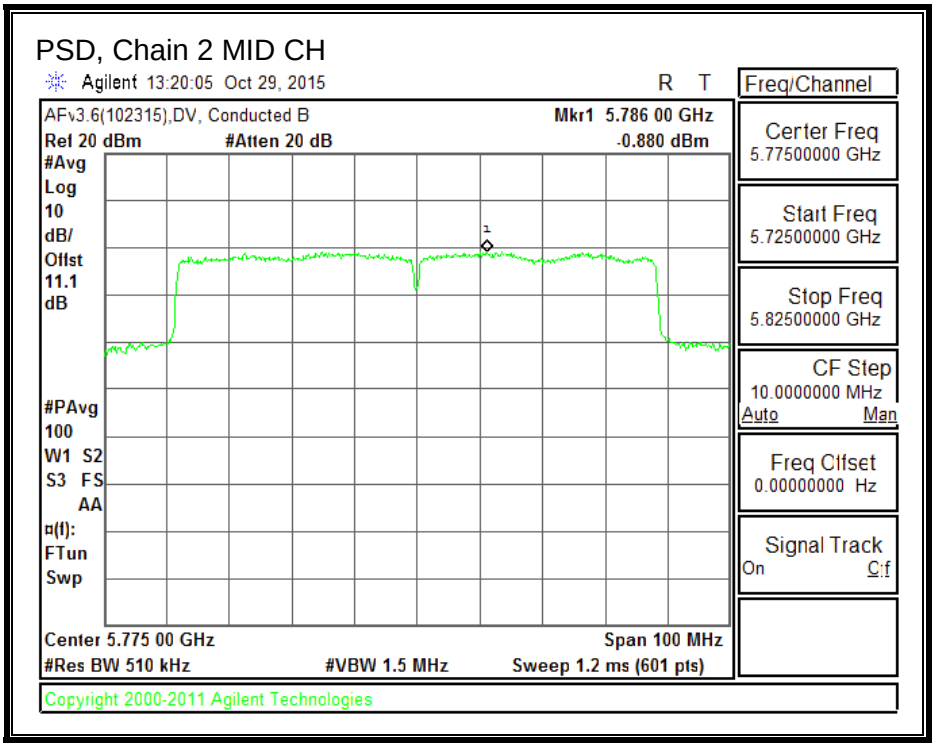
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

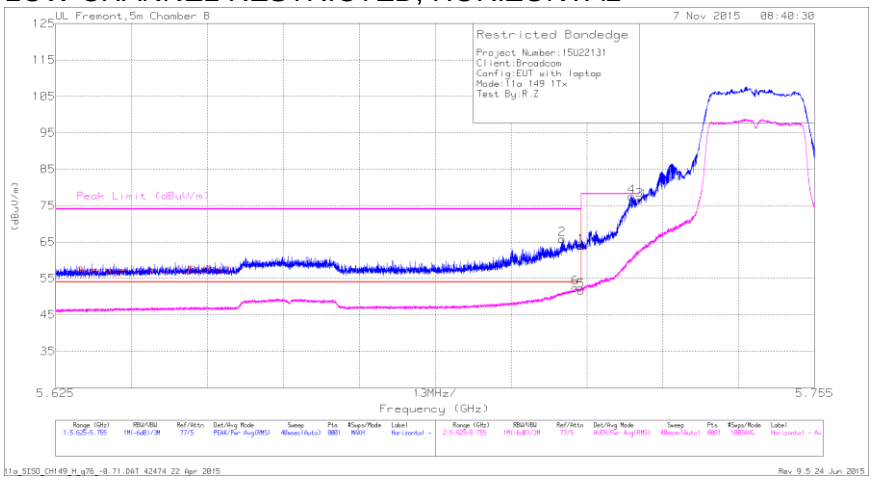
FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

9.2. TX ABOVE 1 GHz 802.11a MODE SISO IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZONTAL



Trace Markers

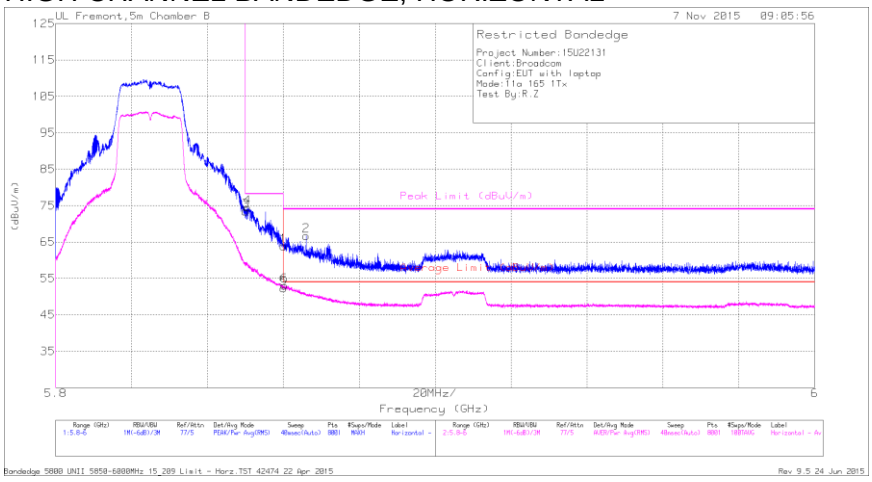
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.712	23.39	Pk	35	7.4	0	65.79	-	-	74	-8.21	15	363	H
6	5.714	9.84	RMS	35	7.3	.21	52.35	54	-1.65	-	-	15	363	H
1	5.715	21.68	Pk	35	7.3	0	63.98	-	-	74	-10.02	15	363	H
5	5.715	9.1	RMS	35	7.3	.21	51.61	54	-2.39	-	-	15	363	H
4	5.724	35.09	Pk	35	7.4	0	77.49	-	-	78.2	-.71	15	363	H
3	5.725	34.06	Pk	35	7.4	0	76.46	-	-	78.2	-1.74	15	363	H

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (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
3	5.85	30.55	Pk	35.4	7.5	0	73.45	-	-	78.2	-4.75	173	402	H
4	5.851	31.64	Pk	35.4	7.5	0	74.54	-	-	78.2	-3.66	173	402	H
1	5.86	20.99	Pk	35.4	7.5	0	63.89	-	-	74	-10.11	173	402	H
5	5.86	9.21	RMS	35.4	7.5	.21	52.32	54	-1.68	-	-	173	402	H
6	5.86	9.86	RMS	35.4	7.5	.21	52.97	54	-1.03	-	-	173	402	H
2	5.866	23.84	Pk	35.4	7.5	0	66.74	-	-	74	-7.26	173	402	H

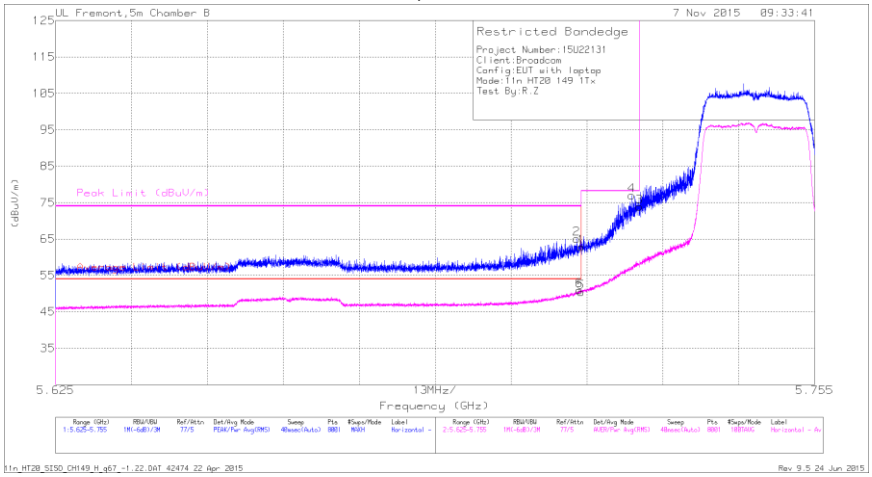
Pk - Peak detector

RMS - RMS detection

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

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZONTAL



Trace Markers

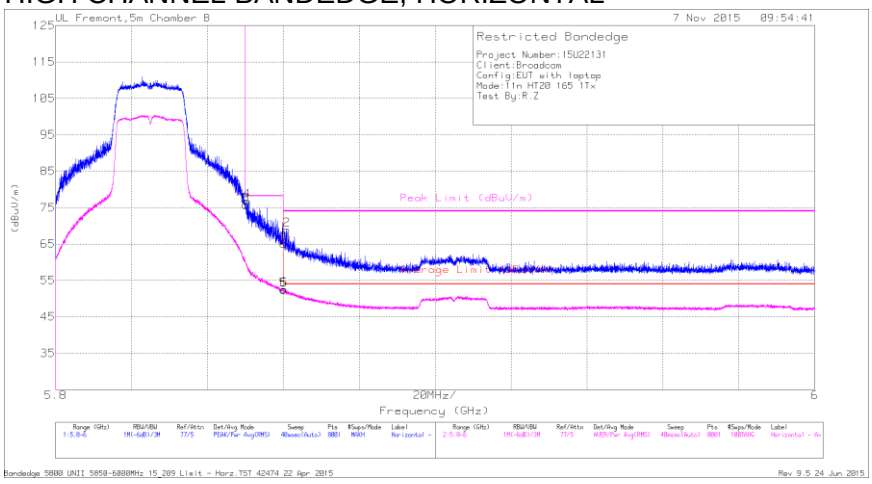
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.714	22.71	Pk	35	7.3	0	65.01	-	-	74	-8.99	21	367	H
1	5.715	20.55	Pk	35	7.3	0	62.85	-	-	74	-11.15	21	367	H
5	5.715	7.89	RMS	35	7.3	.22	50.41	54	-3.59	-	-	21	367	H
6	5.715	8.34	RMS	35	7.3	.22	50.86	54	-3.14	-	-	21	367	H
4	5.724	34.58	Pk	35	7.4	0	76.98	-	-	78.2	-1.22	21	367	H
3	5.725	31.5	Pk	35	7.4	0	73.9	-	-	78.2	-4.3	21	367	H

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (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
3	5.85	32.79	Pk	35.4	7.5	0	75.69	-	-	78.2	-2.51	173	379	H
4	5.85	33.99	Pk	35.4	7.5	0	76.89	-	-	78.2	-1.31	173	379	H
1	5.86	22.18	Pk	35.4	7.5	0	65.08	-	-	74	-8.92	173	379	H
5	5.86	9.28	RMS	35.4	7.5	.22	52.4	54	-1.6	-	-	173	379	H
6	5.86	9.37	RMS	35.4	7.5	.22	52.49	54	-1.51	-	-	173	379	H
2	5.861	26.06	Pk	35.4	7.5	0	68.96	-	-	74	-5.04	173	379	H

Pk - Peak detector

RMS - RMS detection

9.4. TX ABOVE 1 GHz 802.11n HT20 MODE 3Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, VERTICAL

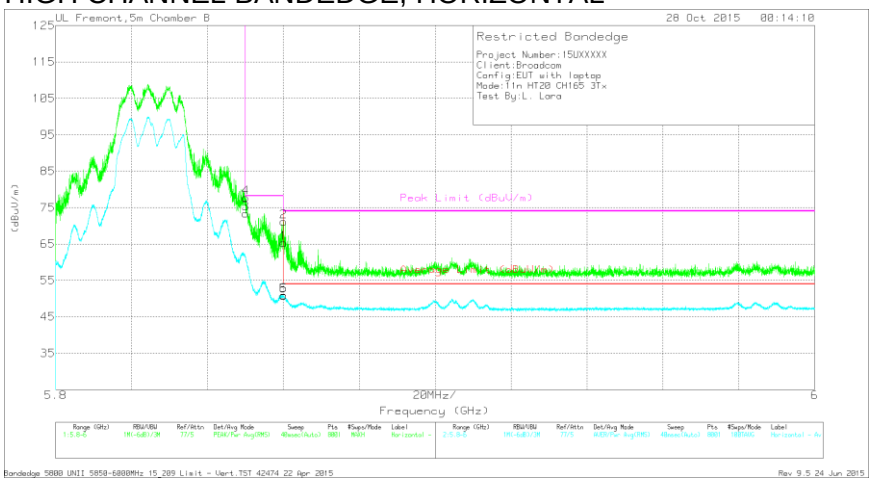
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.724	-71.75	Pk	35	7.4	11.8	-17.55	-17	-.55	62	138	V
1	5.725	-75.41	Pk	35	7.4	11.8	-21.21	-17	-4.21	62	138	V

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

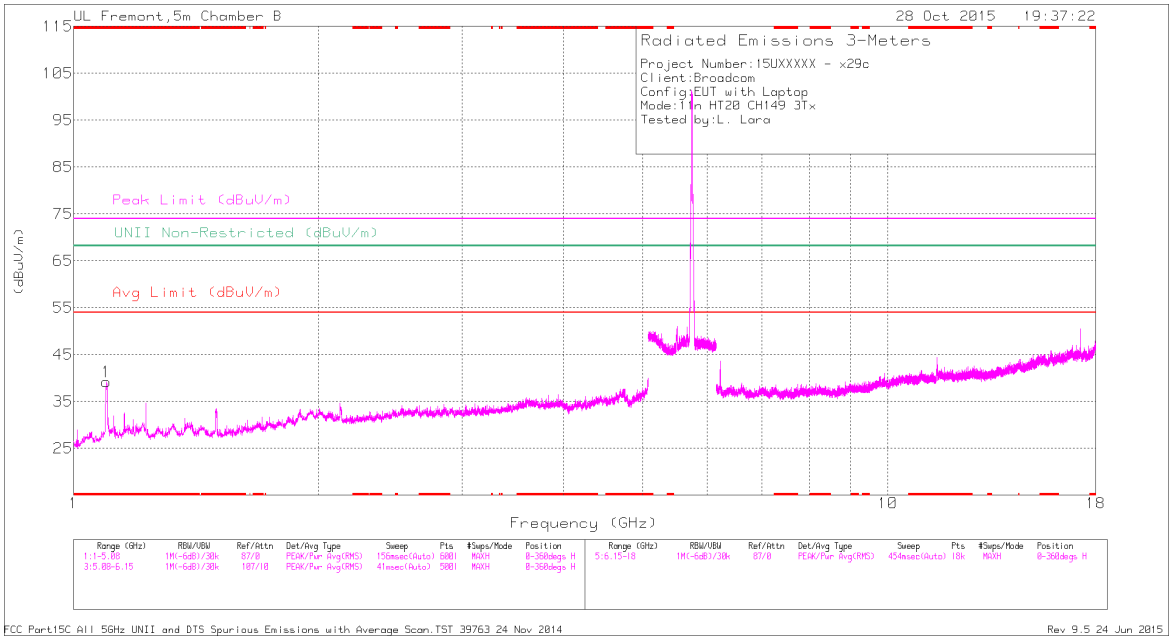
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	5.85	30.43	Pk	35.4	7.5	0	73.33	-	-	78.2	-4.87	164	244	V
4	5.85	34.78	Pk	35.4	7.5	0	77.68	-	-	78.2	-.52	164	244	V
1	5.86	22.44	Pk	35.4	7.5	0	65.34	-	-	74	-8.66	164	244	V
2	5.86	28.26	Pk	35.4	7.5	0	71.16	-	-	74	-2.84	164	244	V
5	5.86	7.64	RMS	35.4	7.5	.22	50.76	54	-3.24	-	-	164	244	V
6	5.86	7.78	RMS	35.4	7.5	.22	50.9	54	-3.1	-	-	164	244	V

