FCC CFR47 PART 15 SUBPART E

CLASS II PERMISSIVE CHANGE

FOR

802.11a/g/n WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94331PCIEBT4

FCC ID: QDS-BRCM1055

REPORT NUMBER: 15U22132-E1V4

ISSUE DATE: FEBRUARY 18, 2016

PREPARED FOR

BROADCOM CORPORATION
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PREPARED BY

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	12/18/15	Initial Issue	H. Mustapha
V2	1/20/16	Removed IC ID from cover page. Updated KDB 789033 version on Page 7. Updated List of Test Reduction. Trace marker tables on pages 92-97 were re-arranged. Updated section 9.4 title to indicate 3Tx. Updated section 9.5 title to indicate SISO. Updated Peak limits in tables on pages 101, 103, 105, 110 and 112	H. Mustapha
V3	1/25/16	Updated Markers on pages 94 and 95.	H. Mustapha
V4	2/18/16	Updated Output power tables in sections 5.2, 8.2, 8.3, 8.4, 8.5 and 8.6 Updated measurement equipment list in section 6	H. Mustapha

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, USA
EUT DESCRIPTION:	802.11a/g/n WLAN + Bluetooth PCI-E Custom Combination Card
MODEL:	BCM94331PCIEBT4
SERIAL NUMBER:	6C1MQF99NDTY3 (Module is installed inside host laptop. This is serial number of host laptop)
DATE TESTED:	NOVEMBER 18, 2015 ~ JANUARY 11, 2016 DECEMBER 23, 2010 FEBRUARY 17, 2016

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

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

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

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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, KDB 662911 D01 v02r01 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 a 802.11a/g/n 3x3 MIMO WLAN + BT Combo PCI-E Mini 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 Legacy	N/A	N/A	14.97	14.97	31.41
5745-5825	802.11n HT20	N/A	N/A	14.93	14.93	31.12
5755-5795	802.11n HT40	N/A	N/A	12.41	12.41	17.42
5.8 GHz band, 3TX						
5745-5825	802.11n HT20 CDD	14.49	14.15	14.91	19.30	85.09
5755-5795	802.11n HT40 CDD	14.55	14.33	14.90	19.37	86.52

5.1. LIST OF TEST REDUCTION AND MODES COVERING OTHER MODES

List of test reduction

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

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)

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes three 802.11agn antennas, with a maximum gain as below table;

K90	Antenna Gain			Antenna Gain
GHz	Ant 1 dBi	Ant 2 dBi	Ant 3 dBi	Combined dBi
5.8	7.25	6.22	5.92	11.27

5.3. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 7.21.94
The test utility software used during testing was BCM Internal, rev. 7.21.RC94.130

5.4. 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, other than the 26dB BW, we have reviewed the original test report (report no. 10U13492-3) 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.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an integral module installed inside a host Laptop PC.

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

For 5.8GHz Band:
All final tests in the 802.11a Mode (SISO Legacy) were made at 6 Mb/s
All final tests in the 802.11n Mode (20 MHz CDD/SDM) were made at MCS0
All final tests in the 802.11n Mode (40 MHz CDD/SDM) were made at MCS0

Worst-case mode and channel used for 30-1000 MHz radiated 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, so final measurements were performed with Horizontal polarization.

For all modes with single chain, a preliminary investigation was performed on the three chains and Chain 2 (J2) was found to be worst-case.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	A1278	C1MQF99NDTY3	QDS-BRCM1055
AC Adapter	Delta Electronics	ADP-85EB T	N/A	N/A

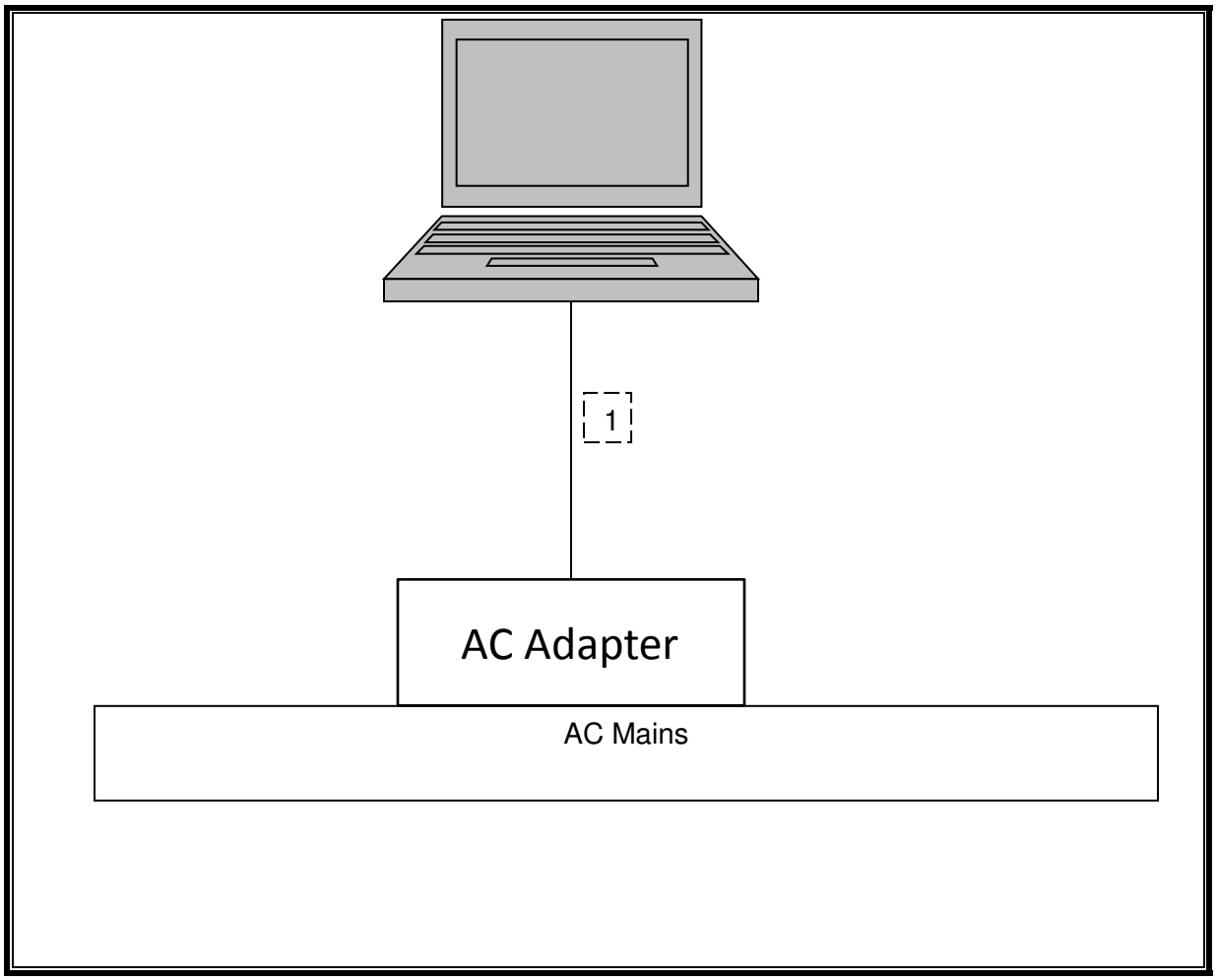
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1	DC	Unshielded	1.8 m	

TEST SETUP

The EUT is installed in the host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM



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
Power Sensor	Agilent	N1921A	1224	07/06/15	03/06/16
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

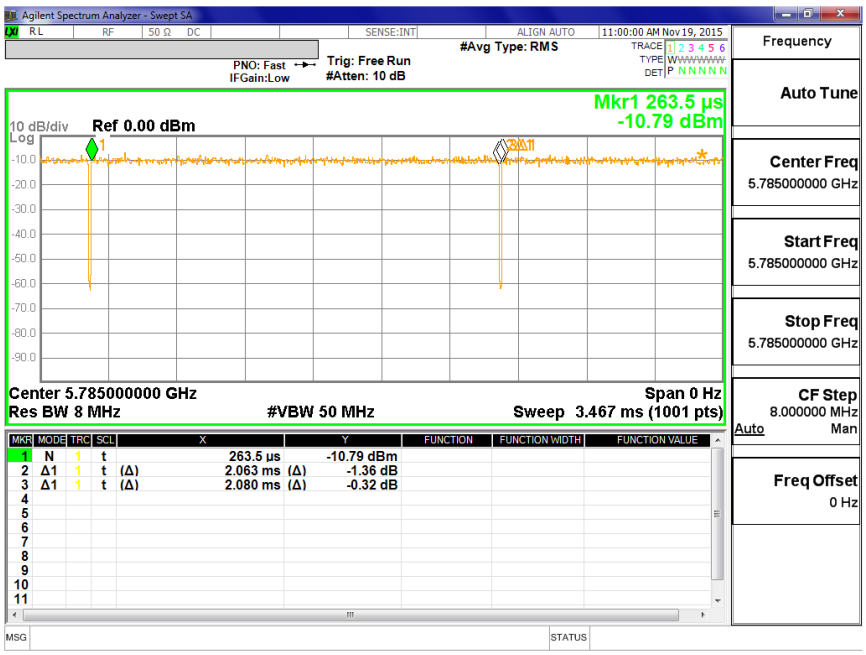
None; for reporting purposes only.

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 1TX	2.063	2.080	0.992	99.18%	0.00	0.010
802.11n HT20 1TX	1.918	1.948	0.985	98.46%	0.00	0.010
802.11n HT20 CDD	1.918	1.936	0.991	99.07%	0.00	0.010
802.11n HT40 1TX	0.944	0.961	0.982	98.19%	0.00	0.010
802.11n HT40 CDD	0.9435	0.9590	0.984	98.38%	0.00	0.010

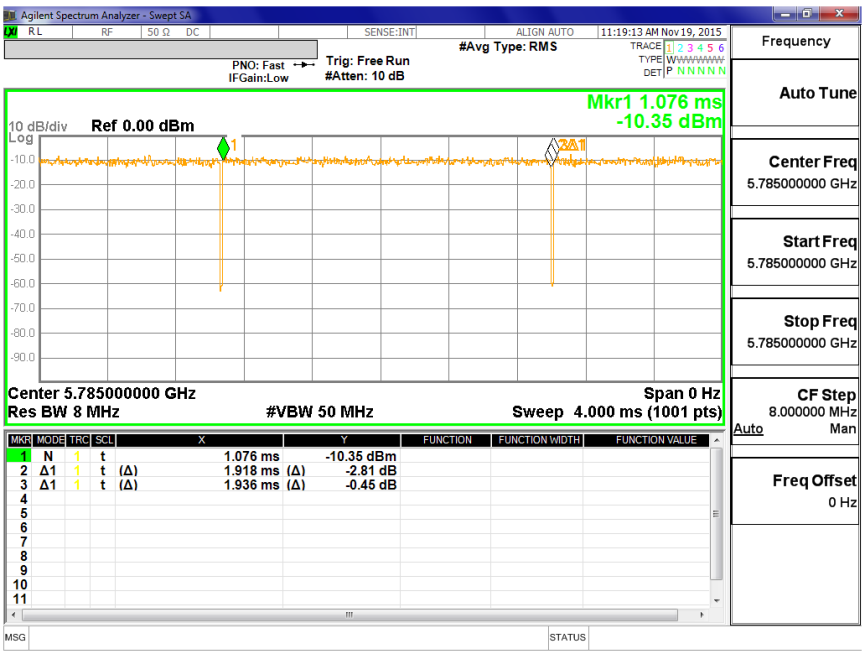
DUTY CYCLE PLOTS

DUTY CYCLE 802.11a 1TX MODE

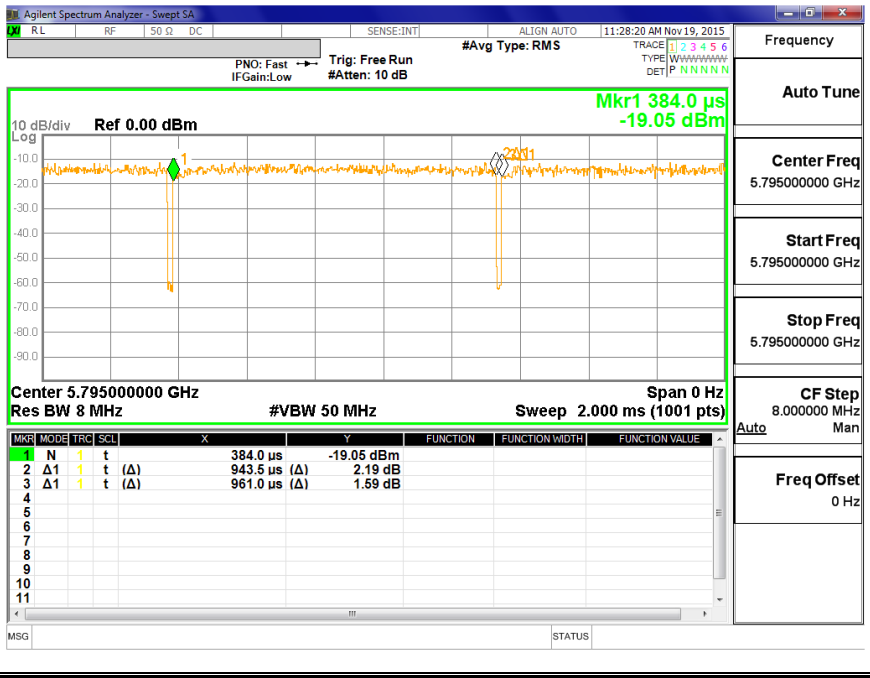


DUTY CYCLE 802.11n HT20 1TX MODE

DUTY CYCLE 802.11n HT20 CDD MODE



DUTY CYCLE 802.11n HT40 1TX MODE



DUTY CYCLE 802.11n HT40 CDD MODE

8.1. 802.11a LEGACY 1TX MODE IN THE 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

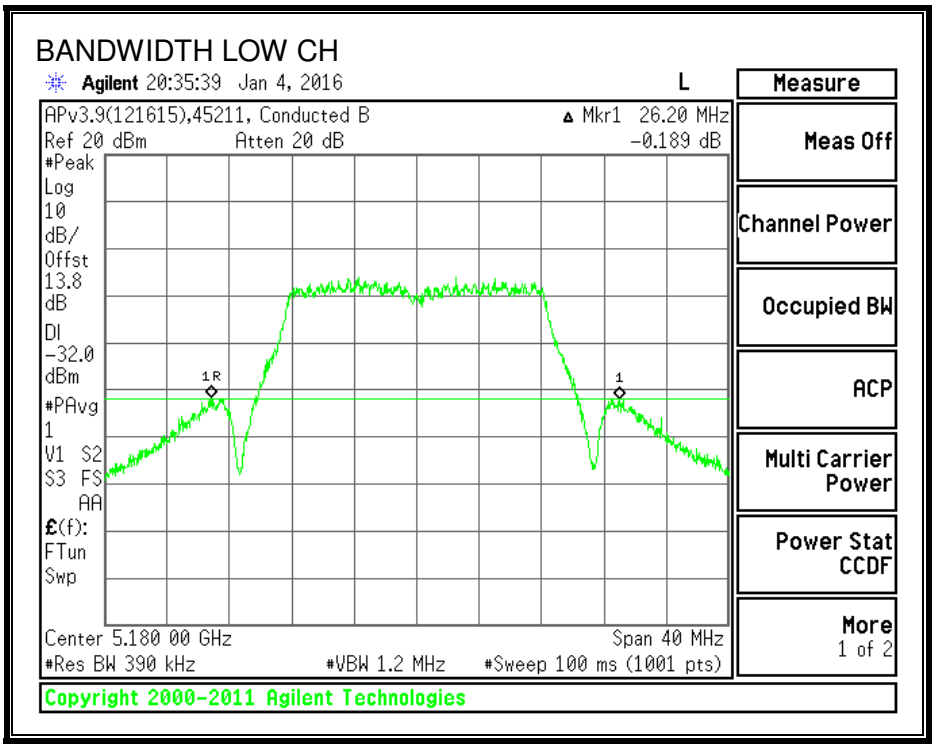
LIMITS

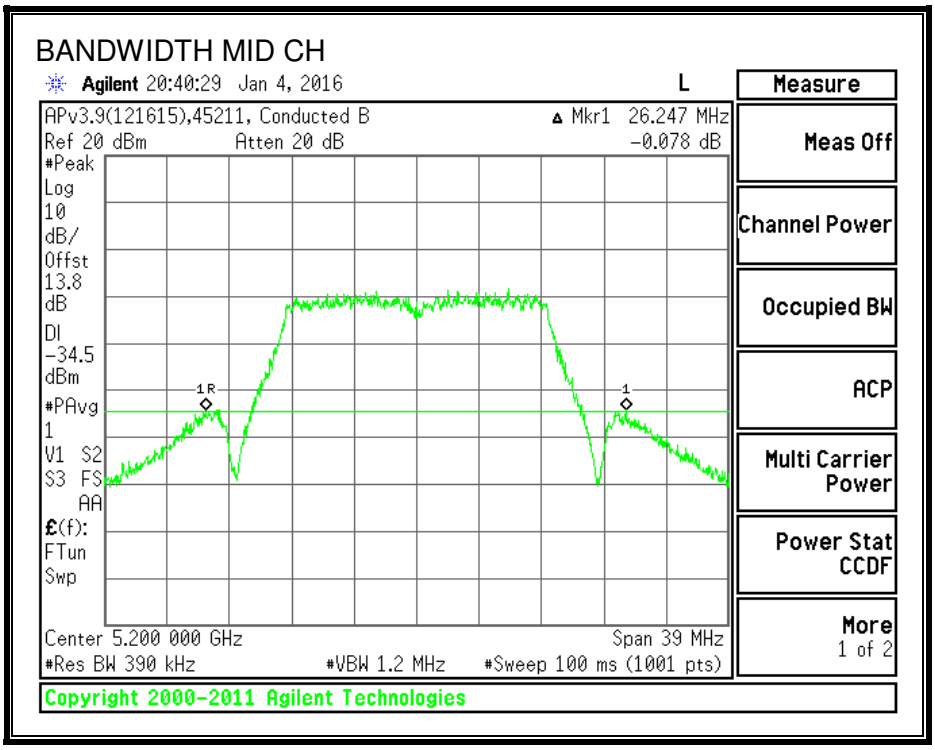
None; for reporting purposes only.

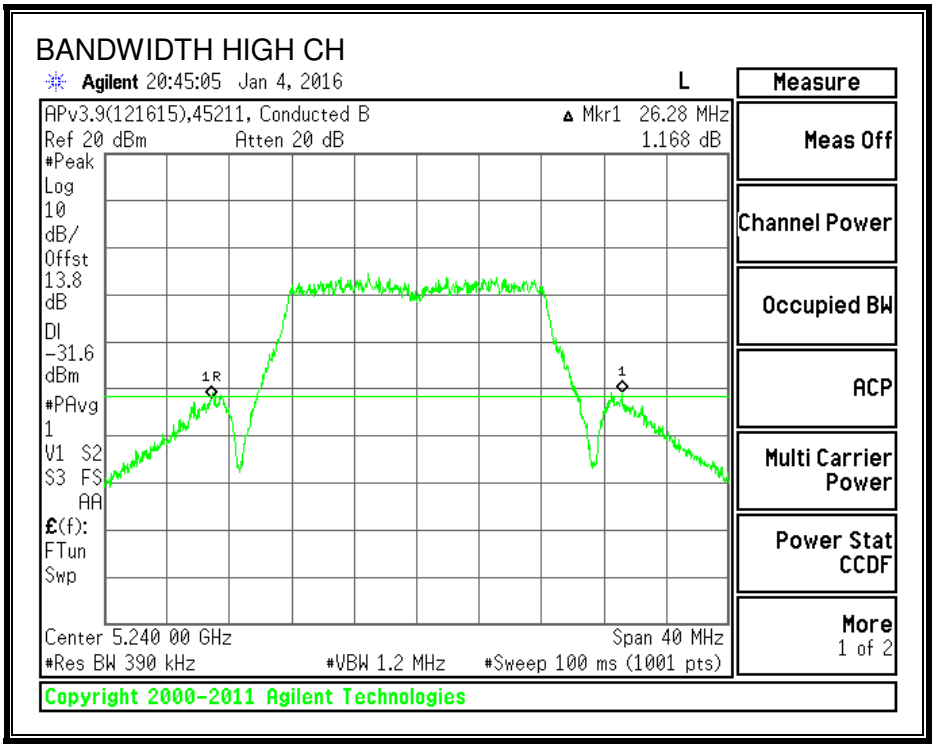
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	26.2
Mid	5200	26.25
High	5240	26.28

26 dB BANDWIDTH







8.2. 802.11n HT20 CDD 3Tx MODE IN THE 5.2 GHz BAND

8.2.1. 26 dB BANDWIDTH

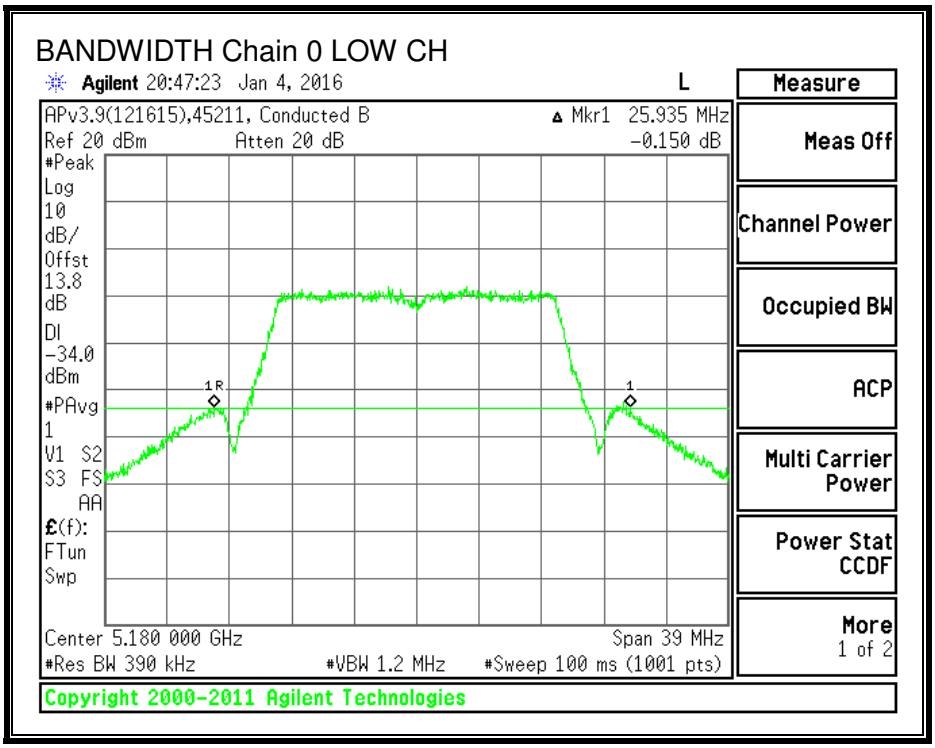
LIMITS

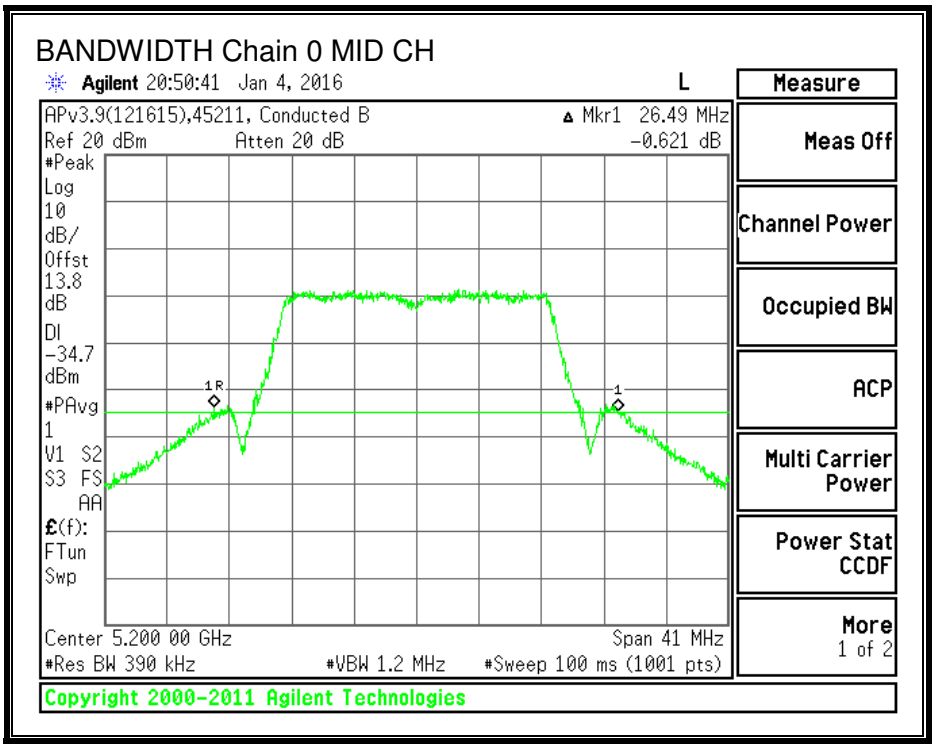
None; for reporting purposes only.

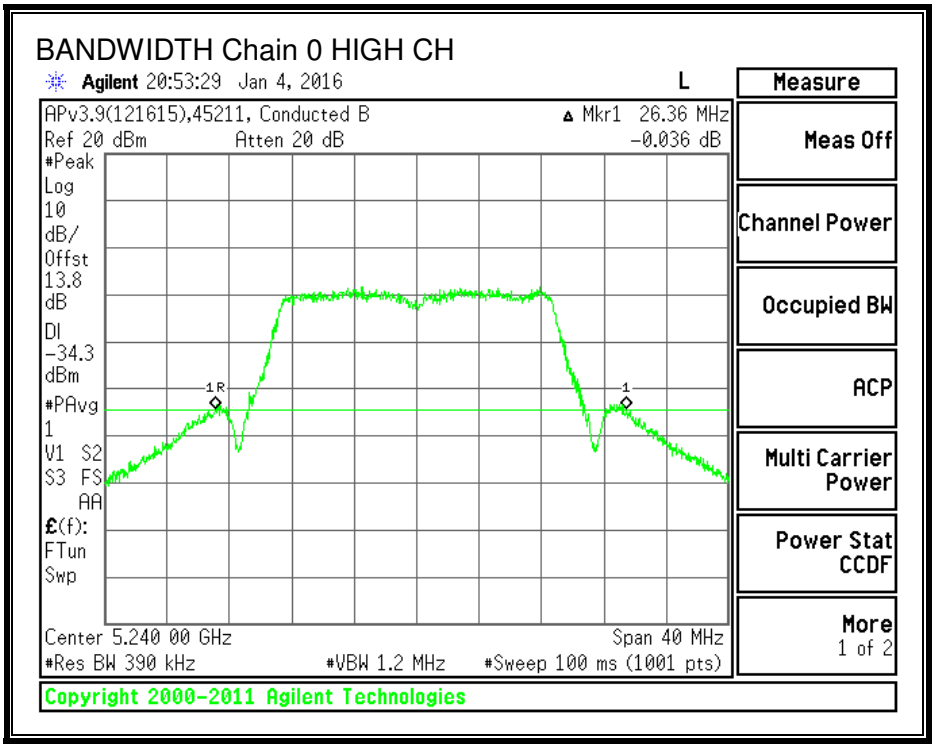
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	25.935	26.480	26.400
Mid	5200	26.490	26.320	26.560
High	5240	26.360	26.403	26.240

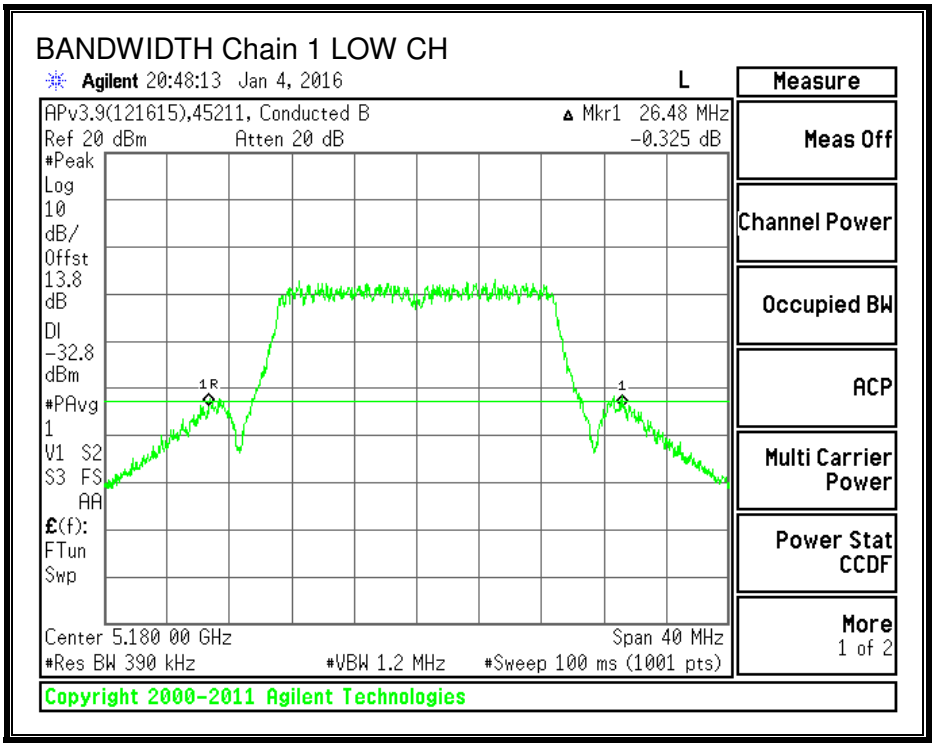
26 dB BANDWIDTH, Chain 0



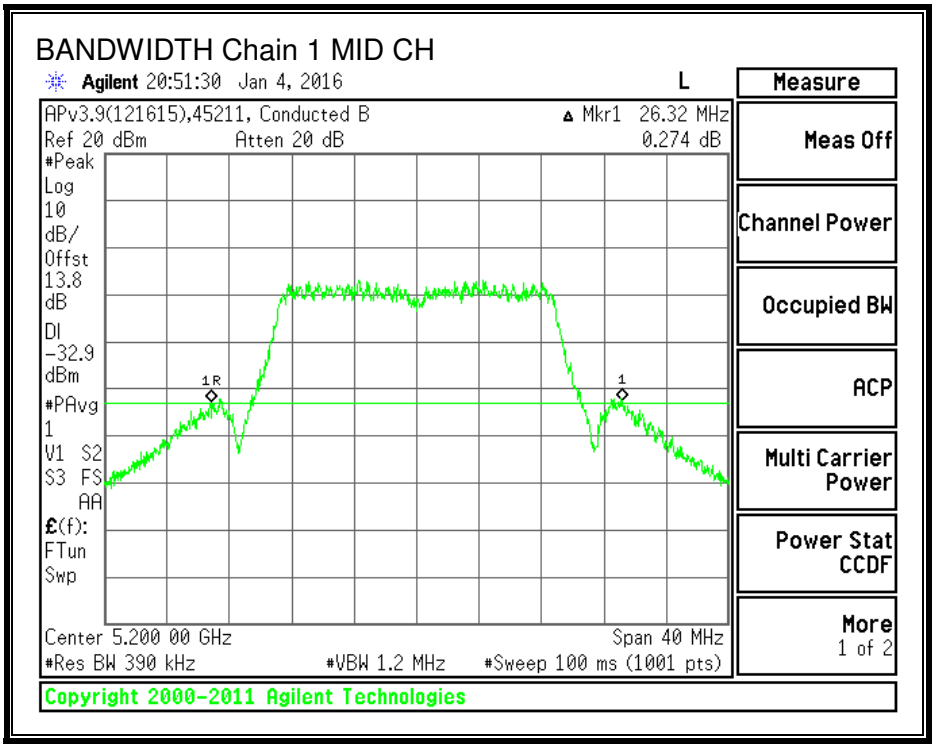




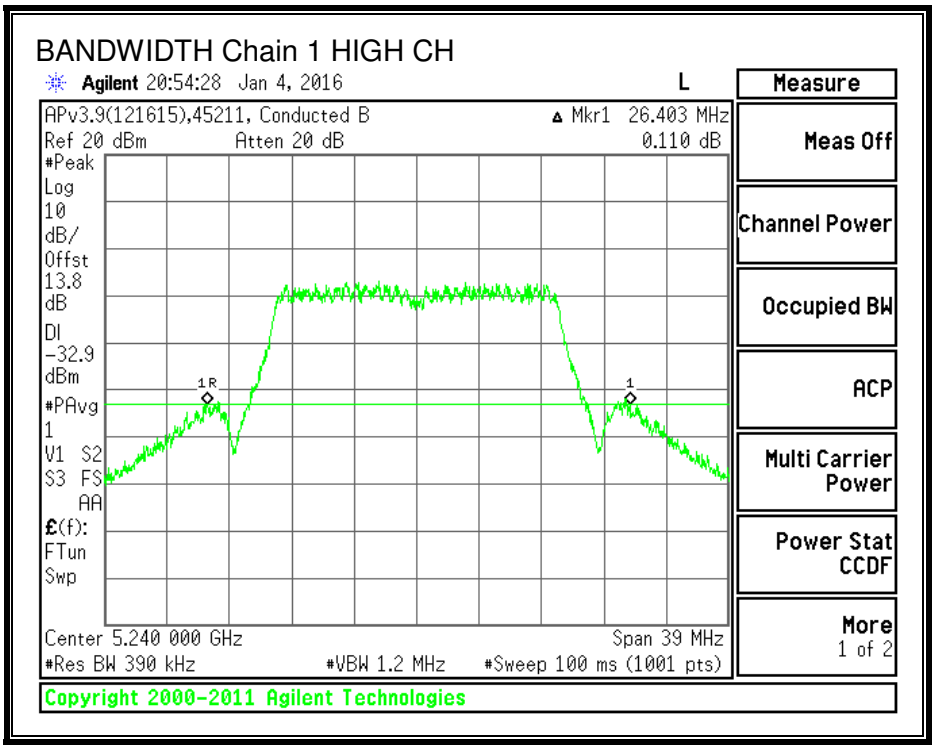
26 dB BANDWIDTH, Chain 1



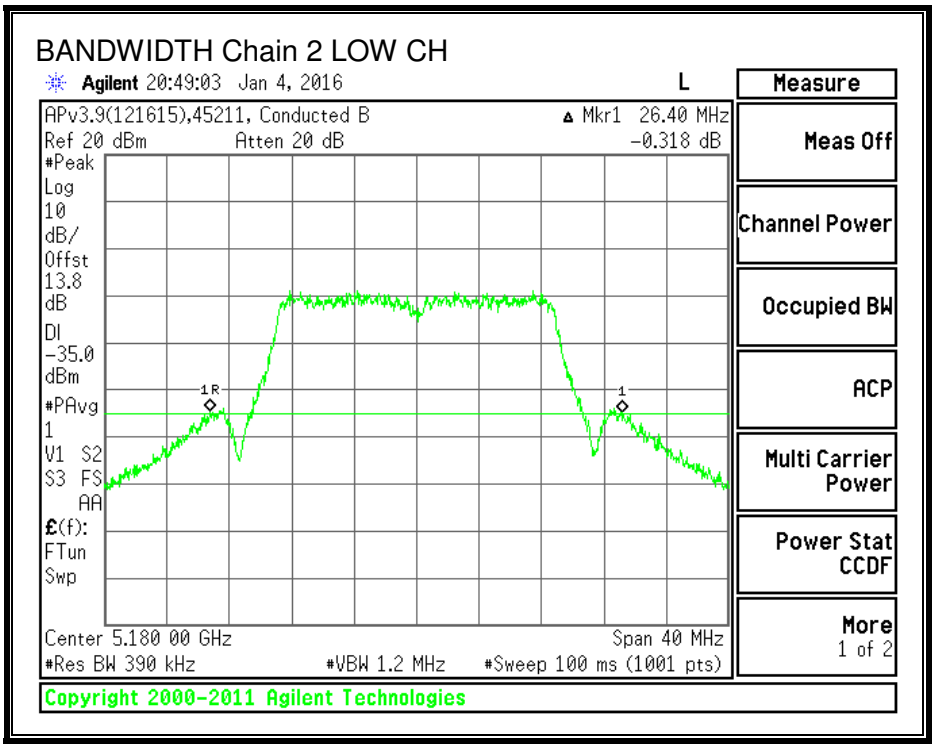
BANDWIDTH Chain 1 MID CH

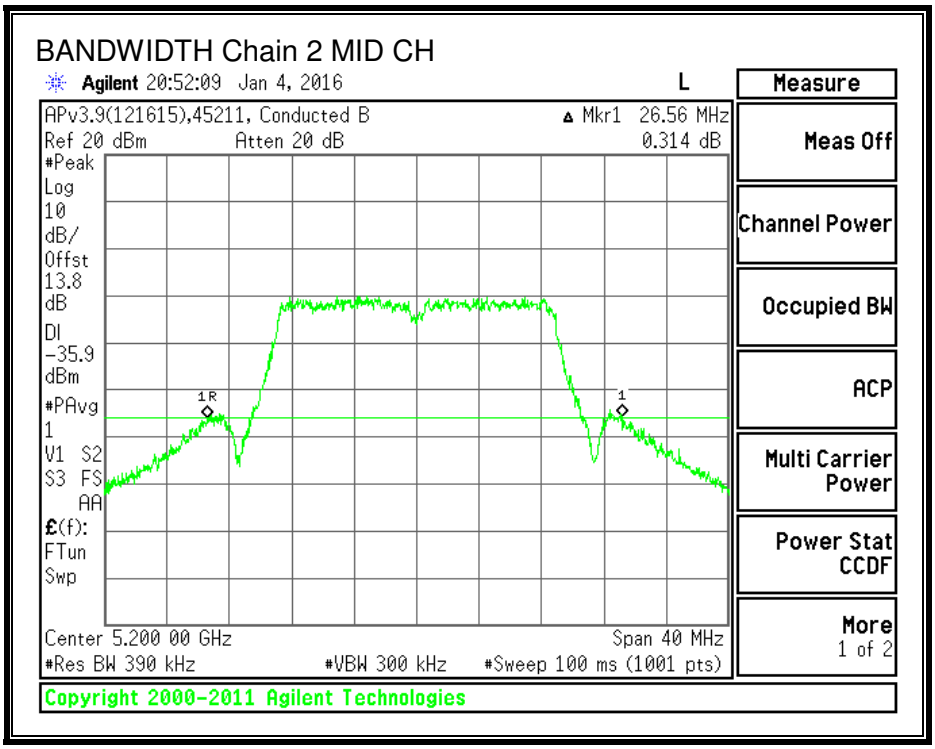


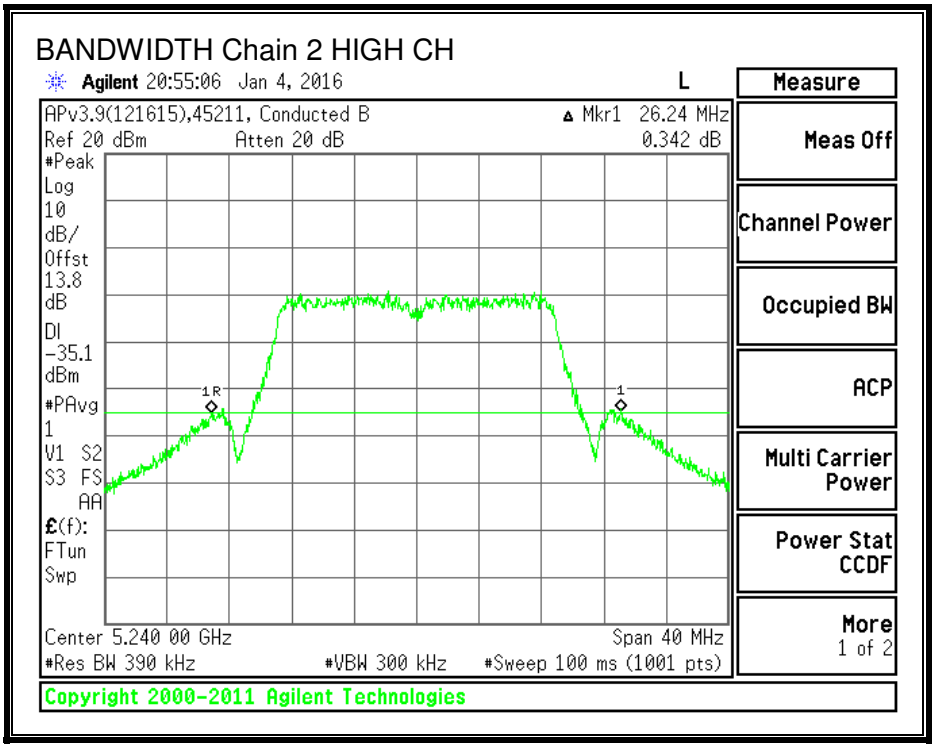
BANDWIDTH Chain 1 HIGH CH



26 dB BANDWIDTH, Chain 2







8.1. 802.11n HT40 CDD 3Tx MODE IN THE 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

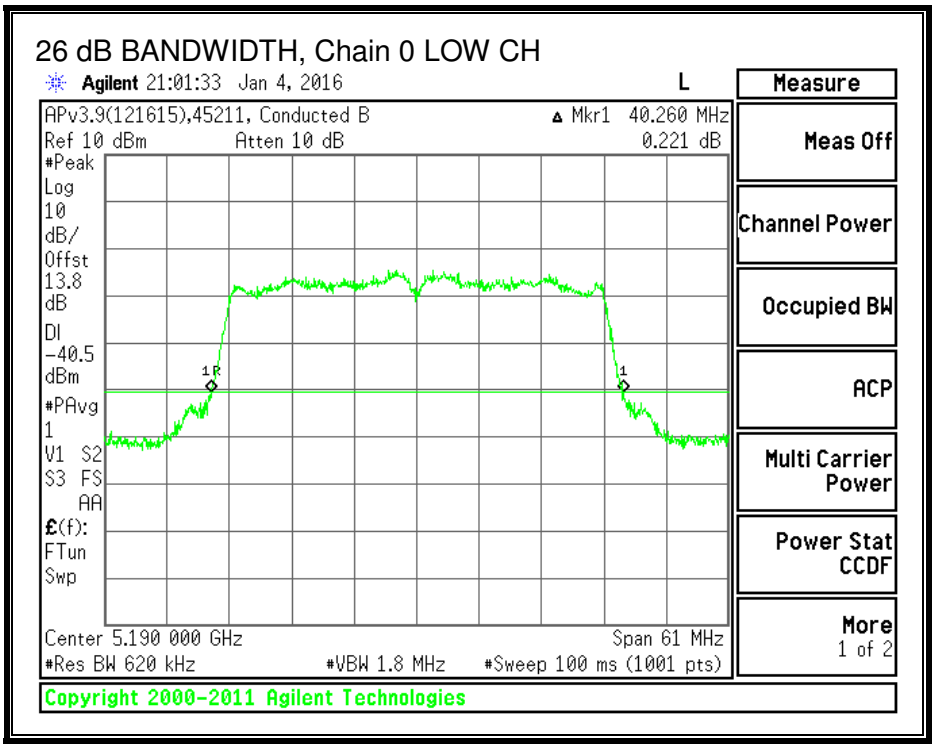
LIMITS

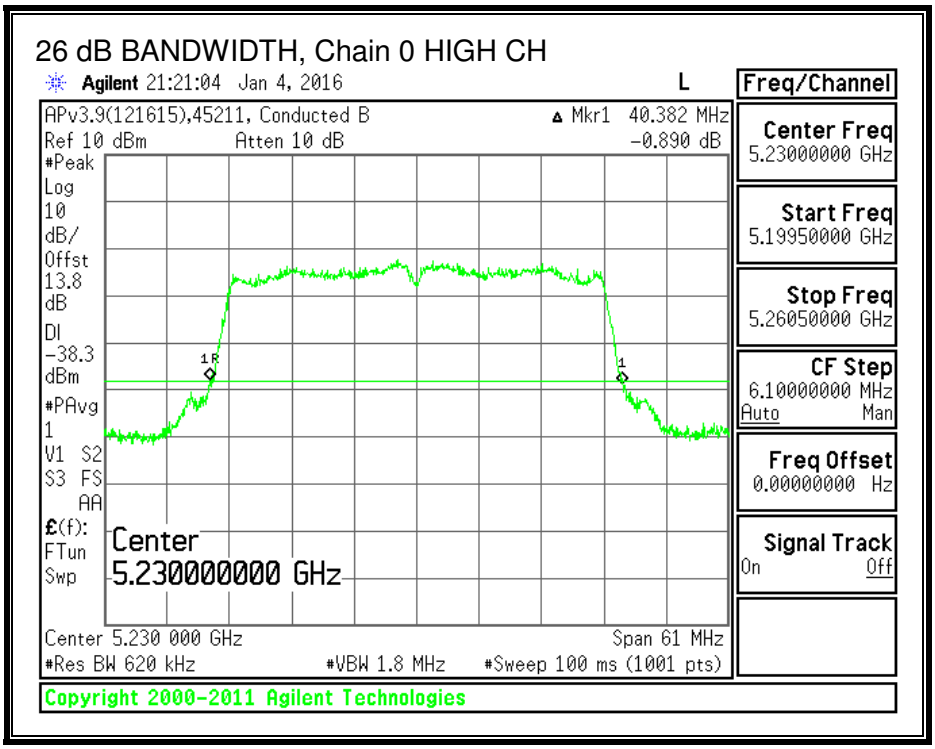
None; for reporting purposes only.

RESULTS

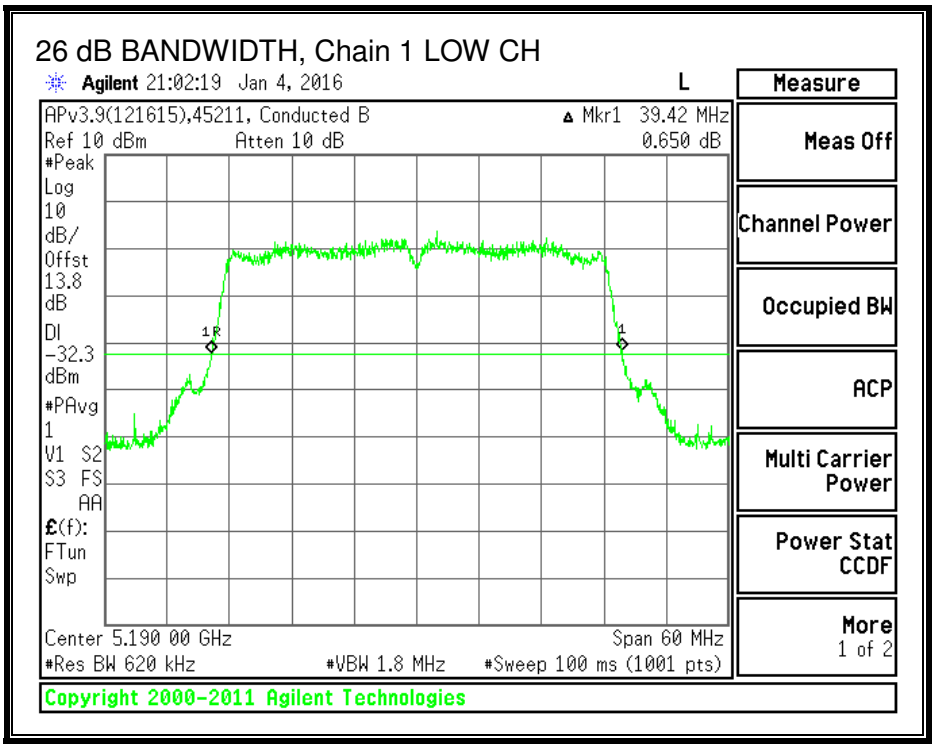
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	40.260	39.420	39.720
High	5230	40.382	39.660	39.600

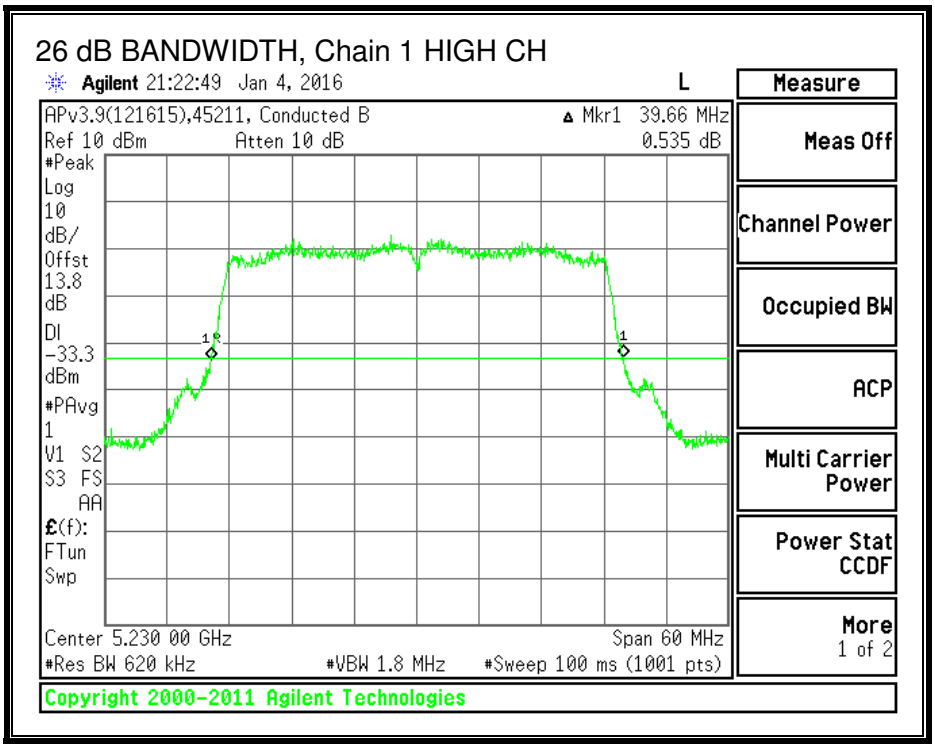
26 dB BANDWIDTH, Chain 0



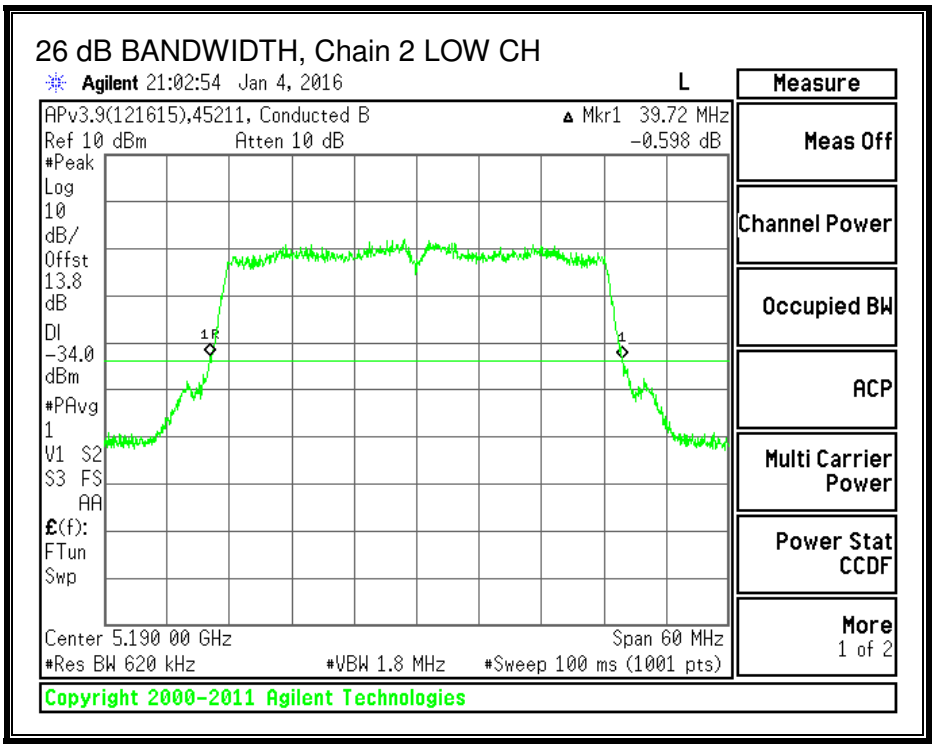


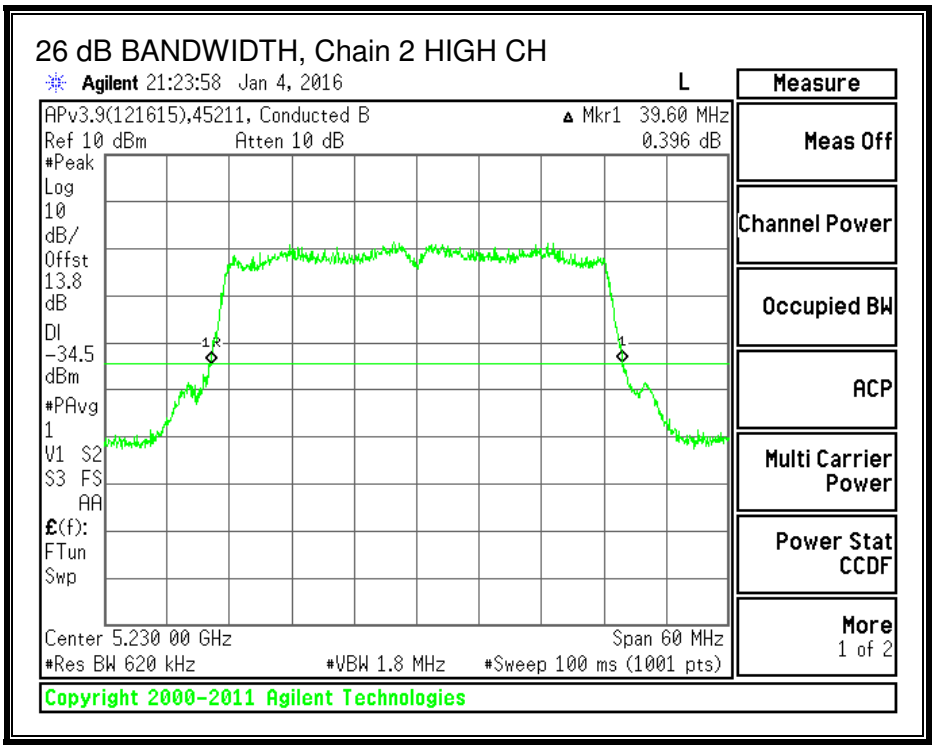
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.1. 802.11a LEGACY 1TX MODE IN THE 5.3 GHz BAND

8.1.1. 26 dB BANDWIDTH

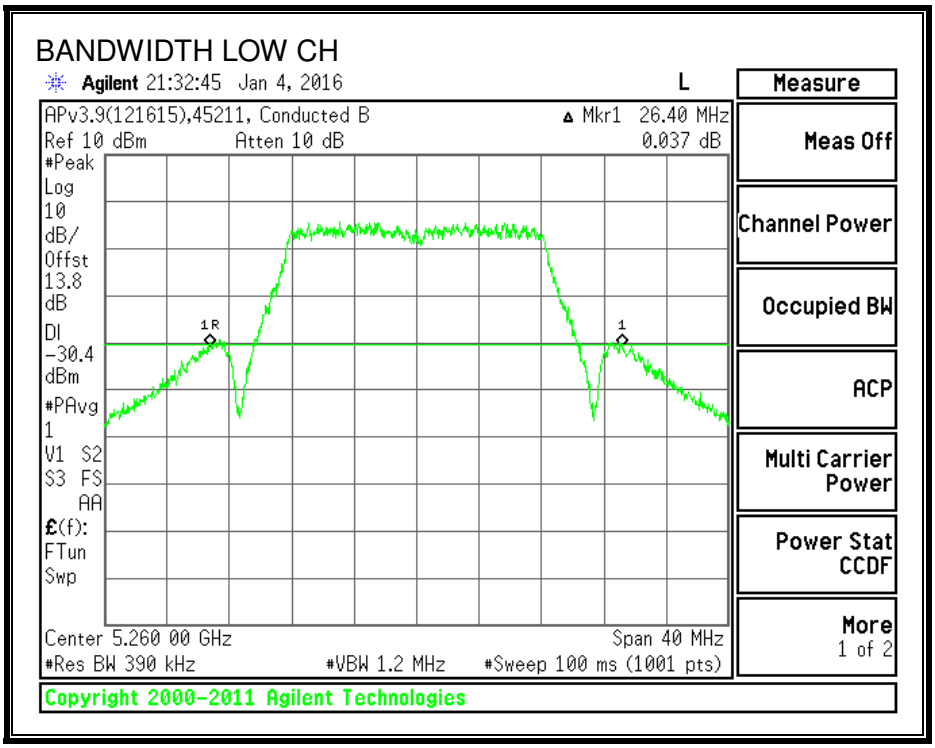
LIMITS

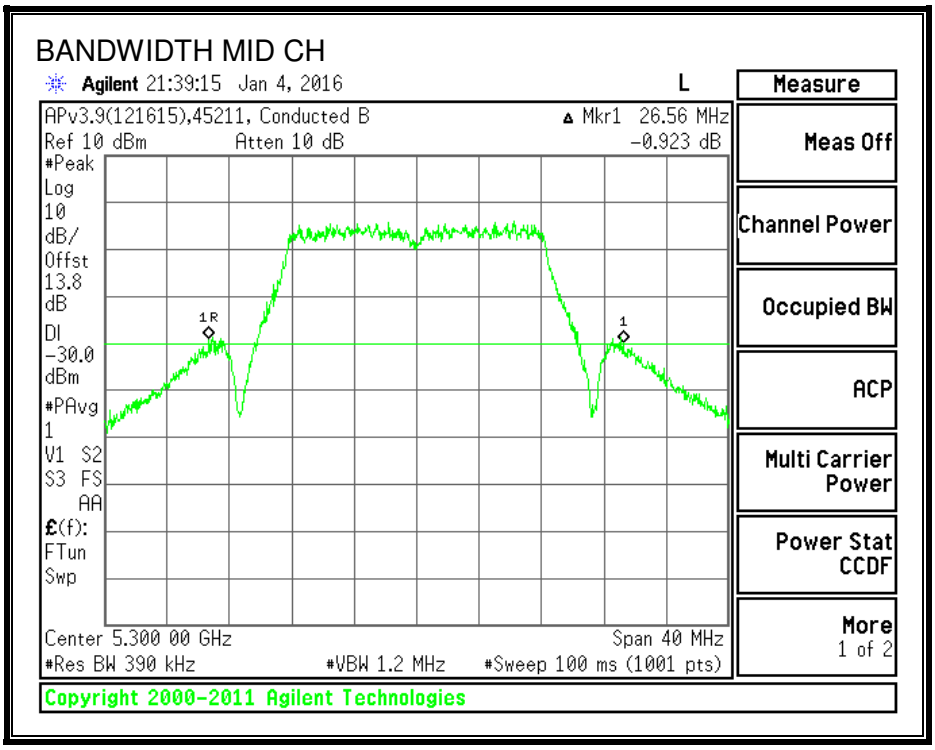
None; for reporting purposes only.

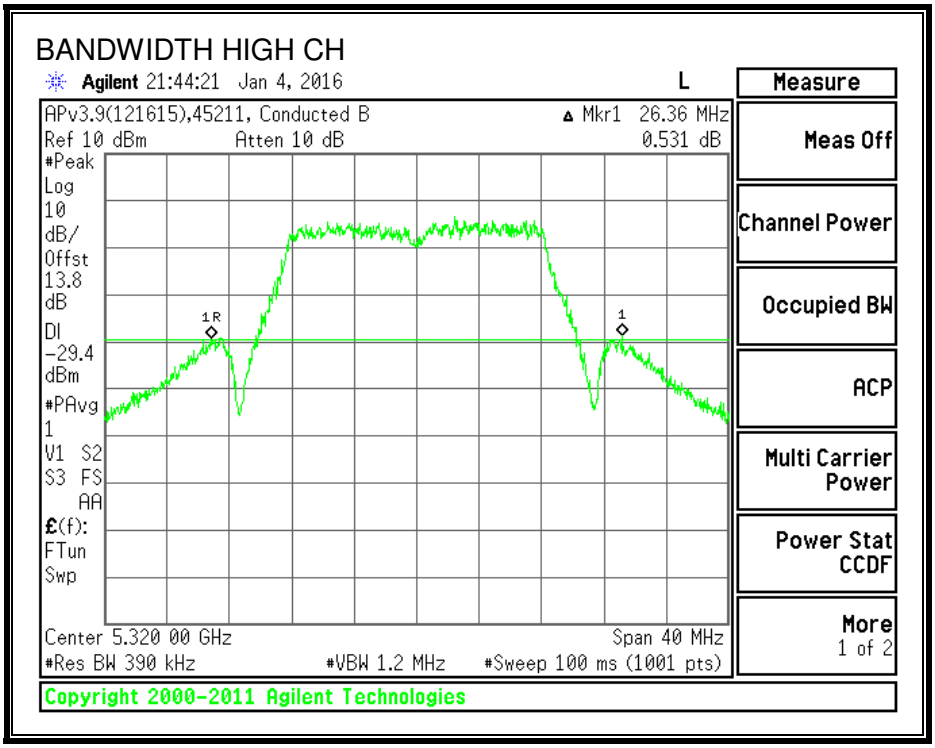
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	26.4
Mid	5300	26.56
High	5320	26.36

26 dB BANDWIDTH







8.1. 802.11n HT20 CDD 3Tx MODE IN THE 5.3 GHz BAND

8.1.1. 26 dB BANDWIDTH

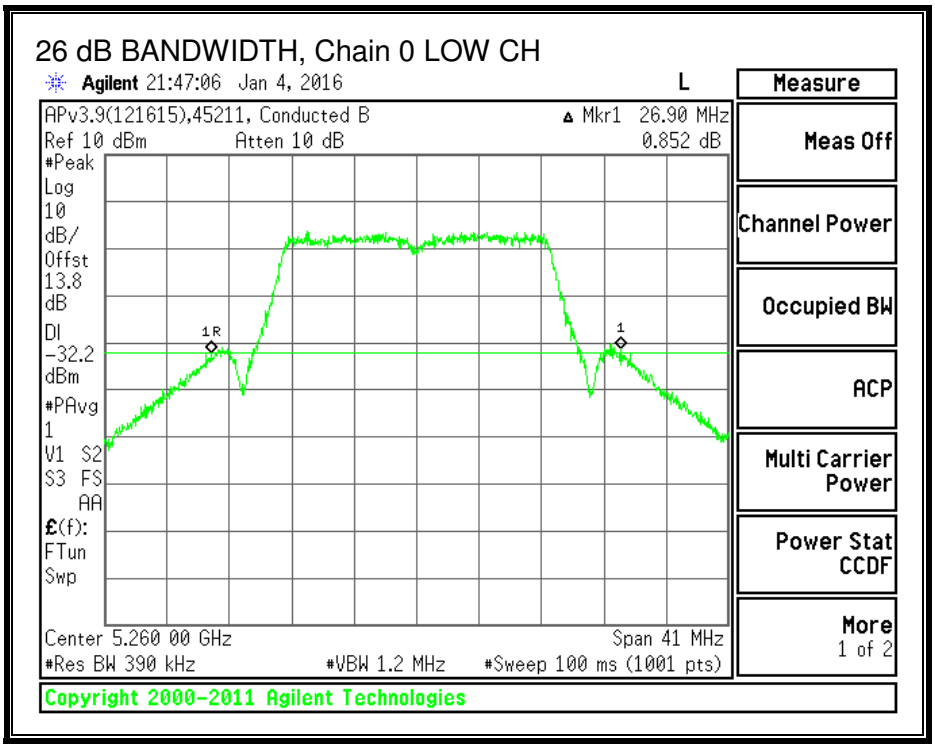
LIMITS

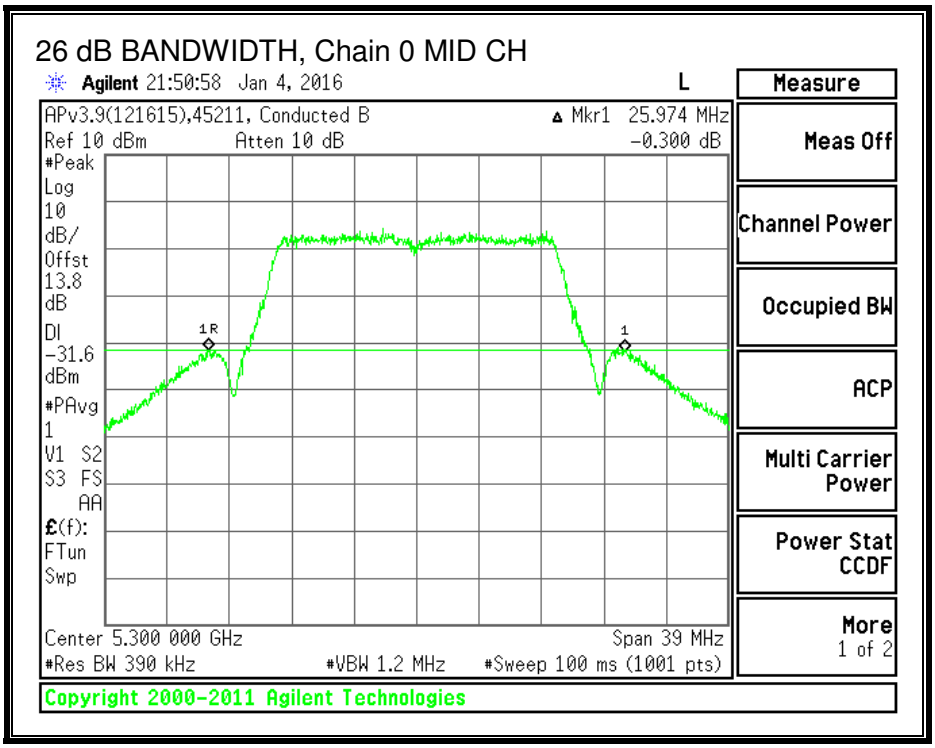
None; for reporting purposes only.

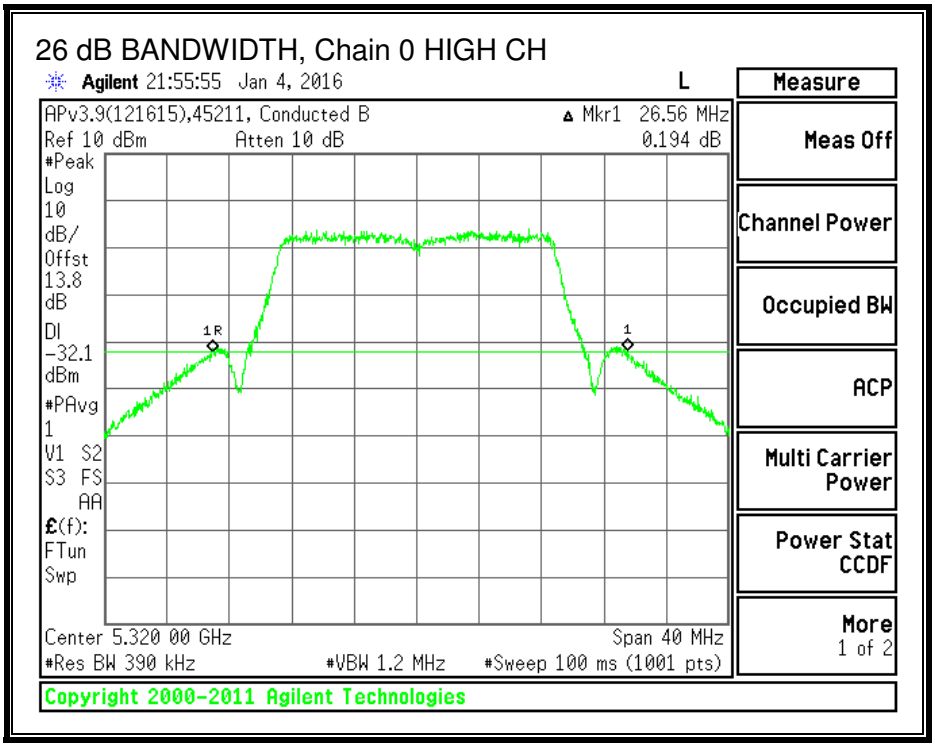
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	26.900	27.000	26.400
Mid	5300	25.974	26.930	26.244
High	5320	26.560	26.600	26.480

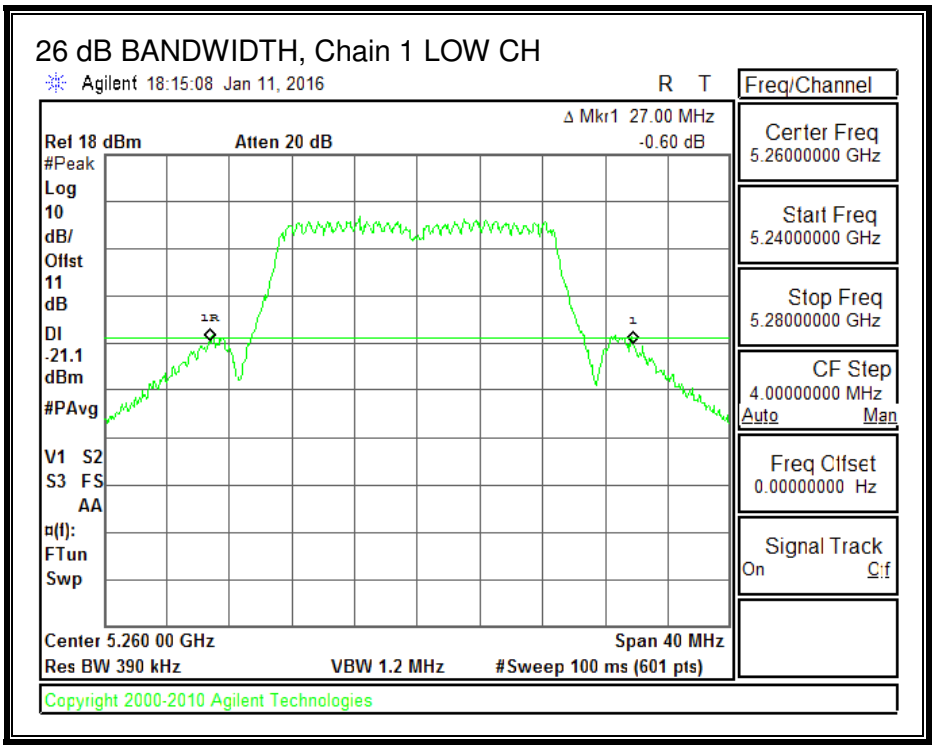
26 dB BANDWIDTH, Chain 0



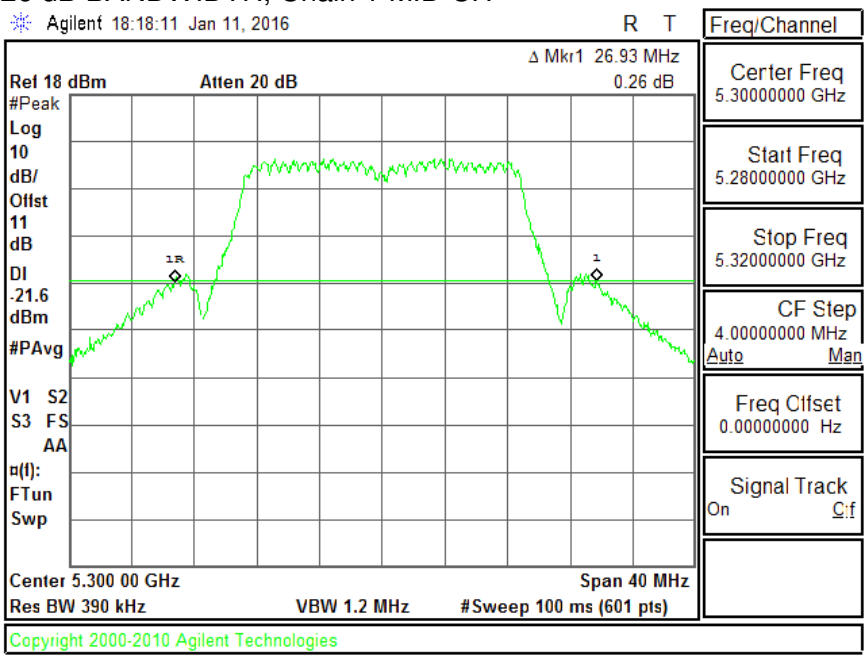




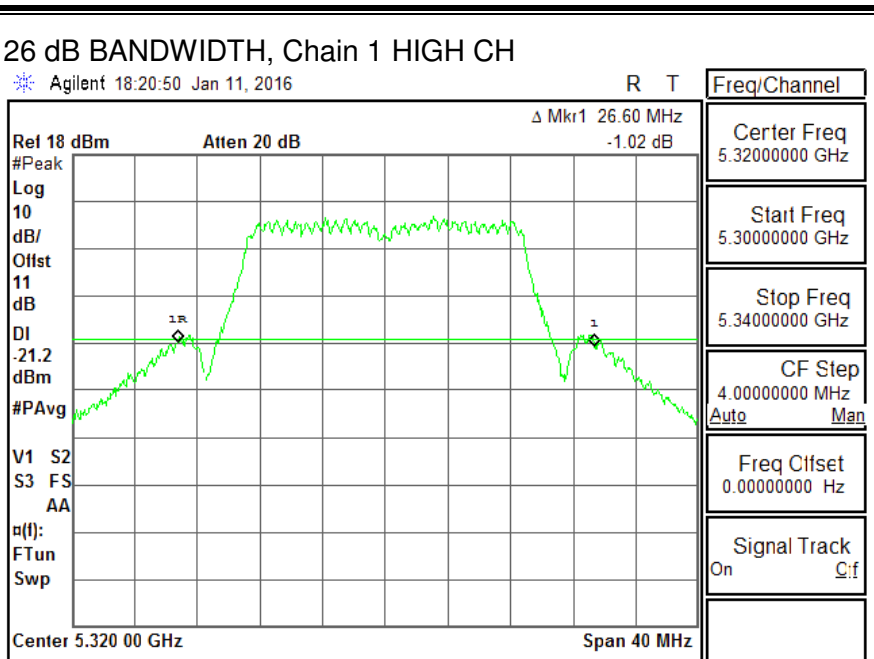
26 dB BANDWIDTH, Chain 1



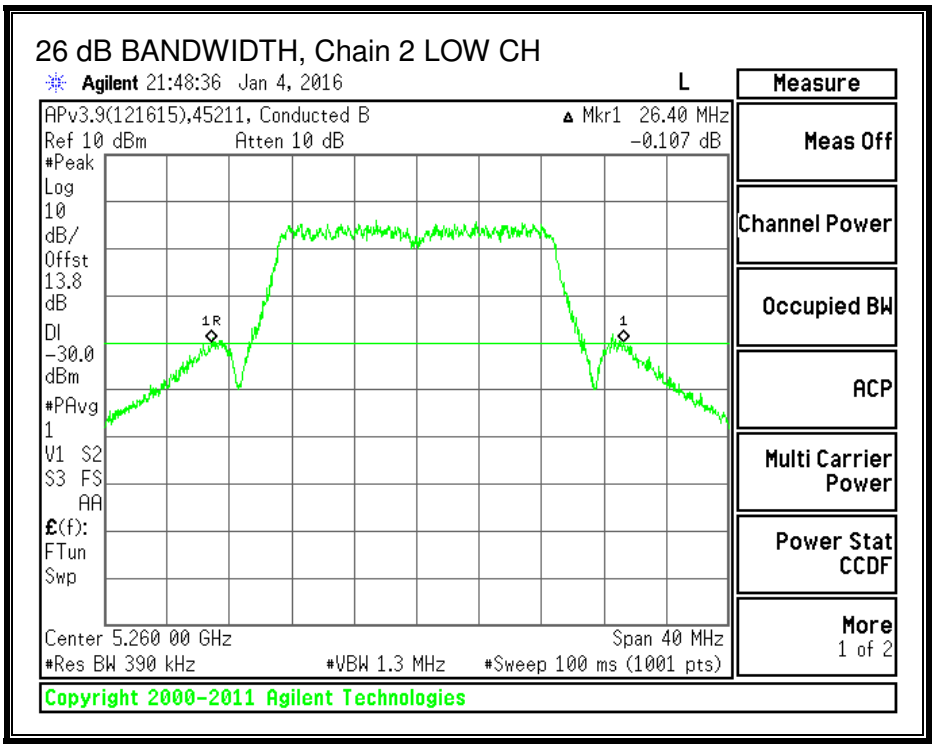
26 dB BANDWIDTH, Chain 1 MID CH

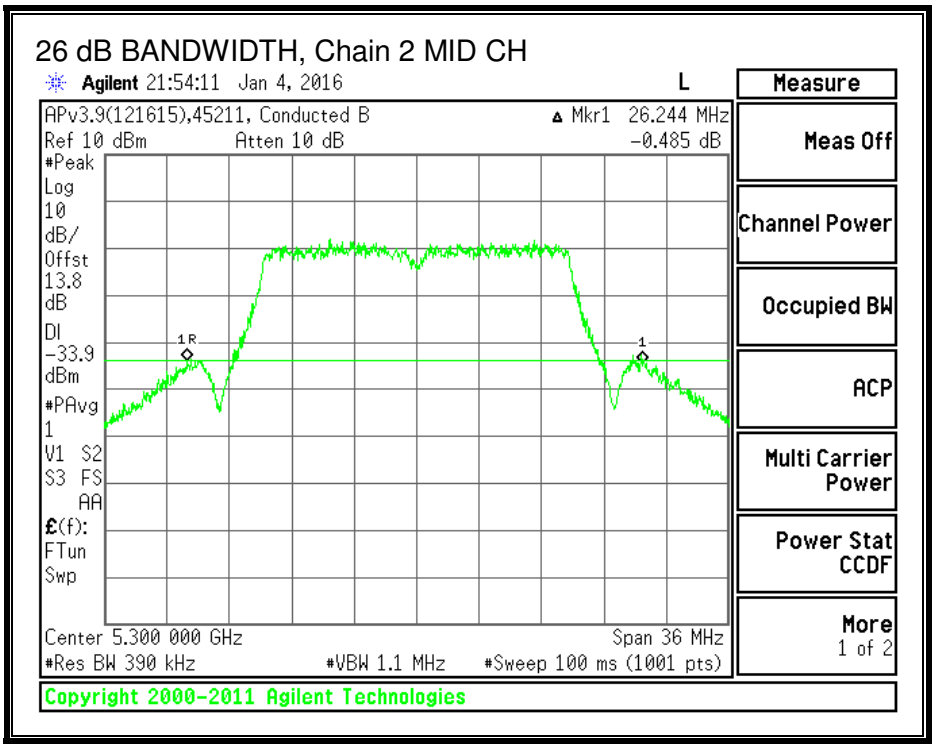


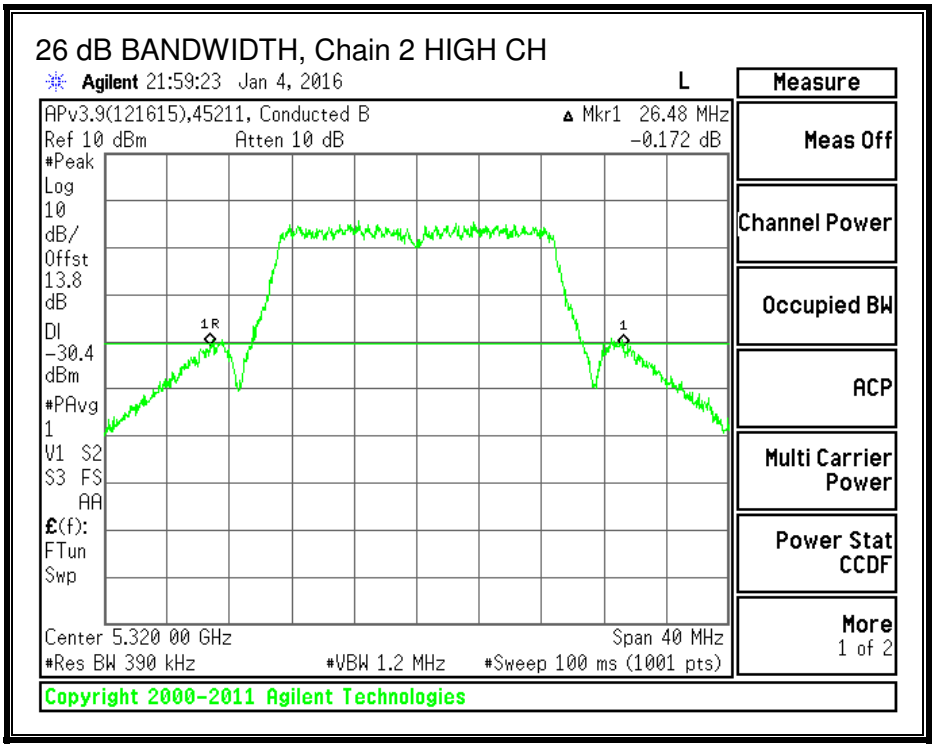
26 dB BANDWIDTH, Chain 1 HIGH CH



26 dB BANDWIDTH, Chain 2







8.1. 802.11n HT40 CDD 3Tx MODE IN THE 5.3 GHz BAND

8.1.1. 26 dB BANDWIDTH

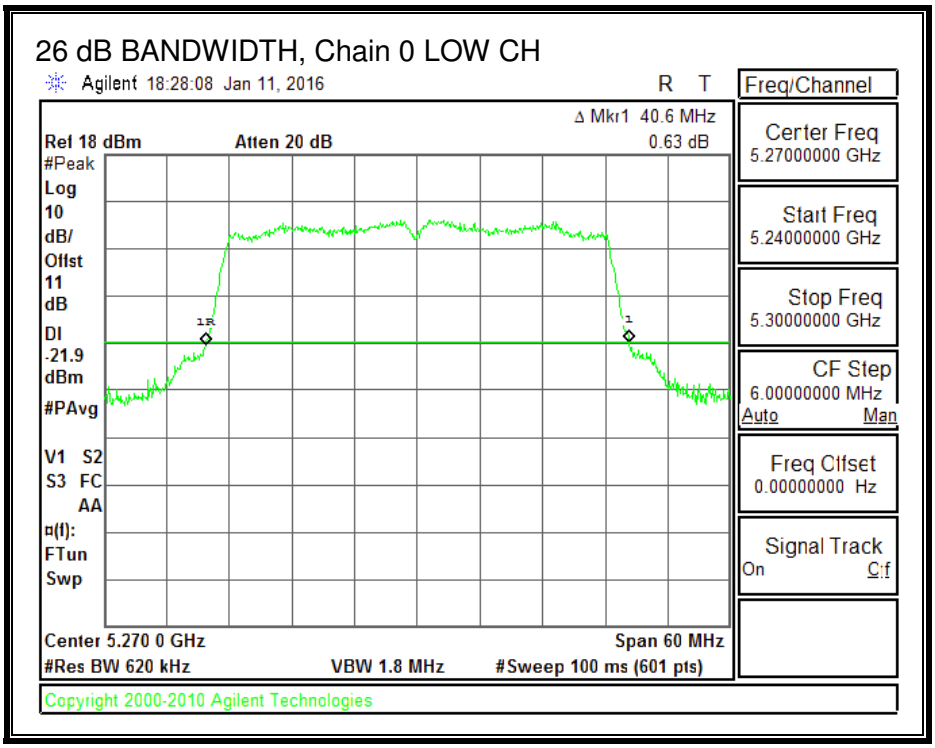
LIMITS

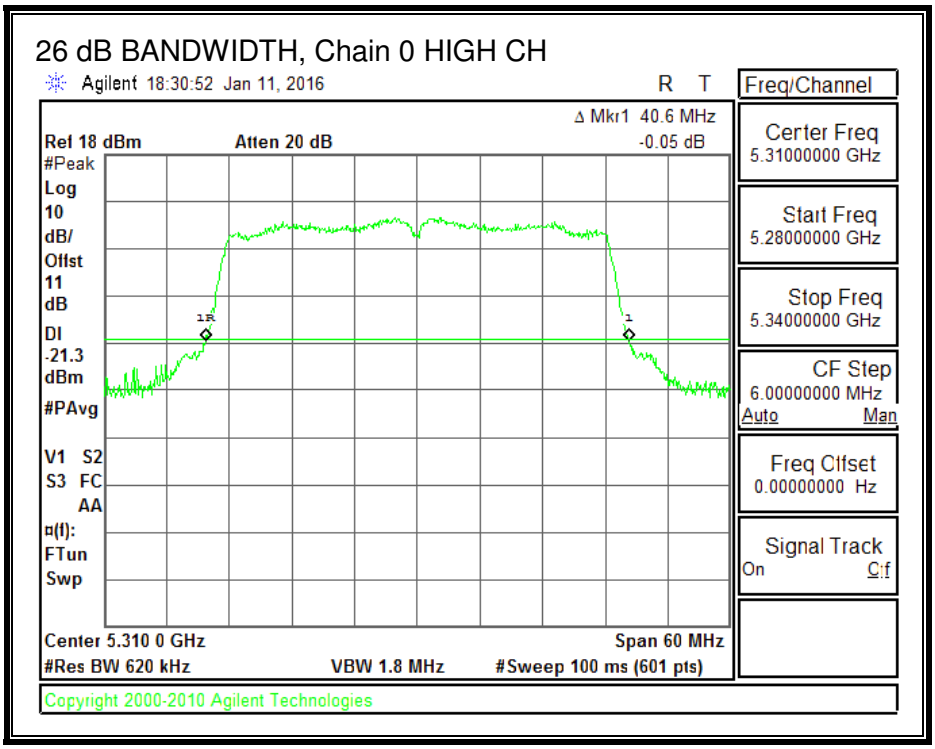
None; for reporting purposes only.

RESULTS

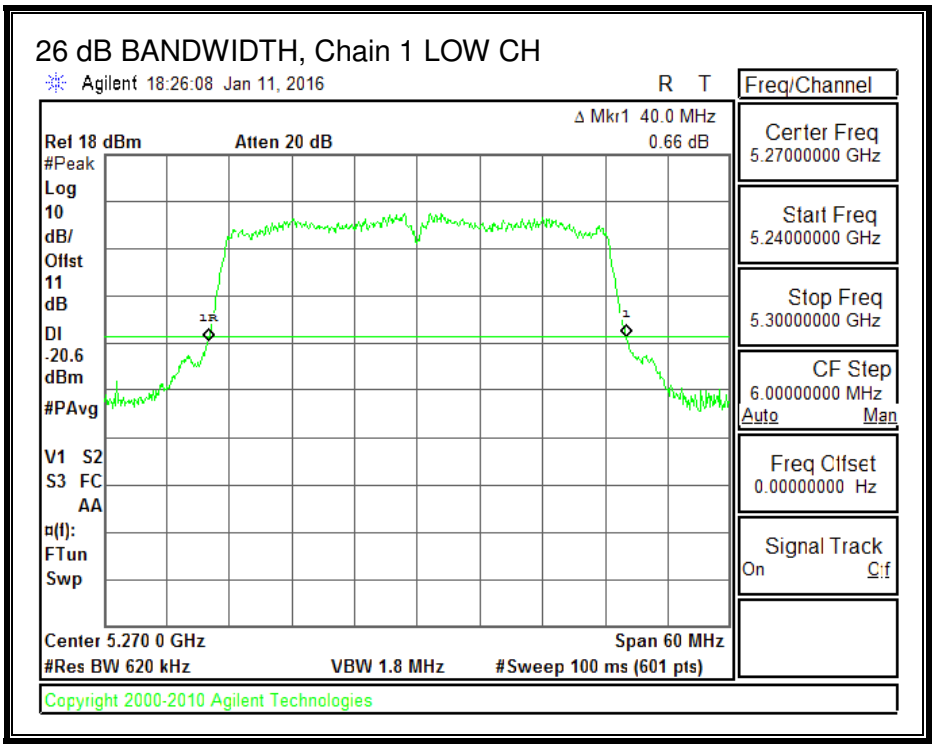
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5270	40.600	40.000	39.660
High	5310	40.600	39.900	39.600

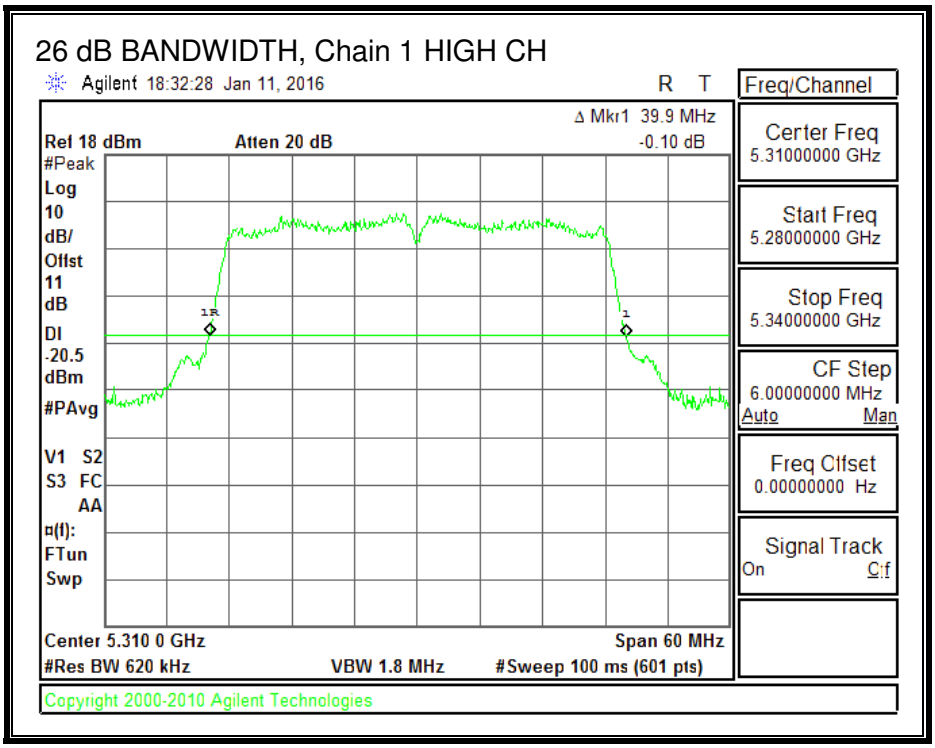
26 dB BANDWIDTH, Chain 0



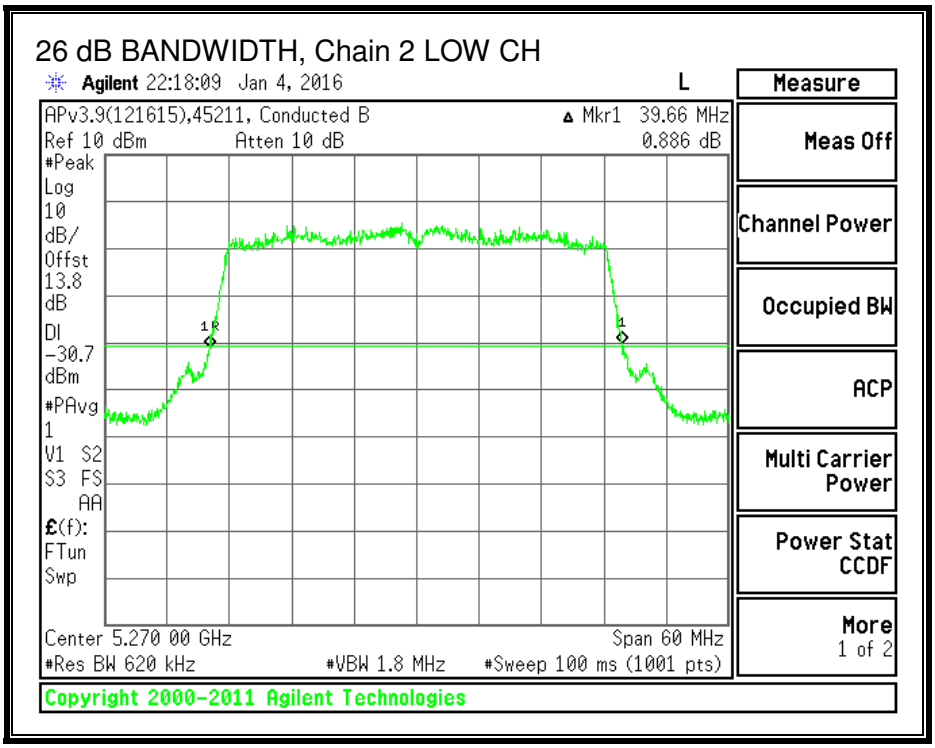


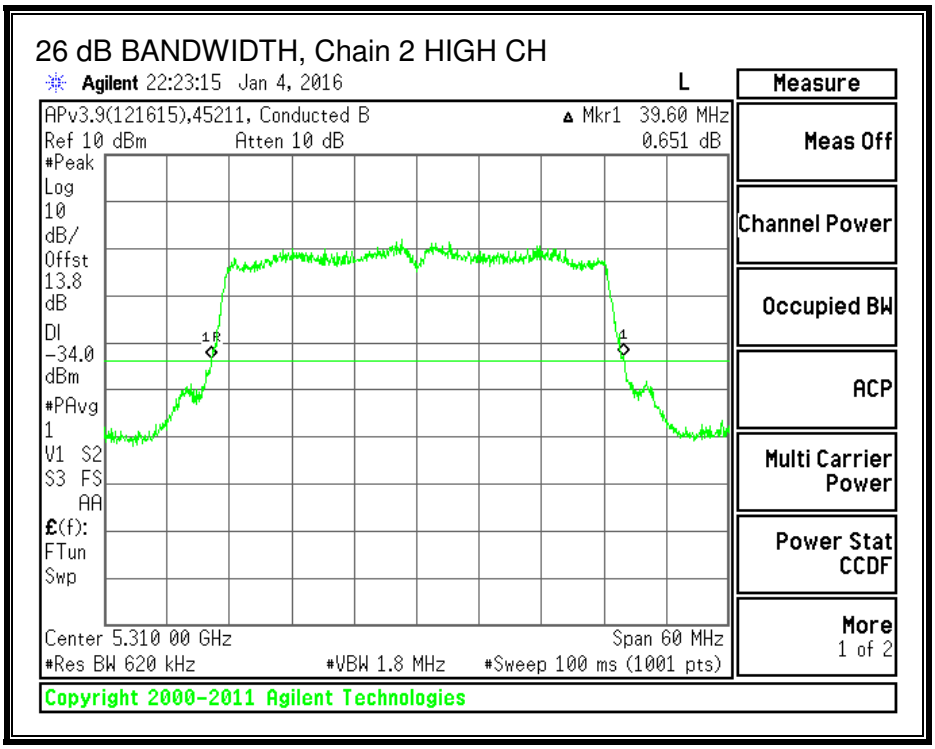
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.2. 802.11a LEGACY 1TX MODE IN THE 5.6 GHz BAND

8.2.1. 26 dB BANDWIDTH

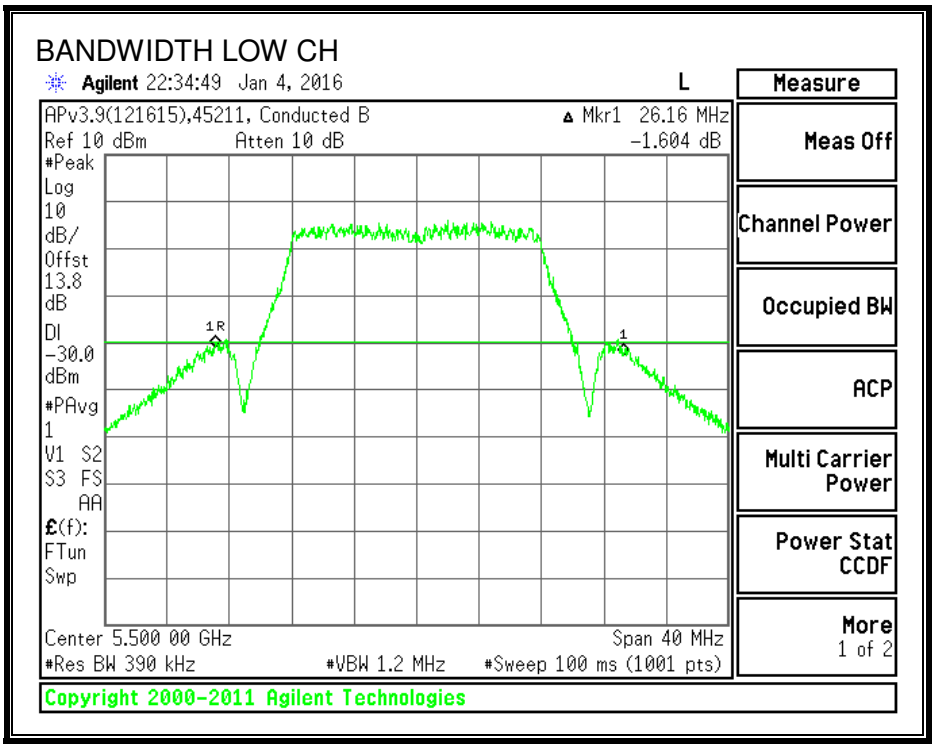
LIMITS

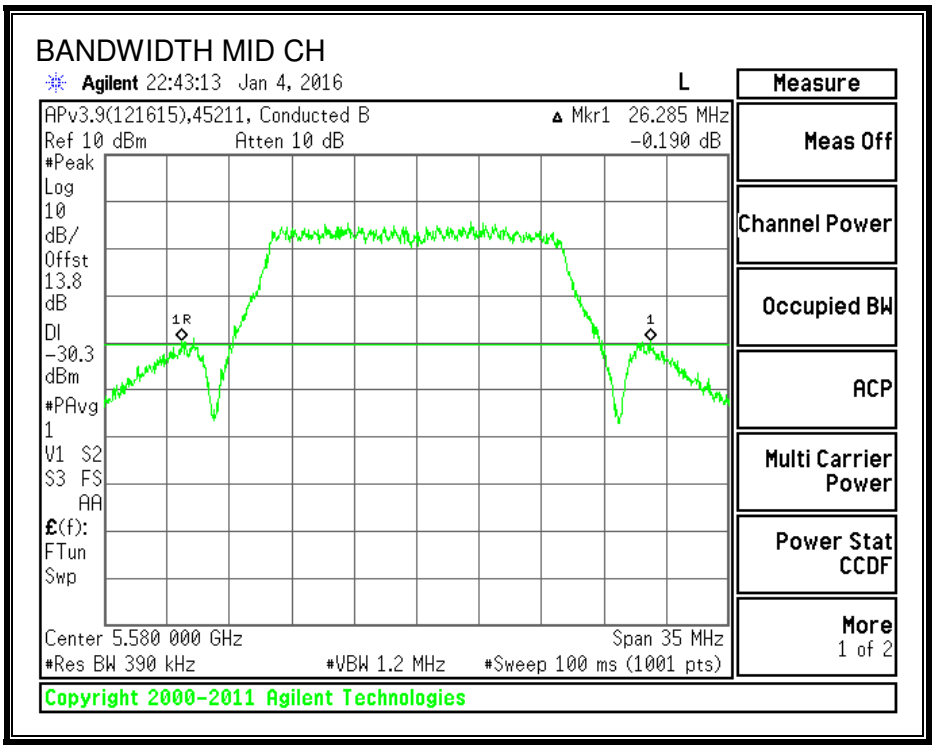
None; for reporting purposes only.

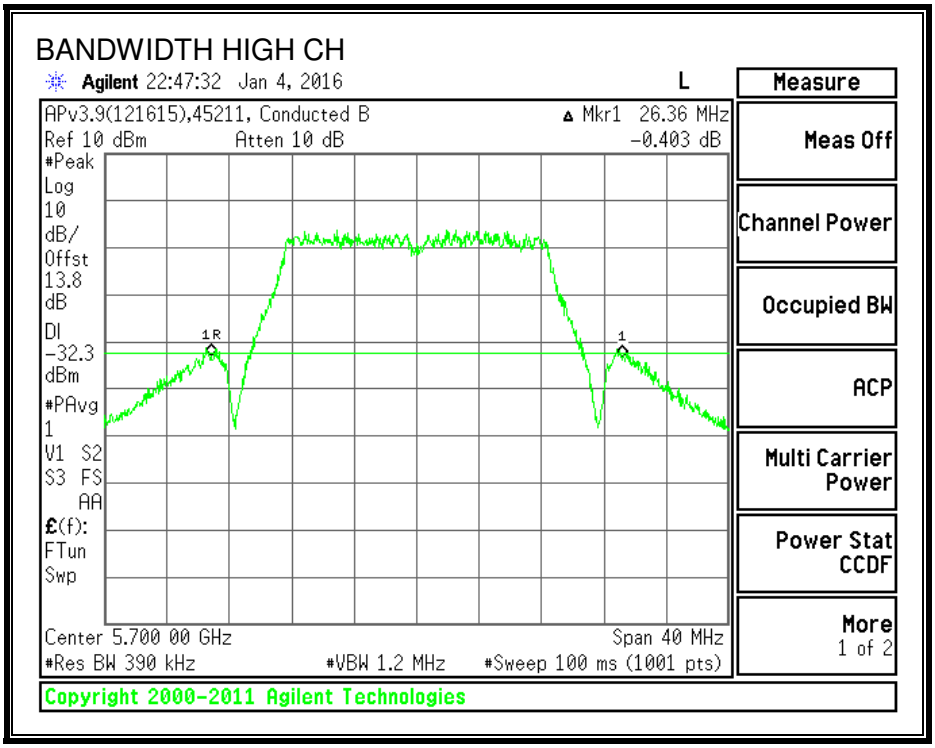
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	26.16
Mid	5580	26.29
High	5700	26.36

26 dB BANDWIDTH







8.1. 802.11n HT20 CDD 3Tx MODE IN THE 5.6 GHz BAND

8.1.1. 26 dB BANDWIDTH

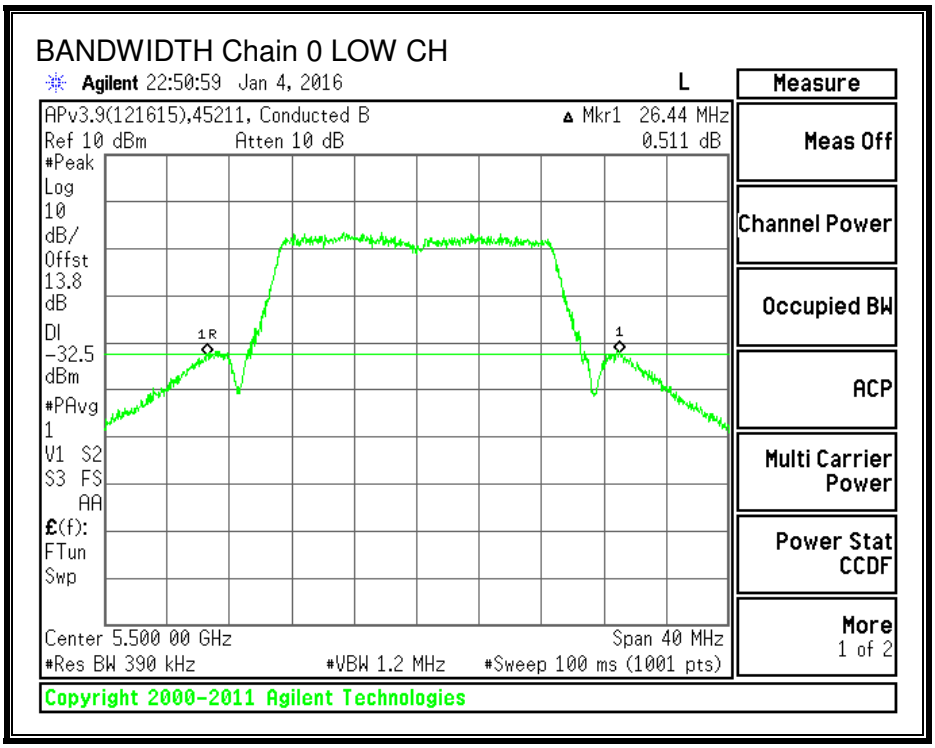
LIMITS

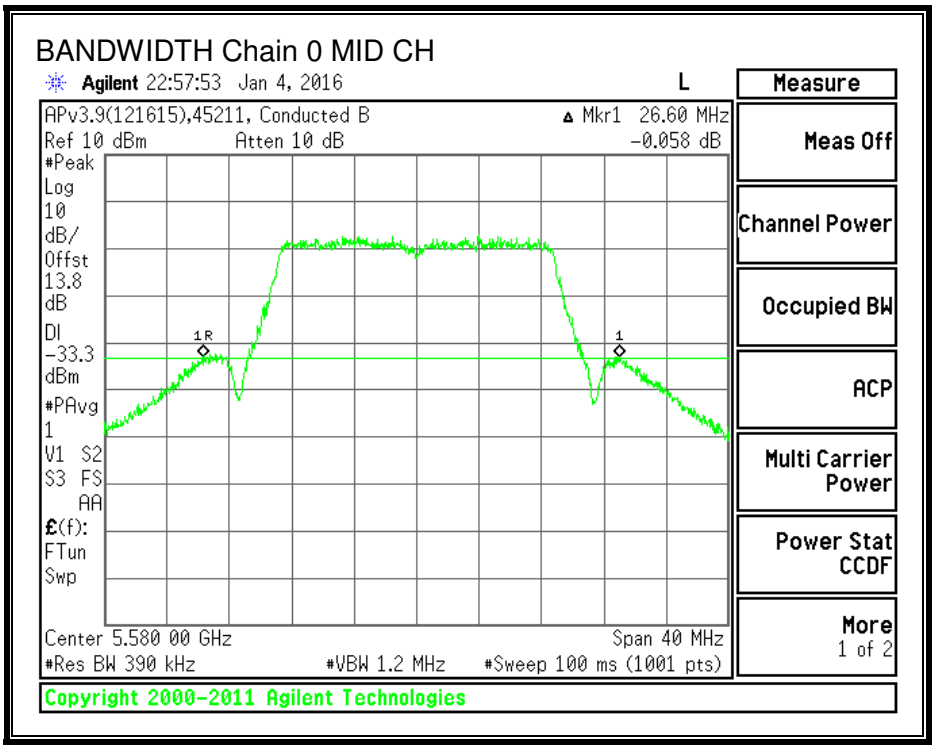
None; for reporting purposes only.

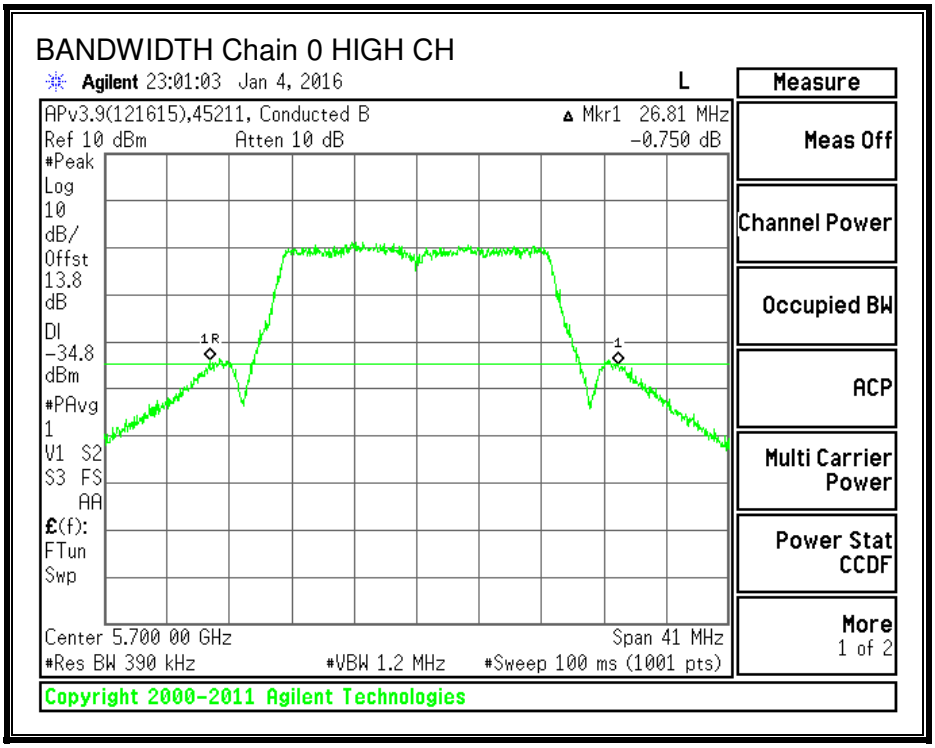
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5500	26.440	26.400	26.440
Mid	5580	26.600	25.935	26.160
High	5700	26.810	25.935	25.623

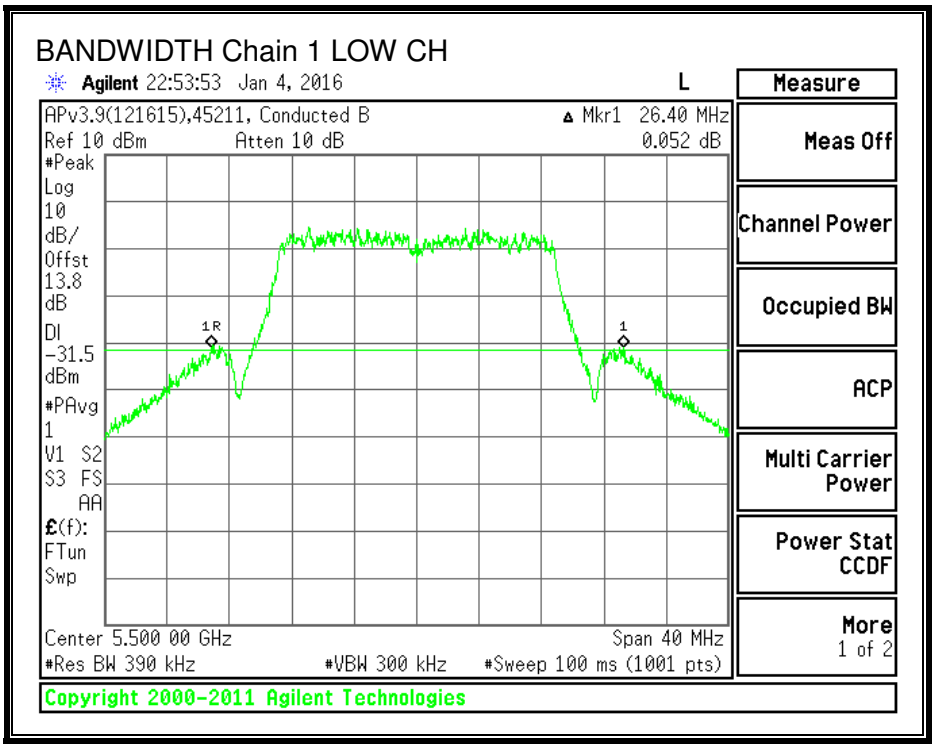
26 dB BANDWIDTH, Chain 0

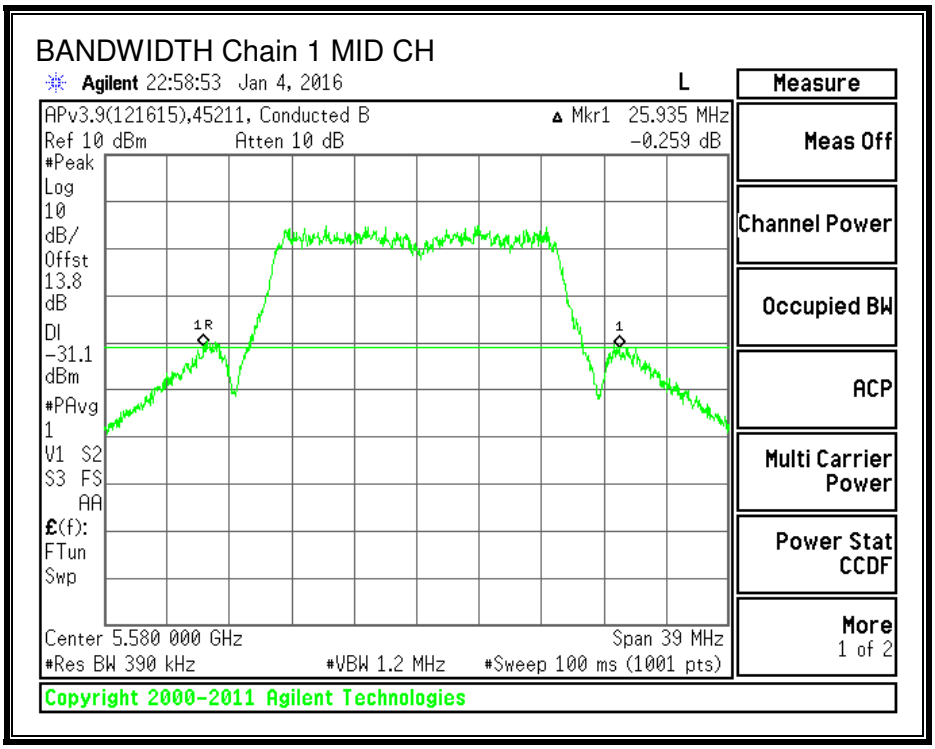


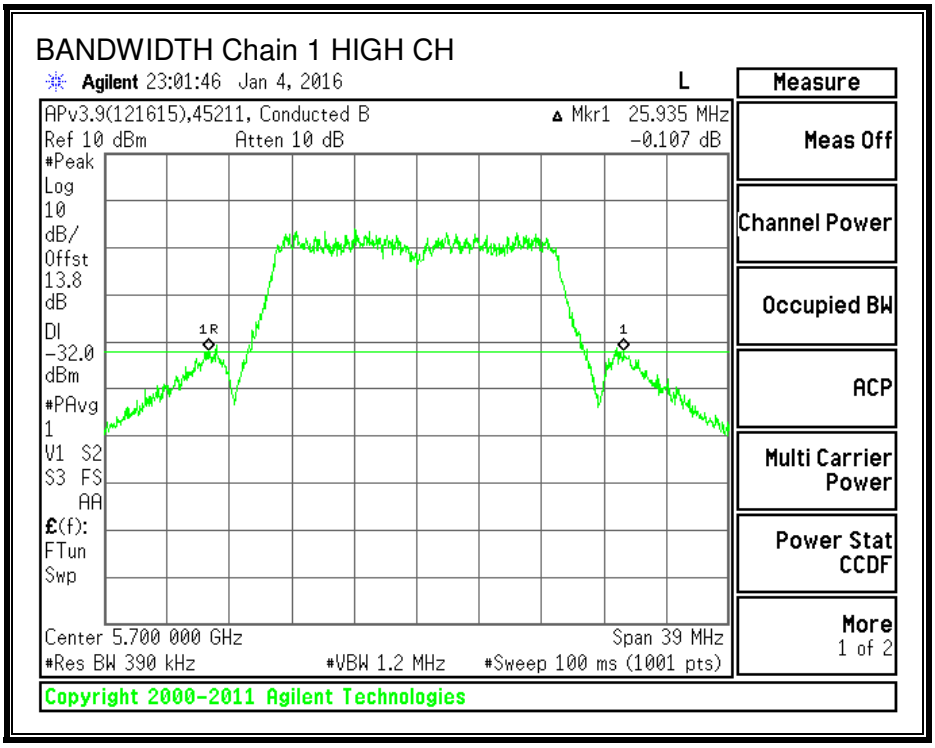




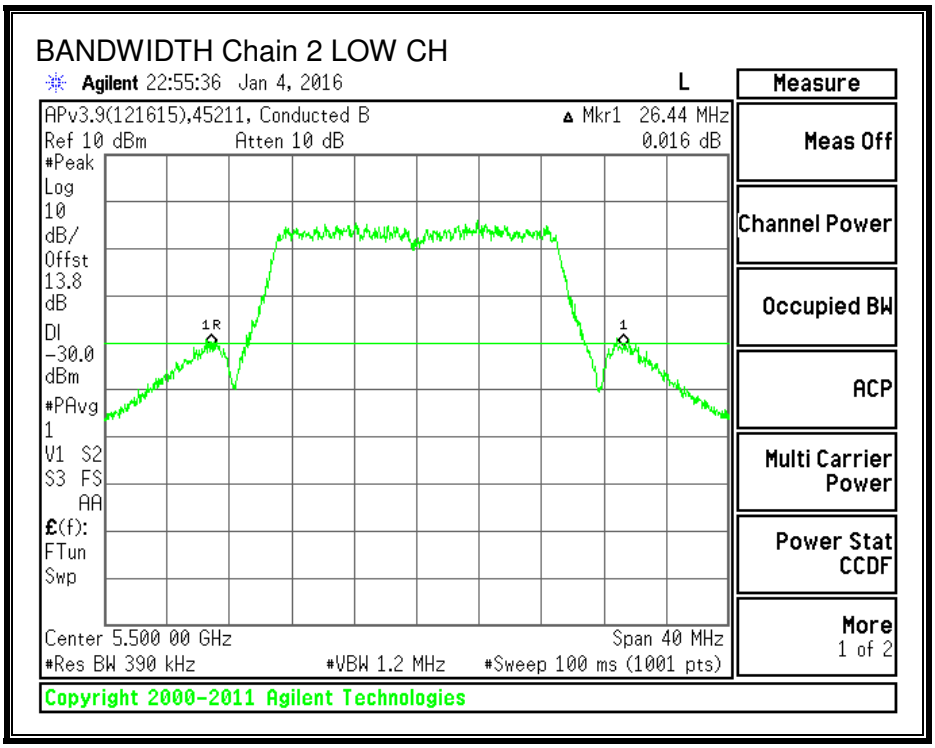
26 dB BANDWIDTH, Chain 1

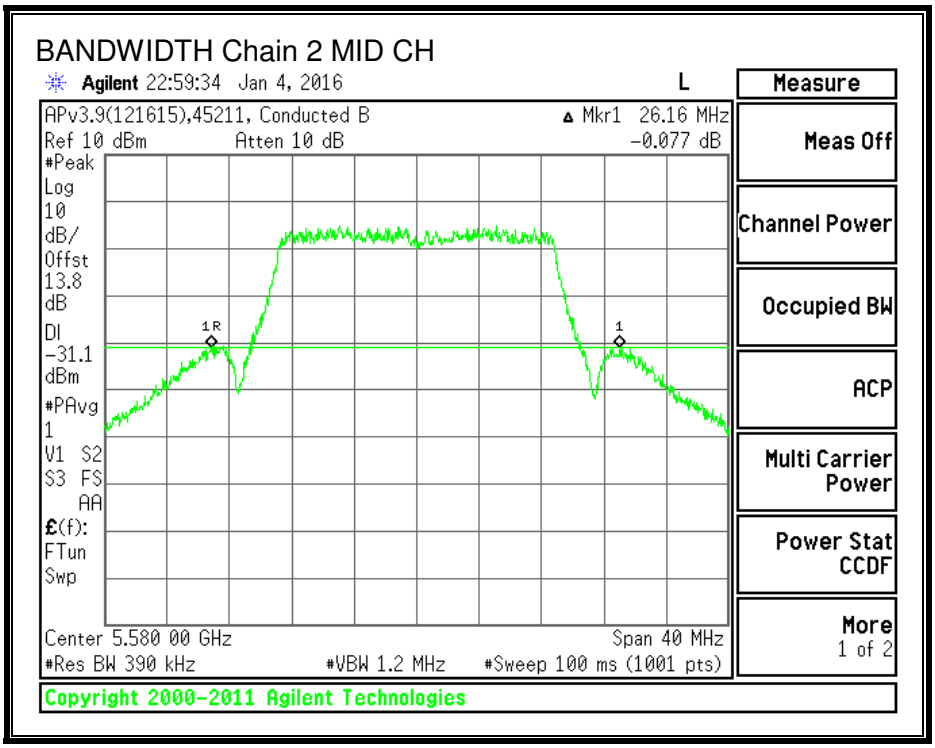


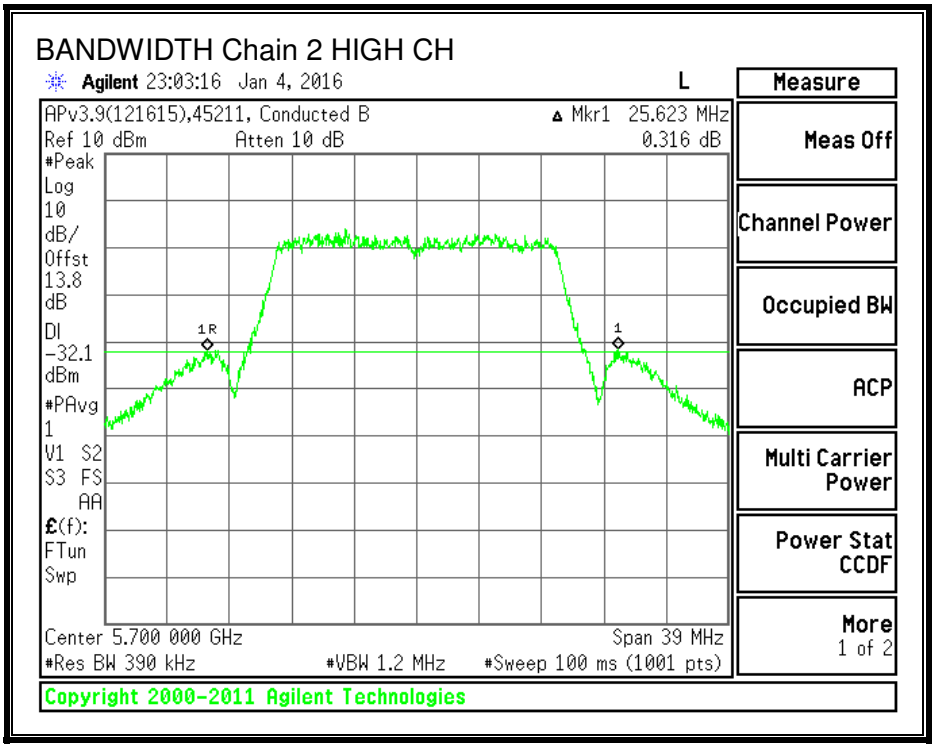




26 dB BANDWIDTH, Chain 2







8.1. 802.11n HT40 CDD 3Tx MODE IN THE 5.6 GHz BAND

8.1.1. 26 dB BANDWIDTH

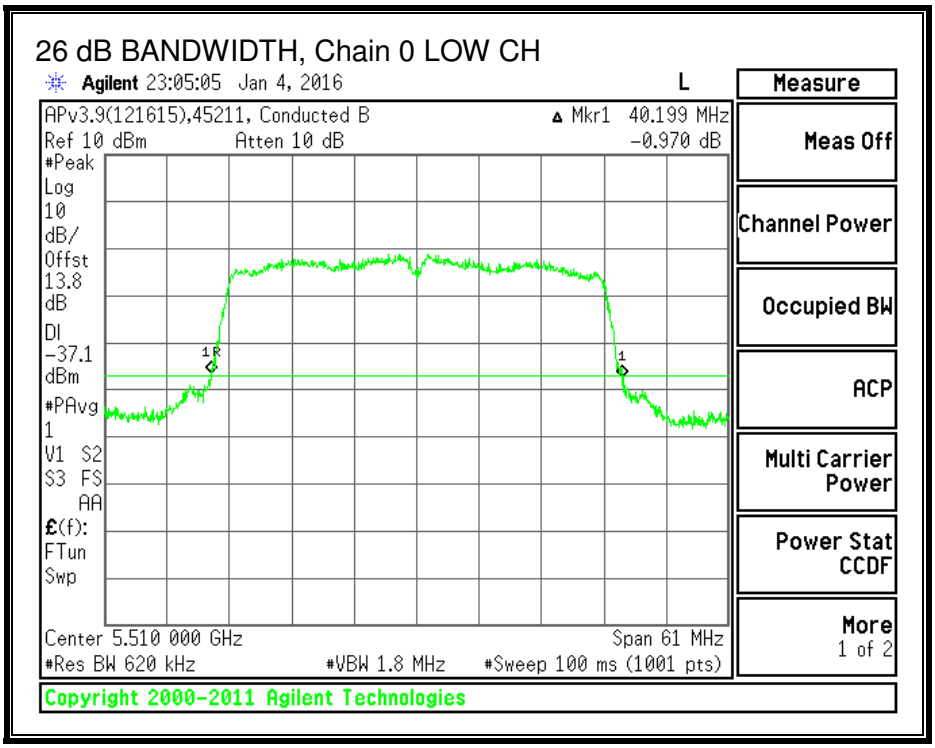
LIMITS

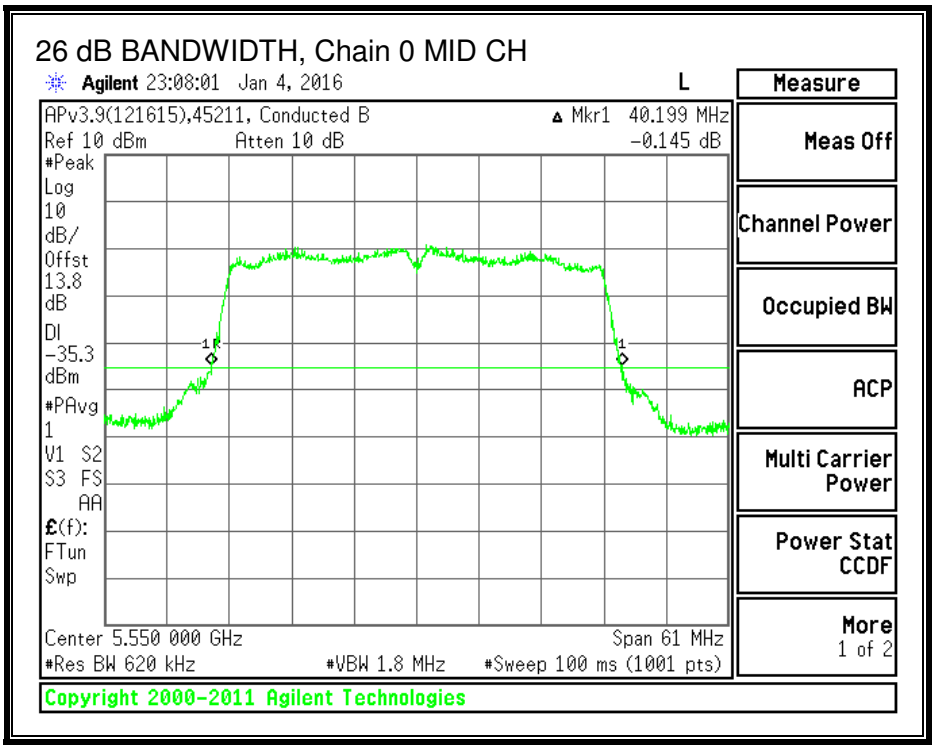
None; for reporting purposes only.

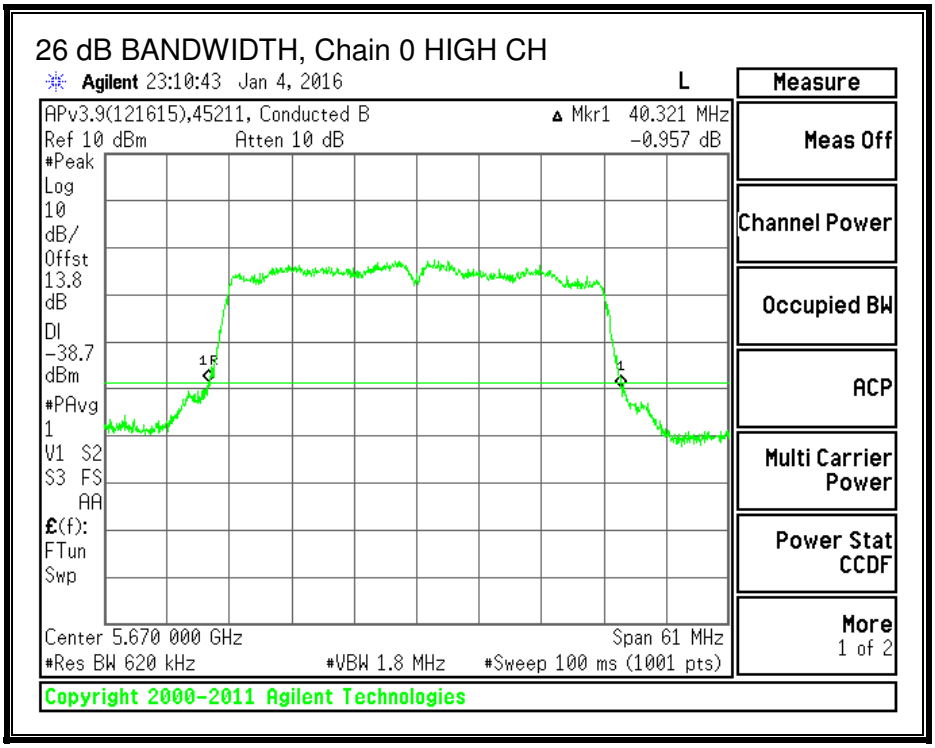
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5510	40.199	39.540	39.720
Mid	5550	40.199	39.480	39.900
High	5670	40.321	39.660	39.840

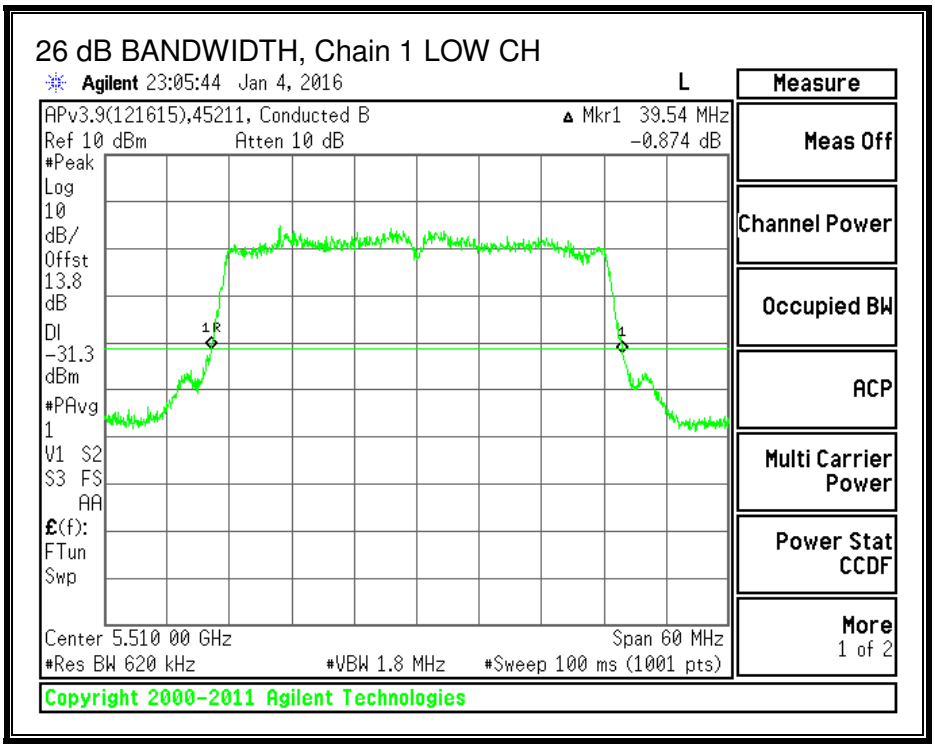
26 dB BANDWIDTH, Chain 0

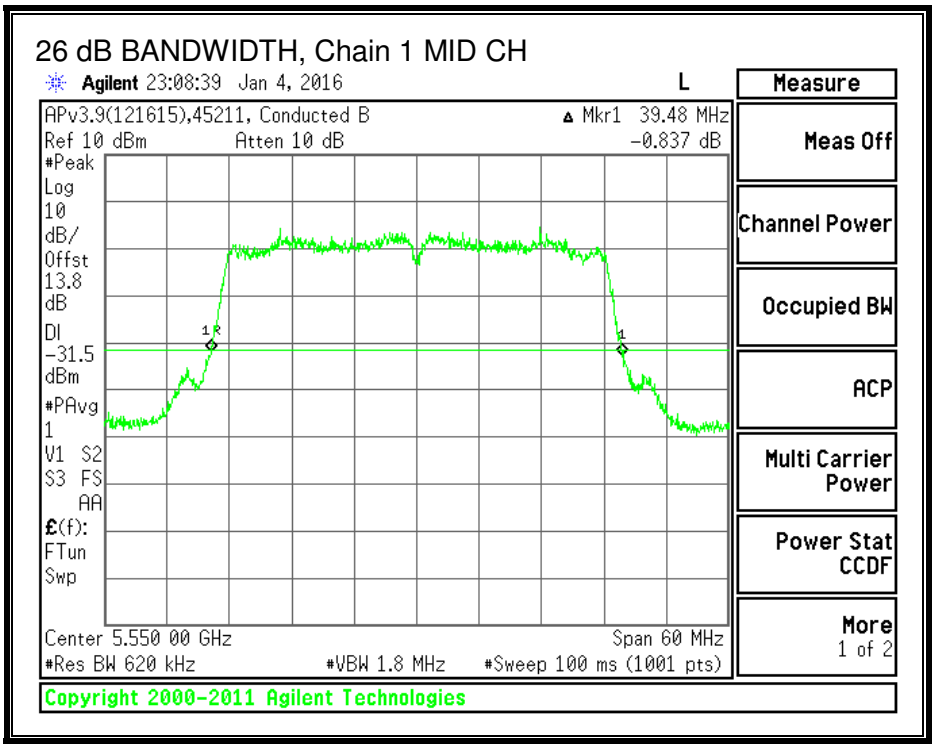


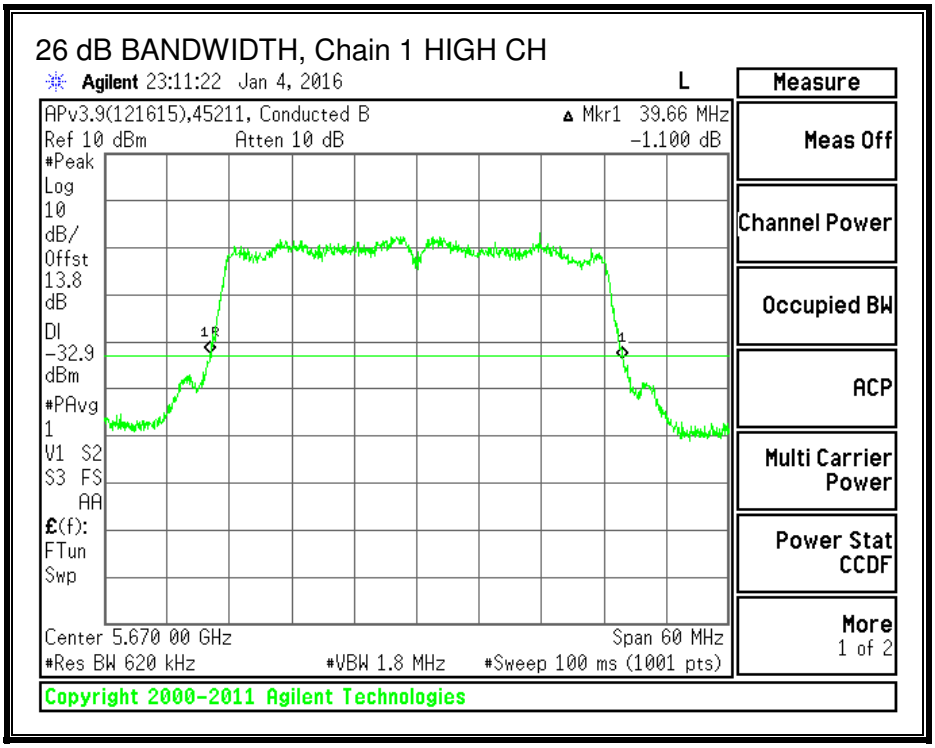




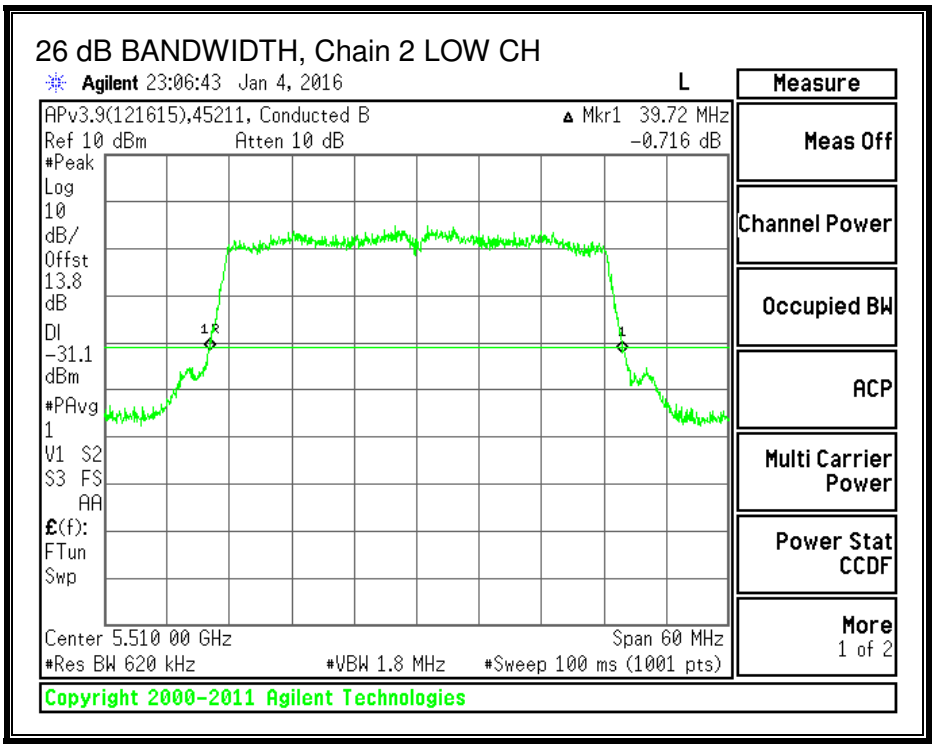
26 dB BANDWIDTH, Chain 1

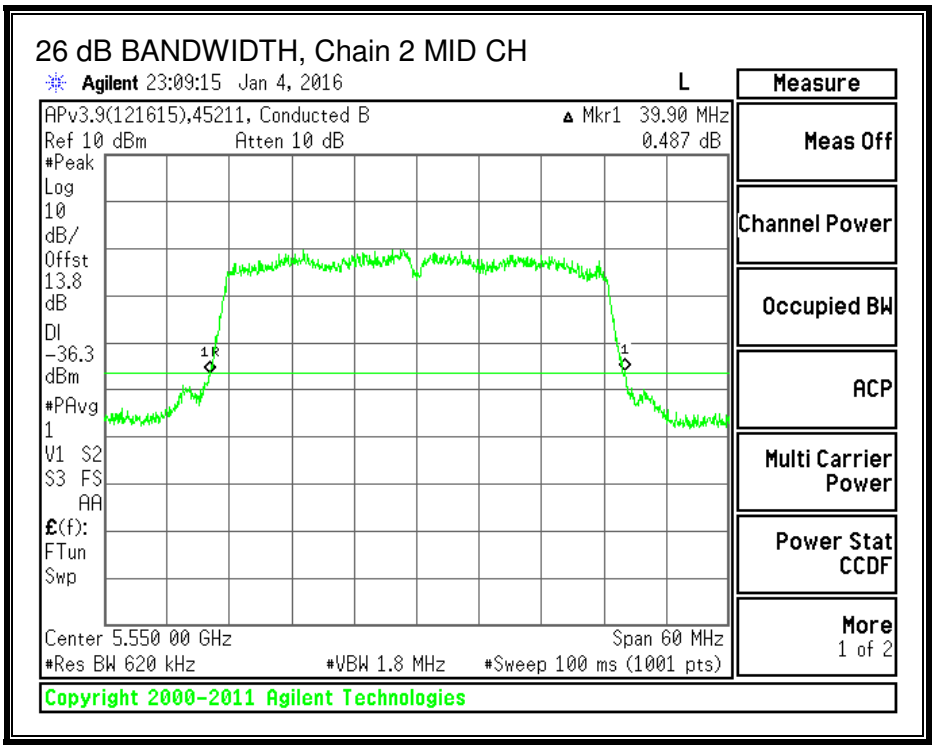


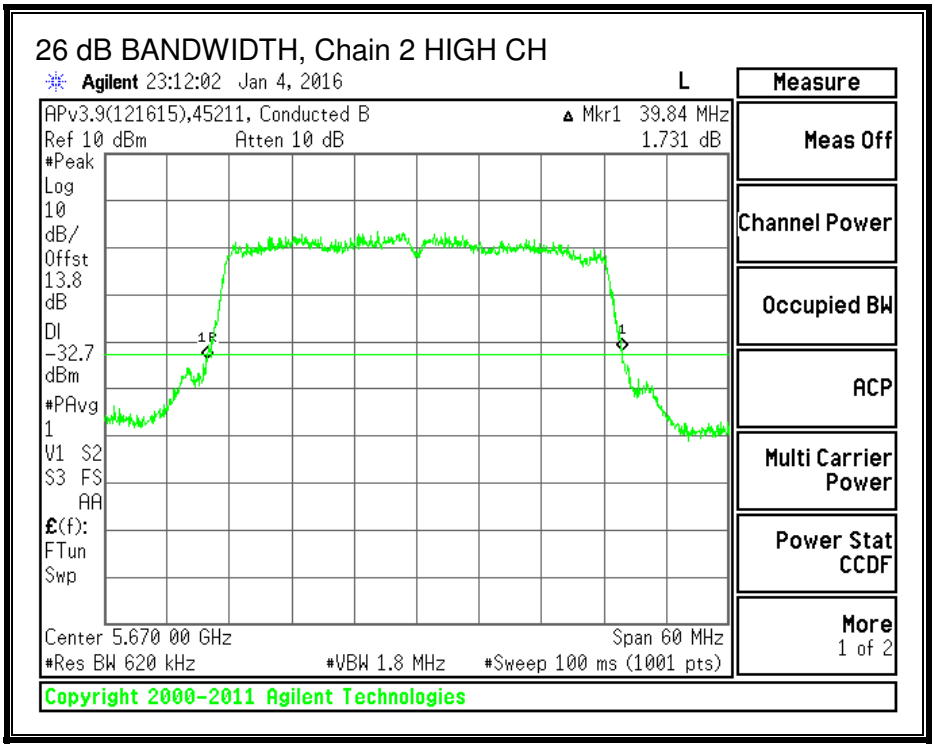




26 dB BANDWIDTH, Chain 2







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

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

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	5.92	30.00
153	5765	5.92	30.00
High	5825	5.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.92	14.92	30.00	-15.08
153	5765	14.90	14.90	30.00	-15.10
High	5825	14.97	14.97	30.00	-15.03

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 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

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

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	5.93	30.00
153	5765	5.93	30.00
High	5825	5.93	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.92	14.92	30.00	-15.08
153	5765	14.92	14.92	30.00	-15.08
High	5825	14.93	14.93	30.00	-15.07

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

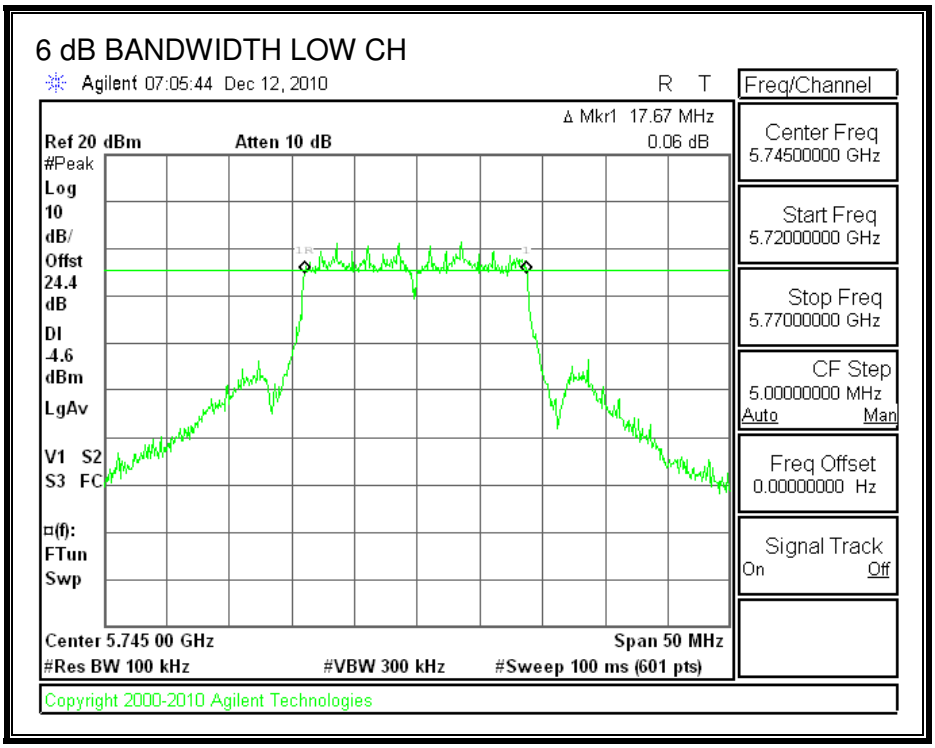
FCC §15.247 (a) (2)

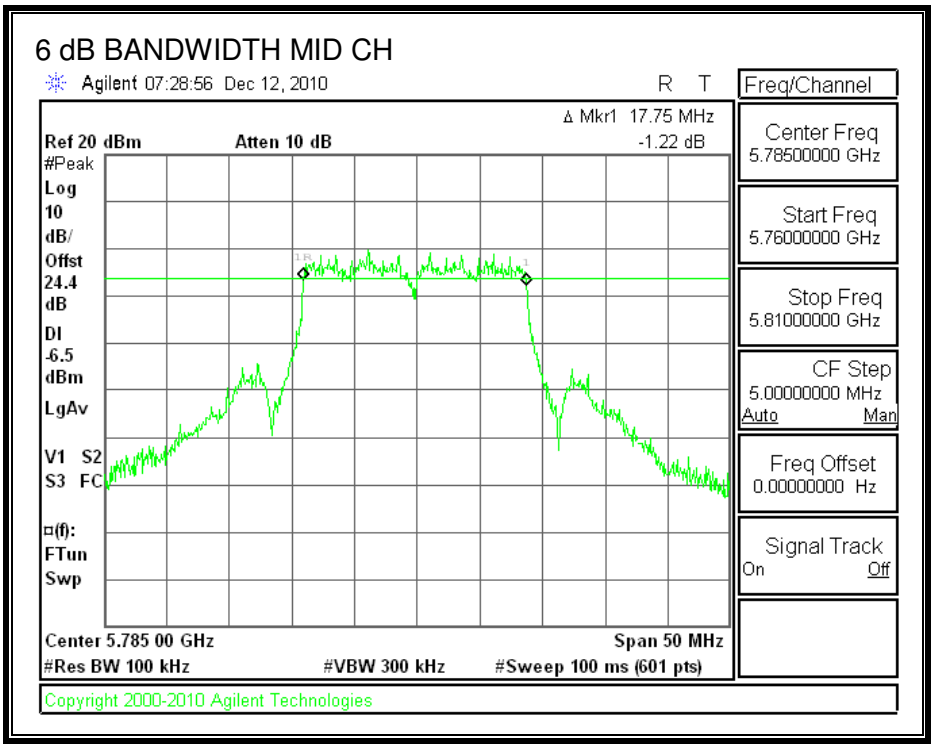
The minimum 6 dB bandwidth shall be at least 500 kHz.

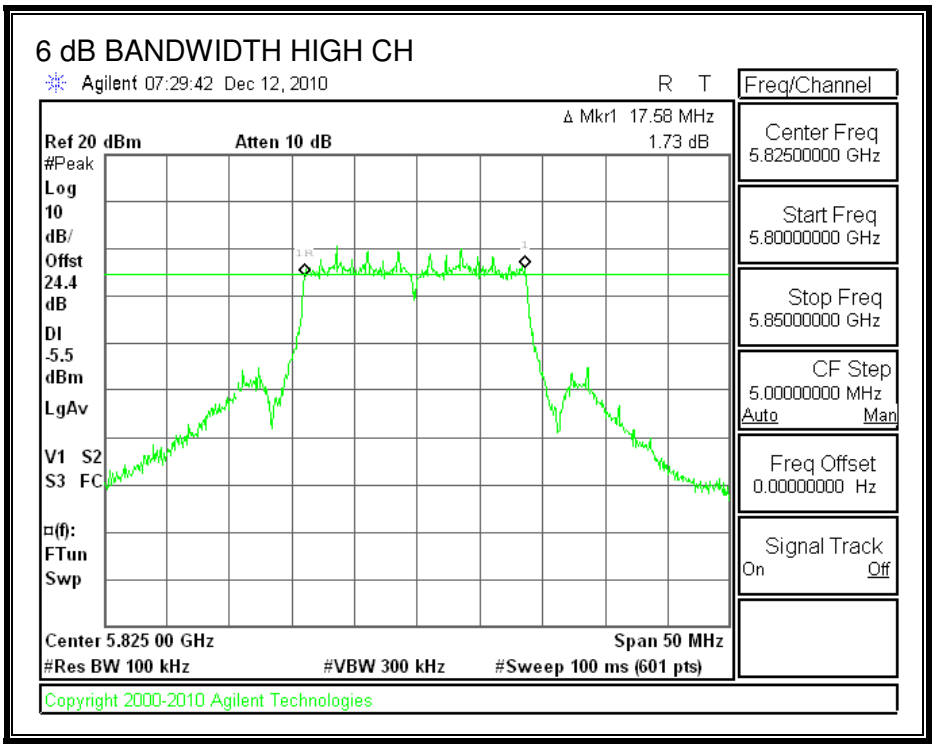
RESULTS

Channel	Frequency (MHz)	6 dB BW (MHz)	Minimum Limit (MHz)
Low	5745	17.67	0.5
Middle	5785	17.75	0.5
High	5825	17.58	0.5

6 dB BANDWIDTH







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)
7.25	6.22	5.92	6.50

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5745	6.50	29.50
Mid	5785	6.50	29.50
High	5825	6.50	29.50

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	12.60	11.80	12.70	17.16	29.50	-12.34
Mid	5785	14.30	14.12	14.90	19.22	29.50	-10.28
High	5825	14.49	14.15	14.91	19.30	29.50	-10.20

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)
7.25	6.22	5.92	11.25

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	11.25	24.75
Mid	5785	11.25	24.75
High	5825	11.25	24.75

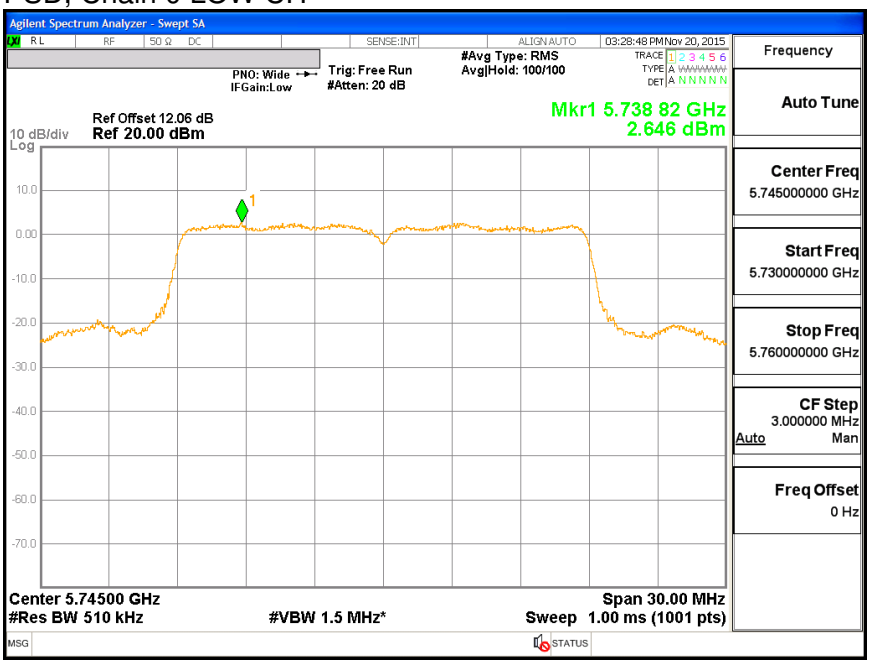
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

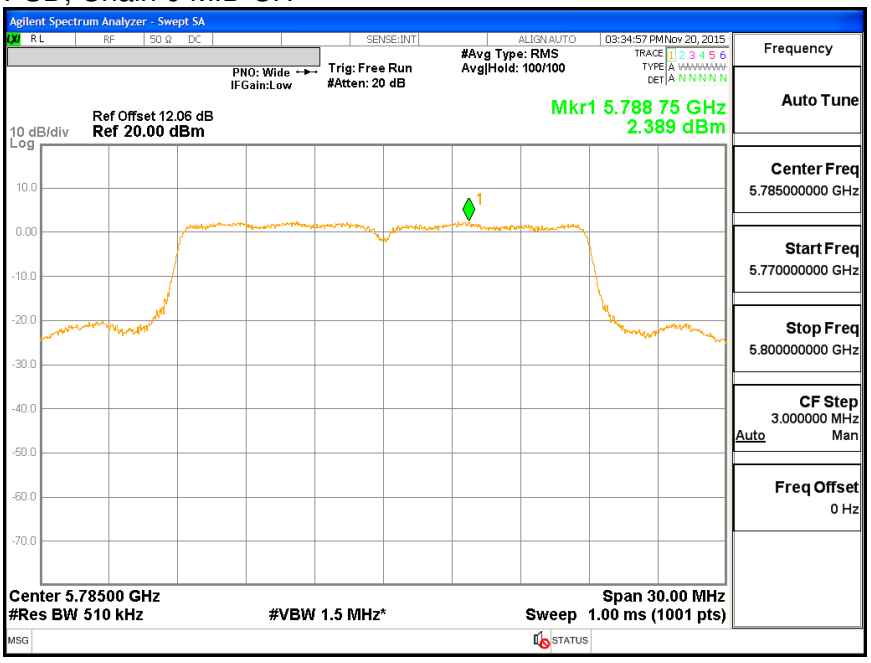
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	2.65	2.70	3.34	7.68	24.75	-17.07
Mid	5785	2.39	2.60	3.45	7.61	24.75	-17.14
High	5825	2.59	2.31	3.36	7.55	24.75	-17.20

PSD, Chain 0

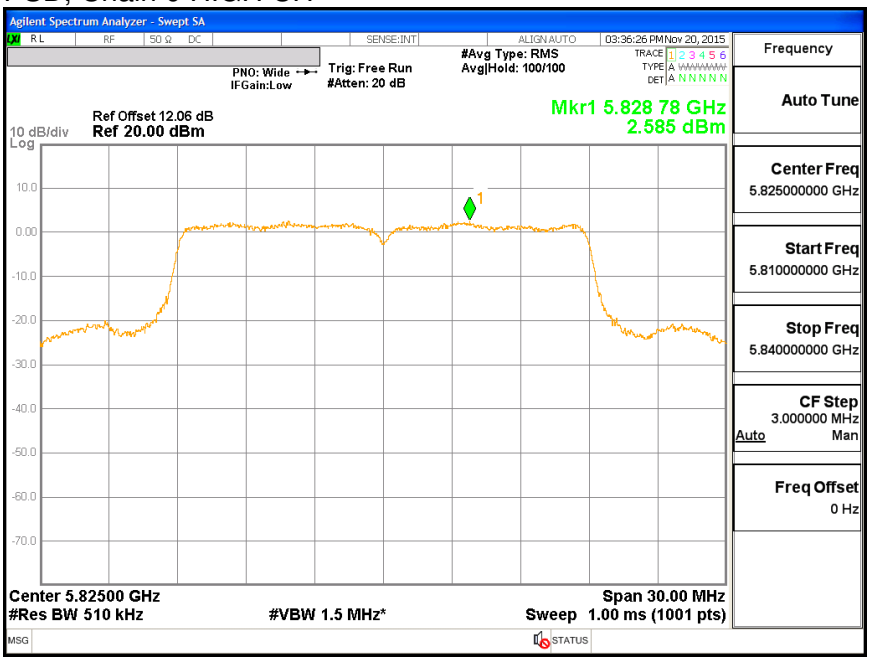
PSD, Chain 0 LOW CH



PSD, Chain 0 MID CH

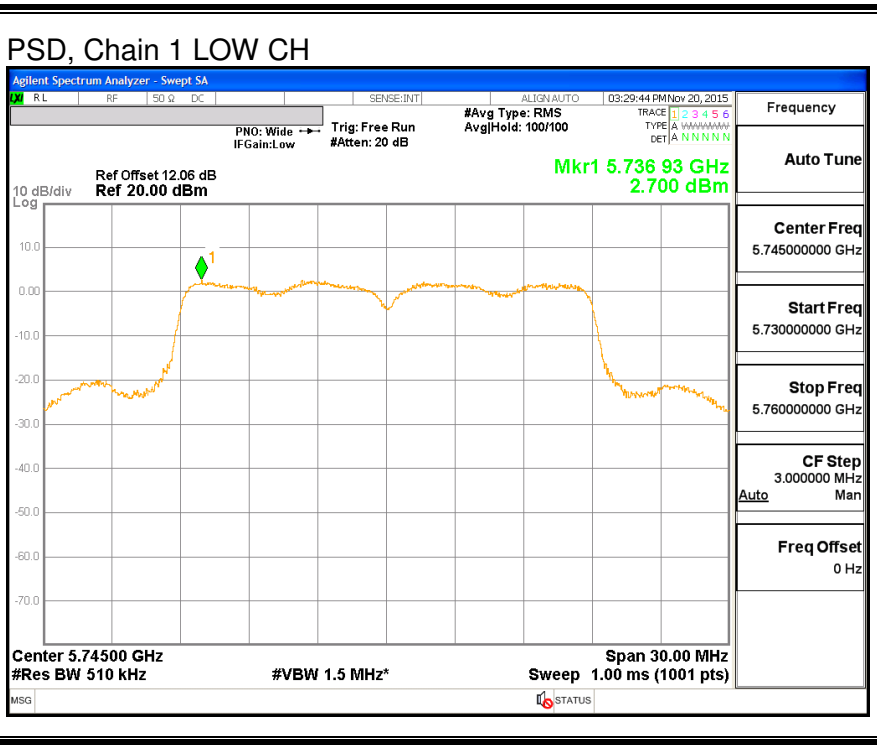


PSD, Chain 0 HIGH CH

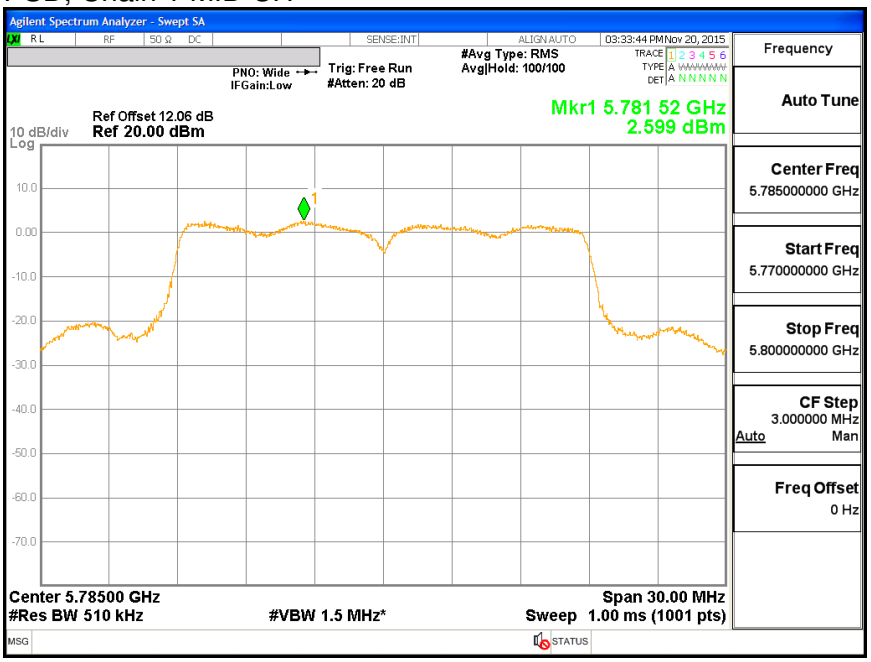


PSD, Chain 1

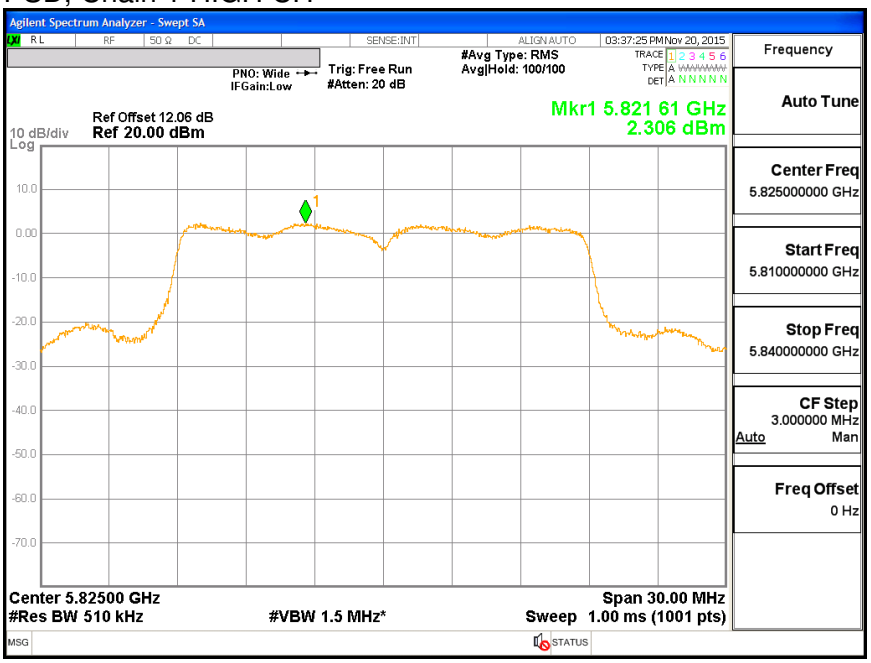
PSD, Chain 1 LOW CH



PSD, Chain 1 MID CH

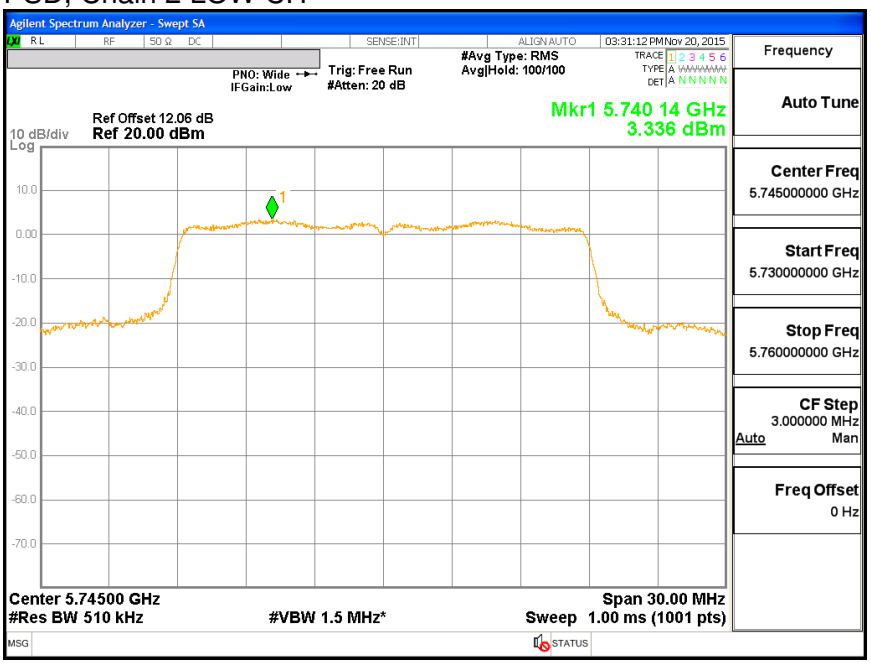


PSD, Chain 1 HIGH CH

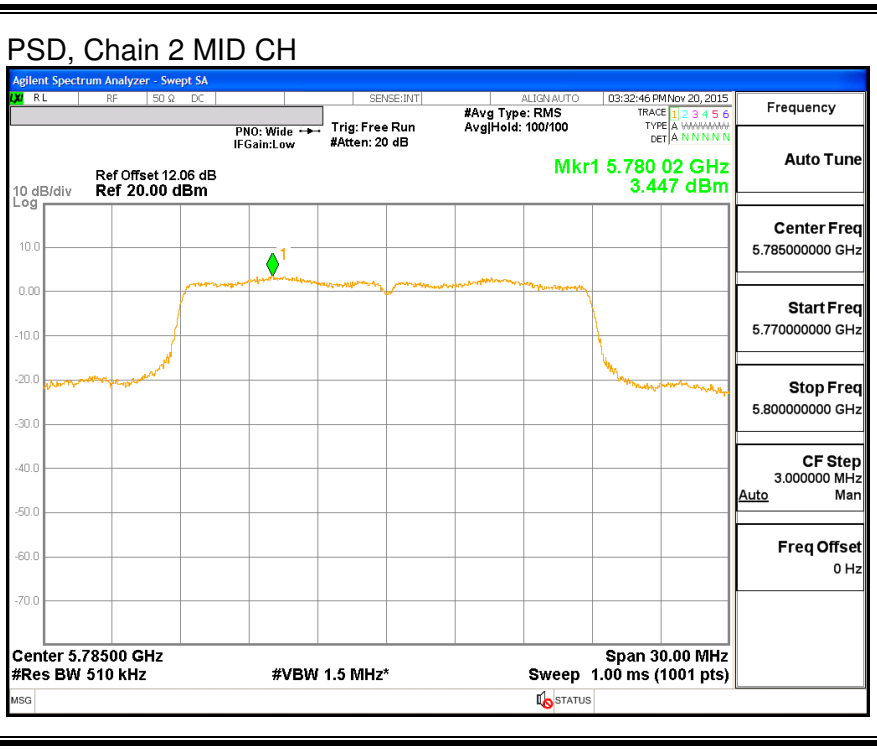


PSD, Chain 2

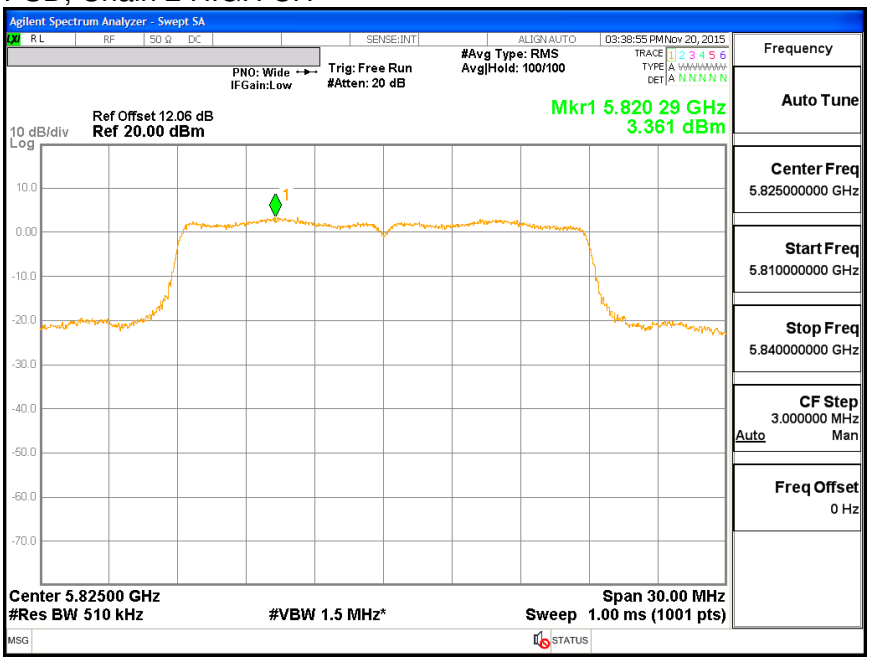
PSD, Chain 2 LOW CH



PSD, Chain 2 MID CH



PSD, Chain 2 HIGH CH



8.5. 802.11n HT40 SISO 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

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

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	5.92	30.00
High	5795	5.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	12.41	12.41	30.00	-17.59

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 CDD 3Tx MODE IN THE 5.8 GHz BAND

8.6.1. 6 dB BANDWIDTH

LIMITS

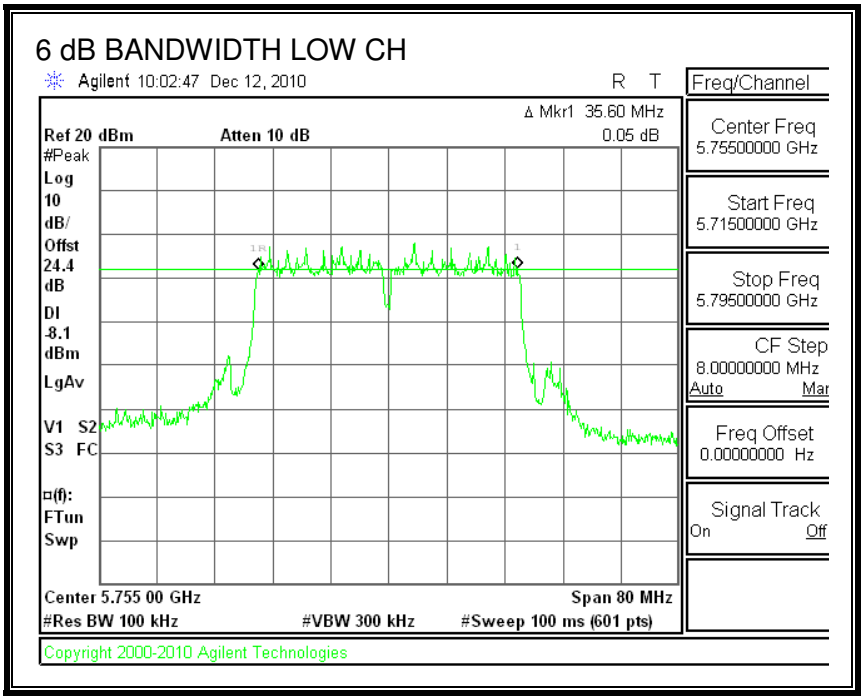
FCC §15.247 (a) (2)

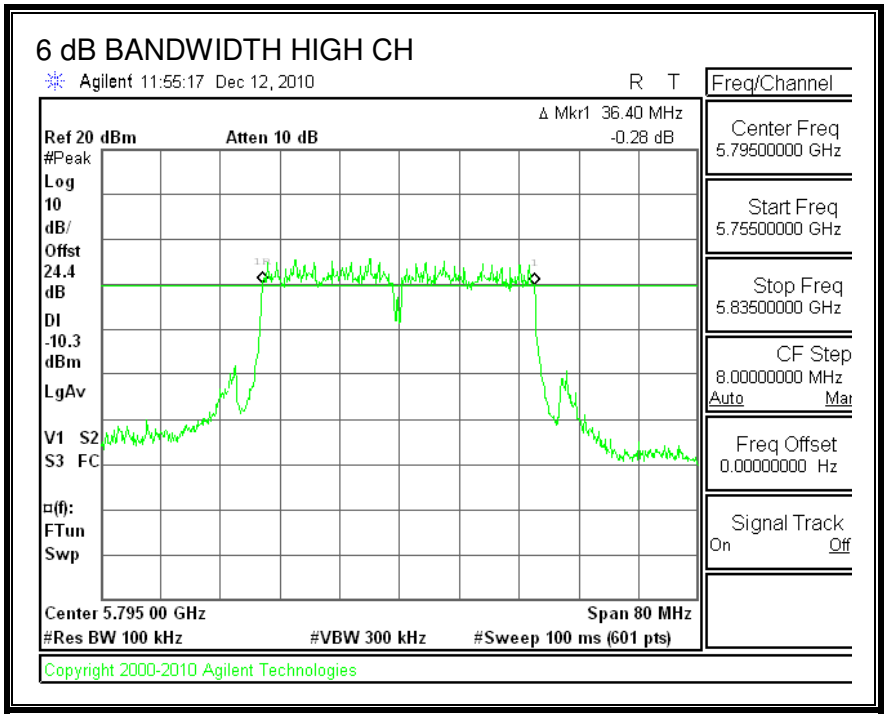
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB BW (MHz)	Minimum Limit (MHz)
Low	5755	35.60	0.5
High	5795	36.40	0.5

6 dB BANDWIDTH





8.6.2. 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)
7.25	6.22	5.92	6.50

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	6.50	29.50
High	5795	6.50	29.50

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	10.50	10.40	10.60	15.27	29.50	-14.23
High	5795	14.55	14.33	14.90	19.37	29.50	-10.13

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.

8.6.3. 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)
7.25	6.22	5.92	11.25

RESULTS

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5755	11.25	24.75
High	5795	11.25	24.75

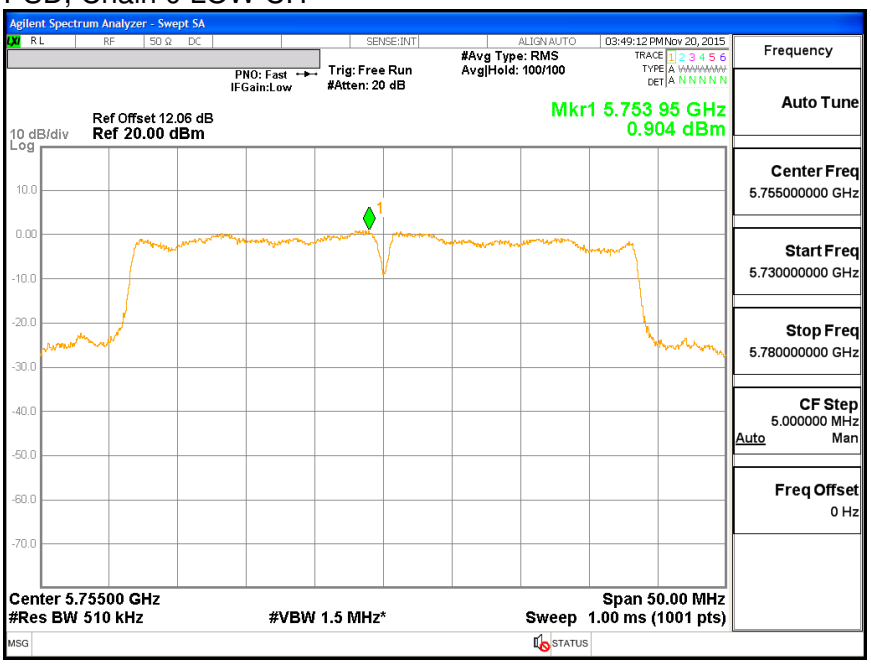
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PPSD Results

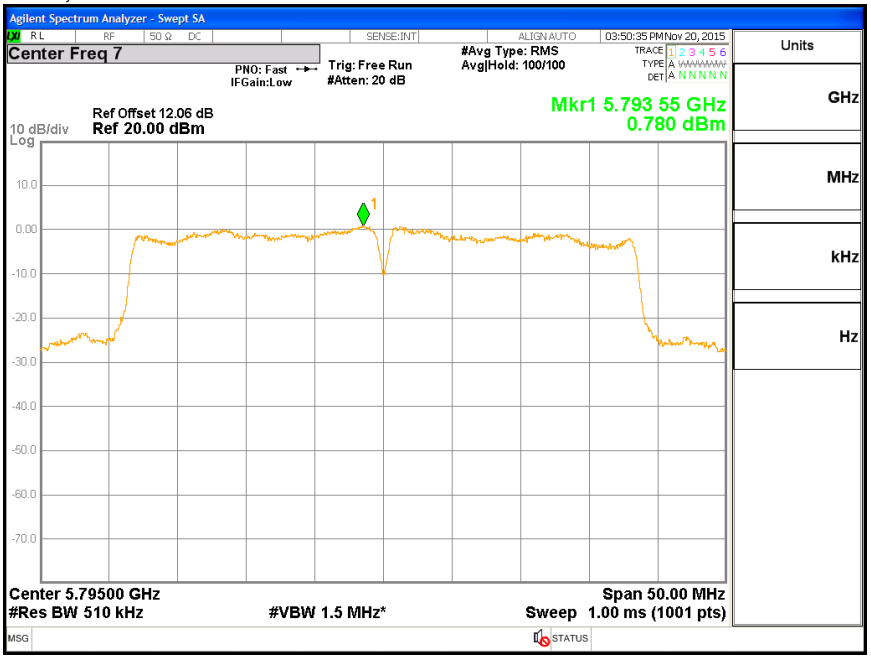
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	0.90	0.82	1.06	5.70	24.75	-19.05
High	5795	0.78	0.87	1.13	5.70	24.75	-19.05

PSD, Chain 0

PSD, Chain 0 LOW CH

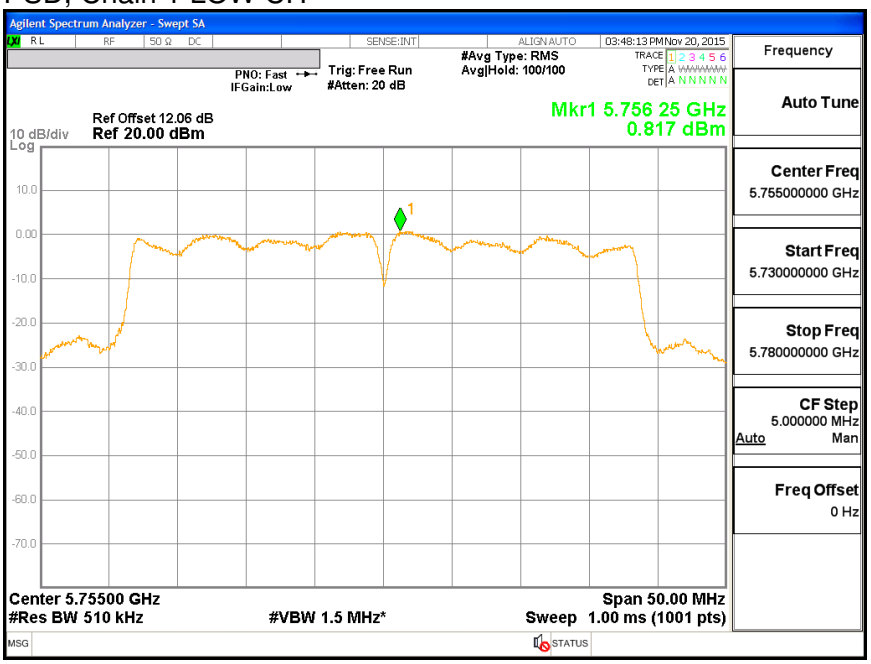


PSD, Chain 0 HIGH CH

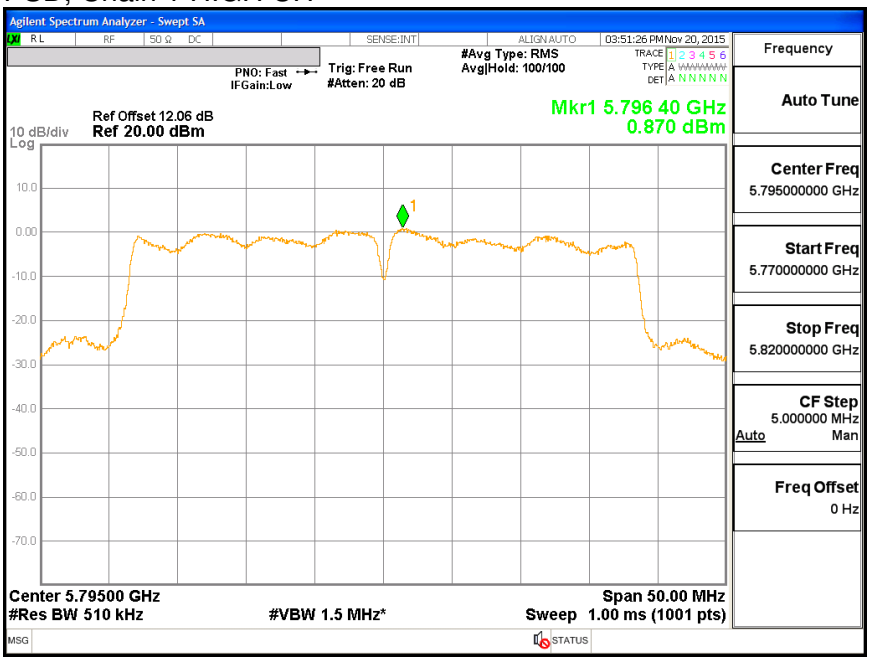


PSD, Chain 1

PSD, Chain 1 LOW CH

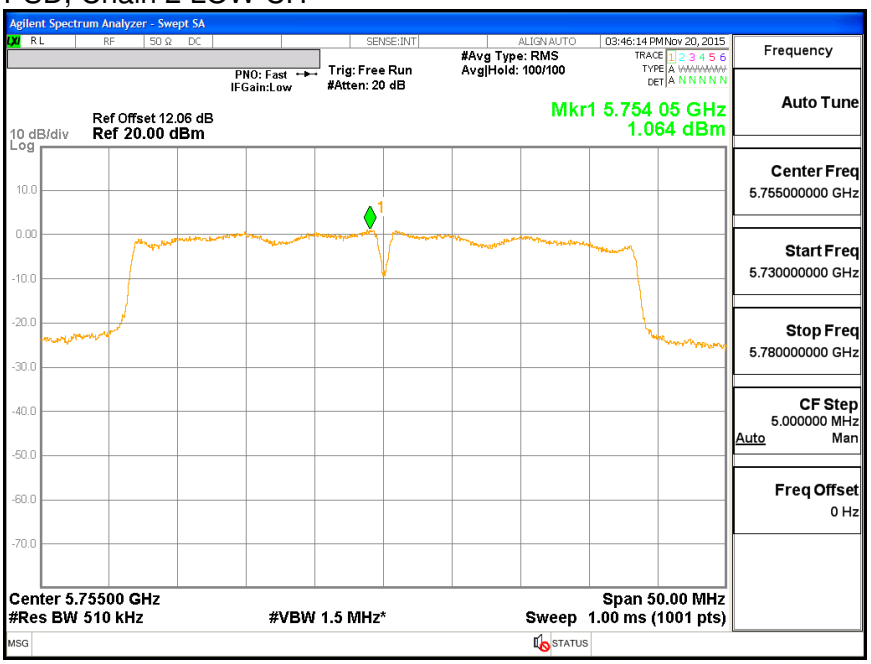


PSD, Chain 1 HIGH CH

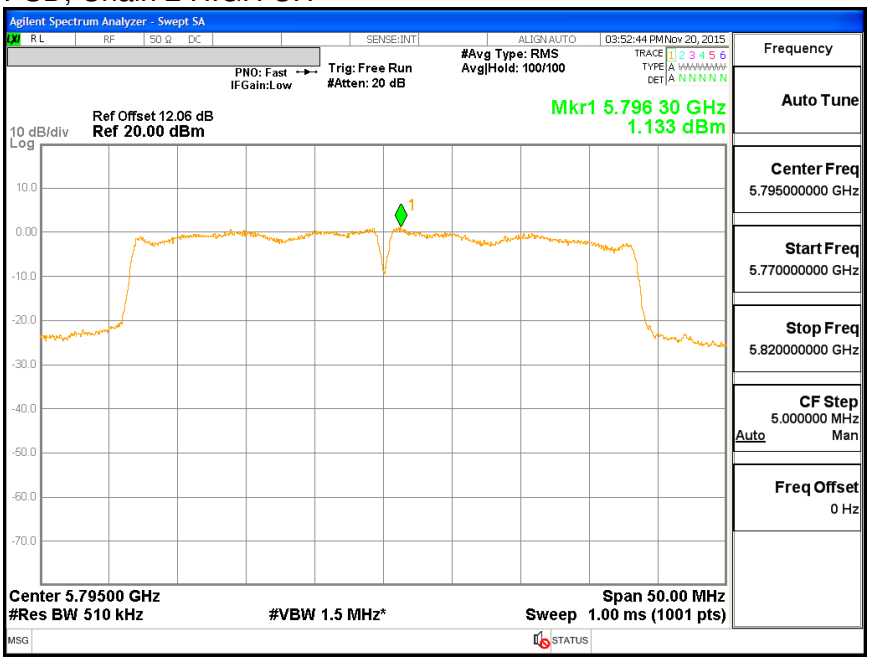


PSD, Chain 2

PSD, Chain 2 LOW CH



PSD, Chain 2 HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

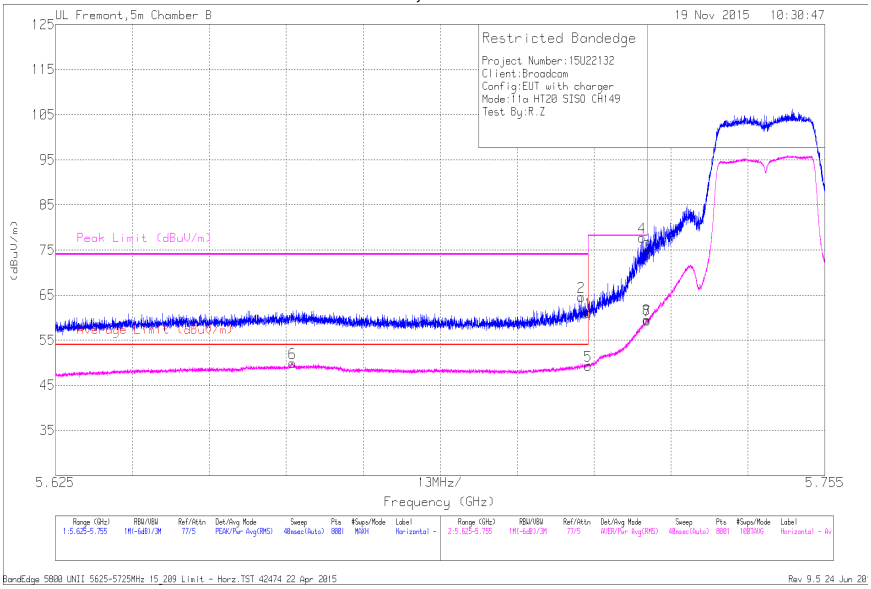
FCC §15.205 and §15.209

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, CH149)

LOW CHANNEL RESTRICTED, HORIZONTAL

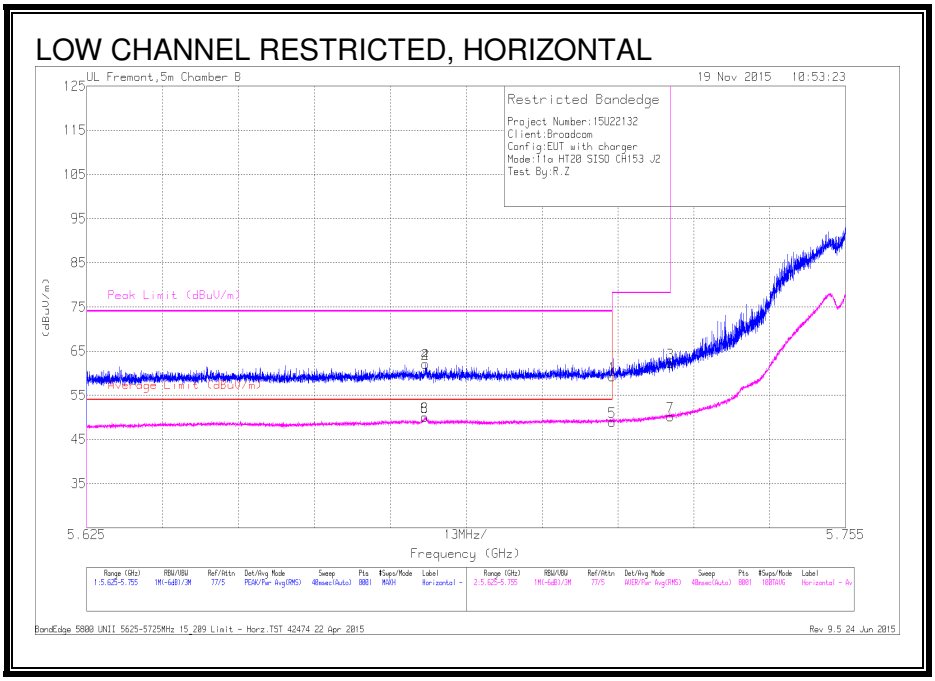


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	5.665	7.72	RMS	34.9	7.3	49.92	54	-4.08	-	-	178	394	H
2	5.714	22.25	Pk	35	7.3	64.55	-	-	74	-9.45	178	394	H
1	5.715	18.84	Pk	35	7.3	61.14	-	-	74	-12.86	178	394	H
5	5.715	7.04	RMS	35	7.3	49.34	54	-4.66	-	-	178	394	H
4	5.724	35.29	Pk	35	7.4	77.69	-	-	78.2	-.51	178	394	H
3	5.725	31.51	Pk	35	7.4	73.91	-	-	78.2	-4.29	178	394	H
7	5.725	16.96	RMS	35	7.4	59.36	-	-	-	-	178	394	H
8	5.725	17.2	RMS	35	7.4	59.6	-	-	-	-	178	394	H

Pk - Peak detector
RMS - RMS detection

RESTRICTED BANDEDGE (LOW CHANNEL, CH153)



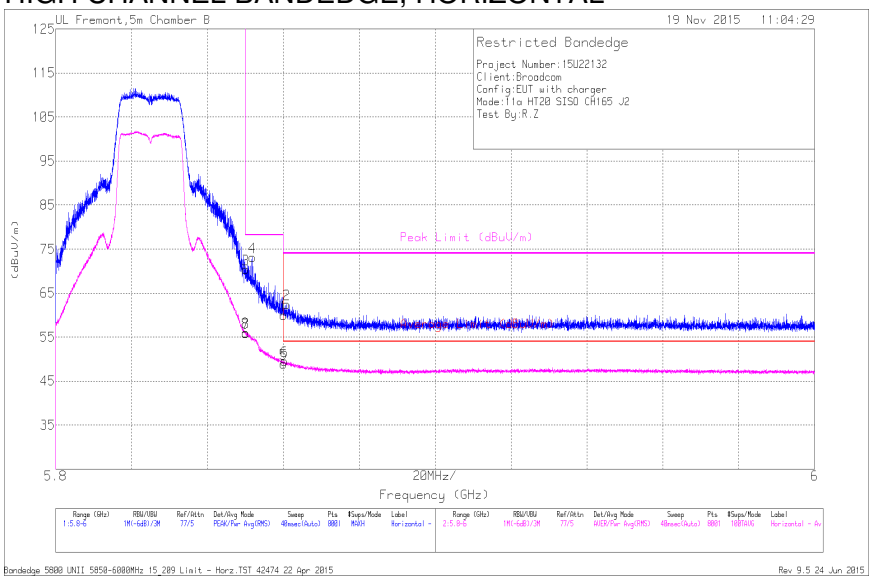
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.683	19.74	Pk	34.9	7.4	62.04	-	-	74	-11.96	175	365	H
8	5.683	7.7	RMS	34.9	7.4	50	54	-4	-	-	175	365	H
1	5.715	16.97	Pk	35	7.3	59.27	-	-	74	-14.73	175	365	H
5	5.715	6.57	RMS	35	7.3	48.87	54	-5.13	-	-	175	365	H
3	5.725	19.81	Pk	35	7.4	62.21	-	-	78.2	-15.99	175	365	H

Pk - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



Trace Markers

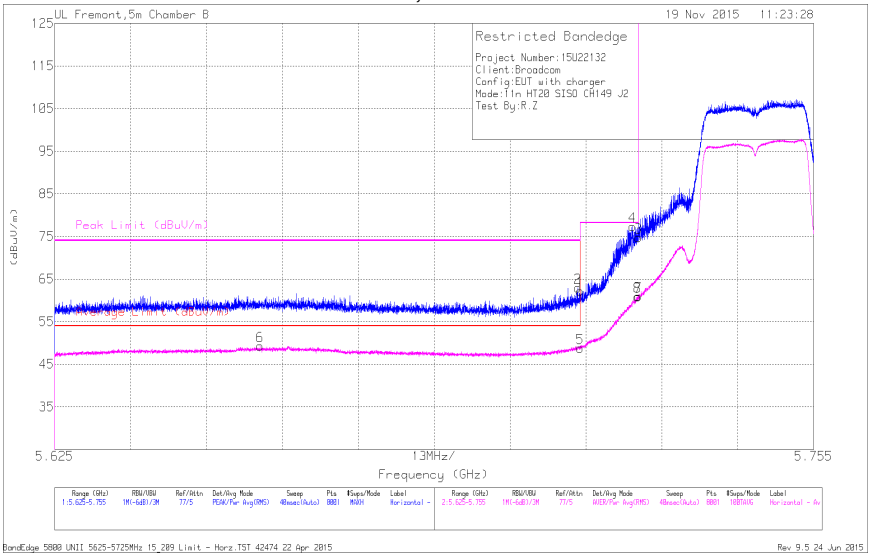
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	5.85	27.49	Pk	35.4	7.5	70.39	-	-	78.2	-7.81	179	390	H
4	5.852	30.33	Pk	35.4	7.4	73.13	-	-	78.2	-5.07	179	390	H
1	5.86	17.03	Pk	35.4	7.5	59.93	-	-	74	-14.07	179	390	H
5	5.86	6.03	RMS	35.4	7.5	48.93	54	-5.07	-	-	179	390	H
2	5.861	19.52	Pk	35.4	7.5	62.42	-	-	74	-11.58	179	390	H
6	5.86	6.69	RMS	35.4	7.5	49.59	54	-4.41	-	-	179	390	H

Pk - Peak detector
RMS - RMS detection

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

RESTRICTED BANDEDGE (LOW CHANNEL, CH149)

LOW CHANNEL RESTRICTED, HORIZONTAL

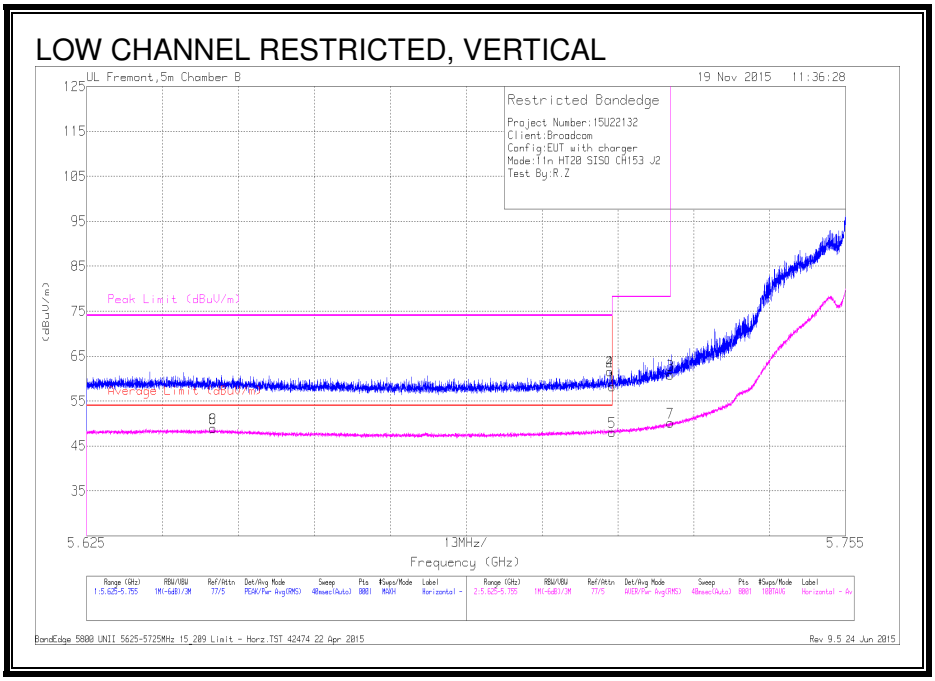


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (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	19.92	Pk	35	7.3	62.22	-	-	74	-11.78	173	398	H
6	5.66	7.05	RMS	34.9	7.3	49.25	54	-4.75	-	-	173	398	H
2	5.715	20.68	Pk	35	7.3	62.98	-	-	74	-11.02	173	398	H
5	5.715	6.52	RMS	35	7.3	48.82	54	-5.18	-	-	173	398	H
4	5.724	34.96	Pk	35	7.4	77.36	-	-	78.2	-.84	173	398	H
3	5.725	32.31	Pk	35	7.4	74.71	-	-	78.2	-3.49	173	398	H

Pk - Peak detector
RMS - RMS detection

RESTRICTED BANDEDGE (LOW CHANNEL, CH153)

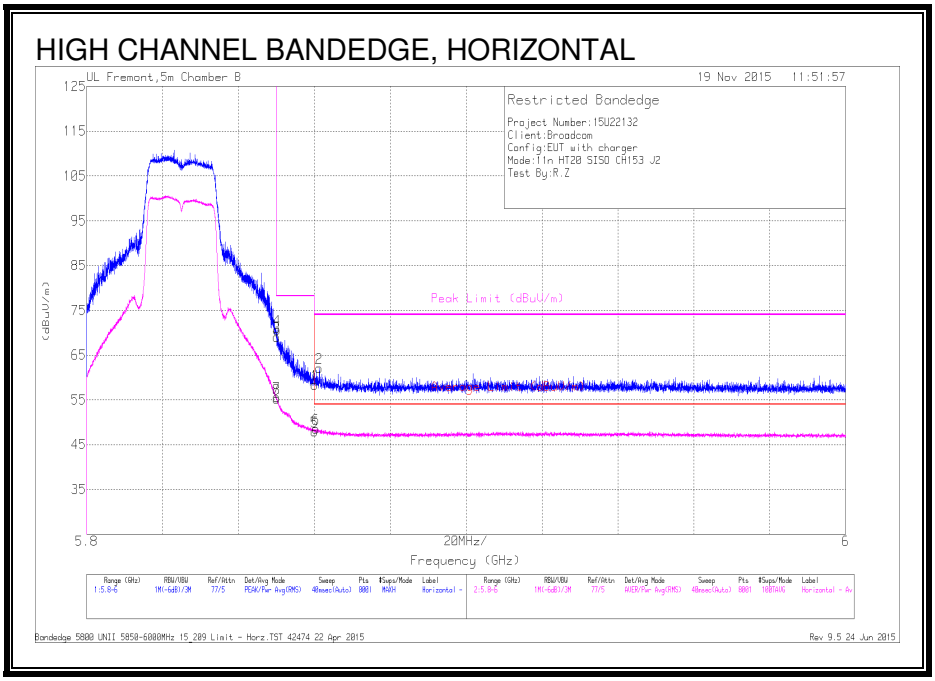


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (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	15.91	Pk	35	7.3	58.21	-	-	74	-15.79	190	402	H
6	5.647	6.88	RMS	34.8	7.3	48.98	54	-5.02	-	-	190	402	H
2	5.715	19.27	Pk	35	7.3	61.57	-	-	74	-12.43	190	402	H
5	5.715	5.81	RMS	35	7.3	48.11	54	-5.89	-	-	190	402	H
3	5.725	18.44	Pk	35	7.4	60.84	-	-	78.2	-17.36	190	402	H

Pk - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)



Trace Markers

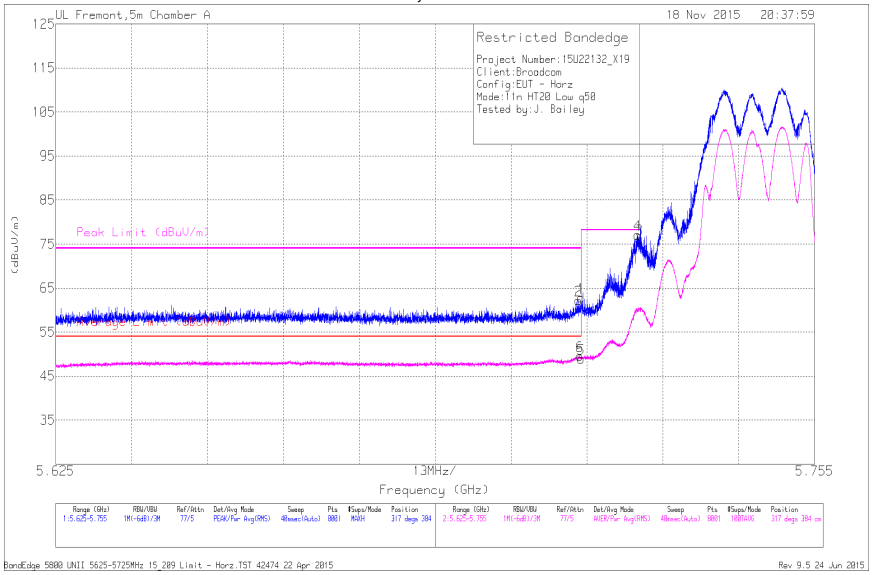
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	5.85	27.81	Pk	35.4	7.5	70.71	-	-	78.2	-7.49	184	372	H
2	5.861	19.17	Pk	35.4	7.5	62.07	-	-	74	-11.93	184	372	H
6	5.86	5.7	RMS	35.4	7.5	48.6	54	-5.4	-	-	184	372	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, CH149)

LOW CHANNEL RESTRICTED, HORIZONTAL



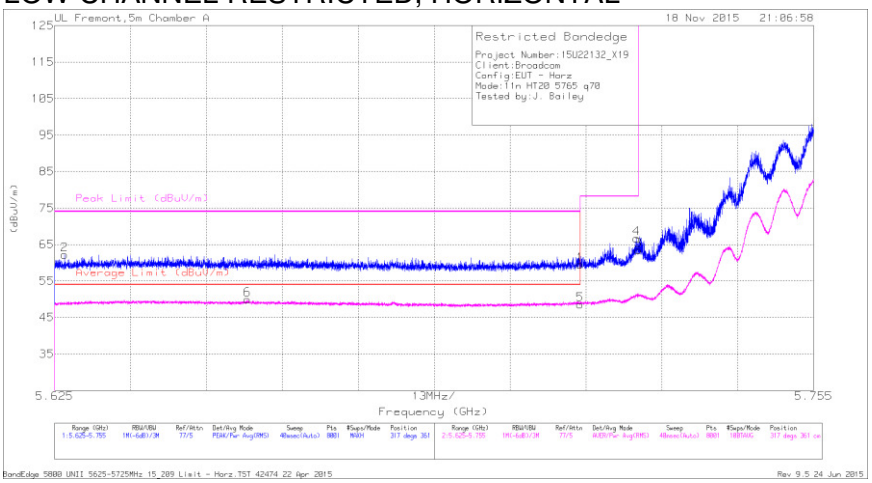
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	20.38	Pk	34.7	7.8	0	62.88	-	-	74	-11.12	317	384	H
6	5.715	7.03	RMS	34.7	7.8	0	49.53	54	-4.47	-	-	317	384	H
4	5.725	34.55	Pk	34.7	7.8	0	77.05	-	-	78.2	-1.15	317	384	H

Pk - Peak detector
RMS - RMS detection

RESTRICTED BANDEDGE (LOW CHANNEL, CH153)

LOW CHANNEL RESTRICTED, HORIZONTAL



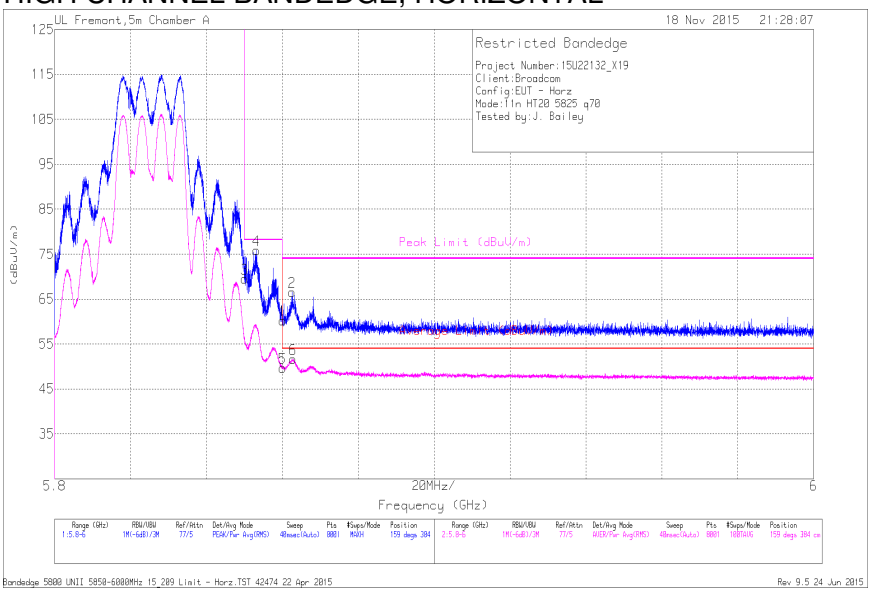
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	5.627	19.93	Pk	34.5	7.8	0	62.23	-	-	74	-11.77	317	361	H
6	5.658	7.67	RMS	34.6	7.7	0	49.97	54	-4.03	-	-	317	361	H
1	5.715	16.93	Pk	34.7	7.8	0	59.43	-	-	74	-14.57	317	361	H
5	5.715	6.01	RMS	34.7	7.8	0	48.51	54	-5.49	-	-	317	361	H
3	5.725	20.98	Pk	34.7	7.8	0	63.48	-	-	78.2	-14.72	317	361	H
4	5.725	24.15	Pk	34.7	7.8	0	66.65	-	-	78.2	-11.55	317	361	H

Pk - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



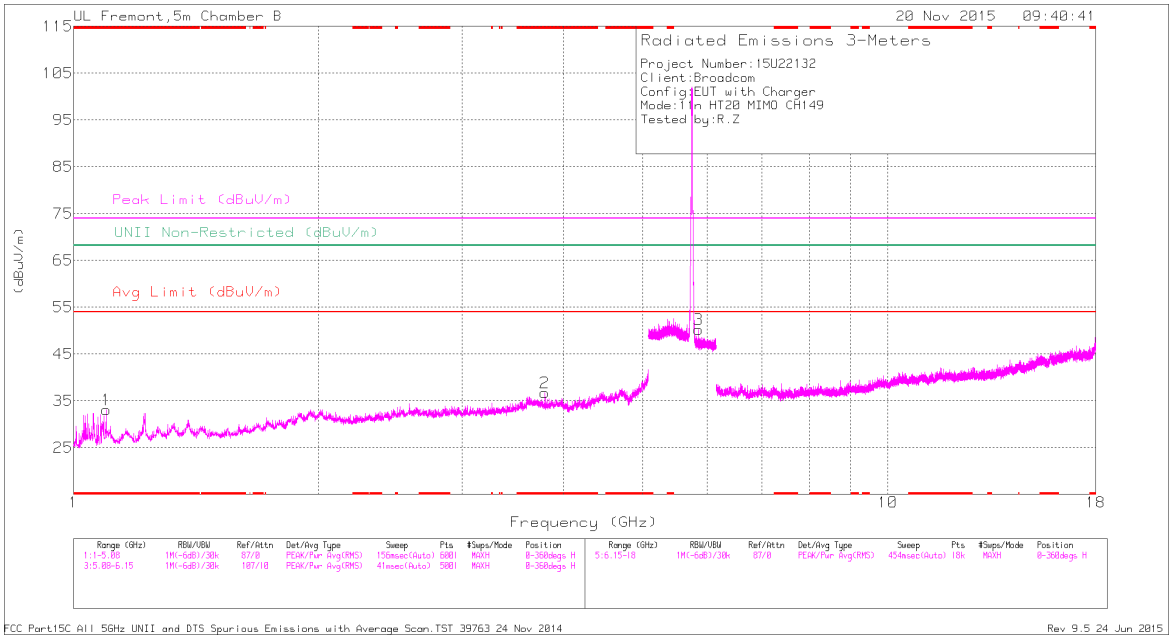
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	26.5	Pk	35.1	7.9	0	69.5	-	-	78.2	-8.7	159	384	H
4	5.853	32.91	Pk	35.1	7.9	0	75.91	-	-	78.2	-2.29	159	384	H
1	5.86	17.23	Pk	35.1	7.9	0	60.23	-	-	74	-13.77	159	384	H
5	5.86	6.68	RMS	35.1	7.9	0	49.68	54	-4.32	-	-	159	384	H
2	5.863	23.58	Pk	35.1	7.9	0	66.58	-	-	74	-7.42	159	384	H
6	5.863	8.66	RMS	35.1	7.9	0	51.66	54	-2.34	-	-	159	384	H

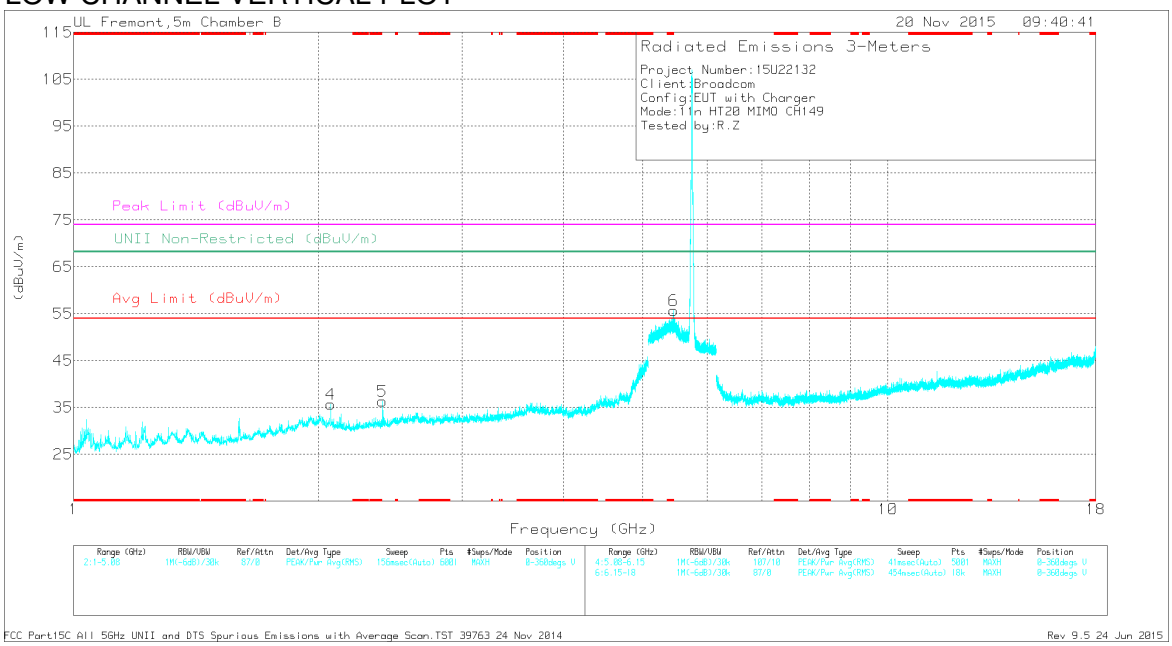
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



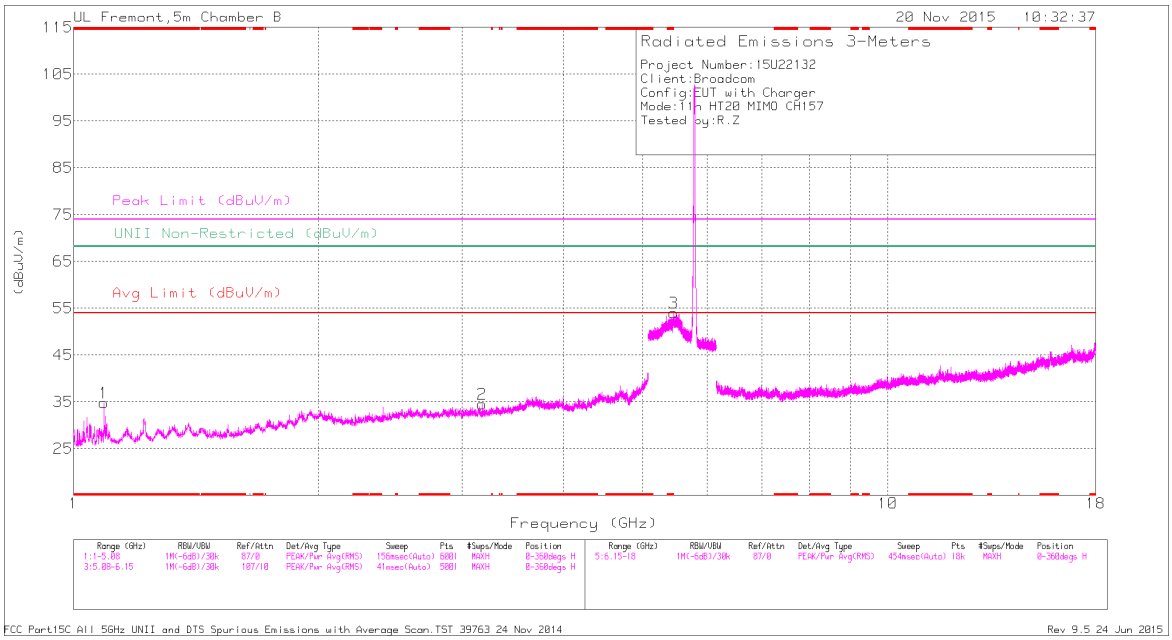
DATA

Trace Markers

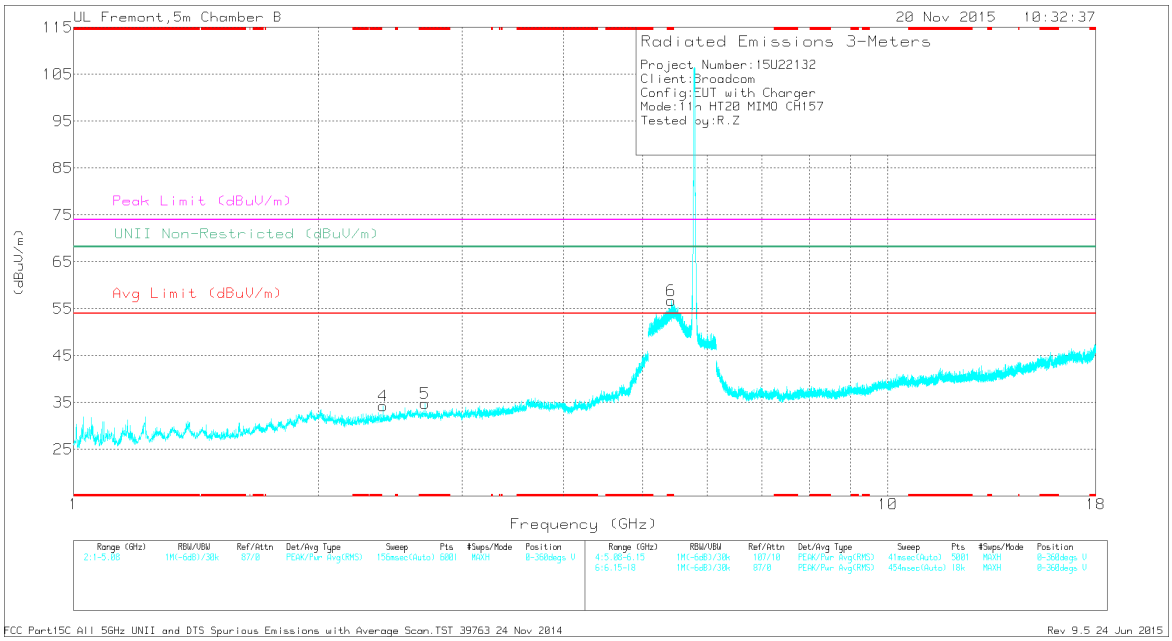
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.095	51.74	PK-U	27.6	-35.6	43.74	-	-	74	-30.26	-	-	84	146	H
	* 1.096	32.64	ADR	27.6	-35.6	24.64	54	-29.64	-	-	-	-	84	146	H
2	* 3.794	42.15	PK-U	33.3	-32.9	42.55	-	-	74	-31.45	-	-	356	383	H
	* 3.792	30.42	ADR	33.3	-32.9	30.82	54	-23.18	-	-	-	-	356	383	H
6	* 5.458	48.54	PK-U	34.5	-20.1	62.94	-	-	74	-11.06	-	-	217	103	V
	* 5.459	36.26	ADR	34.5	-20.3	50.46	54	-30.16	-	-	-	-	217	103	V
4	2.069	45.31	PK-U	32	-34.7	42.61	-	-	-	-	68.2	-25.59	9	217	V
5	2.394	51.29	PK-U	32	-34.5	48.79	-	-	-	-	68.2	-19.41	9	200	V
3	5.858	43.33	PK-U	35.4	-20.7	58.03	-	-	-	-	68.2	-10.17	7	373	H

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

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



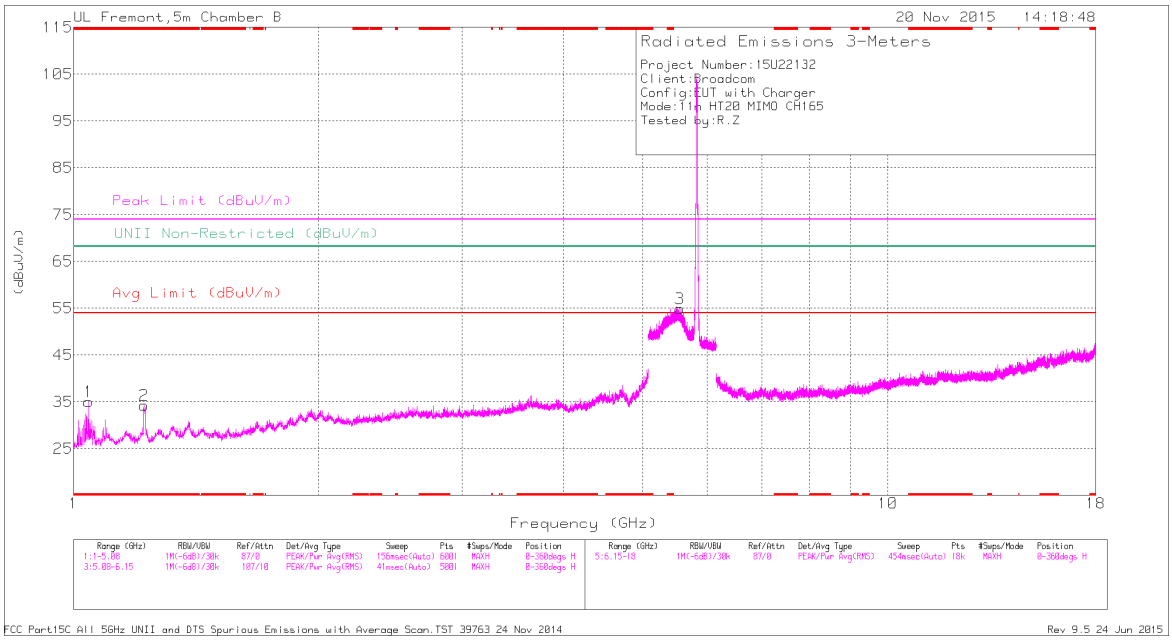
DATA

Trace Markers

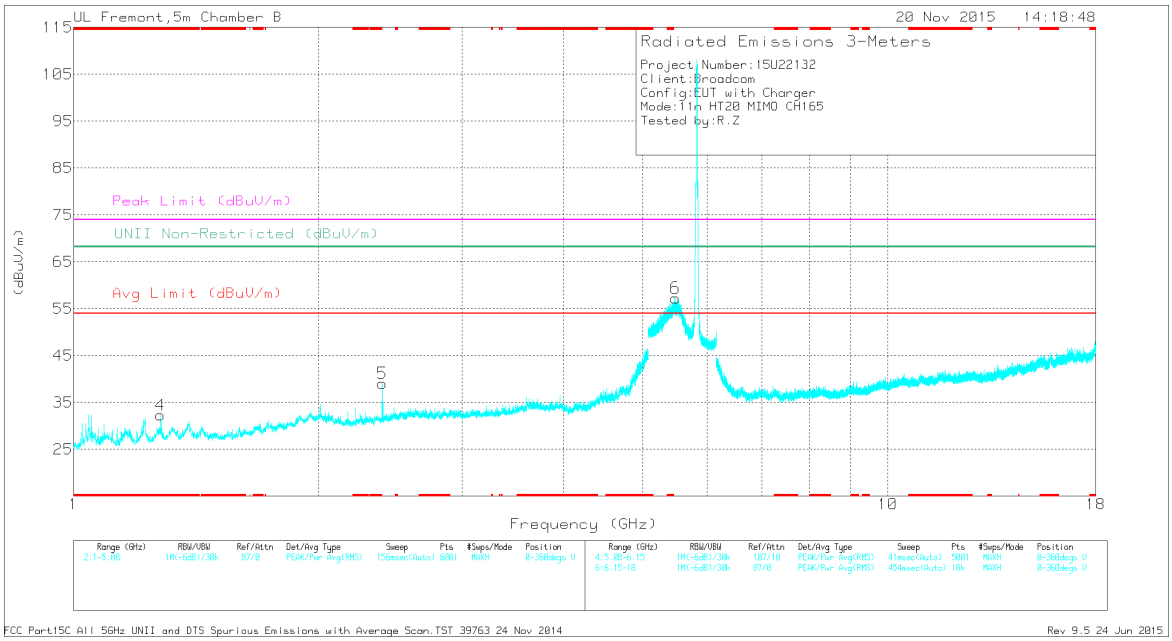
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.089	55.03	PK-U	27.6	-35.6	47.03	-	-	74	-26.97	-	-	90	309	H
	* 1.089	32.75	ADR	27.6	-35.6	24.75	54	-29.25	-	-	-	-	90	309	H
5	* 2.703	43.14	PK-U	32.6	-33.9	41.84	-	-	74	-32.16	-	-	194	112	V
	* 2.702	30.7	ADR	32.6	-33.9	29.4	54	-24.6	-	-	-	-	194	112	V
6	* 5.425	52.41	PK-U	34.5	-20.2	66.71	-	-	74	-7.29	-	-	120	267	V
	* 5.43	39.62	ADR	34.5	-20.4	53.72	54	-.28	-	-	-	-	120	267	V
4	2.397	44.03	PK-U	32	-34.5	41.53	-	-	-	-	68.2	-26.67	90	201	V
2	3.175	41.89	PK-U	32.4	-33.2	41.09	-	-	-	-	68.2	-27.11	90	203	H
3	5.461	48.9	PK-U	34.5	-20.5	62.9	-	-	-	-	68.2	-5.3	348	191	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

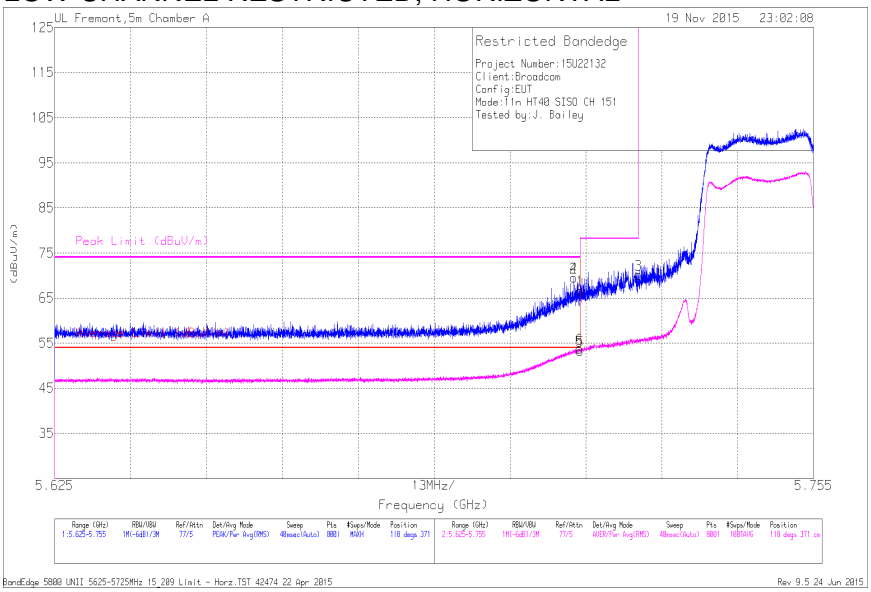
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.044	55.41	PK-U	27.4	-35.8	47.01	-	-	74	-26.99	-	-	86	319	H
	* 1.041	33.48	ADR	27.4	-35.8	25.08	54	-28.92	-	-	-	-	86	319	H
2	* 1.219	48.64	PK-U	28.7	-35.8	41.54	-	-	74	-32.46	-	-	56	247	H
	* 1.22	37.27	ADR	28.7	-35.8	30.17	54	-23.83	-	-	-	-	56	247	H
4	* 1.279	46.4	PK-U	29.2	-35.8	39.8	-	-	74	-34.2	-	-	28	200	V
	* 1.278	31.9	ADR	29.2	-35.8	25.3	54	-28.7	-	-	-	-	28	200	V
5	2.396	45.35	PK-U	32	-34.5	42.85	-	-	-	-	68.2	-25.35	28	200	V
6	5.487	47.59	PK-U	34.5	-20.5	61.59	-	-	-	-	68.2	-6.61	28	102	V
3	5.552	48.43	PK-U	34.6	-20.9	62.13	-	-	-	-	68.2	-6.07	28	200	H

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

9.5. TX ABOVE 1 GHz 802.11n HT40 MODE SISO IN THE 5.8 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZONTAL



Trace Markers

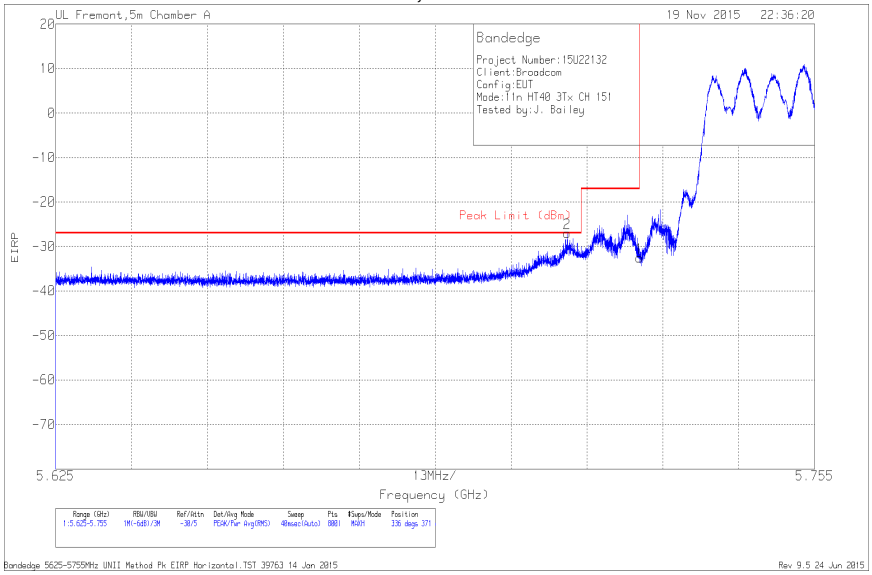
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.714	27.04	Pk	34.7	7.8	69.54	-	-	74	-4.46	118	371	H
4	5.714	27.04	Pk	34.7	7.8	69.54	-	-	74	-4.46	118	371	H
1	5.715	24.16	Pk	34.7	7.8	66.66	-	-	74	-7.34	118	371	H
5	5.715	10.74	RMS	34.7	7.8	53.24	54	-.76	-	-	118	371	H
6	5.715	11.25	RMS	34.7	7.8	53.75	54	-.25	-	-	118	371	H
3	5.725	27.64	Pk	34.7	7.8	70.14	-	-	78.2	-8.06	118	371	H

Pk - Peak detector
RMS - RMS detection

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

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZONTAL



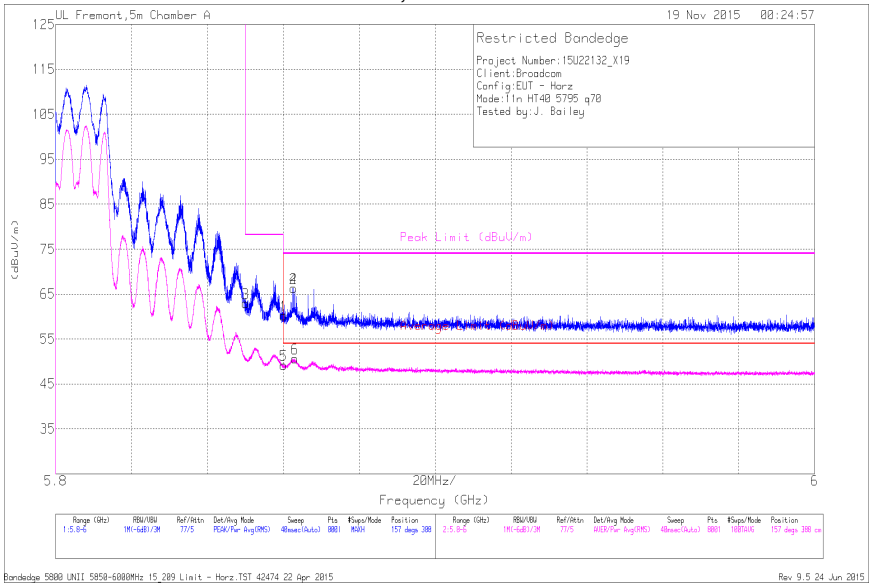
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Bypass (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.713	-81.32	Pk	34.7	7.8	11.8	-27.02	-27	-.02	336	371	H
1	5.725	-86.8	Pk	34.7	7.8	11.8	-32.5	-17	-15.5	336	371	H

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZONTAL



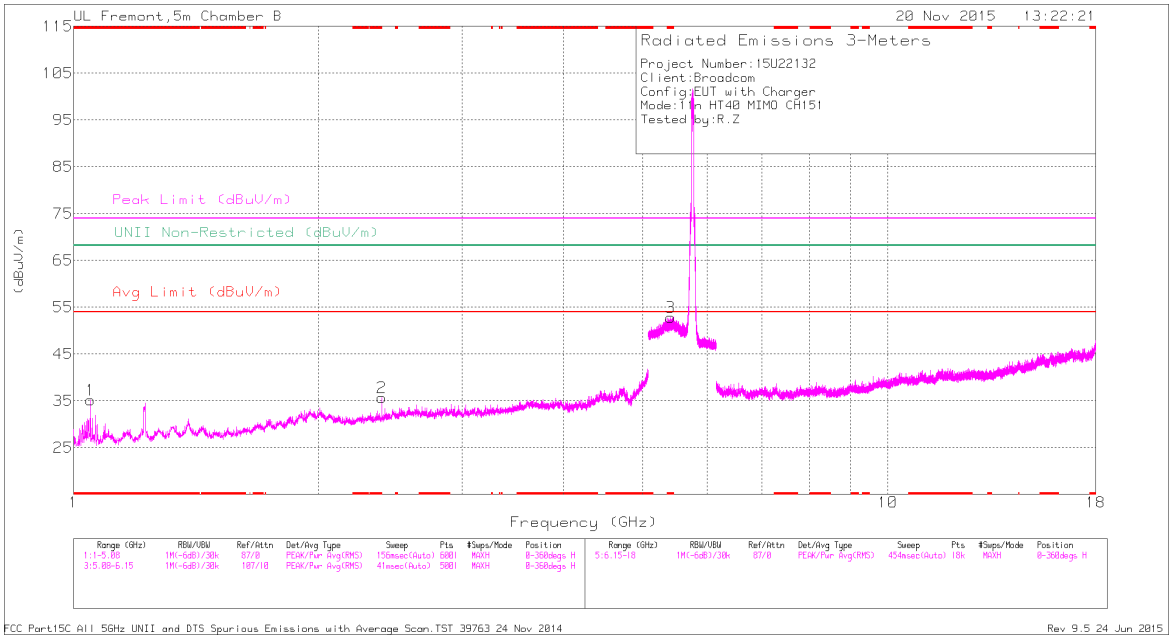
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Bypass (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	19.95	Pk	35.1	7.9	62.95	-	-	78.2	-15.25	157	388	H
1	5.86	17.23	Pk	35.1	7.9	60.23	-	-	74	-13.77	157	388	H
5	5.86	6.14	RMS	35.1	7.9	49.14	54	-4.86	-	-	157	388	H
2	5.863	23.35	Pk	35.1	7.9	66.35	-	-	74	-7.65	157	388	H
4	5.863	23.35	Pk	35.1	7.9	66.35	-	-	74	-7.65	157	388	H
6	5.863	7.66	RMS	35.1	7.9	50.66	54	-3.34	-	-	157	388	H

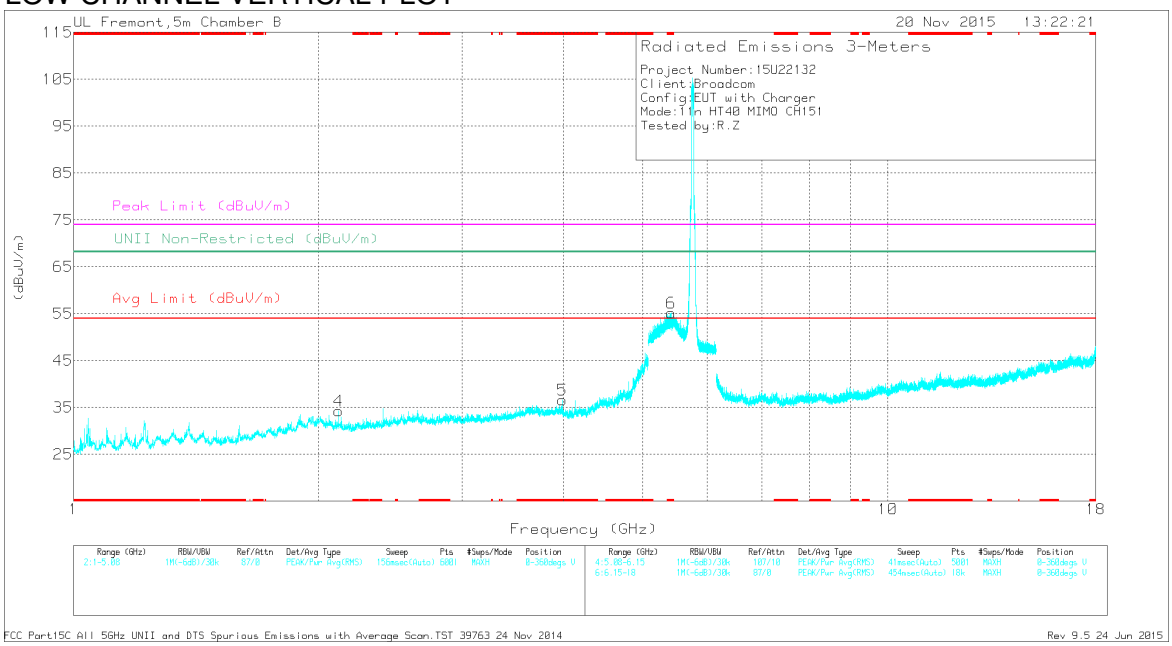
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

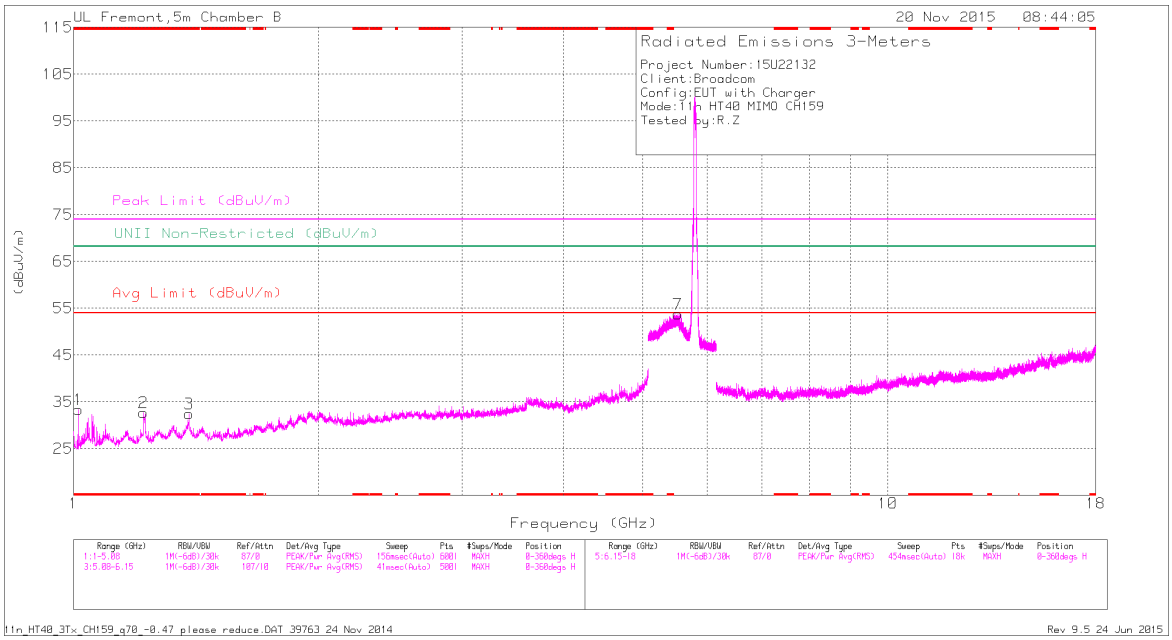
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	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	* 1.047	53.94	PK-U	27.4	-35.7	45.64	-	-	74	-28.36	-	-	98	289	H
	* 1.048	32.65	ADR	27.5	-35.7	24.45	54	-29.55	-	-	-	-	98	289	H
2	* 2.39	50.29	PK-U	32	-34.4	47.89	-	-	74	-26.11	-	-	98	358	H
	* 2.39	30.83	ADR	32	-34.4	28.43	54	-25.57	-	-	-	-	98	358	H
5	* 3.986	47.46	PK-U	33.3	-31.7	49.06	-	-	74	-24.94	-	-	80	297	V
	* 3.986	30.53	ADR	33.3	-31.7	32.13	54	-21.87	-	-	-	-	80	297	V
3	* 5.41	47.47	PK-U	34.5	-19.8	62.17	-	-	74	-11.83	-	-	19	175	H
	* 5.409	35.38	ADR	34.5	-20	49.88	54	-4.12	-	-	-	-	19	175	H
6	* 5.421	50.17	PK-U	34.5	-19.9	64.77	-	-	74	-9.23	-	-	110	101	V
	* 5.418	37.81	ADR	34.5	-20.3	52.01	54	-1.99	-	-	-	-	110	101	V
4	2.118	44.79	PK-U	31.7	-35	41.49	-	-	-	-	68.2	-26.71	98	200	V

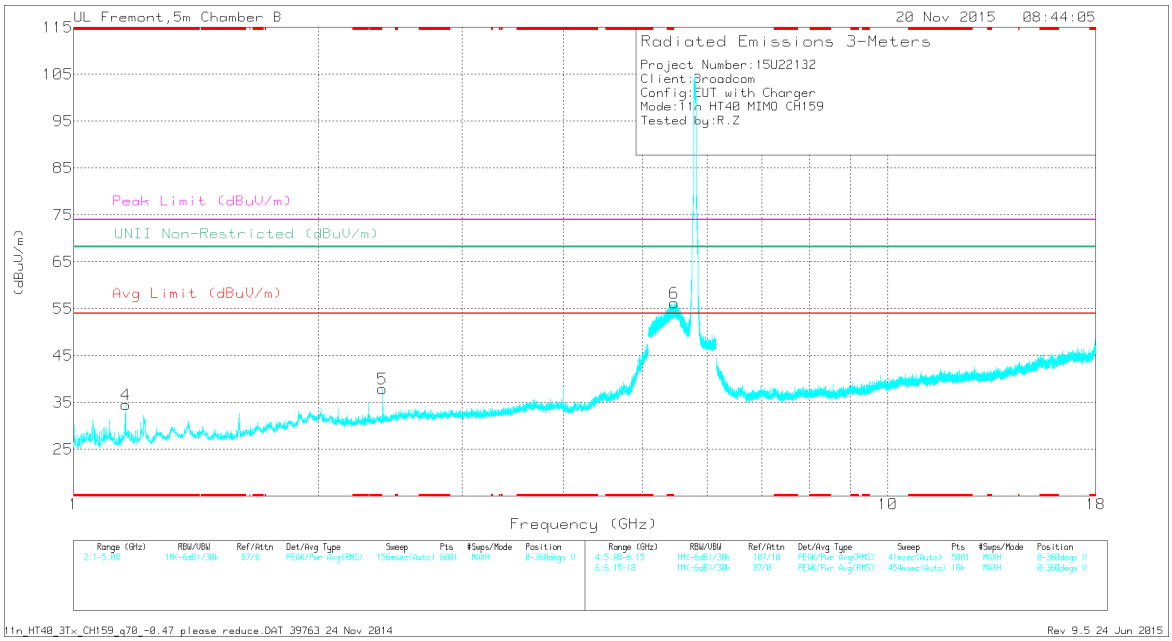
* - indicates frequency in CFR15.205 Restricted Band
Pk - Peak detector

Radiated Emissions

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)	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	* 1.014	51.98	PK-U	27.3	-36	43.28	-	-	74	-30.72	-	-	113	357	H
	* 1.013	31.55	ADR	27.3	-36	22.85	54	-31.15	-	-	-	-	113	357	H
2	* 1.22	48.1	PK-U	28.7	-35.8	41	-	-	74	-33	-	-	26	345	H
	* 1.221	35.6	ADR	28.7	-35.8	28.5	54	-25.5	-	-	-	-	26	345	H
3	* 1.385	45.34	PK-U	29.4	-34.8	39.94	-	-	74	-34.06	-	-	16	241	H
	* 1.385	33.16	ADR	29.4	-34.8	27.76	54	-26.24	-	-	-	-	16	241	H
4	* 1.159	49.58	PK-U	28.1	-35.4	42.28	-	-	74	-31.72	-	-	137	243	V
	* 1.16	32.58	ADR	28.1	-35.4	25.28	54	-28.72	-	-	-	-	137	243	V
5	2.395	50.45	PK-U	32	-34.5	47.95	-	-	-	-	68.2	-20.25	173	182	V
6	5.469	53.43	PK-U	34.5	-20.2	67.73	-	-	-	-	68.2	-.47	126	295	V
7	5.522	50.29	PK-U	34.6	-20.5	64.39	-	-	-	-	68.2	-3.81	14	400	H

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

9.7. WORST-CASE BELOW 1 GHz

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

Trace Markers

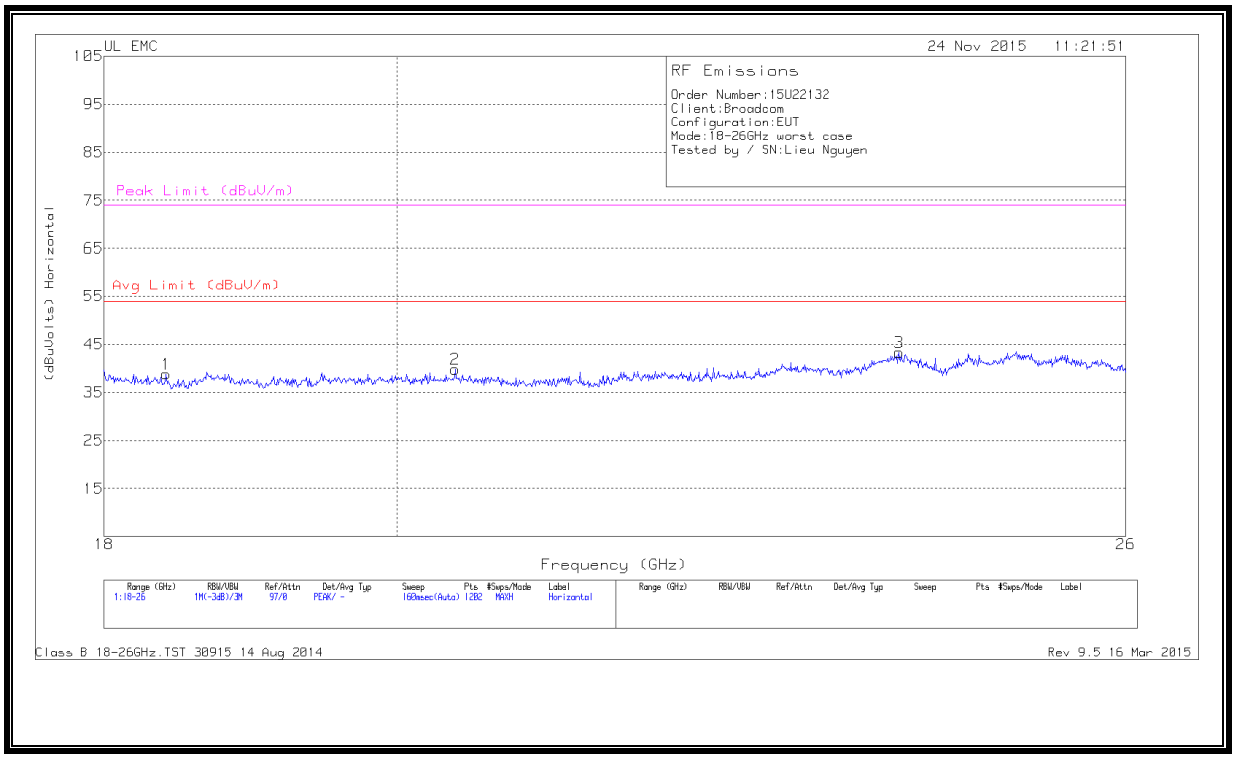
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 123.415	34.93	Pk	17.8	-30.4	22.33	43.52	-21.19	0-360	199	H
4	* 131.235	33.09	Pk	17.6	-30.3	20.39	43.52	-23.13	0-360	101	V
2	49.21	48.33	Pk	12.1	-31	29.43	40	-10.57	0-360	101	V
1	102.845	49.87	Pk	15	-30.5	34.37	43.52	-9.15	0-360	199	H
5	143.56	34.07	Pk	16.7	-30.3	20.47	43.52	-23.05	0-360	101	V
6	763.6	35.47	Pk	24.8	-28.3	31.97	46.02	-14.05	0-360	199	V

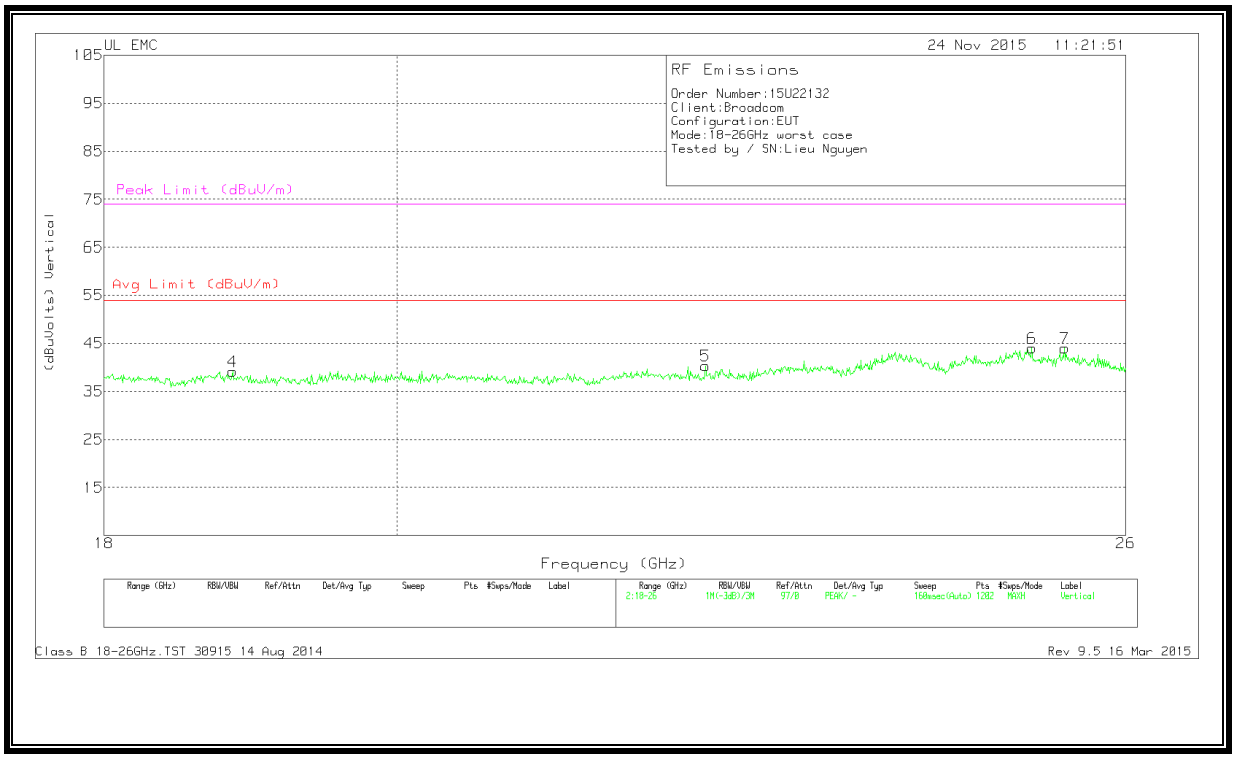
* - indicates frequency in CFR15.205Restricted Band

Pk - Peak detector

9.8. WORST-CASE ABOVE 18GHz

SPURIOUS EMISSIONS 18 – 26GHz



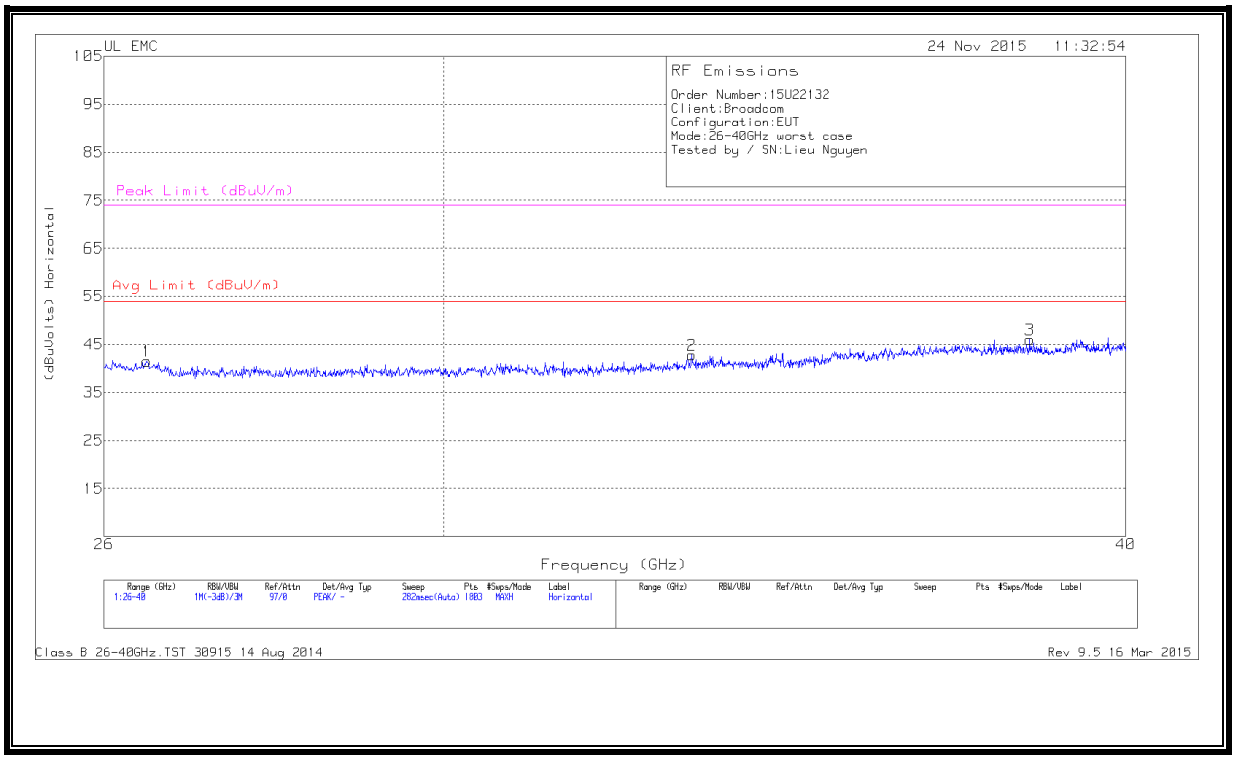


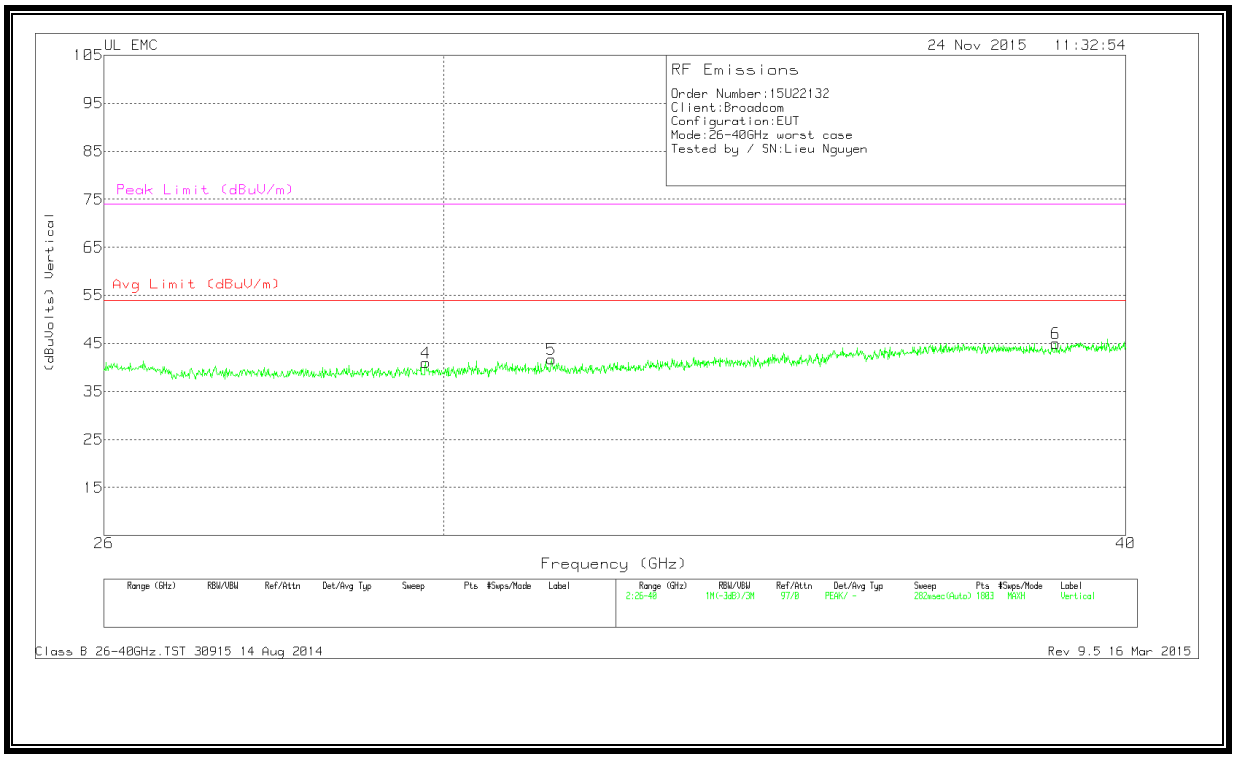
Trace Markers

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	18.406	41.03	Pk	32.4	-25.1	-9.5	38.83	54	-15.16	74	-35.16
2	20.425	41.93	Pk	32.6	-25.2	-9.5	39.83	54	-14.16	74	-34.16
3	23.962	43.73	Pk	33.3	-24.2	-9.5	43.33	54	-10.66	74	-30.66
4	18.853	41.37	Pk	32.4	-25.1	-9.5	39.16	54	-14.83	74	-34.83
5	22.35	41.53	Pk	33	-24.7	-9.5	40.33	54	-13.66	74	-33.66
6	25.134	44.4	Pk	33.8	-24.7	-9.5	44	54	-10	74	-30
7	25.434	44	Pk	33.8	-24.3	-9.5	44	54	-10	74	-30

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	26.474	46	Pk	35.5	-30.5	-9.5	41.5	54	-12.5	74	-32.5
2	33.311	48.13	Pk	37	-32.8	-9.5	42.83	54	-11.1	74	-31.16
3	38.407	50.5	Pk	37.1	-32.1	-9.5	46	54	-8	74	-28
4	29.776	47	Pk	36.1	-32.6	-9.5	41	54	-13	74	-33
5	31.4	47.87	Pk	36.1	-32.8	-9.5	41.66	54	-12.33	74	-32.33
6	38.835	49.7	Pk	36.8	-32	-9.5	45	54	-9	74	-29

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

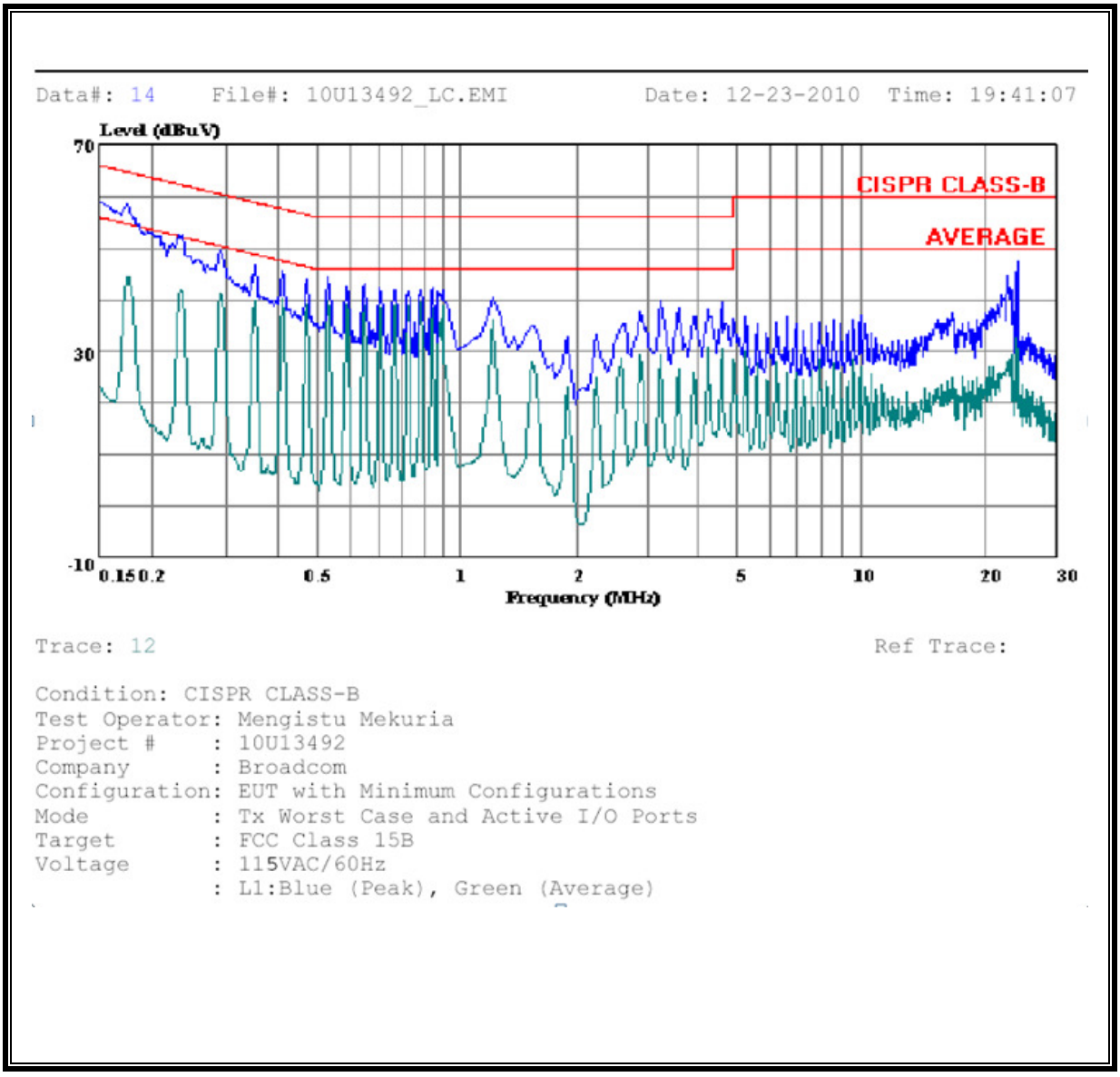
* Decreases with the logarithm of the frequency.

RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	58.99	--	44.66	0.00	64.77	54.77	-5.78	-10.11	L1
0.23	53.31	--	40.82	0.00	62.31	52.31	-9.00	-11.49	L1
0.29	49.37	--	39.80	0.00	60.50	50.50	-11.13	-10.70	L1
0.17	58.41	--	44.41	0.00	64.77	54.77	-6.36	-10.36	L2
0.23	52.82	--	41.82	0.00	62.38	52.38	-9.56	-10.56	L2
0.29	49.57	--	41.22	0.00	60.50	50.50	-10.93	-9.28	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS