



CERTIFICATION TEST REPORT

Report Number. : 12371351-E5V2

Applicant : SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA
SHINAGAWA-KU, TOKYO, 140-0002, JAPAN

FCC ID : PY7-26828G

EUT Description : GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac &
NFC

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E

Date Of Issue:

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REPORT REVISION HISTORY

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V1	7/6/2018	Initial Issue	
V2	7/24/2018	Updated Section 8.2.15, 8.4.3, 8.5.9, 8.5.10 and 8.5.6 – 8.5.12	Kiya Kedida

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA-KU, TOKYO, 140-0002, JAPAN

EUT DESCRIPTION: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC

SERIAL NUMBER: BH93002BD4, BH930058D4 (Conducted),
BH93002FD4, BH930094D4, BH93008HD4 (Radiated)

DATE TESTED: June 20 – July 2, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Complies

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 the U.S. 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 KDB 662911 D01 v02r01, FCC KDB 789033 D02 v02r01, 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, and at 47658 Kato Road, 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	47658 Kato Rd.
<input type="checkbox"/> Chamber A (ISED:2324B-1)	<input type="checkbox"/> Chamber D (ISED:22541-1)	<input checked="" type="checkbox"/> Chamber K (ISED: 2324A-1)
<input checked="" type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input checked="" type="checkbox"/> Chamber L (ISED: 2324A-3)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	
	<input type="checkbox"/> Chamber G (ISED:22541-4)	
	<input type="checkbox"/> Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under ISED company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under ISED company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

ISED company address codes for chambers K through L are in process, and have yet to be determined.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Conducted Output Power (dBm)	Conducted Output Power (mW)	Uncorrelated Chains Directional Gain	Maximum EIRP (dBm)	Maximum EIRP (mW)
5.2 GHz band, 2TX						
5180-5240	802.11a CDD	16.56	45.29	-3.45	13.11	20.46
5180-5240	802.11n HT20 CDD	16.61	45.81	-3.45	13.16	20.70
5190-5230	802.11n HT40 CDD	16.83	48.19	-3.45	13.38	21.78
5210	802.11ac VHT80 CDD	13.89	24.49	-3.45	10.44	11.07

5.3 GHz BAND

Frequency Range (MHz)	Mode	Conducted Output Power (dBm)	Conducted Output Power (mW)	Uncorrelated Chains Directional	Maximum EIRP (dBm)	Maximum EIRP (mW)
5.3 GHz band, 2TX						
5260 - 5320	802.11a CDD	16.61	45.81	-3.45	13.16	20.70
5260 - 5320	802.11n HT20 CDD	16.55	45.19	-3.45	13.10	20.42
5270 - 5310	802.11n HT40 CDD	16.53	44.98	-3.45	13.08	20.32
5290	802.11ac VHT80 CDD	13.05	20.18	-3.45	9.60	9.12

5.6 GHz BAND

Frequency Range (MHz)	Mode	Conducted Output Power (dBm)	Conducted Output Power (mW)	Uncorrelated Chains Directional	Maximum EIRP (dBm)	Maximum EIRP (mW)
5.6 GHz band, 2TX						
5500-5720	802.11a CDD	16.38	43.45	-4.15	12.23	16.71
5500-5720	802.11n HT20 CDD	16.41	43.75	-4.15	12.26	16.83
5510-5710	802.11n HT40 CDD	16.82	48.08	-4.15	12.67	18.49
5530-5690	802.11ac VHT80 CDD	16.64	46.13	-4.15	12.49	17.74

5.8 GHz BAND

Frequency Range (MHz)	Mode	Conducted Output Power (dBm)	Conducted Output Power (mW)	Uncorrelated Chains Directional	Maximum EIRP (dBm)	Maximum EIRP (mW)
5.8 GHz band, 2TX						
5745-5825	802.11a CDD	16.23	41.98	-4.70	11.53	14.22
5745-5825	802.11n HT20 CDD	16.35	43.15	-4.70	11.65	14.62
5755-5795	802.11n HT40 CDD	16.42	43.85	-4.70	11.72	14.86
5775	802.11ac VHT80 CDD	12.59	18.16	-4.70	7.89	6.15

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

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes Loop Type antennas, with the following maximum gains:

Frequency (GHz)	Peak Antenna Gain (dBi)	
	Main (Chain 0)	Sub (Chain 1)
5180-5320	-4.30	-2.90
5500-5700	-4.20	-4.10
5725-5850	-4.50	-4.90

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was s_atp_0_00436_A_12_16.
The test utility software used during testing was Tera Term Ver 4.79

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

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

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages and have the same power settings.

The simultaneous mode (SISO 2.4GHz Chain 0 and 5GHz chain 1) was checked and stand-alone (MIMO) 2.4 GHz / 5GHz remain worst case.

NOTE: SISO mode is covered by MIMO mode due to same maximum tune-up limit (power).

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	20B7S0A200	PC015REW	N/A
Desktop	Lenovo	ThinkCentre	MJ00QA59	N/A
AC Adapter	SONY	UCH20	3416W45305784	N/A
DC Power Supply	Ametek	XT 15-4	T463	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	RF	Shielded	0.2	To spectrum Analyzer
2	USB	1	USB Type C	Shielded	1	N/A
3	DC	1	DC	Shielded	0.3	N/A

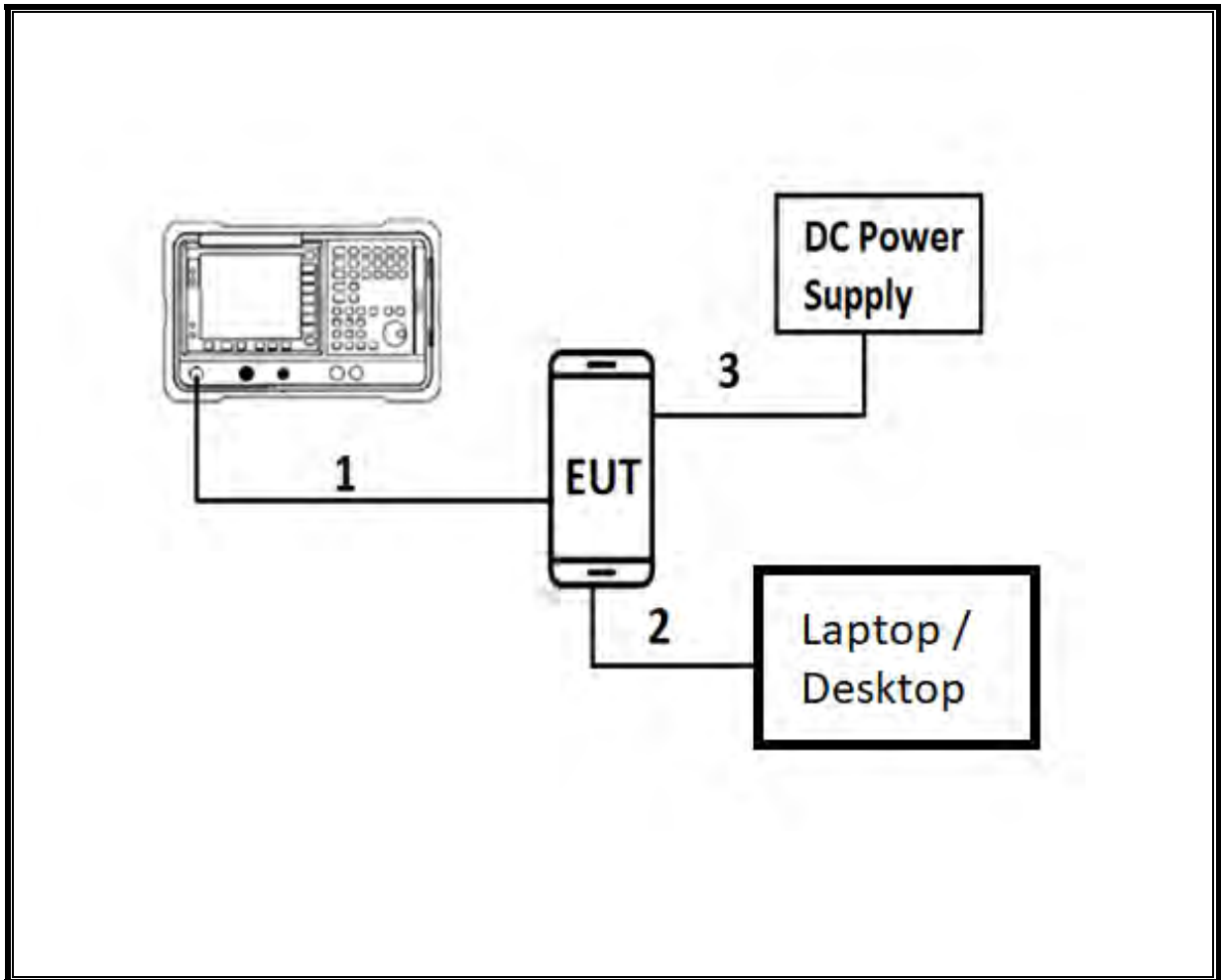
I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB Type C	Shielded	3	N/A

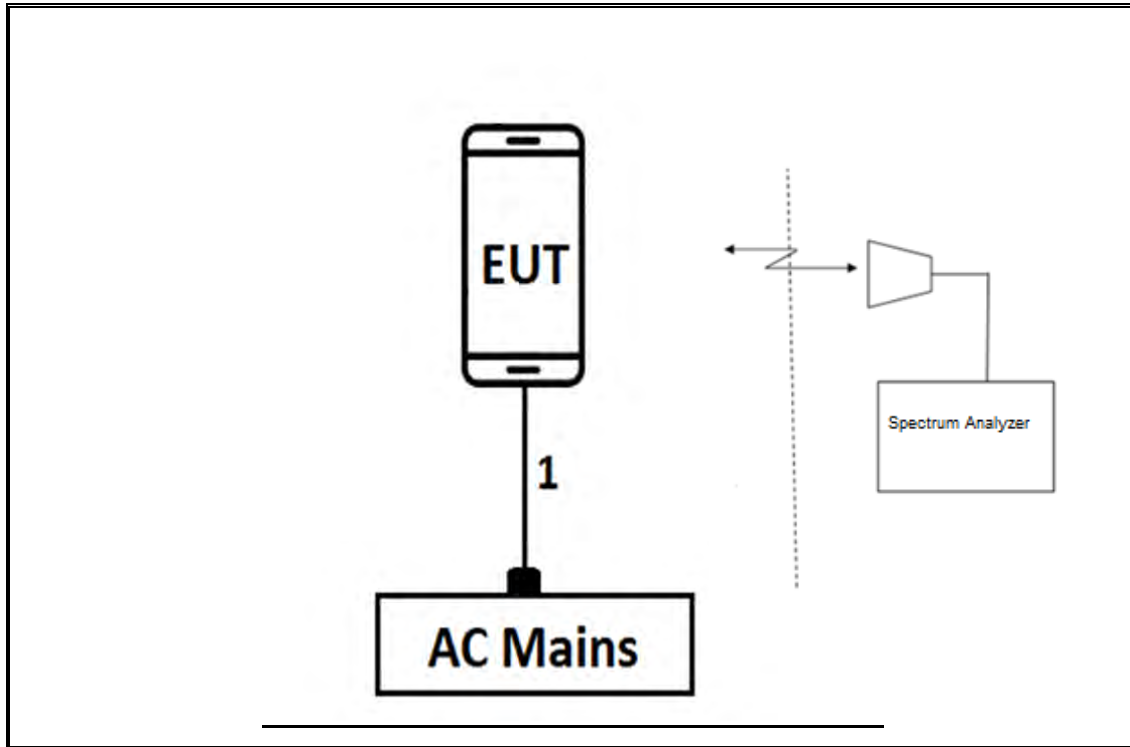
TEST SETUP

The EUT is connected to a test laptop/desktop during the tests. Test software exercised the radio card.

CONDCUTED TEST SETUP DIAGRAM



RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



6. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

6 dB Emission BW: KDB 789033 D02 v02r01, Section C.2

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

99% Occupied BW: KDB 789033 D02 v02r01, Section D.

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

Power Spectral Density: KDB 789033 D02 v02r01, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

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

7. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	ID Num	Cal Due
Amplifier	Hewlet Packard	8447D	T64	06/25/2019
Amplifier, 9KHz to 1GHz, 32dB	Sonoma Instrument	310	PRE0180089	06/21/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T407	05/10/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	07/07/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	04/30/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T4294	04/30/2019
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	T1569	06/03/2019
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T1568	06/21/2019
Amplifier, 1 to 7.0GHz, 20.0dB Gain minimum, 6dB NF	AMPLICAL	AMP1G7-20-27	T1563	06/03/2019
Amplifier 1-8GHz 30dB gain	L3 Narda	AMF-4D-01000800-30-29P	167495	06/22/2019
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179522	05/11/2019
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179367	04/25/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1113	12/21/2018
Spectrum Analyzer, PSA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019
Spectrum Analyzer, PSA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T146	07/18/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1271	07/17/2018
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1225	04/10/2019
Filter, HPF 6.0GHz	MICRO-TRONICS	HPS17542	T1017	06/21/2019
Filter, HPF 6.0GHz	MICRO-TRONICS	HPS17542	T897	06/03/2019
Filter, LPF 5.0GHz	MICRO-TRONICS	LPS17541	T1020	06/21/2019
Filter, LPF 5.0GHz	MICRO-TRONICS	LPS17541	T891	06/03/2019
Antenna, Active Loop 9kHz-30MHz	Com-Power Corp.	AL-130R	T1866	10/10/2018
18 - 26.5 GHz Horn Antenna	Seavey Division	MWH-1826/B	T89	01/18/2019
26.5 - 40 GHz Horn Antenna	ARA	MWH-2640/B	T90	08/25/2018
Pre-Amp 1-26.5 GHz	Agilent	8449B	T404	03/09/2019
Pre-Amp, 26-40GHz	MITEQ	NSTTA2640-35-HG	T1864	03/09/2019
EMI Reciever	Rohde & Schwarz	ESR	T1436	02/21/2019
L.I.S.N.	FCC INC.	FCC LISN 50/250	T1310	06/15/2019
L.I.S.N.	FCC INC.	FCC LISN 50/250	T24	03/06/2019
Thermometer - Digital	Control Company	14-650-118	PRE0177862	02/22/2019

UL AUTOMATION SOFTWARE			
Radiated Software	UL	UL EMC	Ver 9.5, June 22, 2018
Antenna Port Software	UL	UL EMC	Ver 8.4, June 12, 2018

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a CDD	2.028	2.065	0.982	98.21%	0.00	0.010
802.11n HT20 CDD	2.508	2.558	0.980	98.05%	0.00	0.010
802.11n HT40 CDD	1.228	1.307	0.940	93.96%	0.27	0.814
802.11ac VHT80 CDD	0.592	0.669	0.885	88.48%	0.53	1.689

DUTY CYCLE PLOTS



DUTY CYCLE 802.11a CDD MODE



DUTY CYCLE 802.11n HT20 CDD MODE



DUTY CYCLE 802.11n HT40 CDD MODE



DUTY CYCLE 802.11ac VHT80 CDD MODE

8.2. 26 dB BANDWIDTH

LIMITS

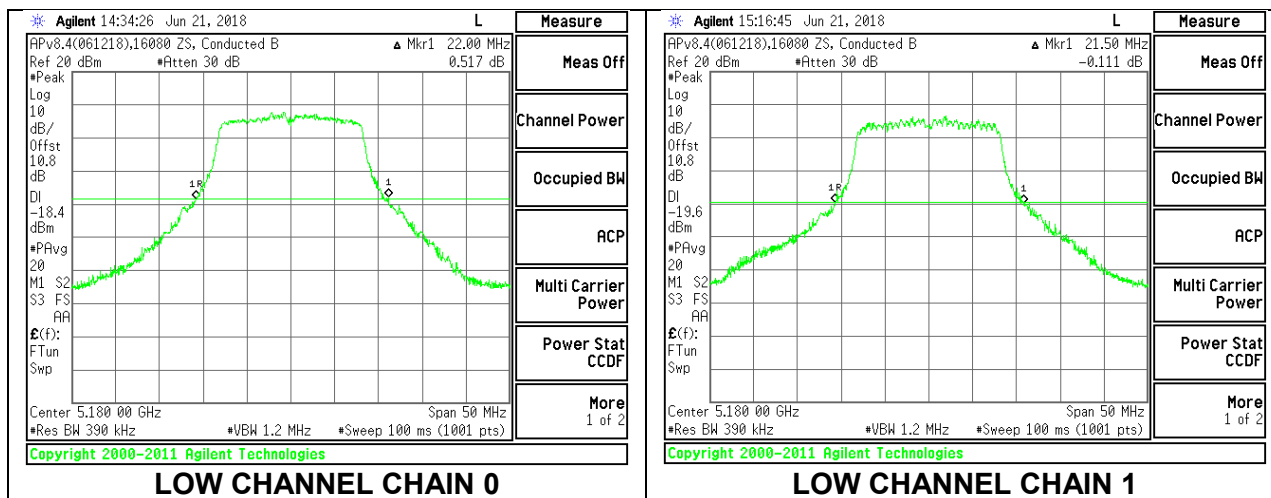
None; for reporting purposes only.

RESULTS

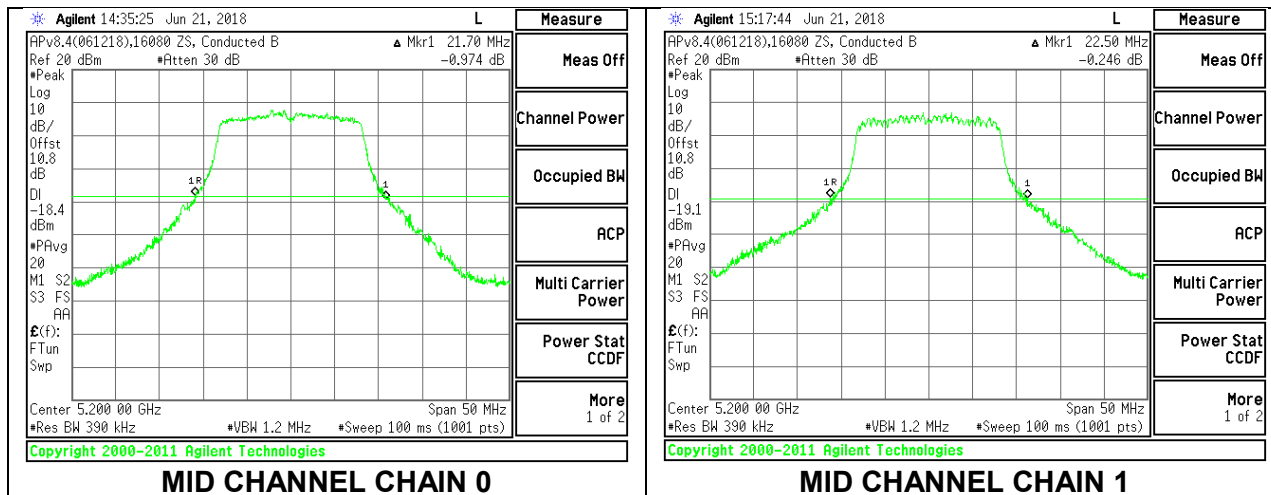
8.2.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	22.00	21.50
Mid	5200	21.70	22.50
High	5240	22.35	22.60

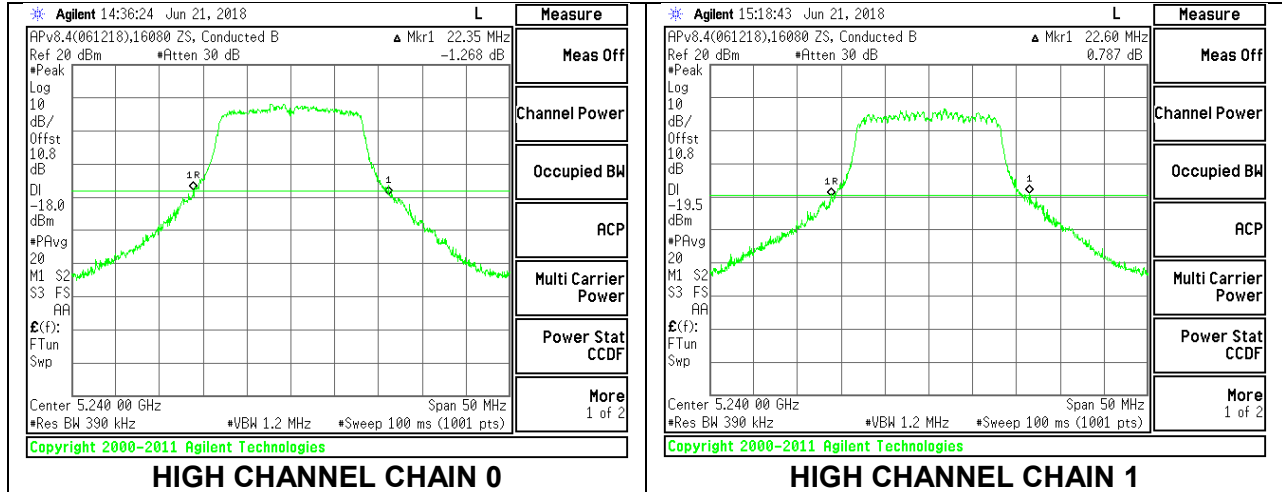
LOW CHANNEL



MID CHANNEL



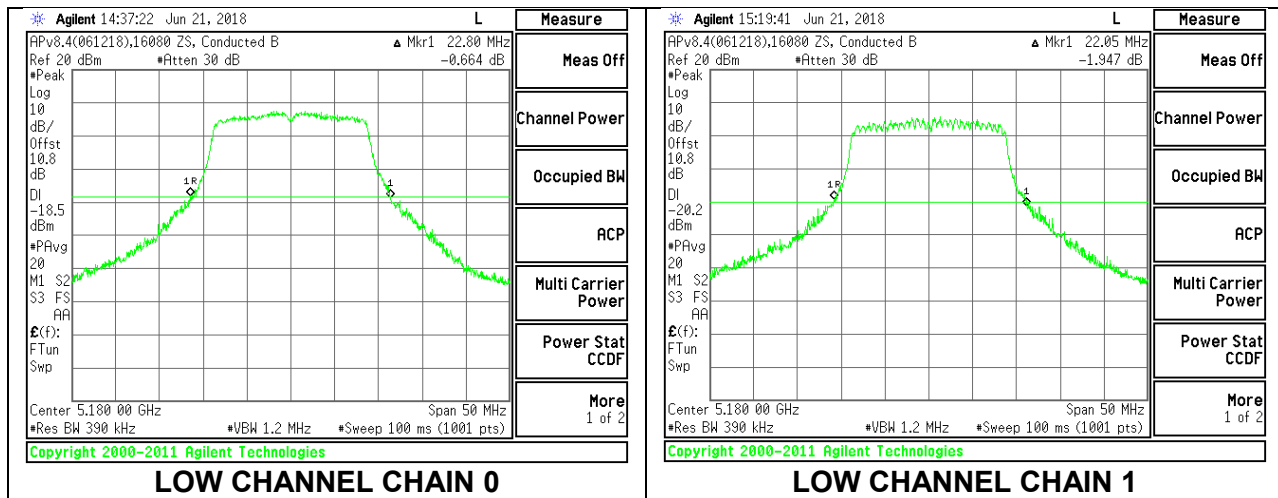
HIGH CHANNEL



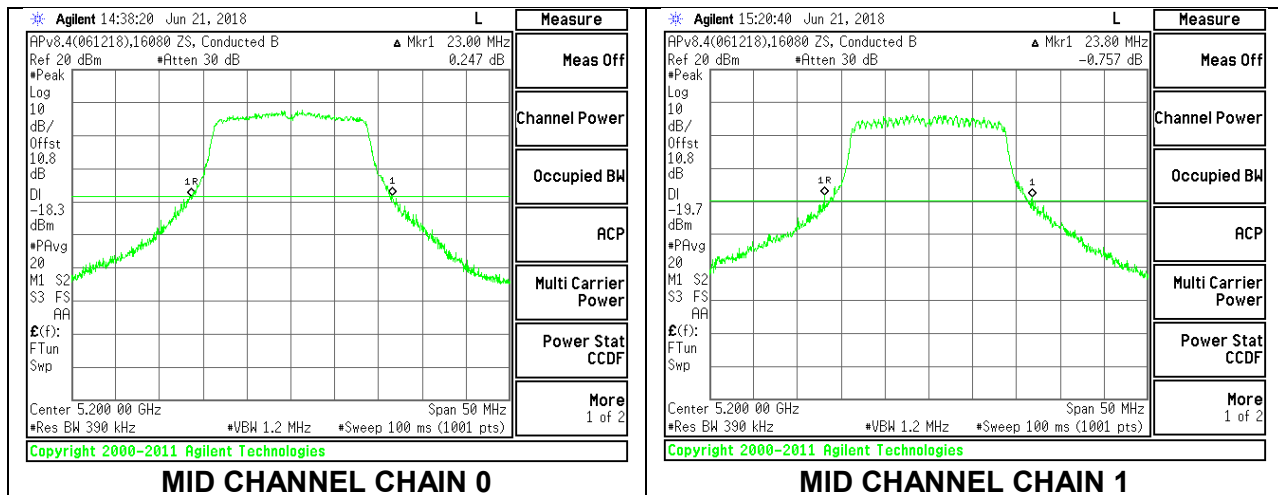
8.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	22.80	22.05
Mid	5200	23.00	23.80
High	5240	23.80	22.65

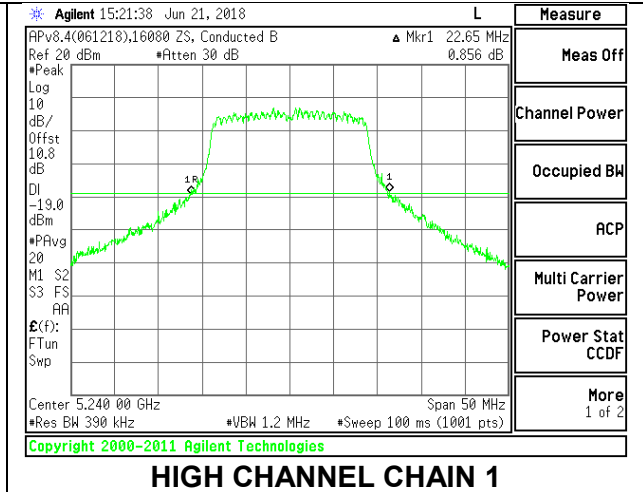
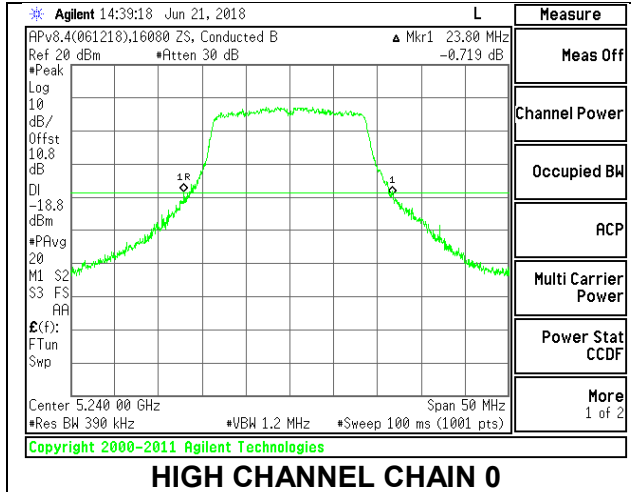
LOW CHANNEL



MID CHANNEL



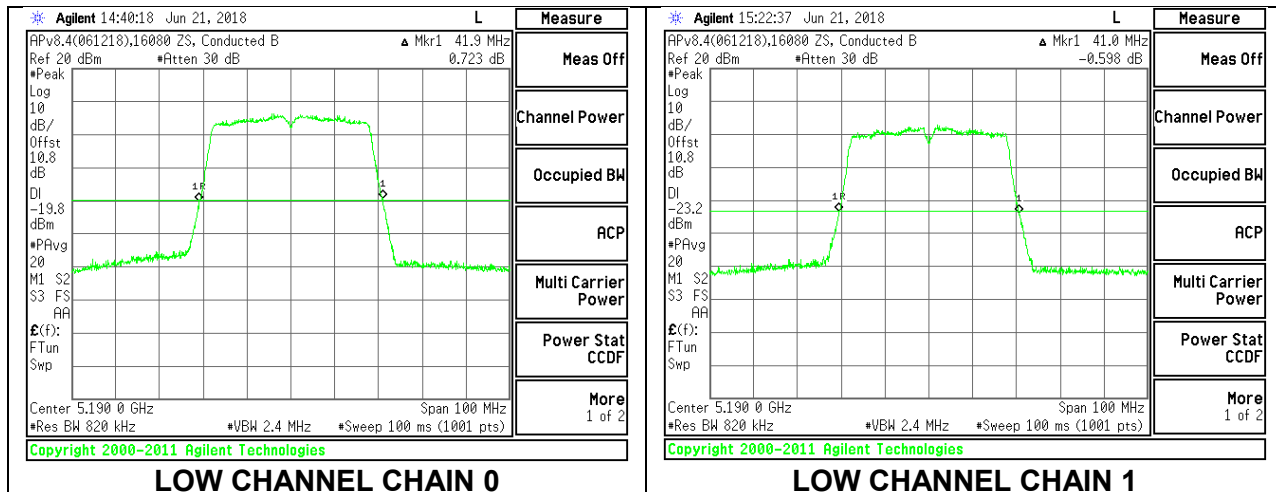
HIGH CHANNEL



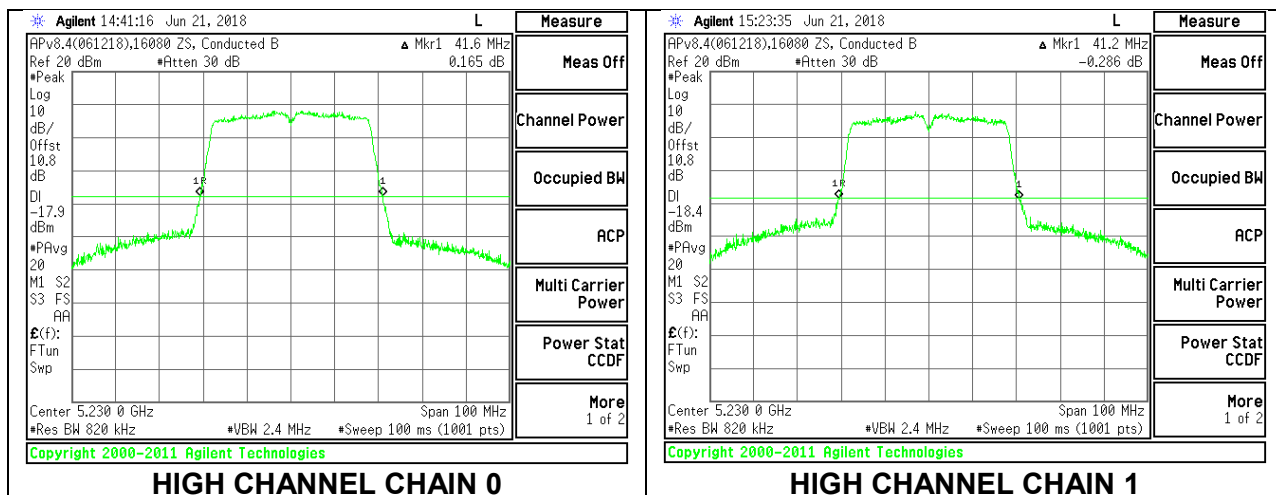
8.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	41.90	41.00
High	5230	41.60	41.20

LOW CHANNEL



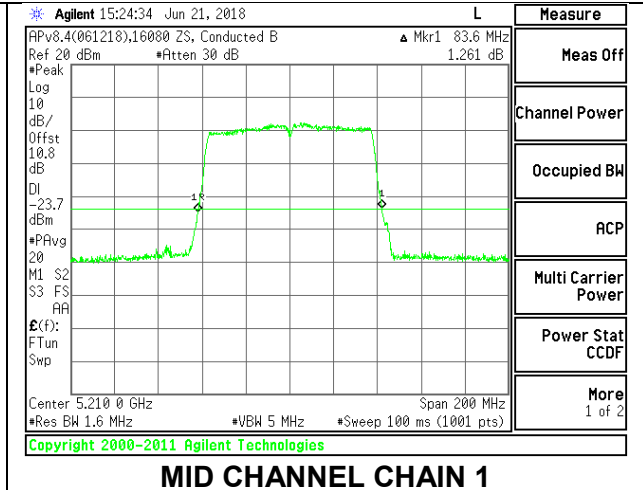
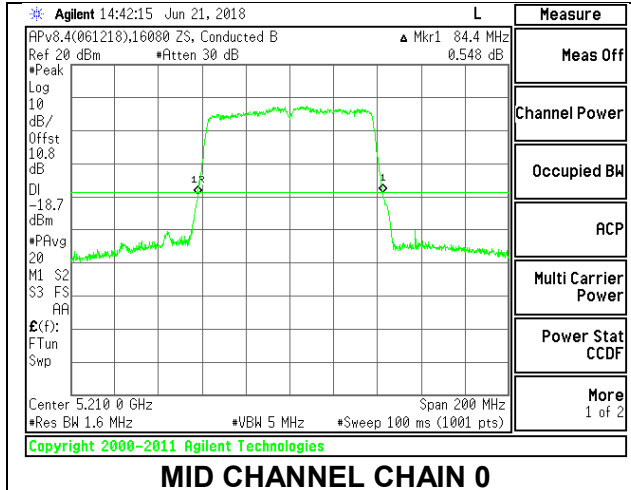
HIGH CHANNEL



8.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	84.40	83.60

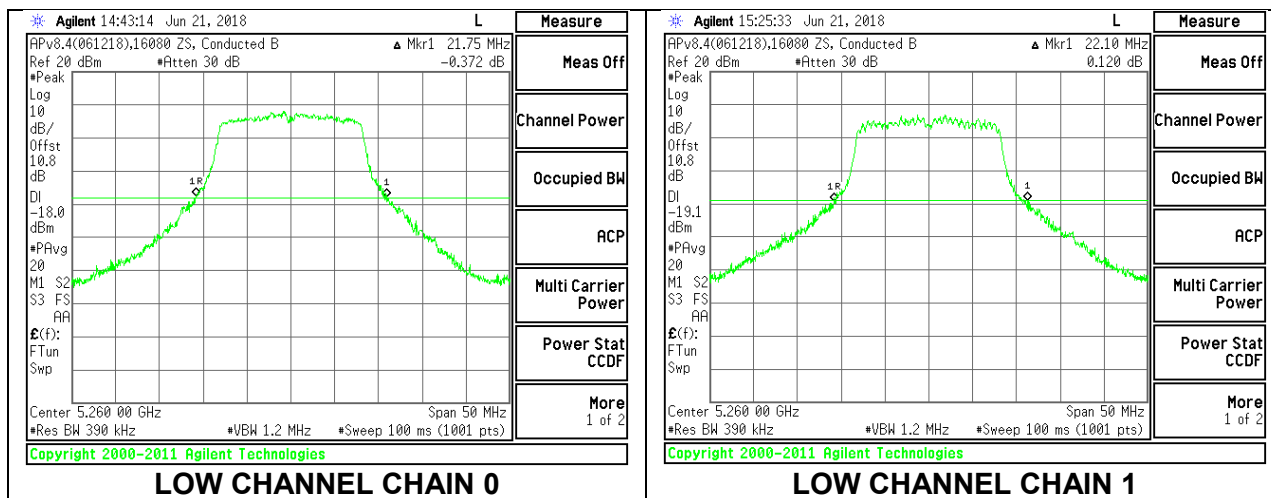
MID CHANNEL



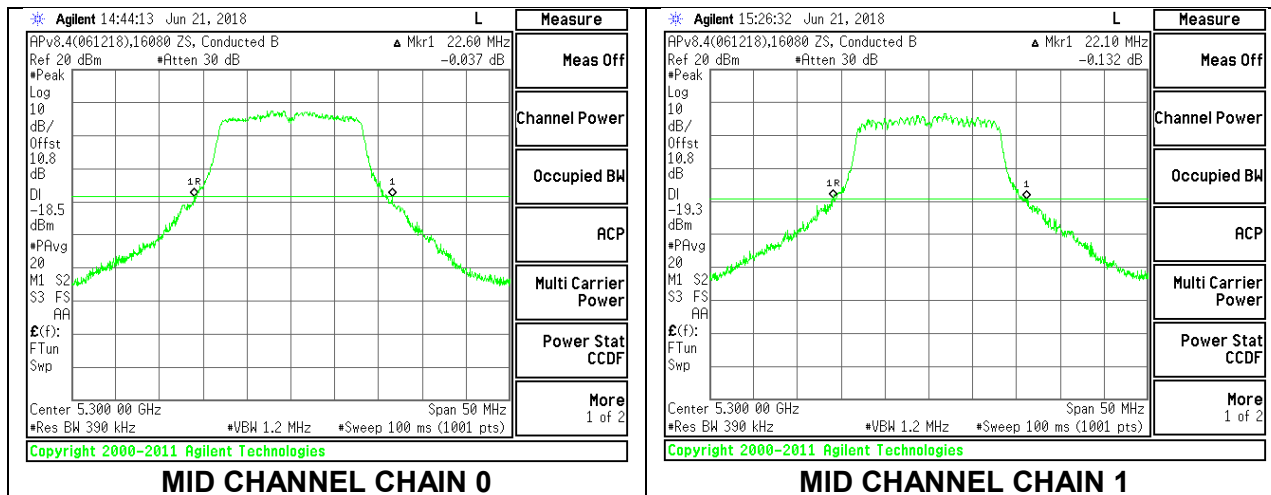
8.2.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.75	22.10
Mid	5300	22.60	22.10
High	5320	22.05	22.05

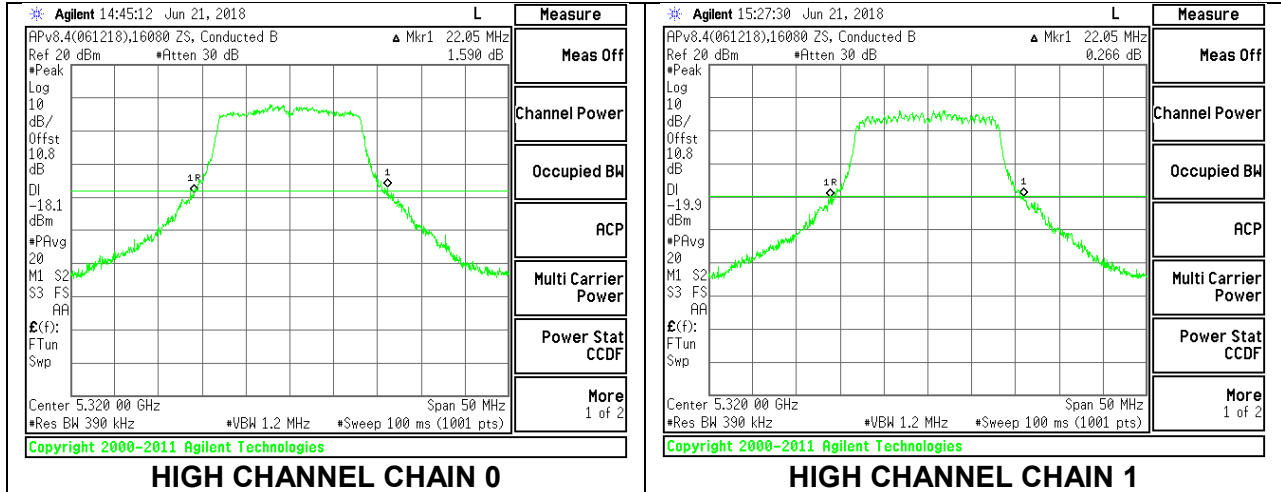
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



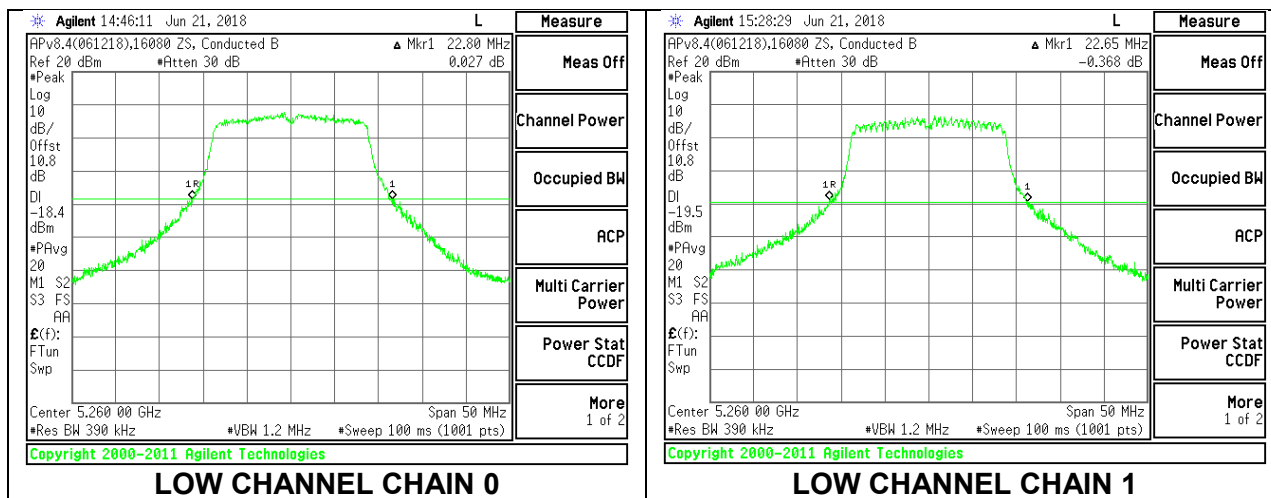
HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

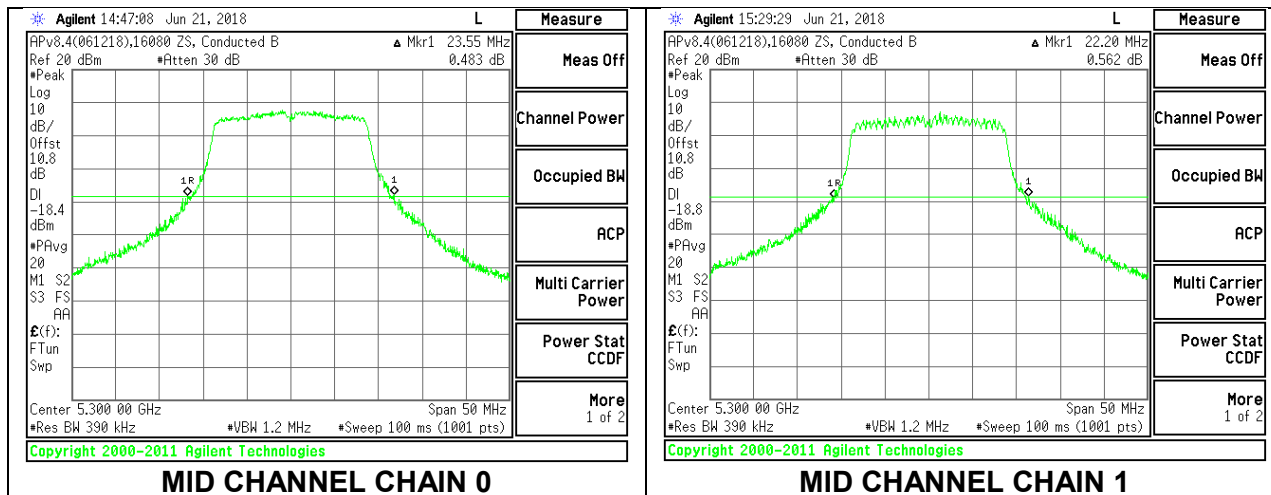
8.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	22.80	22.65
Mid	5300	23.55	22.20
High	5320	23.05	23.15

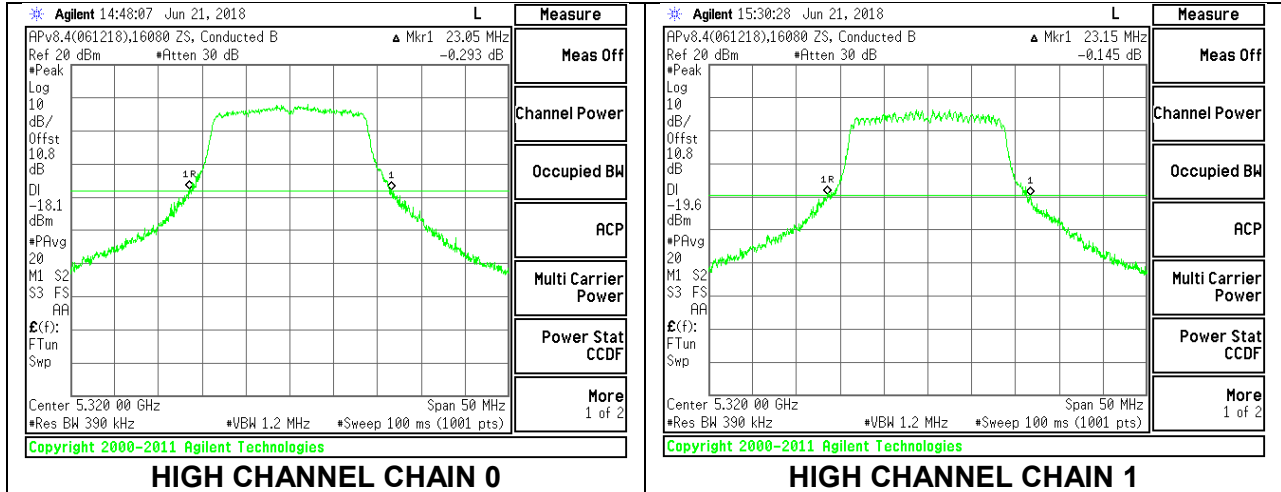
LOW CHANNEL



MID CHANNEL



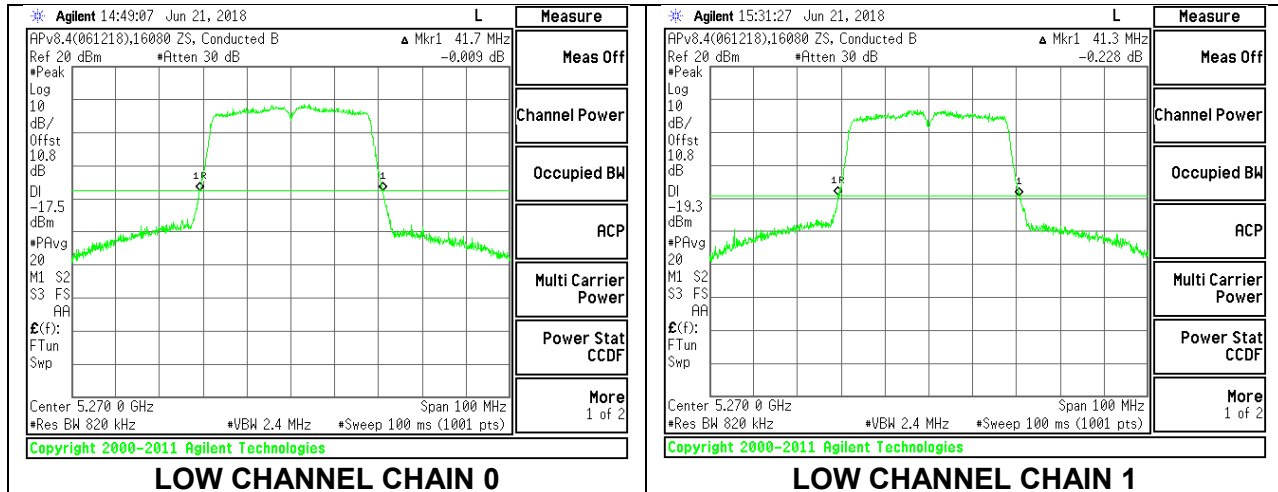
HIGH CHANNEL



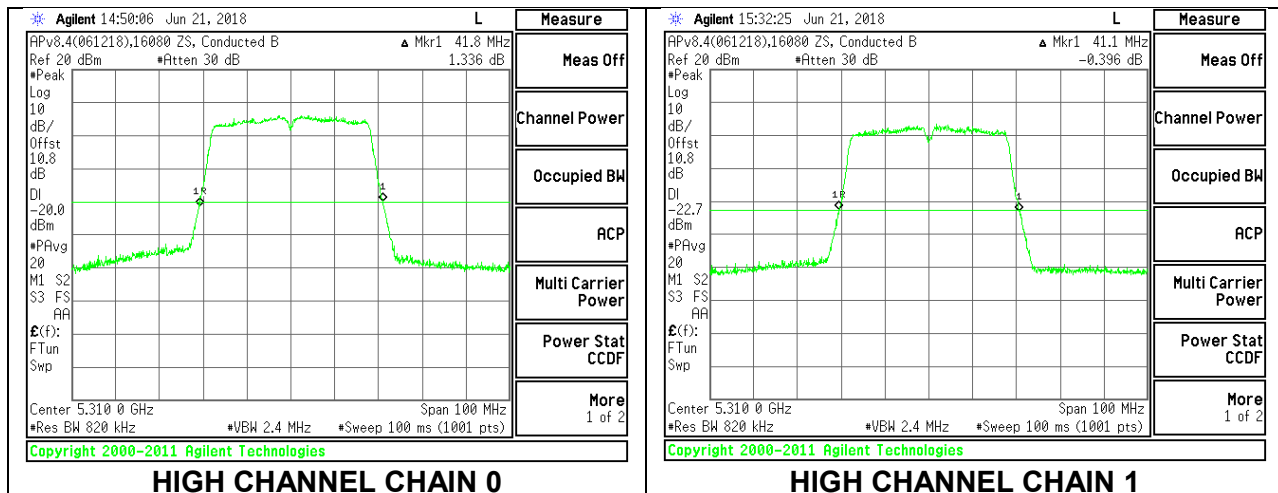
8.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	41.70	41.30
High	5310	41.80	41.10

LOW CHANNEL



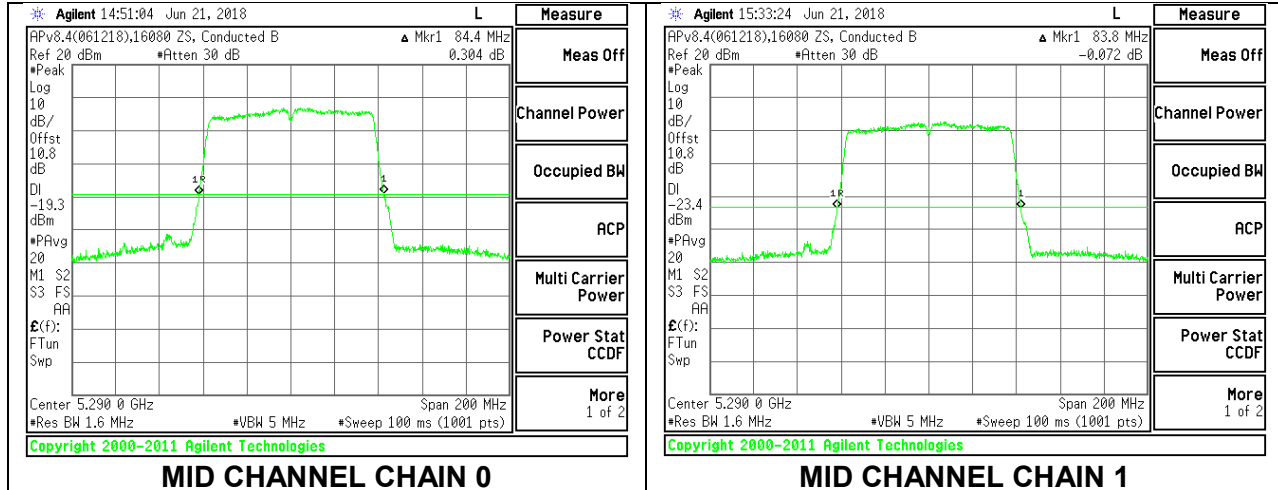
HIGH CHANNEL



8.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5290	84.40	83.80

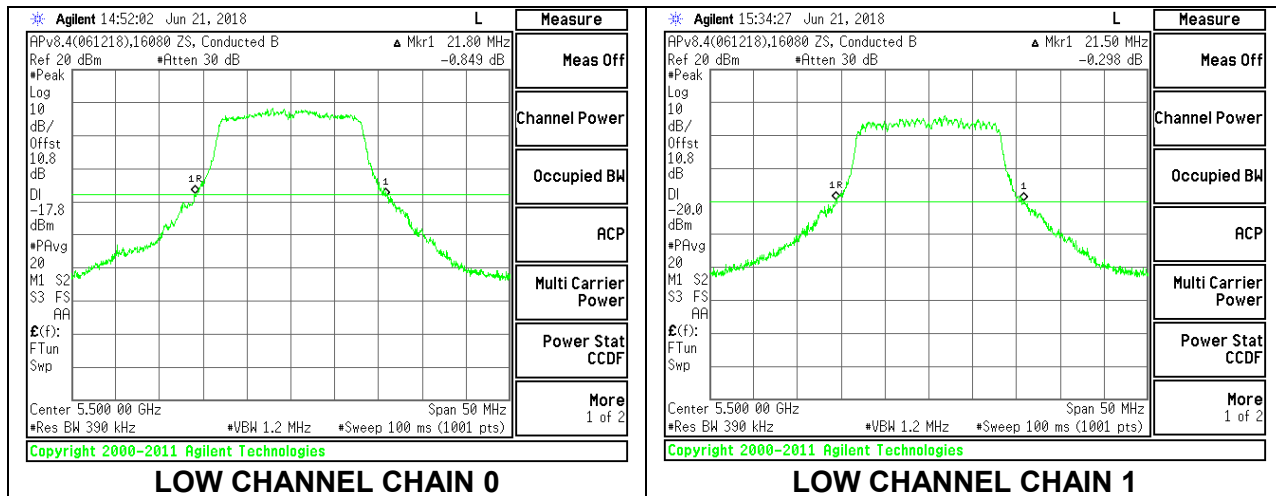
MID CHANNEL



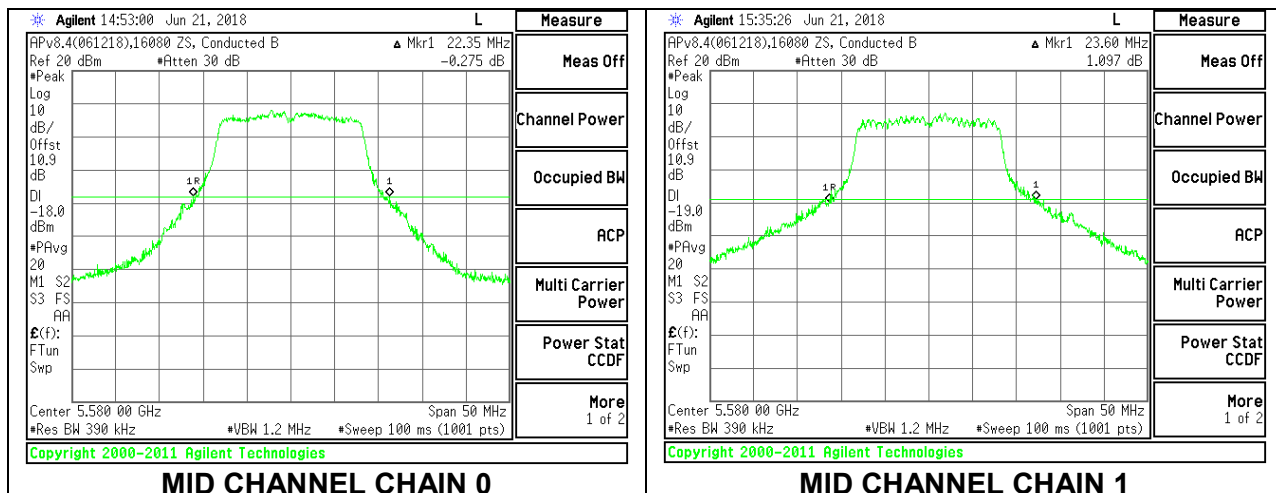
8.2.9. 802.11a MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5500	21.80	21.50
Mid	5580	22.35	23.60
High	5700	22.00	21.95
144	5720	22.25	25.65

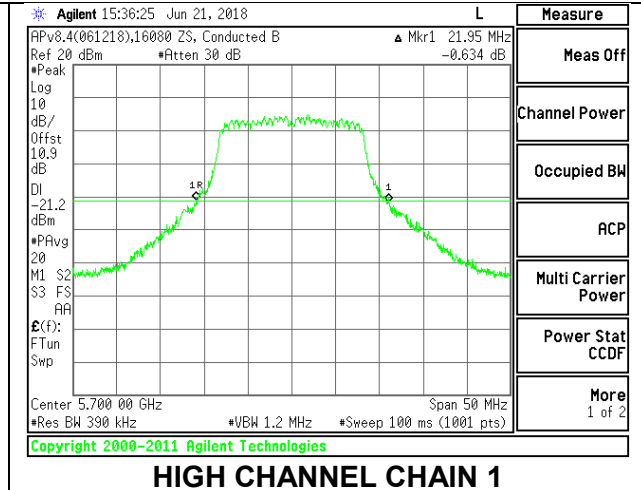