Pk - Peak detector

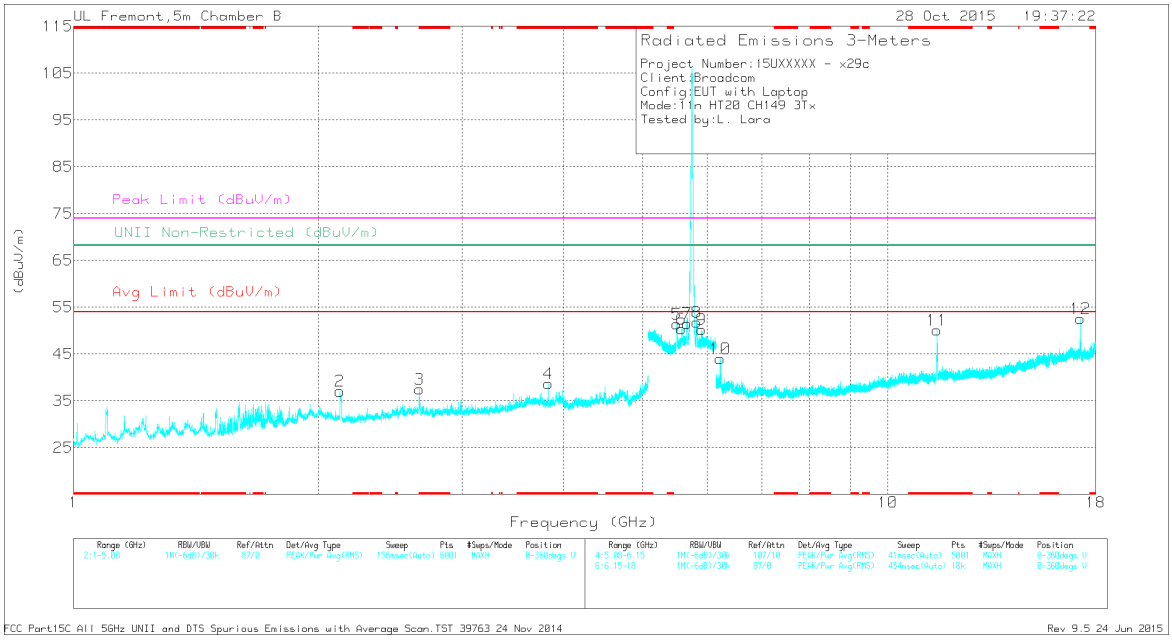
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.099	54.24	PK-U	27.6	-35.5	0	46.34	-	-	74	-27.66	-	-	294	221	H
	* 1.099	43.68	ADR	27.6	-35.5	.22	36	54	-18	-	-	-	-	294	221	H
11	* 11.494	46.52	PK-U	38.3	-25.4	0	59.42	-	-	74	-14.58	-	-	161	197	V
	* 11.489	33.16	ADR	38.3	-25.4	.22	46.28	54	-7.72	-	-	-	-	161	197	V
3	* 2.657	48.87	PK-U	32.7	-33.5	0	48.07	-	-	74	-25.93	-	-	355	106	V
	* 2.655	31.66	ADR	32.7	-33.5	.22	31.08	54	-22.92	-	-	-	-	355	106	V
4	* 3.83	44.4	PK-U	33.4	-33	0	44.8	-	-	74	-29.2	-	-	314	141	V
	* 3.83	35.48	ADR	33.4	-33	.22	36.1	54	-17.9	-	-	-	-	314	141	V
12	17.233	41.41	PK-U	41.1	-21.7	0	60.81	-	-	-	-	68.2	-7.39	135	308	V
2	2.124	50.29	PK-U	31.6	-35	0	46.89	-	-	-	-	68.2	-21.31	33	121	V
5	5.504	49.25	PK-U	34.5	-20.7	0	63.05	-	-	-	-	68.2	-5.15	175	257	V
6	5.594	44.52	PK-U	34.7	-20.8	0	58.42	-	-	-	-	68.2	-9.78	356	122	V
7	**5.666	37.39	Pk	34.9	-20.7	0	51.59	-	-	-	-	68.2	-16.61	0-360	101	V
8	***5.826	37.21	Pk	35.3	-20.7	0	51.81	-	-	-	-	-	-	0-360	200	V
9	5.903	43.65	PK-U	35.5	-20.9	0	58.25	-	-	-	-	68.2	-9.95	2	103	V
10	6.224	49.14	PK-U	35.5	-31.5	0	53.14	-	-	-	-	68.2	-15.06	204	269	V

* - indicates frequency in CFR15.205 Restricted Band

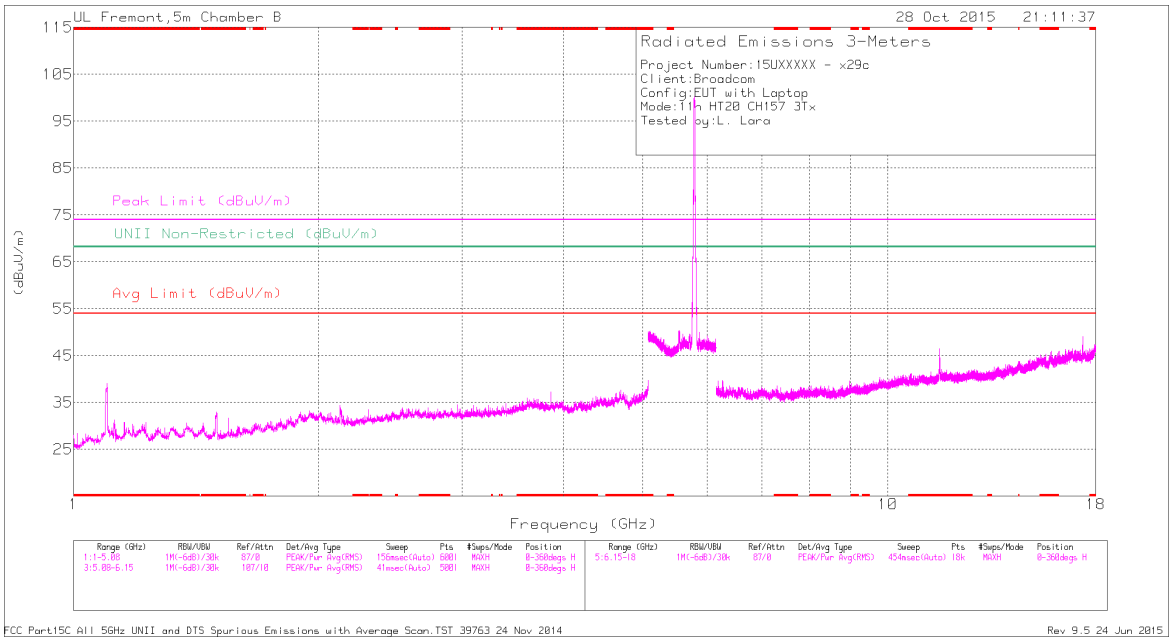
** - indicates frequency covered by the radiated band edge

*** - indicates frequency in the authorized band

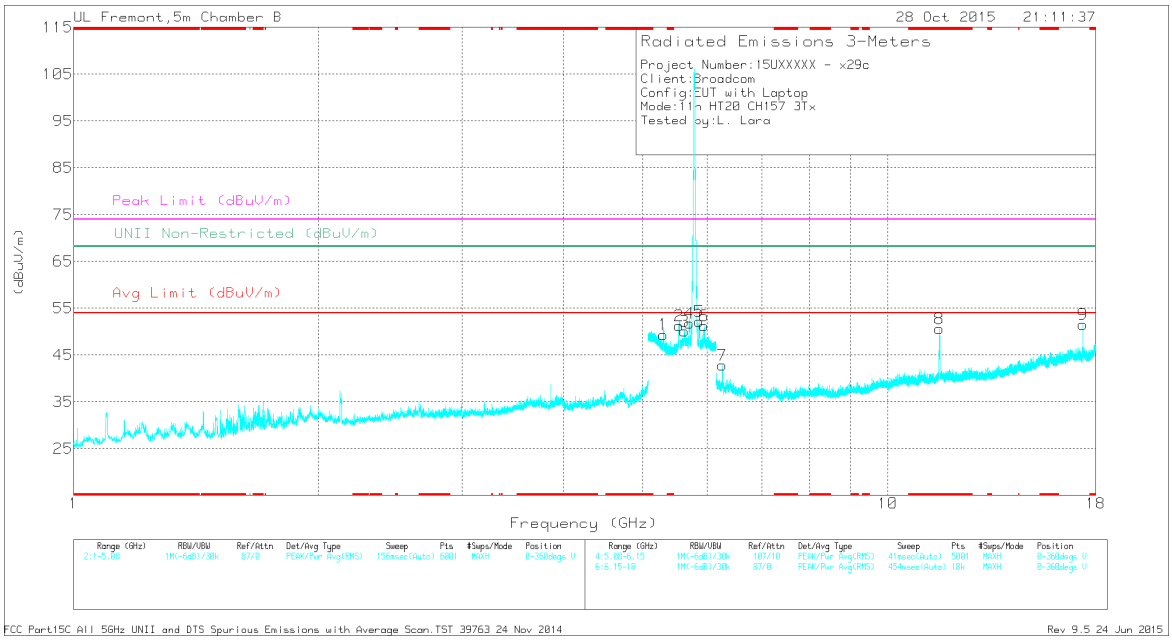
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

Trace Markers

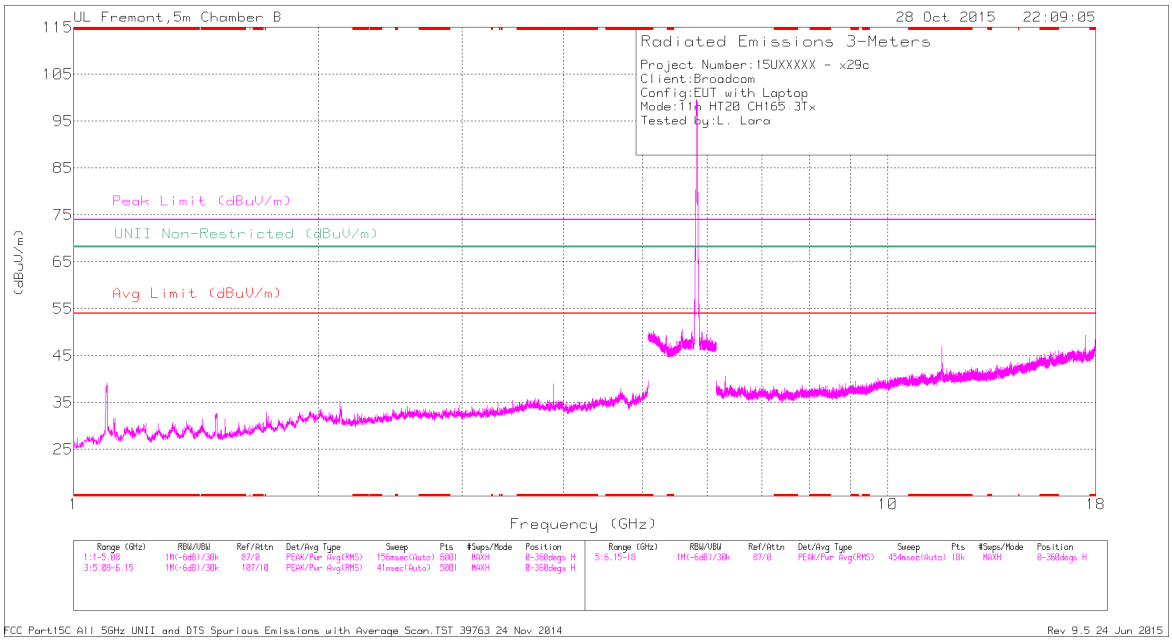
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
8	* 11.573	47.34	PK-U	38.4	-24.5	0	61.24	-	-	74	-12.76	-	-	163	209	V
	* 11.572	35.89	ADR	38.4	-24.6	.22	49.91	54	-4.09	-	-	-	-	163	209	V
1	5.301	46.56	PK-U	34.4	-19.7	0	61.26	-	-	-	-	68.2	-6.94	256	302	V
2	5.536	46.08	PK-U	34.6	-20.7	0	59.98	-	-	-	-	68.2	-8.22	353	117	V
3	5.626	47.19	PK-U	34.8	-20.9	0	61.09	-	-	-	-	68.2	-7.11	189	266	V
4	5.707	49.95	PK-U	35	-21	0	63.95	-	-	-	-	68.2	-4.25	189	267	V
5	5.862	48.46	PK-U	35.4	-20.8	0	63.06	-	-	-	-	68.2	-5.14	181	270	V
6	5.943	44.35	PK-U	35.6	-20.8	0	59.15	-	-	-	-	68.2	-9.05	0	101	V
7	6.268	50.76	PK-U	35.5	-31.6	0	54.66	-	-	-	-	68.2	-13.54	188	292	V
9	17.348	41.35	PK-U	40.8	-21.5	0	60.65	-	-	-	-	68.2	-7.55	133	302	V

* - indicates frequency in CFR15.205 Restricted Band

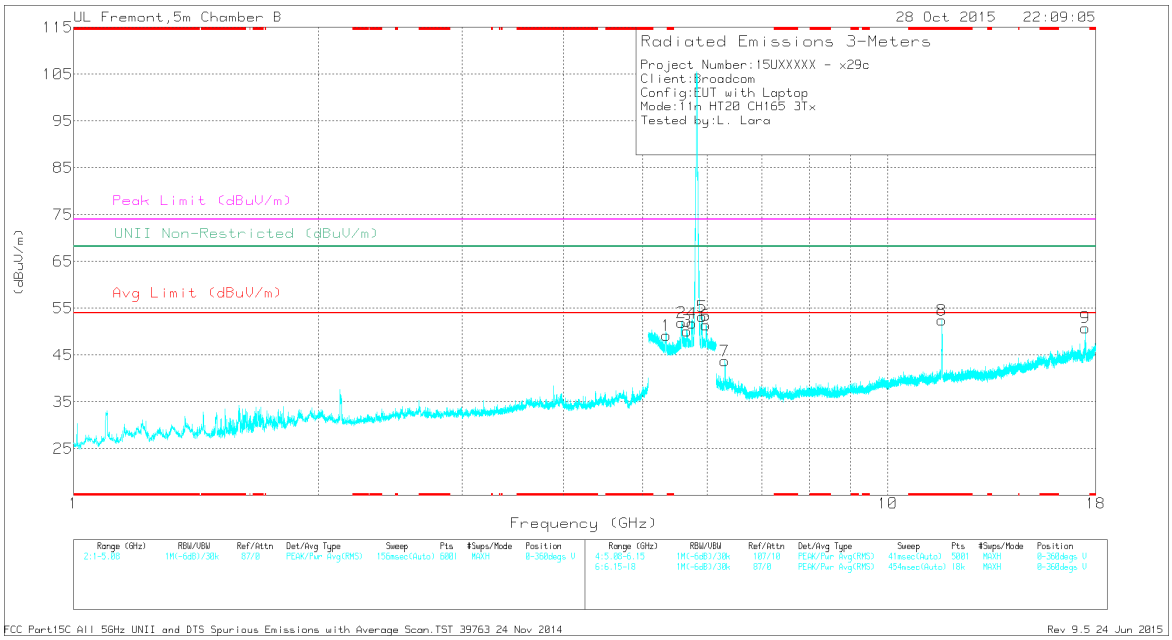
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
8	* 11.651	48.48	PK-U	38.5	-24.8	0	62.18	-	-	74	-11.82	-	-	162	212	V
	* 11.651	35.86	ADR	38.5	-24.8	.22	49.78	54	-4.22	-	-	-	-	162	212	V
1	5.338	46.28	PK-U	34.4	-19.8	0	60.88	-	-	-	-	68.2	-7.32	246	266	V
2	5.581	49.89	PK-U	34.7	-20.5	0	64.09	-	-	-	-	68.2	-4.11	174	310	V
3	5.664	44.62	PK-U	34.9	-21.2	0	58.32	-	-	-	-	68.2	-9.88	357	101	V
4	***5.747	37.69	Pk	35.1	-21	0	51.79	-	-	-	-	-	-	0-360	199	V
5	**5.912	38.38	Pk	35.5	-20.6	0	53.28	-	-	-	-	68.2	-14.92	0-360	199	V
6	**5.981	36.46	Pk	35.6	-20.7	0	51.36	-	-	-	-	68.2	-16.84	0-360	199	V
7	6.309	51.34	PK-U	35.6	-31.3	0	55.64	-	-	-	-	68.2	-12.56	193	251	V
9	17.463	43.1	PK-U	40.7	-20.9	0	62.9	-	-	-	-	68.2	-5.3	123	276	V

* - indicates frequency in CFR15.205 Restricted Band

** - indicates frequency covered by the radiated band edge

*** - indicates frequency in the authorized band

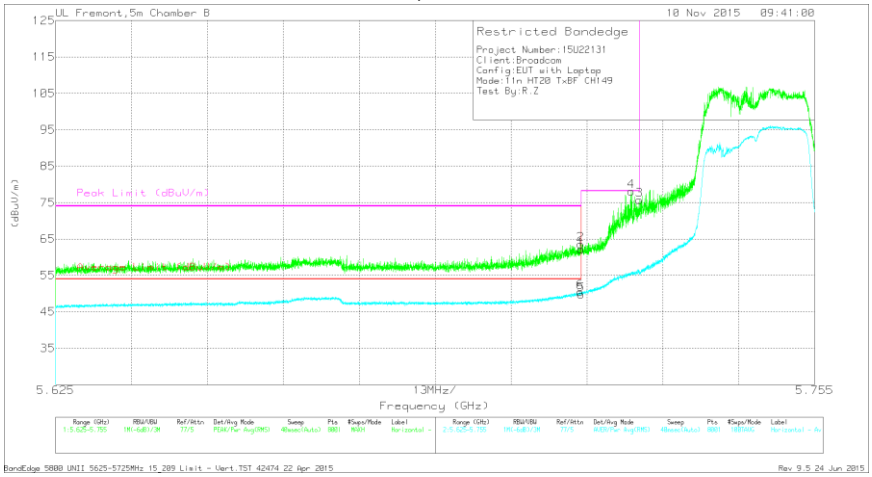
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.5. TX ABOVE 1 GHz 802.11n HT20 MODE TxBF 3 TX IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, VERTICAL



Trace Markers

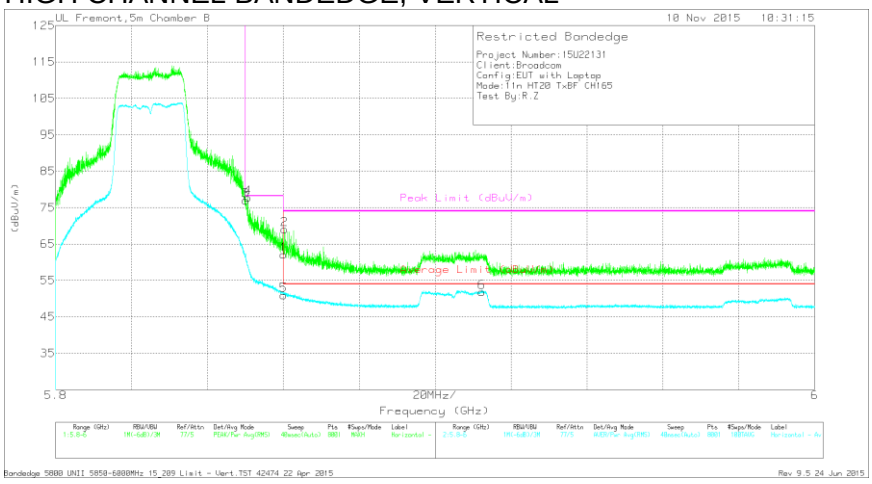
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.715	19.77	Pk	35	7.3	0	62.07	-	-	74	-11.93	299	368	V
2	5.715	21.28	Pk	35	7.3	0	63.58	-	-	74	-10.42	299	368	V
5	5.715	6.89	RMS	35	7.3	.56	49.75	54	-4.25	-	-	299	368	V
6	5.715	7.56	RMS	35	7.3	.56	50.42	54	-3.58	-	-	299	368	V
4	5.724	35.68	Pk	35	7.4	0	78.08	-	-	78.2	-.12	299	368	V
3	5.725	33.33	Pk	35	7.4	0	75.73	-	-	78.2	-2.47	299	368	V

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, VERTICAL



Trace Markers

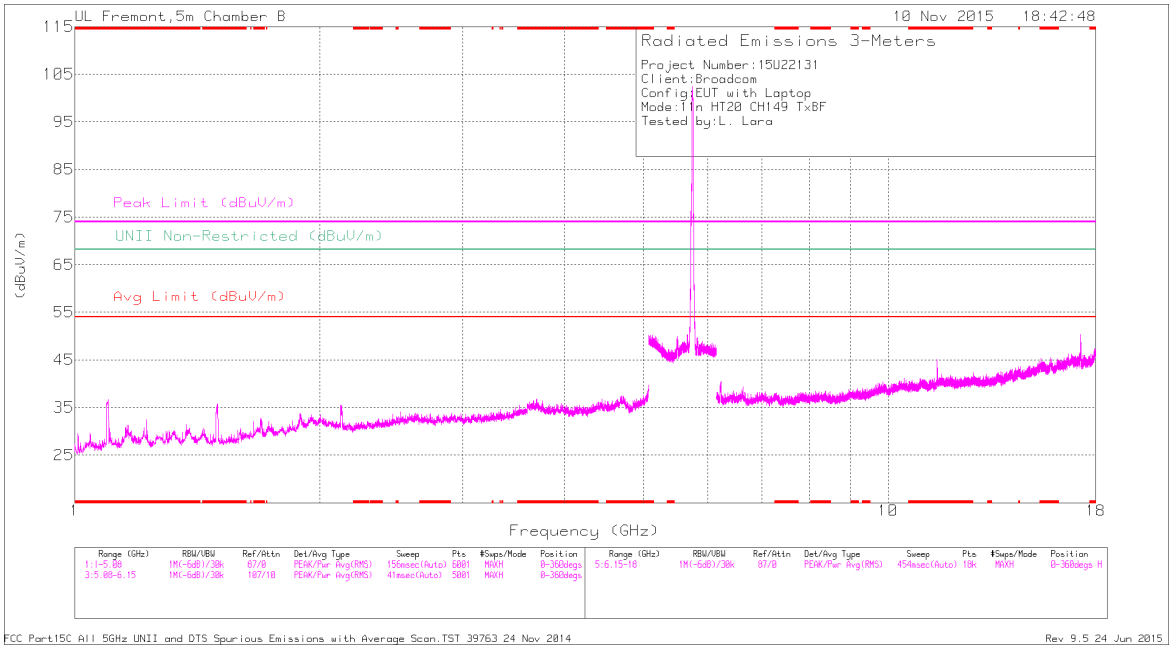
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	5.85	34.09	Pk	35.4	7.5	0	76.99	-	-	78.2	-1.21	305	301	V
4	5.851	34.79	Pk	35.4	7.5	0	77.69	-	-	78.2	-.51	305	301	V
1	5.86	19.17	Pk	35.4	7.5	0	62.07	-	-	74	-11.93	305	301	V
2	5.86	26.13	Pk	35.4	7.5	0	69.03	-	-	74	-4.97	305	301	V
5	5.86	8.07	RMS	35.4	7.5	.56	51.53	54	-2.47	-	-	305	301	V
6	5.912	8.79	RMS	35.5	7.5	.56	52.35	54	-1.65	-	-	305	301	V

Pk - Peak detector

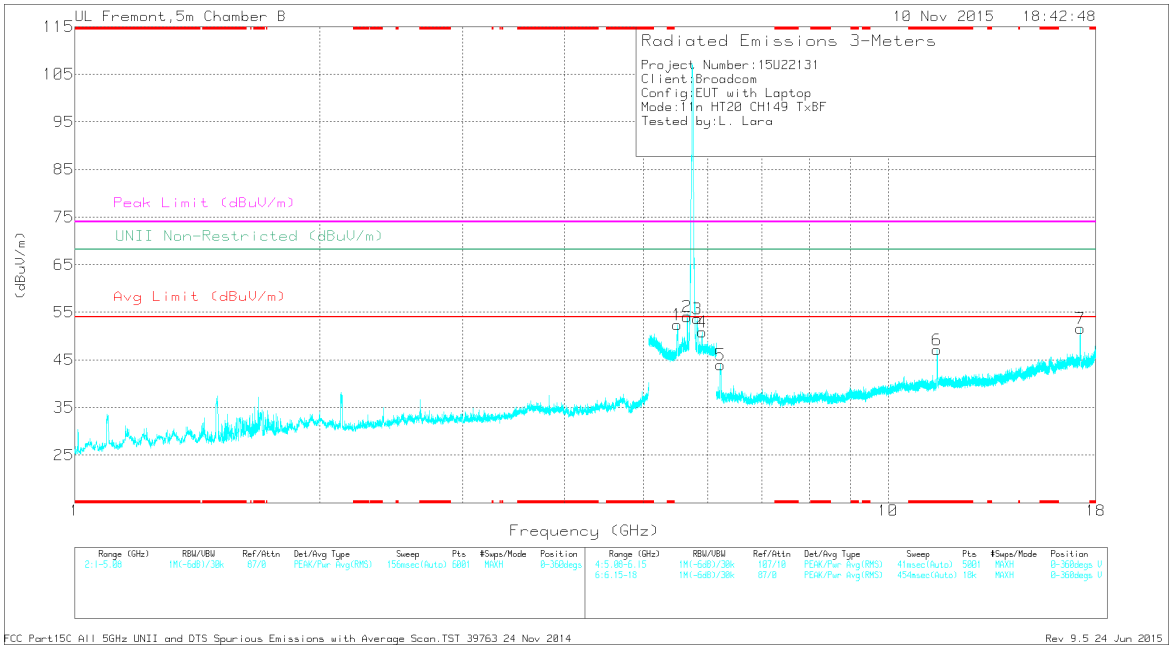
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
6	* 11.5	42.88	PK-U	38.3	-25.3	0	55.88	-	-	74	-18.12	-	-	291	224	V
	* 11.5	30.91	ADR	38.3	-25.3	.56	44.47	54	-9.53	-	-	-	-	291	224	V
1	5.498	50.38	PK-U	34.5	-20.6	0	64.28	-	-	-	-	68.2	-3.92	321	268	V
2	**5.663	40.2	Pk	34.9	-21	0	54.1	-	-	-	-	68.2	-14.1	0-360	199	V
3	***5.826	39.14	Pk	35.3	-20.8	0	53.64	-	-	-	-	-	-	0-360	199	V
4	5.912	46.78	PK-U	35.5	-20.7	0	61.58	-	-	-	-	68.2	-6.62	311	271	V
5	6.222	51.39	PK-U	35.5	-31.4	0	55.49	-	-	-	-	68.2	-12.71	326	246	V
7	17.237	43.03	PK-U	41.1	-21.7	0	62.43	-	-	-	-	68.2	-5.77	320	230	V

* - indicates frequency in CFR15.205 Restricted Band

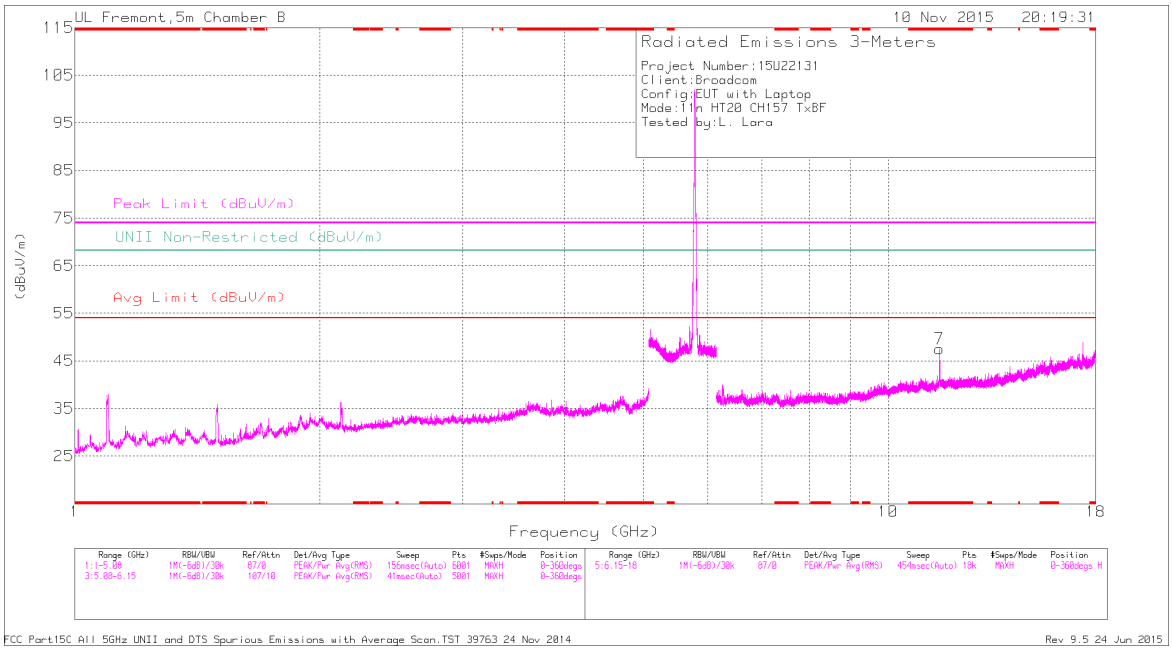
** - indicates frequency covered by the radiated band edge

*** - indicates frequency within the authorized band

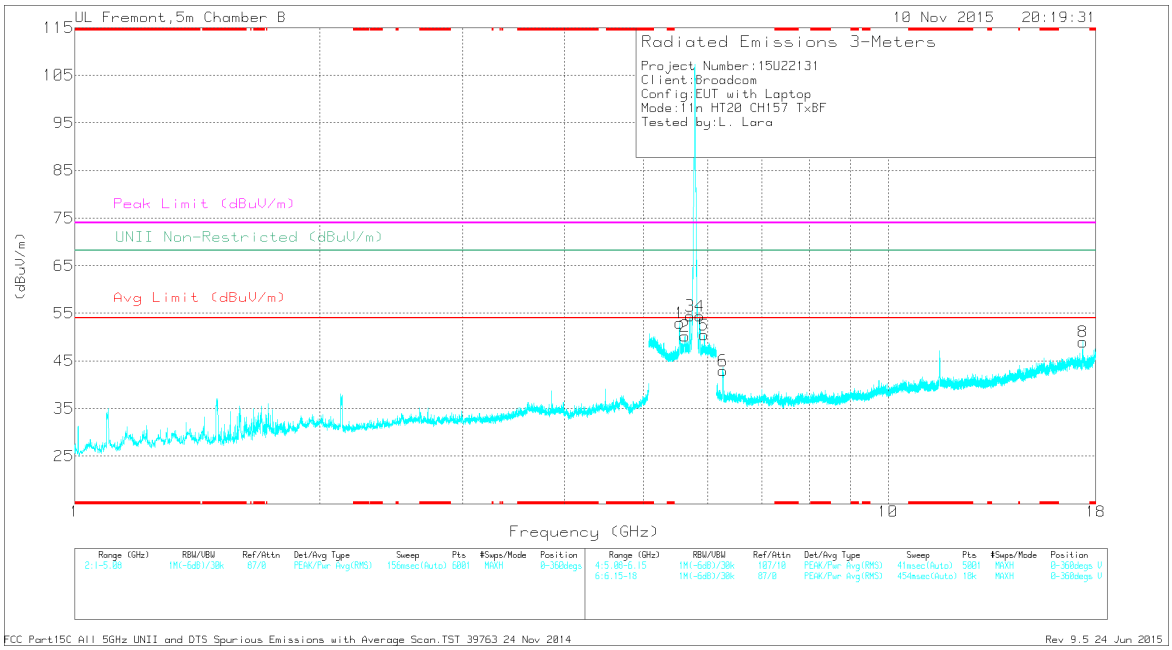
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

Trace Markers

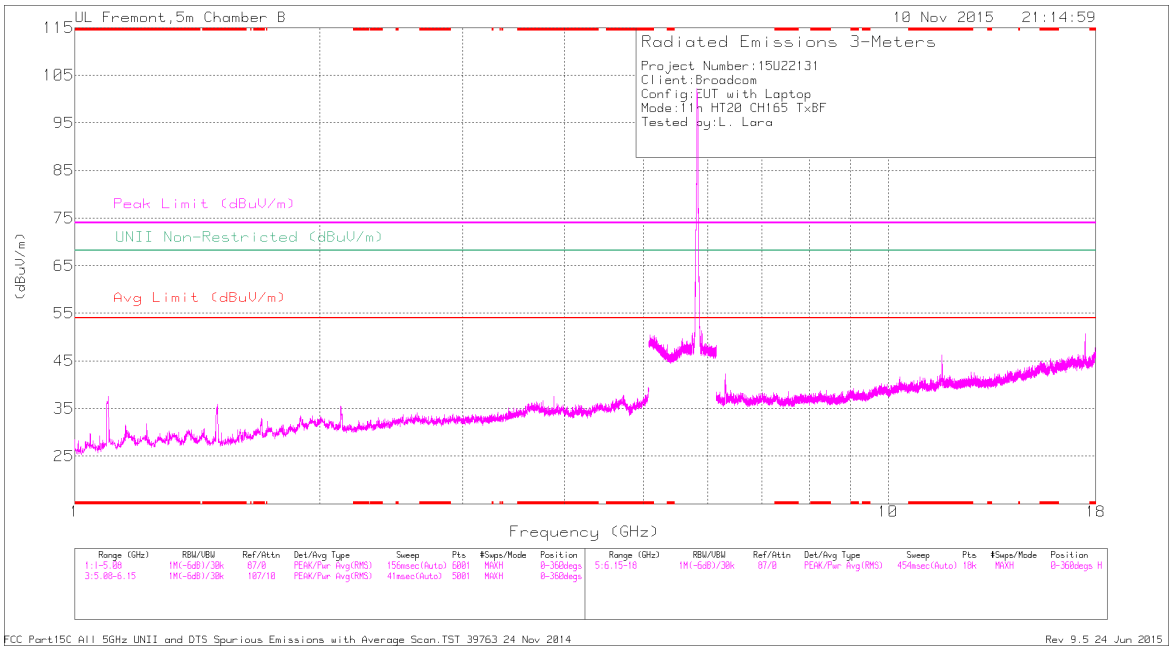
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7	* 11.57	45.92	PK-U	38.4	-24.6	0	59.72	-	-	74	-14.28	-	-	312	381	H
	* 11.57	32.95	ADR	38.4	-24.6	.56	47.31	54	-6.69	-	-	-	-	312	381	H
1	5.546	49.86	PK-U	34.6	-20.8	0	63.66	-	-	-	-	68.2	-4.54	325	265	V
2	5.623	47.3	PK-U	34.8	-20.7	0	61.4	-	-	-	-	68.2	-6.8	319	281	V
3	5.708	51.47	PK-U	35	-21	0	65.47	-	-	-	-	68.2	-2.73	317	260	V
4	5.864	50.83	PK-U	35.4	-20.8	0	65.43	-	-	-	-	68.2	-2.77	315	259	V
5	5.939	47.48	PK-U	35.6	-20.8	0	62.28	-	-	-	-	68.2	-5.92	312	278	V
6	6.267	51.02	PK-U	35.5	-31.6	0	54.92	-	-	-	-	68.2	-13.28	326	244	V
8	17.356	39.09	PK-U	40.8	-21.2	0	58.69	-	-	-	-	68.2	-9.51	320	292	V

* - indicates frequency in CFR15.205 Restricted Band

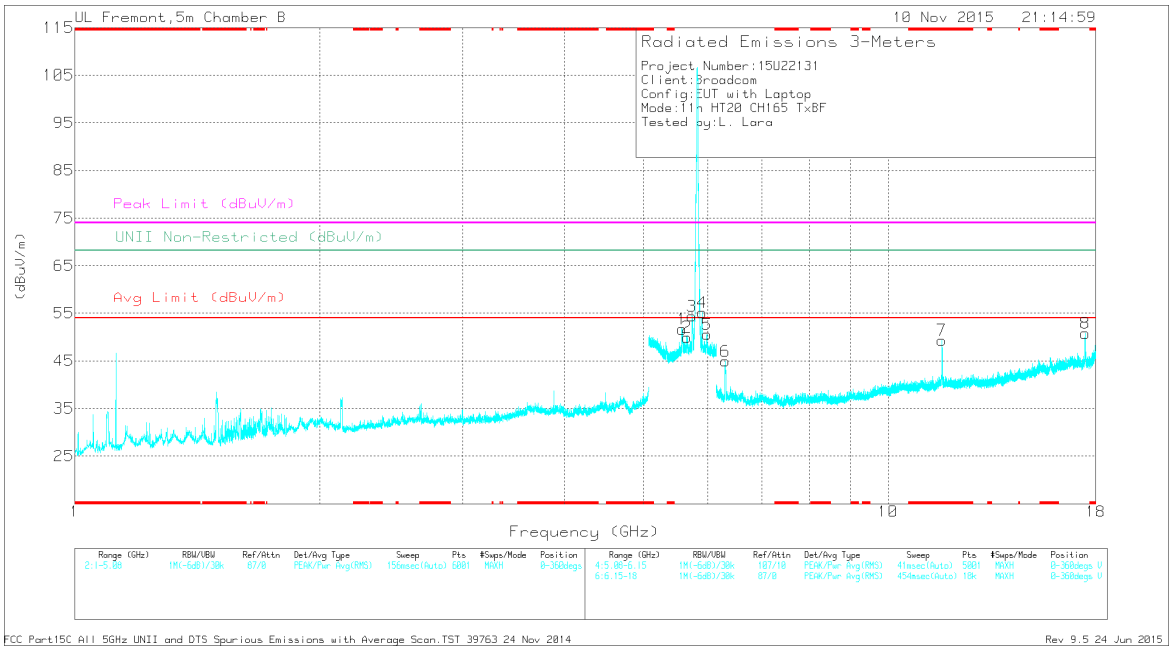
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
7	* 11.647	45.5	PK-U	38.5	-24.8	0	59.2	-	-	74	-14.8	-	-	298	209	V
	* 11.646	32.93	ADR	38.5	-24.7	.56	47.29	54	-6.71	-	-	-	-	298	209	V
1	5.575	51.53	PK-U	34.7	-20.8	0	65.43	-	-	-	-	68.2	-2.77	325	262	V
2	5.663	48.18	PK-U	34.9	-21.1	0	61.98	-	-	-	-	68.2	-6.22	319	258	V
3	***5.743	40.52	Pk	35.1	-21.2	0	54.42	-	-	-	-	-	-	0-360	200	V
4	**5.907	40.44	Pk	35.5	-20.8	0	55.14	-	-	-	-	68.2	-13.06	0-360	200	V
5	**5.988	35.88	Pk	35.6	-20.9	0	50.58	-	-	-	-	68.2	-17.62	0-360	200	V
6	6.305	51.58	PK-U	35.6	-31.3	0	55.88	-	-	-	-	68.2	-12.32	8	266	V
8	17.467	41.81	PK-U	40.7	-21	0	61.51	-	-	-	-	68.2	-6.69	312	217	V

* - indicates frequency in CFR15.205 Restricted Band

** - indicates frequency covered by the radiated band edge

*** - indicates frequency within the authorized band

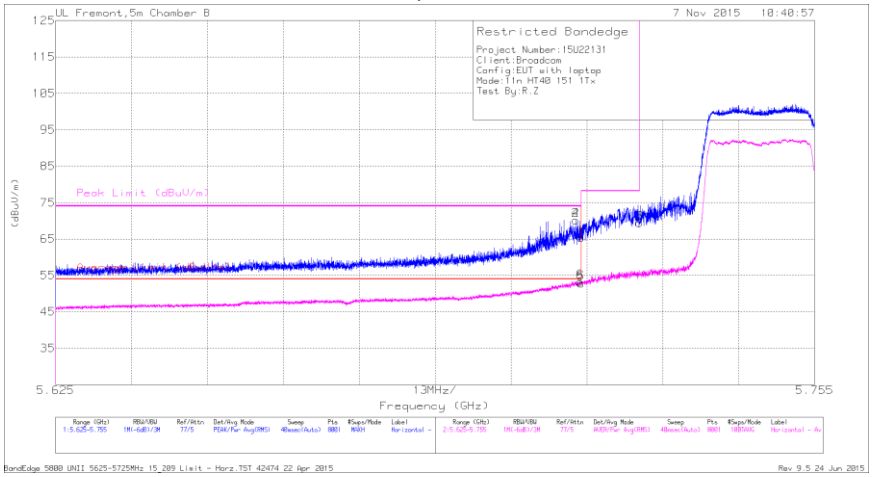
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.6. TX ABOVE 1 GHz 802.11n HT40 MODE 1Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZONTAL



Trace Markers

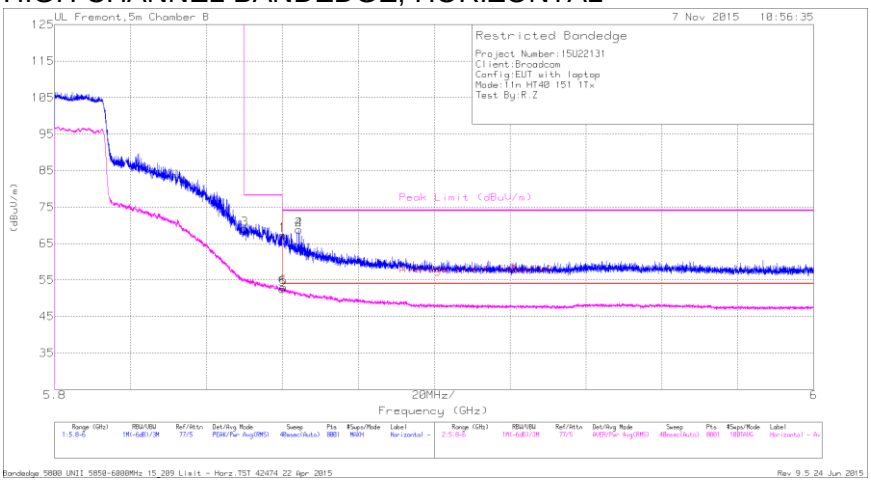
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.714	27.91	Pk	35	7.3	0	70.21	-	-	74	-3.79	22	367	H
4	5.714	27.91	Pk	35	7.3	0	70.21	-	-	74	-3.79	22	367	H
1	5.715	23.03	Pk	35	7.3	0	65.33	-	-	74	-8.67	22	367	H
5	5.715	10.01	RMS	35	7.3	.43	52.74	54	-1.26	-	-	22	367	H
6	5.715	10.57	RMS	35	7.3	.43	53.3	54	-.7	-	-	22	367	H
3	5.725	27.02	Pk	35	7.4	0	69.42	-	-	78.2	-8.78	22	367	H

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (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
3	5.85	26.12	Pk	35.4	7.5	0	69.02	-	-	78.2	-9.18	166	400	H
1	5.86	24.46	Pk	35.4	7.5	0	67.36	-	-	74	-6.64	166	400	H
5	5.86	9.23	RMS	35.4	7.5	.43	52.56	54	-1.44	-	-	166	400	H
6	5.86	9.64	RMS	35.4	7.5	.43	52.97	54	-1.03	-	-	166	400	H
2	5.864	25.84	Pk	35.4	7.5	0	68.74	-	-	74	-5.26	166	400	H
4	5.864	25.84	Pk	35.4	7.5	0	68.74	-	-	74	-5.26	166	400	H

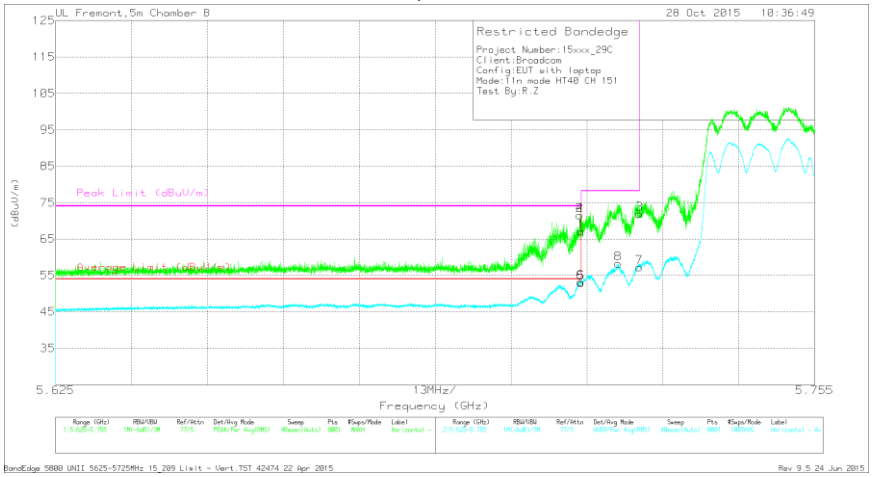
Pk - Peak detector

RMS - RMS detection

9.7. TX ABOVE 1 GHz 802.11n HT40 MODE 3Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, VERTICAL



Trace Markers

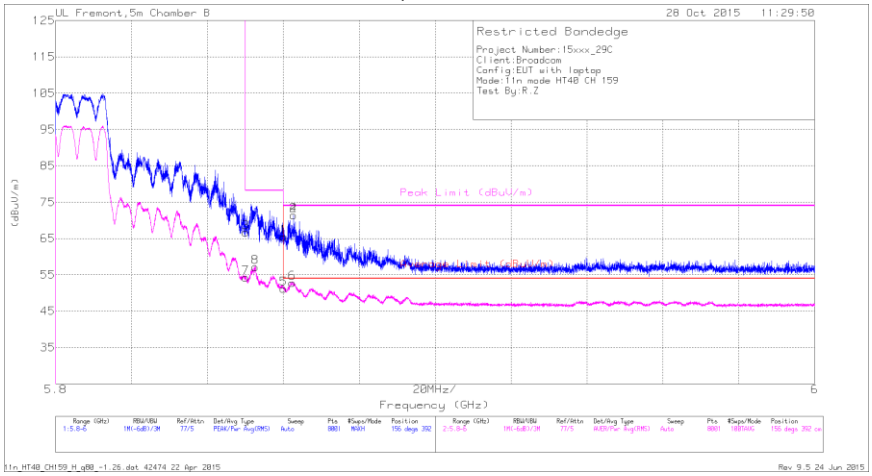
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.715	24.77	Pk	35	7.3	0	67.07	-	-	74	-6.93	347	113	V
2	5.715	29.17	Pk	35	7.3	0	71.47	-	-	74	-2.53	347	113	V
4	5.715	29.17	Pk	35	7.3	0	71.47	-	-	74	-2.53	347	113	V
5	5.715	10.17	RMS	35	7.3	.43	52.9	54	-1.1	-	-	347	113	V
6	5.715	10.41	RMS	35	7.3	.43	53.14	54	-.86	-	-	347	113	V
8	5.721	15.41	RMS	35	7.4	.43	58.24	-	-	-	-	347	113	V
3	5.725	29.48	Pk	35	7.4	0	71.88	-	-	78.2	-6.32	347	113	V
7	5.725	14.39	RMS	35	7.4	.43	57.22	-	-	-	-	347	113	V

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

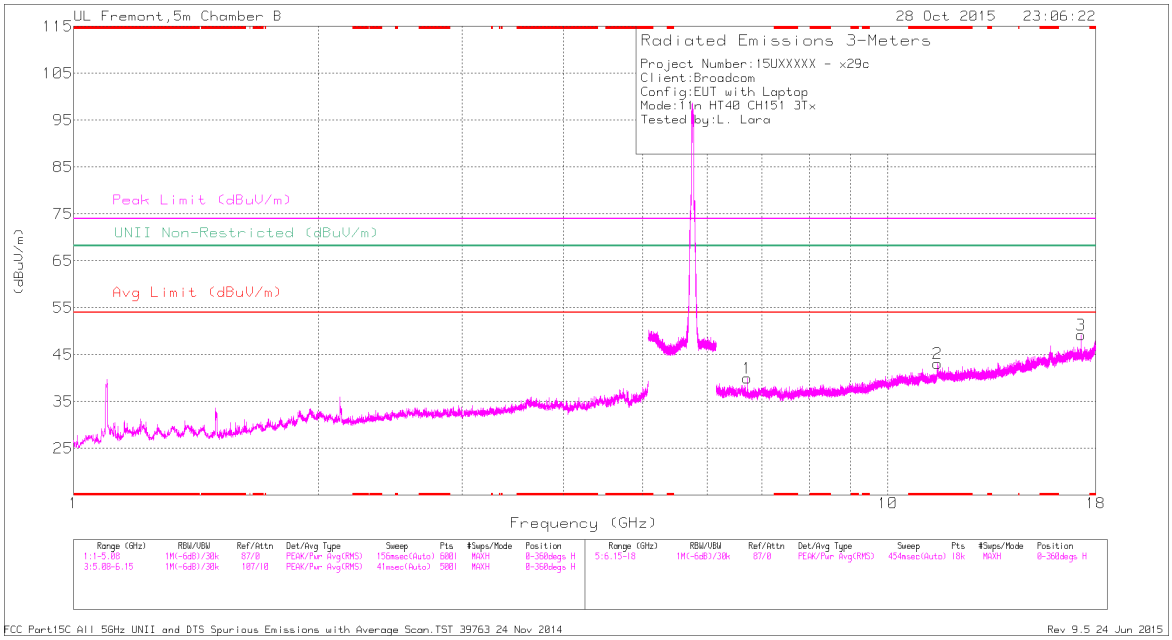
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	5.85	23.78	Pk	35.4	7.5	0	66.68	-	-	78.2	-11.52	156	392	H
7	5.85	11.39	RMS	35.4	7.5	.43	54.72	-	-	-	-	156	392	H
8	5.853	14.35	RMS	35.4	7.4	.43	57.58	-	-	-	-	156	392	H
1	5.86	22.58	Pk	35.4	7.5	0	65.48	-	-	74	-8.52	156	392	H
5	5.86	8.23	RMS	35.4	7.5	.43	51.56	54	-2.44	-	-	156	392	H
6	5.862	9.84	RMS	35.4	7.5	.43	53.17	54	-.83	-	-	156	392	H
2	5.863	28.51	Pk	35.4	7.5	0	71.41	-	-	74	-2.59	156	392	H
4	5.863	28.51	Pk	35.4	7.5	0	71.41	-	-	74	-2.59	156	392	H

Pk - Peak detector

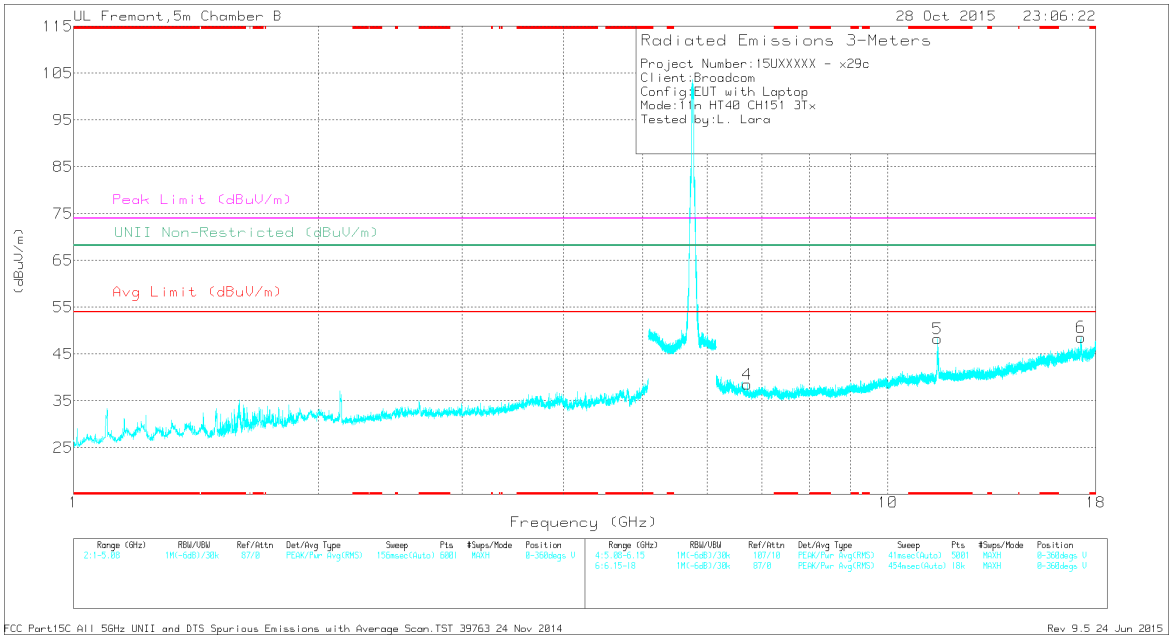
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Trace Markers

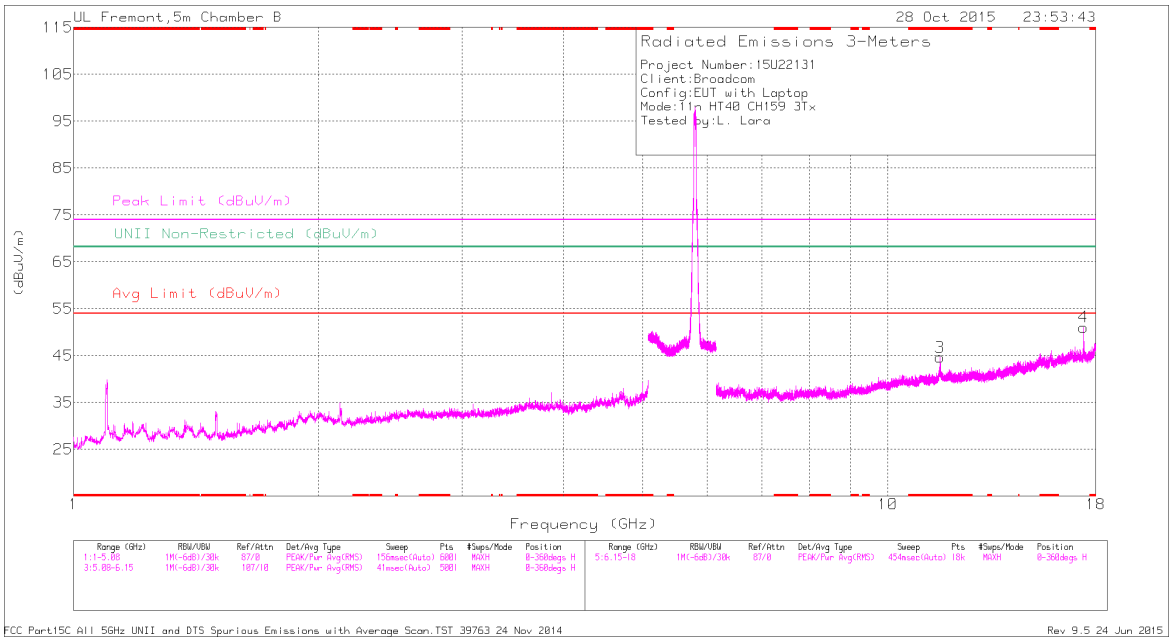
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 11.508	40.65	PK-U	38.3	-25.3	0	53.65	-	-	74	-20.35	-	-	158	245	H
	* 11.508	28.04	ADR	38.3	-25.3	.43	41.47	54	-12.53	-	-	-	-	158	245	H
5	* 11.513	44.76	PK-U	38.3	-25.2	0	57.86	-	-	74	-16.14	-	-	163	204	V
	* 11.508	33.02	ADR	38.3	-25.3	.43	46.45	54	-7.55	-	-	-	-	163	204	V
1	6.714	42.35	PK-U	35.9	-31	0	47.25	-	-	-	-	68.2	-20.95	154	225	H
4	6.714	41.83	PK-U	35.9	-31	0	46.73	-	-	-	-	68.2	-21.47	136	101	V
6	17.268	37.4	PK-U	41	-21.6	0	56.8	-	-	-	-	68.2	-11.4	139	317	V
3	17.254	37.27	PK-U	41	-21.5	0	56.77	-	-	-	-	68.2	-11.43	133	202	H

* - indicates frequency in CFR15.205 Restricted Band

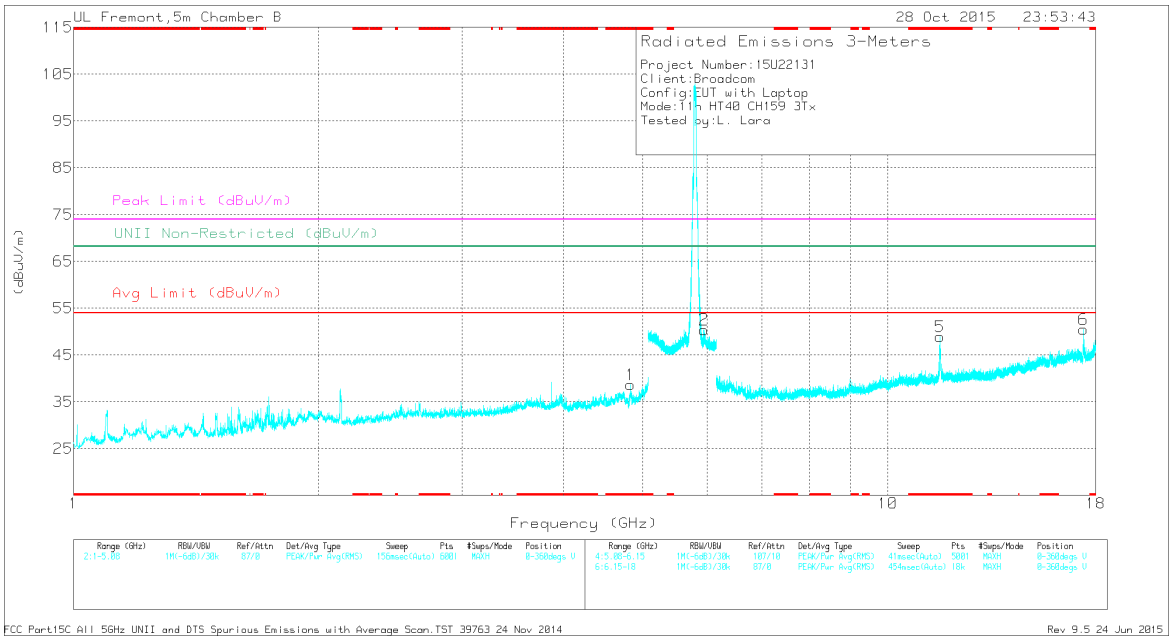
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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	* 4.823	44.75	PK-U	34.3	-32.1	0	46.95	-	-	74	-27.05	-	-	346	102	V
	* 4.829	34.8	ADR	34.3	-32.1	.43	37.43	54	-16.57	-	-	-	-	346	102	V
3	* 11.606	39.83	PK-U	38.4	-24.6	0	53.63	-	-	74	-20.37	-	-	155	361	H
	* 11.591	28.53	ADR	38.4	-24.7	.43	42.66	54	-11.34	-	-	-	-	155	361	H
5	* 11.593	44.89	PK-U	38.4	-24.6	0	58.69	-	-	74	-15.31	-	-	124	315	V
	* 11.591	33.6	ADR	38.4	-24.7	.43	47.73	54	-6.27	-	-	-	-	124	315	V
2	**5.947	35.64	Pk	35.6	-20.8	0	50.44	-	-	-	-	68.2	-17.76	0-360	101	V
4	17.379	38.75	PK-U	40.8	-20.7	0	58.85	-	-	-	-	68.2	-9.35	176	202	V
6	17.385	37.33	PK-U	40.8	-20.8	0	57.33	-	-	-	-	68.2	-10.87	128	205	H

* - indicates frequency in CFR15.205/Restricted Band

** - indicates frequency covered by radiated band edge

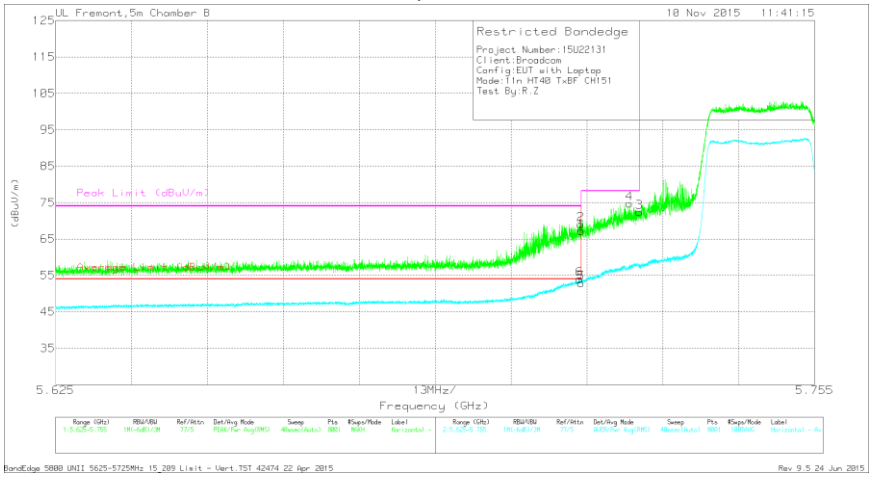
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.8. TX ABOVE 1 GHz 802.11n HT40 MODE TxBF 3TX IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, VERTICAL



Trace Markers

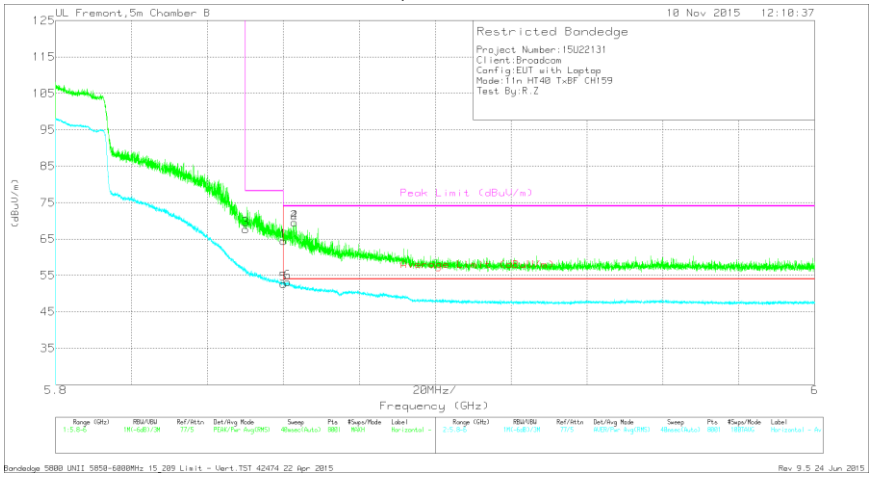
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.715	24.84	Pk	35	7.3	0	67.14	-	-	74	-6.86	223	104	V
2	5.715	26.79	Pk	35	7.3	0	69.09	-	-	74	-4.91	223	104	V
5	5.715	10.15	RMS	35	7.3	.41	52.86	54	-1.14	-	-	223	104	V
6	5.715	11.26	RMS	35	7.3	.41	53.97	54	-.03	-	-	223	104	V
4	5.723	32.31	Pk	35	7.4	0	74.71	-	-	78.2	-3.49	223	104	V
3	5.725	29.97	Pk	35	7.4	0	72.37	-	-	78.2	-5.83	223	104	V

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, VERTICAL



Trace Markers

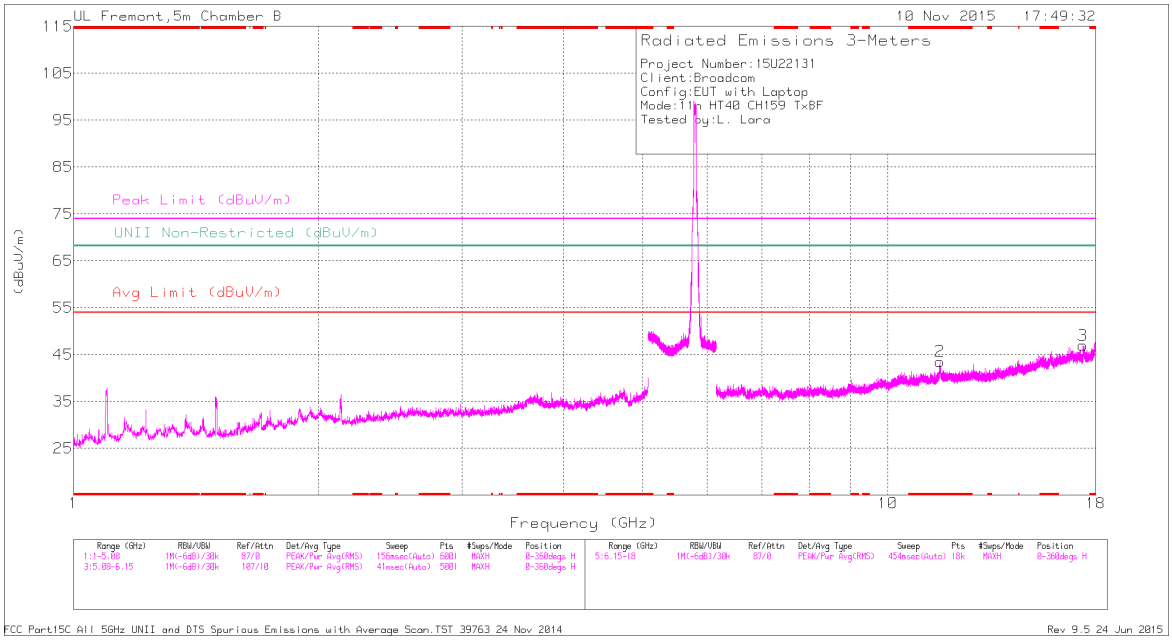
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	5.85	24.81	Pk	35.4	7.5	0	67.71	-	-	78.2	-10.49	319	345	V
1	5.86	21.6	Pk	35.4	7.5	0	64.5	-	-	74	-9.5	319	345	V
5	5.86	9.31	RMS	35.4	7.5	.41	52.62	54	-1.38	-	-	319	345	V
6	5.861	9.87	RMS	35.4	7.5	.41	53.18	54	-.82	-	-	319	345	V
2	5.863	26.65	Pk	35.4	7.5	0	69.55	-	-	74	-4.45	319	345	V
4	5.863	26.65	Pk	35.4	7.5	0	69.55	-	-	74	-4.45	319	345	V

Pk - Peak detector

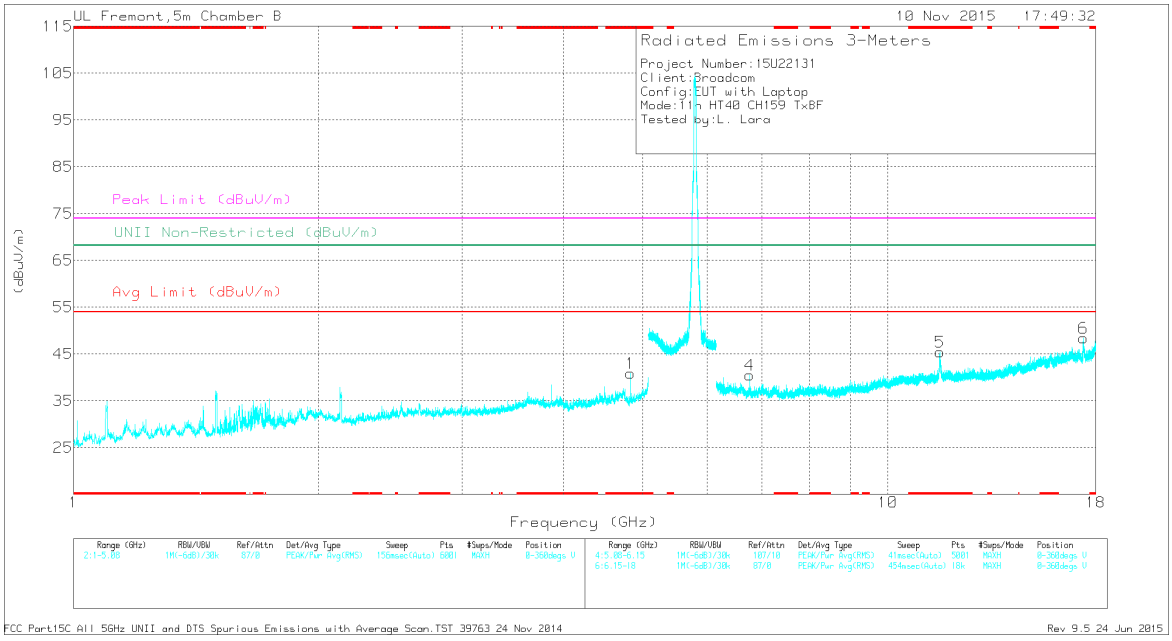
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Trace Markers

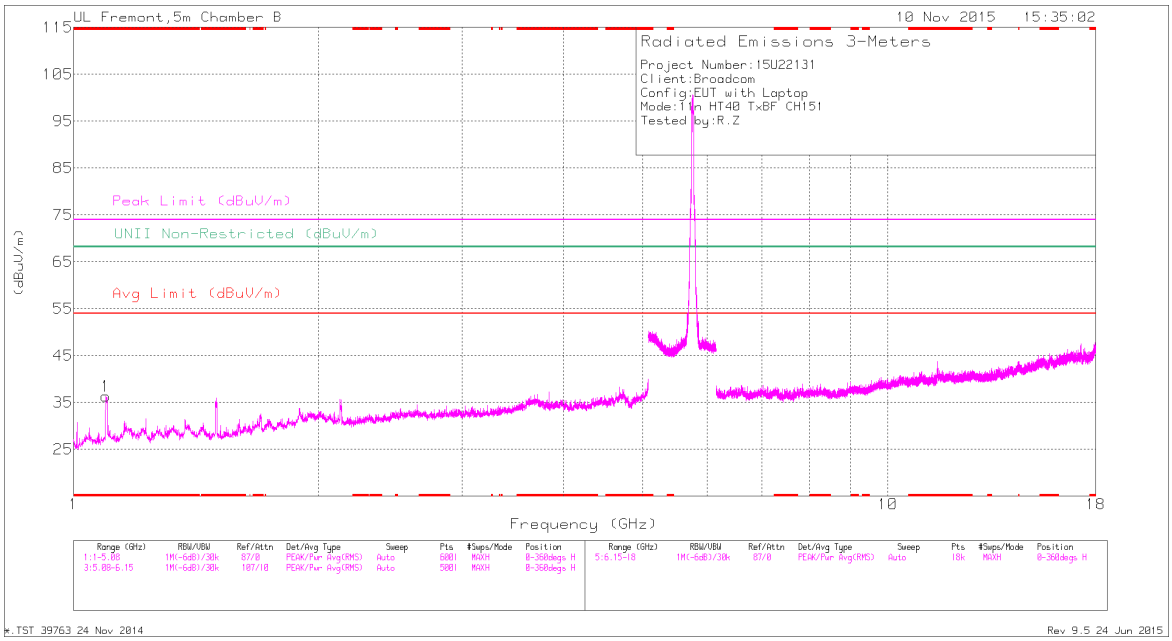
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.829	46.26	PK-U	34.3	-32.1	0	48.46	-	-	74	-25.54	-	-	349	321	V
	* 4.829	39.73	ADR	34.3	-32.1	.41	42.34	54	-11.66	-	-	-	-	349	321	V
2	* 11.594	43.27	PK-U	38.4	-24.7	0	56.97	-	-	74	-17.03	-	-	296	247	H
	* 11.591	30.29	ADR	38.4	-24.7	.41	44.4	54	-9.6	-	-	-	-	296	247	H
5	* 11.608	40.68	PK-U	38.4	-24.6	0	54.48	-	-	74	-19.52	-	-	290	246	V
	* 11.609	27.91	ADR	38.4	-24.6	.41	42.12	54	-11.88	-	-	-	-	290	246	V
4	6.761	44.07	PK-U	35.9	-30.9	0	49.07	-	-	-	-	68.2	-19.13	34	288	V
3	17.364	38.82	PK-U	40.8	-20.9	0	58.72	-	-	-	-	68.2	-9.48	322	288	H
6	17.386	36.3	PK-U	40.8	-20.8	0	56.3	-	-	-	-	68.2	-11.9	306	377	V

* - indicates frequency in CFR15.205 Restricted Band

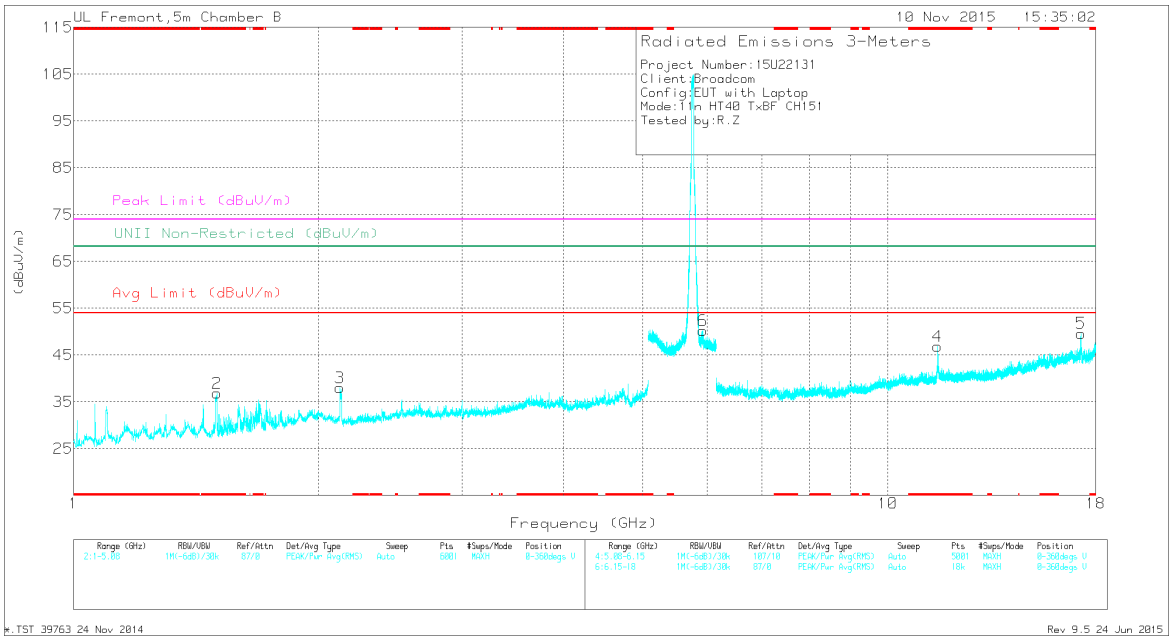
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.097	50.82	PK-U	27.6	-35.6	0	42.82	-	-	74	-31.18	-	-	218	259	H
	* 1.096	38.63	ADR	27.6	-35.6	.41	31.04	54	-22.96	-	-	-	-	218	259	H
2	* 1.497	51.85	PK-U	28.7	-35.5	0	45.05	-	-	74	-28.95	-	-	216	184	V
	* 1.499	38.19	ADR	28.6	-35.5	.41	31.7	54	-22.3	-	-	-	-	216	184	V
4	* 11.51	39.87	PK-U	38.3	-25.3	0	52.87	-	-	74	-21.13	-	-	2	196	V
	* 11.51	28.01	ADR	38.3	-25.3	.41	41.42	54	-12.58	-	-	-	-	2	196	V
3	2.125	50.68	PK-U	31.6	-35	0	47.28	-	-	-	-	68.2	-20.92	243	137	V
6	5.917	47.29	PK-U	35.5	-20.7	0	62.09	-	-	-	-	68.2	-6.11	309	279	V
5	17.268	37.2	PK-U	41	-21.6	0	56.6	-	-	-	-	68.2	-11.6	291	186	V

* - indicates frequency in CFR15.205 Restricted Band

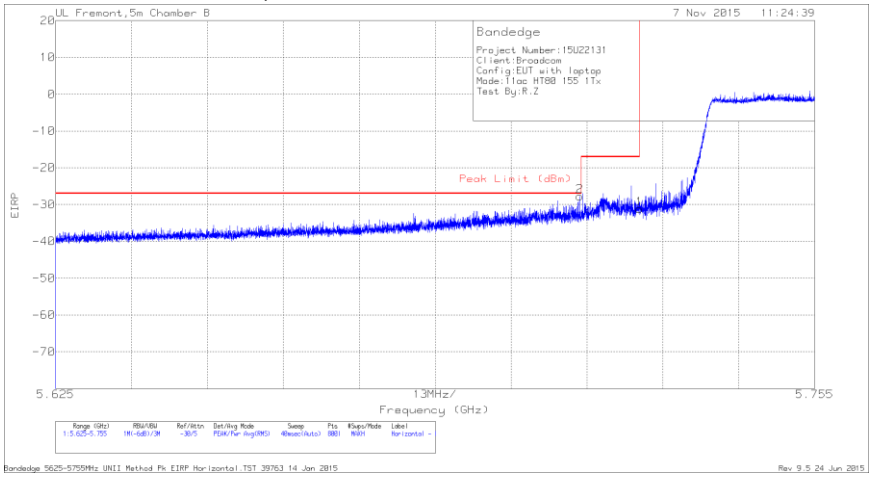
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.9. TX ABOVE 1 GHz 802.11ac HT80 MODE 1Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW EDGE)

CH155 LOW EDGE, HORIZONTAL



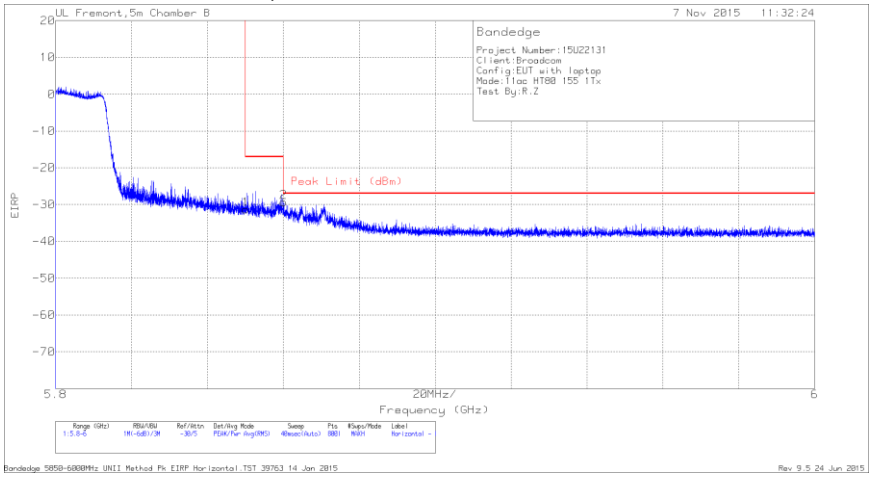
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.715	-81.89	Pk	35	7.3	11.8	0	-27.79	-27	-.79	0	382	H
1	5.725	-85.37	Pk	35	7.4	11.8	0	-31.17	-17	-14.17	0	382	H

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH EDGE)

CH155 HIGH EDGE, HORIZONTAL



Trace Markers

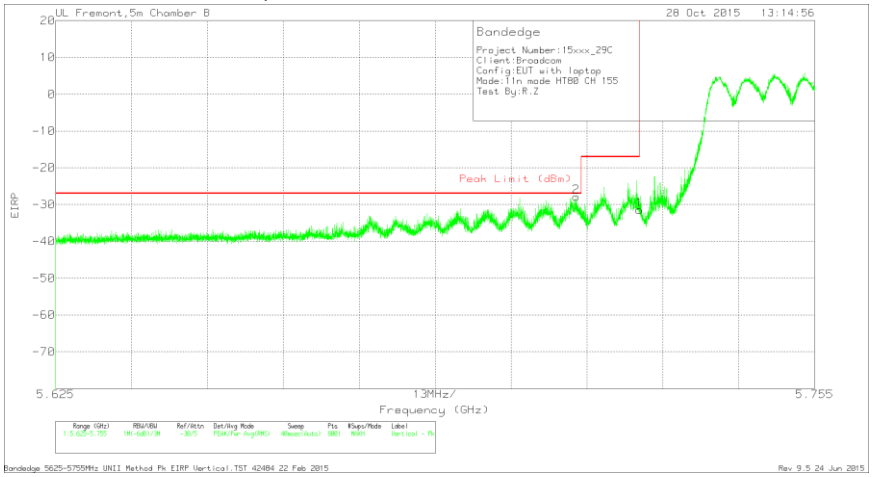
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-85.95	Pk	35.4	7.5	11.8	0	-31.25	-17	-14.25	20	371	H
2	5.86	-84.08	Pk	35.4	7.5	11.8	0	-29.38	-27	-2.38	20	371	H

Pk - Peak detector

9.10. TX ABOVE 1 GHz 802.11ac HT80 MODE 3Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW EDGE)

CH155 LOW EDGE, VERTICAL



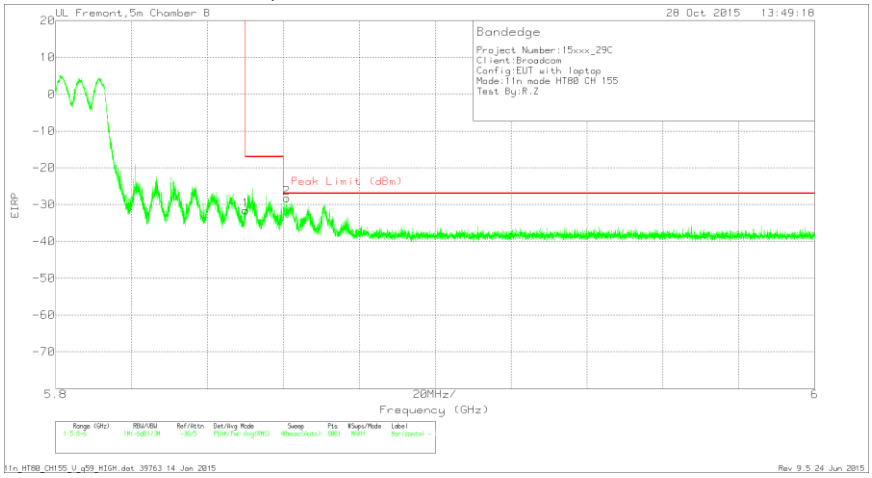
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.714	-81.92	Pk	35	7.3	11.8	0	-27.82	-27	-.82	282	299	V
1	5.725	-85.68	Pk	35	7.4	11.8	0	-31.48	-17	-14.48	282	299	V

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH EDGE)

CH155 HIGH EDGE, VERTICAL



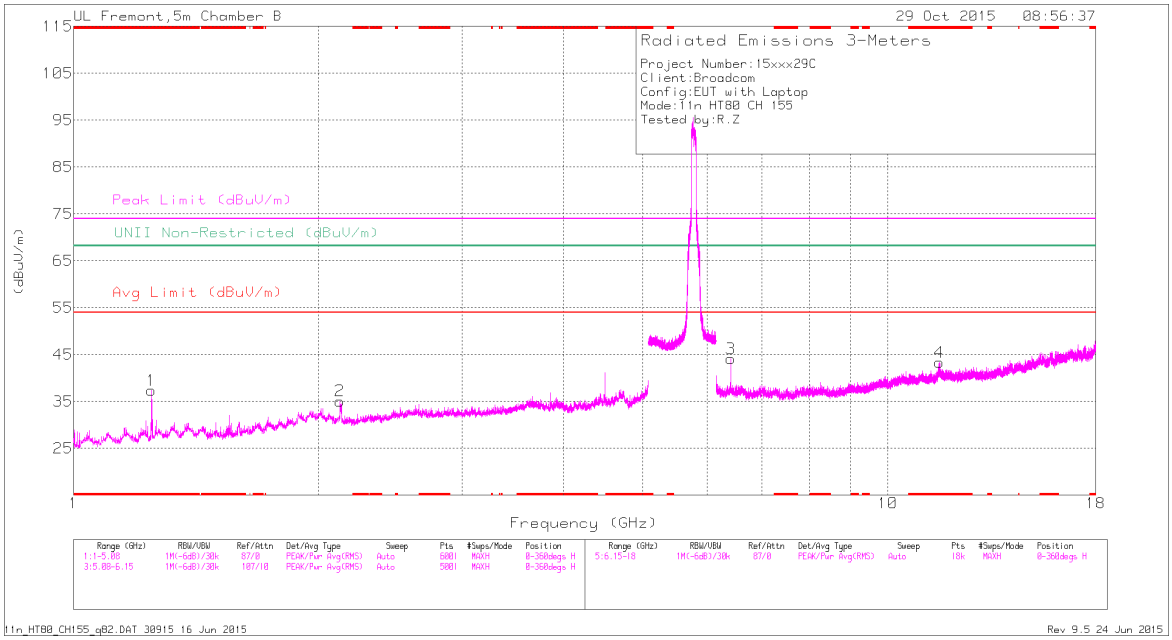
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-86.27	Pk	35.4	7.5	11.8	-31.57	-17	-14.57	185	271	V
2	5.861	-82.96	Pk	35.4	7.5	11.8	-28.26	-27	-1.26	185	271	V

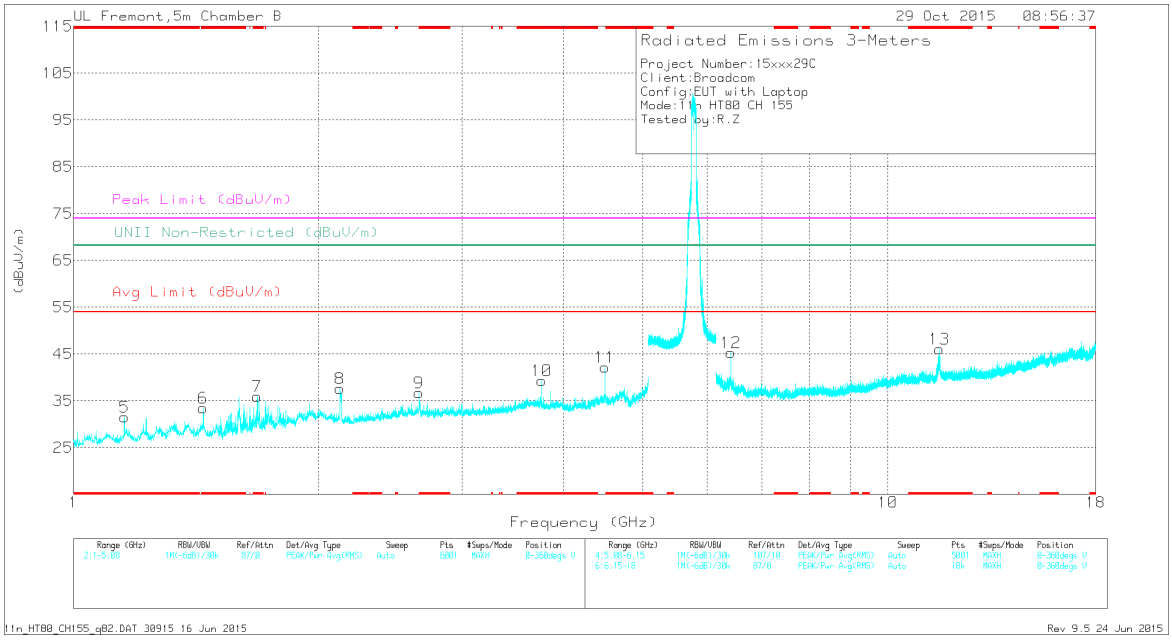
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

CH155 HORIZONTAL PLOT



CH155 VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.245	52.52	PK-U	28.9	-35.9	0	45.52	-	-	74	-28.48	-	-	325	175	H
	* 1.244	31.72	ADR	28.9	-35.9	.84	25.56	54	-28.44	-	-	-	-	325	175	H
5	* 1.154	45.92	PK-U	28.1	-35.5	0	38.52	-	-	74	-35.48	-	-	0	103	V
	* 1.154	34.46	ADR	28.1	-35.5	.84	27.90	54	-26.10	-	-	-	-	0	103	V
6	* 1.443	46.7	PK-U	29	-35	0	40.7	-	-	74	-33.3	-	-	225	261	V
	* 1.443	35.08	ADR	29	-35	.84	29.92	54	-24.08	-	-	-	-	225	261	V
7	* 1.682	50.83	PK-U	29.6	-34.2	0	46.23	-	-	74	-27.77	-	-	70	246	V
	* 1.682	31.64	ADR	29.6	-34.2	.84	27.88	54	-26.12	-	-	-	-	70	246	V
10	* 3.759	42.41	PK-U	33.4	-32.6	0	43.21	-	-	74	-30.79	-	-	70	200	V
	* 3.759	30.53	ADR	33.4	-32.6	.84	32.17	54	-21.83	-	-	-	-	70	200	V
4	* 11.565	41.83	PK-U	38.4	-24.6	0	55.63	-	-	74	-18.37	-	-	3	379	H
	* 11.568	28.38	ADR	38.4	-24.6	.84	43.02	54	-10.98	-	-	-	-	3	379	H
13	* 11.569	41.21	PK-U	38.4	-24.6	0	55.01	-	-	74	-18.99	-	-	353	283	V
	* 11.568	28.33	ADR	38.4	-24.6	.84	42.97	54	-11.03	-	-	-	-	353	283	V
8	2.124	45.69	PK-U	31.6	-35	0	42.29	-	-	-	-	68.2	-25.91	70	201	V
2	2.125	43.47	PK-U	31.6	-35	0	40.07	-	-	-	-	68.2	-28.13	0	103	H
9	2.654	47.34	PK-U	32.7	-33.5	0	46.54	-	-	-	-	68.2	-21.66	70	102	V
11	4.492	44.25	PK-U	34	-31.7	0	46.55	-	-	-	-	68.2	-21.65	70	102	V
3	6.417	45.95	PK-U	35.7	-29.9	0	51.75	-	-	-	-	68.2	-16.45	3	200	V
12	6.418	40.98	PK-U	35.7	-30	0	46.68	-	-	-	-	68.2	-21.52	70	198	H

* - indicates frequency in CFR15.205 Restricted Band

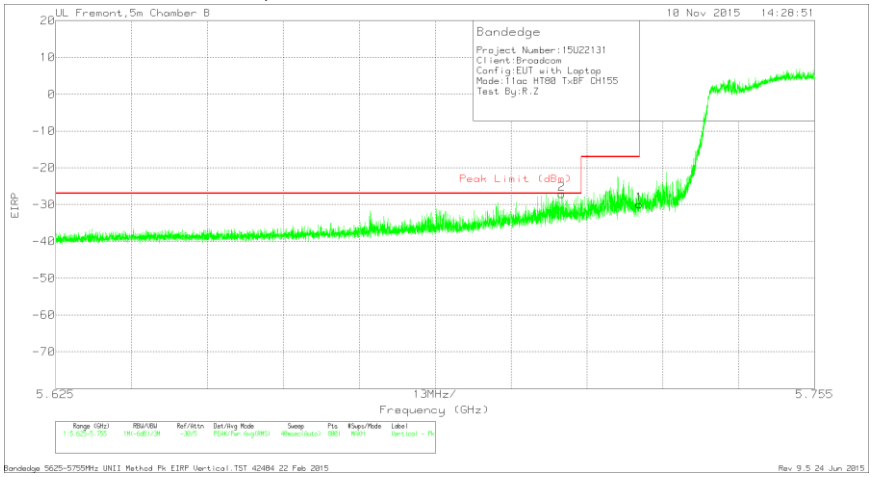
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.11. TX ABOVE 1 GHz 802.11ac HT80 MODE TxBF 3Tx IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW EDGE)

CH155 LOW EDGE, VERTICAL



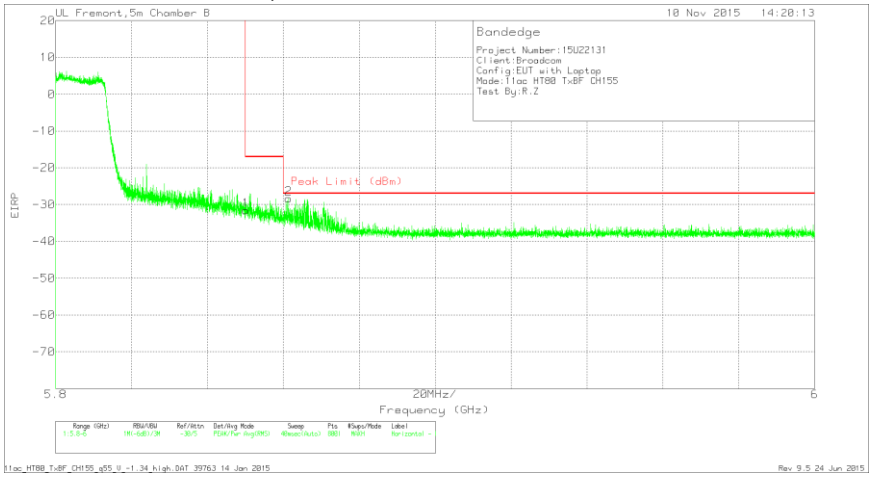
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.712	-81.31	Pk	35	7.4	11.8	-27.11	-27	-.11	309	382	V
1	5.725	-84.2	Pk	35	7.4	11.8	-30	-17	-13	309	382	V

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH EDGE)

CH155 HIGH EDGE, VERTICAL



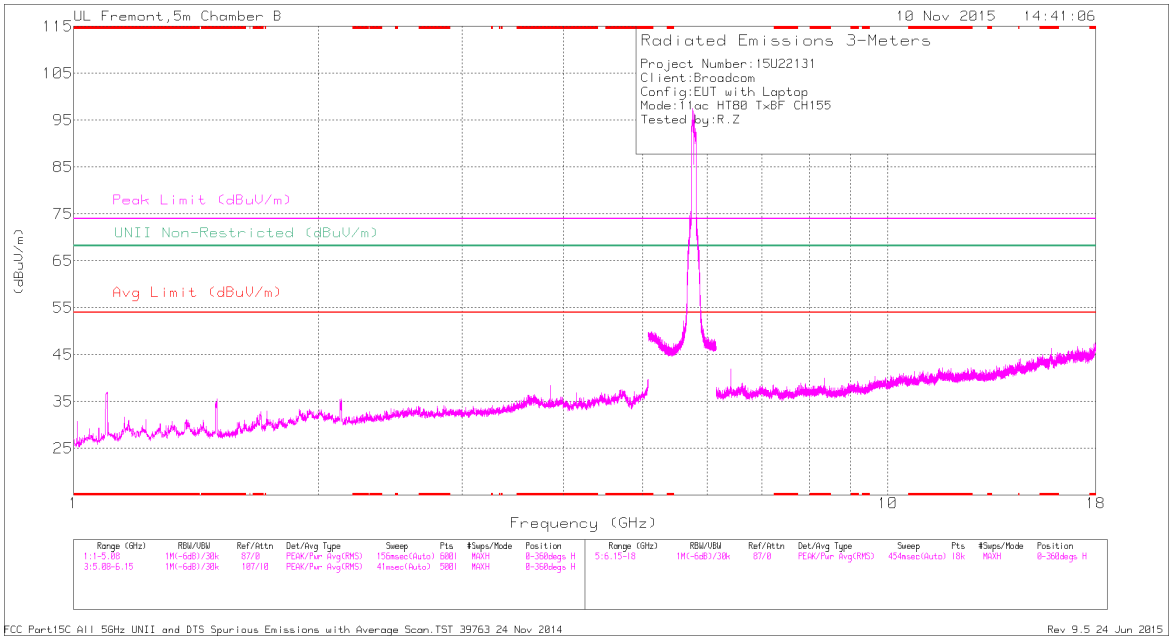
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Bypass (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-86.28	Pk	35.4	7.5	11.8	0	-31.58	-17	-14.58	323	305	V
2	5.861	-83.04	Pk	35.4	7.5	11.8	0	-28.34	-27	-1.34	323	305	V

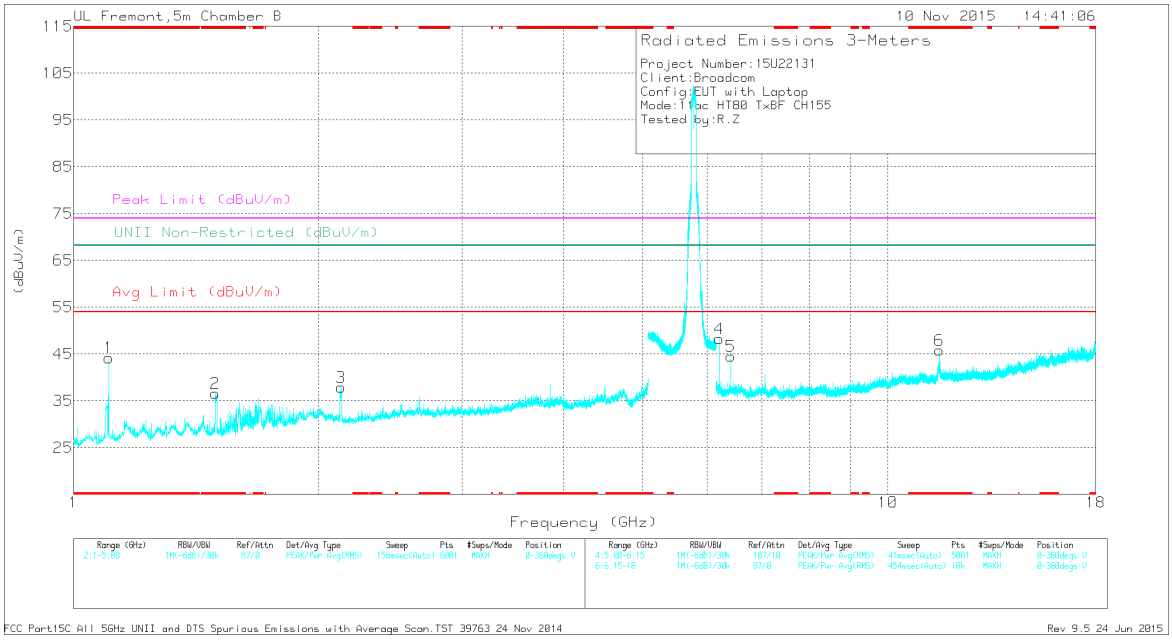
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

CH155 HORIZONTAL PLOT



CH155 VERTICAL PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.105	44.53	PK-U	27.7	-35.5	0	36.73	-	-	74	-37.27	-	-	150	255	V
	* 1.103	32.78	ADR	27.6	-35.5	4.03	28.91	54	-25.09	-	-	-	-	150	255	V
2	* 1.493	50.3	PK-U	28.7	-35.5	0	43.5	-	-	74	-30.5	-	-	0	184	V
	* 1.493	37.39	ADR	28.7	-35.5	4.03	34.62	54	-19.38	-	-	-	-	0	184	V
6	* 11.573	39.83	PK-U	38.4	-24.5	0	53.73	-	-	74	-20.27	-	-	296	201	V
	* 11.572	25.52	ADR	38.4	-24.6	4.03	43.35	54	-10.65	-	-	-	-	296	201	V
3	2.132	49.34	PK-U	31.6	-34.9	0	46.04	-	-	-	-	68.2	-22.16	249	107	V
4	6.209	41.76	PK-U	35.5	-31.2	0	46.06	-	-	-	-	68.2	-22.14	249	199	V
5	6.417	42.64	PK-U	35.7	-29.9	0	48.44	-	-	-	-	68.2	-19.76	249	199	V

* - indicates frequency in CFR15.205 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

9.12. WORST-CASE BELOW 1 GHz

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

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	158.69	40.64	Pk	16.3	-30.2	26.74	43.52	-16.78	0-360	101	V
5	221.2	42.13	Pk	14.6	-29.8	26.93	46.02	-19.09	0-360	101	V
1	372.3	49.67	Pk	18.9	-29.1	39.47	46.02	-6.55	0-360	101	H
6	499.6816	46.71	Qp	21.7	-28.7	39.71	46.02	-6.31	335	182	V
2	*499.6	54.16	Pk	21.7	-28.7	47.16	-	-	0-360	199	H
3	898.8434	37.45	Qp	26.1	-27.4	36.15	46.02	-9.87	55	105	H

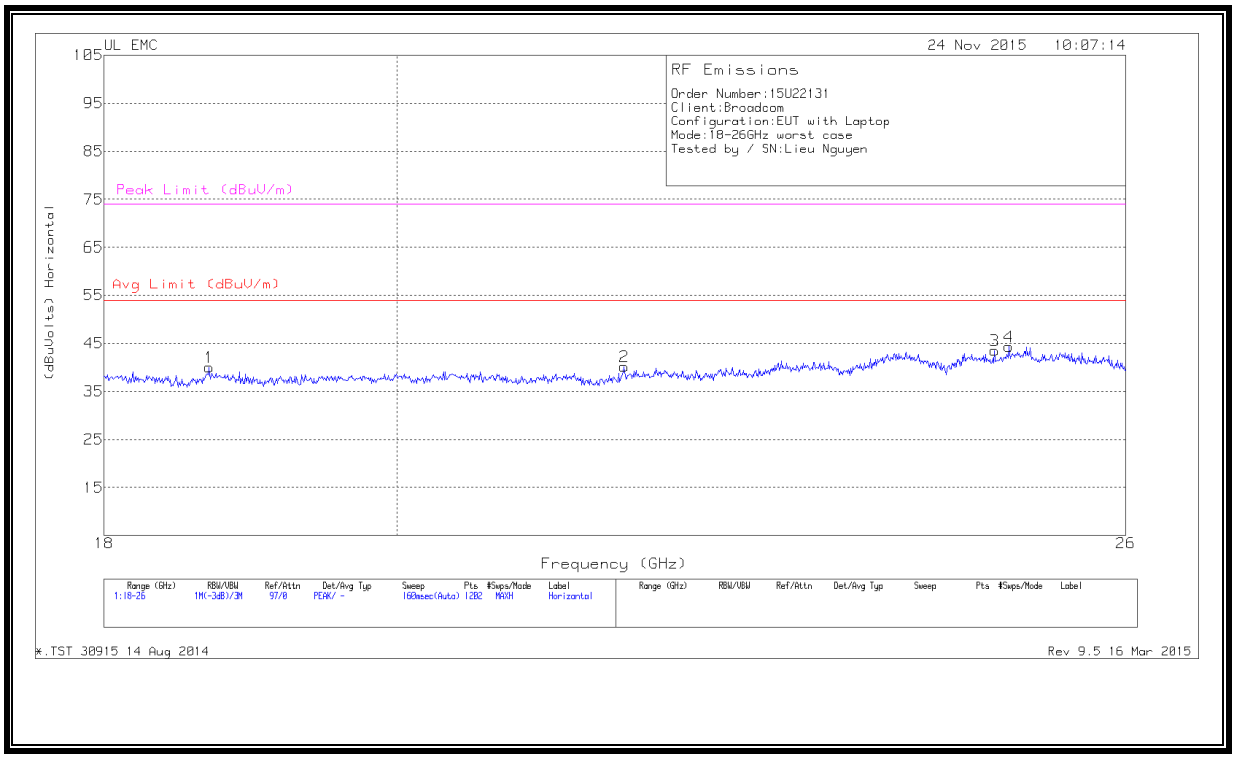
Pk - Peak detector

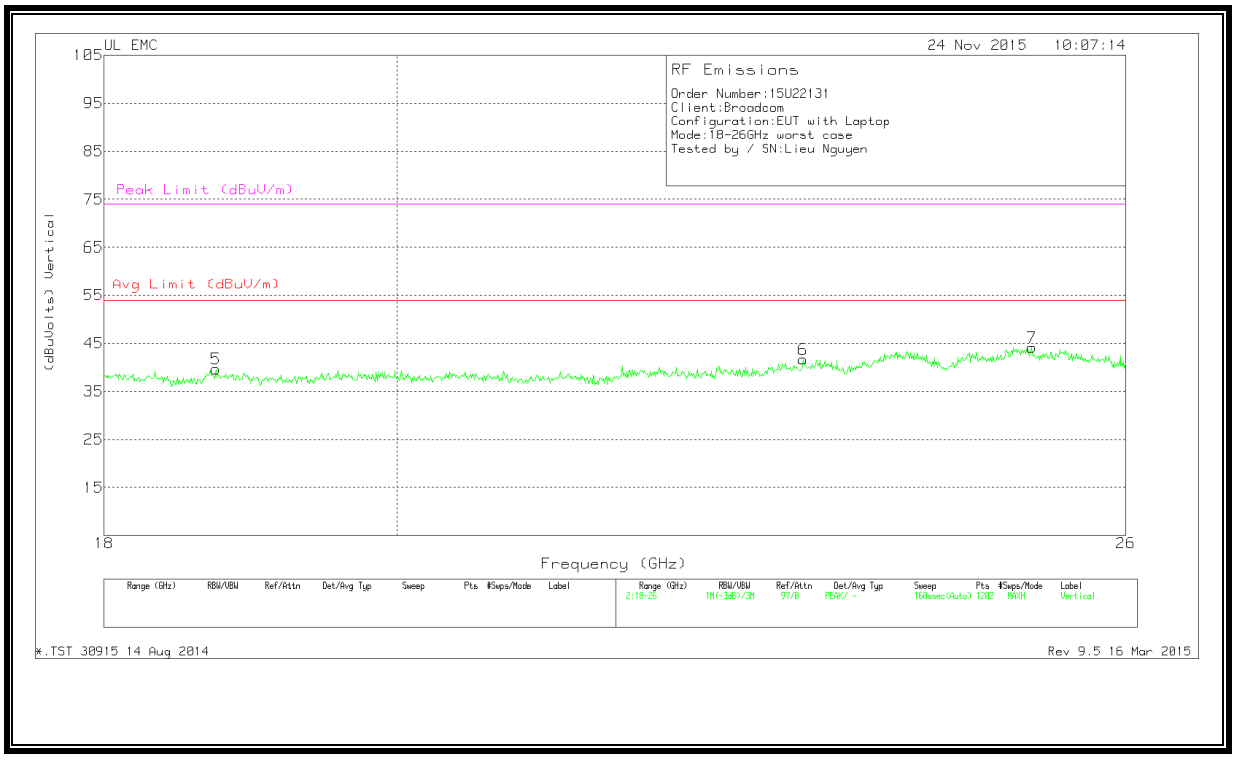
Qp - Quasi-Peak detector

* - frequency determined to be coming from the support equipment

9.13. WORST-CASE ABOVE 18GHz

SPURIOUS EMISSIONS 18 – 26GHz



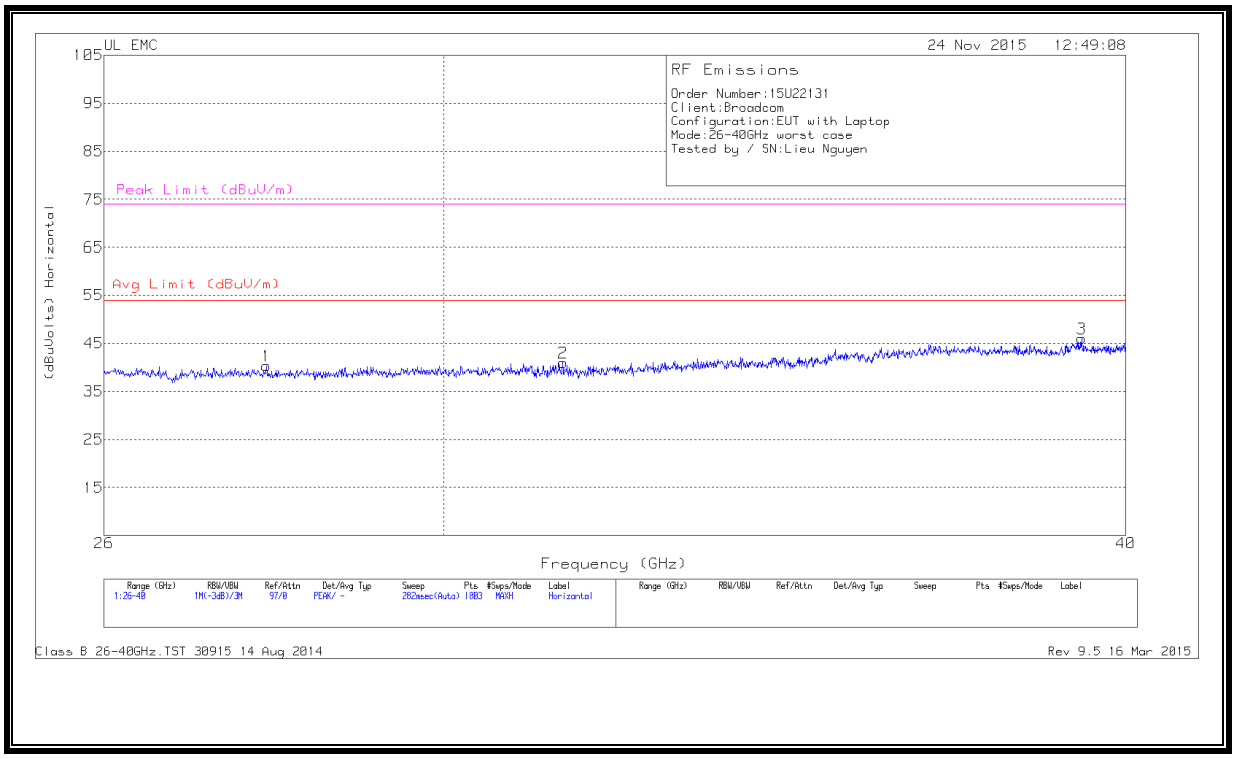


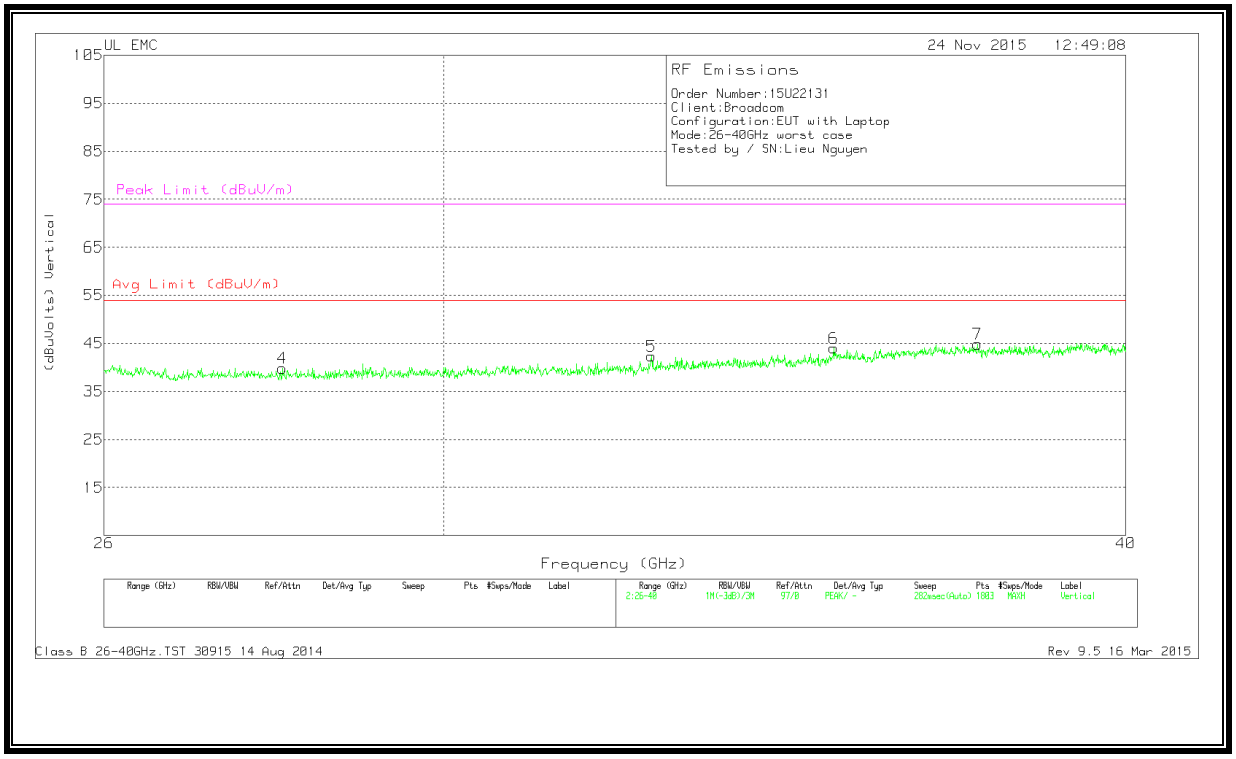
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 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	18.693	41.2	Pk	32.5	-24.2	-9.5	40	54	-14	74	-34
2	21.704	40.97	Pk	33.3	-24.6	-9.5	40.16	54	-13.83	74	-33.83
3	24.801	43.7	Pk	33.9	-24.6	-9.5	43.5	54	-10.5	74	-30.5
4	24.928	44.03	Pk	34.1	-24.3	-9.5	44.33	54	-9.66	74	-29.66
5	18.739	41.17	Pk	32.6	-24.6	-9.5	39.66	54	-14.33	74	-34.33
6	23.149	42.67	Pk	33.5	-25	-9.5	41.66	54	-12.33	74	-32.33
7	25.134	44.57	Pk	33.8	-24.7	-9.5	44.16	54	-9.83	74	-29.83

Pk - Peak detector

SPURIOUS EMISSIONS 26 – 40GHz





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	27.841	45.63	Pk	35.8	-31.6	-9.5	40.33	54	-13.66	74	-33.66
2	31.547	47.2	Pk	36.3	-33	-9.5	41	54	-13	74	-33
3	39.262	49.1	Pk	38.6	-32.2	-9.5	46	54	-8	74	-28
4	28.028	45.33	Pk	35.8	-31.8	-9.5	39.83	54	-14.16	74	-34.16
5	32.751	48.03	Pk	36.6	-32.8	-9.5	42.33	54	-11.66	74	-31.66
6	35.362	49.1	Pk	37.8	-33.4	-9.5	44	54	-10	74	-30
7	37.576	50.23	Pk	37.2	-33.1	-9.5	44.83	54	-9.16	74	-29.16

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

6 WORST EMISSIONS

Company Name: Broadcom
Project: 12U14668
Model/Device: BCM94360CS
Date: 12/21/2012
Configuraiton: TX WLAN Worst case
Test Voltage/Frequency: 120VAC 60Hz
Tested by: Steve Aguilar

Line-L1 .15 - 30MHz

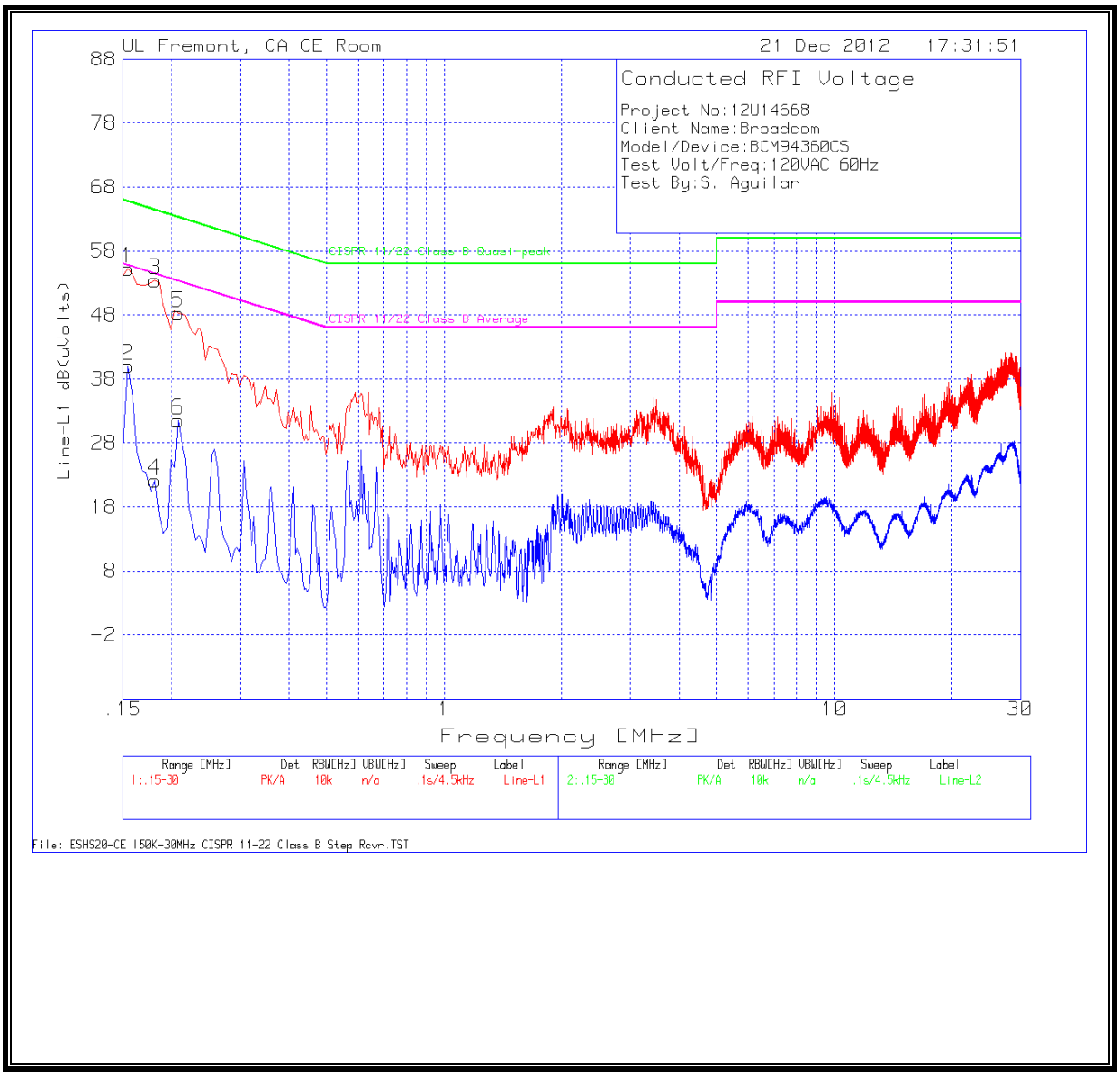
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.1545	55.11	PK	0.1	0	55.21	65.8	-10.59	-	-
0.1545	39.99	Av	0.1	0	40.09	-	-	55.8	-15.71
0.1815	53.37	PK	0.1	0	53.47	64.4	-10.93	-	-
0.1815	22.05	Av	0.1	0	22.15	-	-	54.4	-32.25
0.2085	48.17	PK	0.1	0	48.27	63.3	-15.03	-	-
0.2085	31.45	Av	0.1	0	31.55	-	-	53.3	-21.75

Line-L2 .15 - 30MHz

Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.1545	52.78	PK	0.1	0	52.88	65.8	-12.92	-	-
0.1545	34.68	Av	0.1	0	34.78	-	-	55.8	-21.02
0.168	50.95	PK	0.1	0	51.05	65.1	-14.05	-	-
0.168	22.76	Av	0.1	0	22.86	-	-	55.1	-32.24
0.204	47.04	PK	0.1	0	47.14	63.4	-16.26	-	-
0.204	30.88	Av	0.1	0	30.98	-	-	53.4	-22.42

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS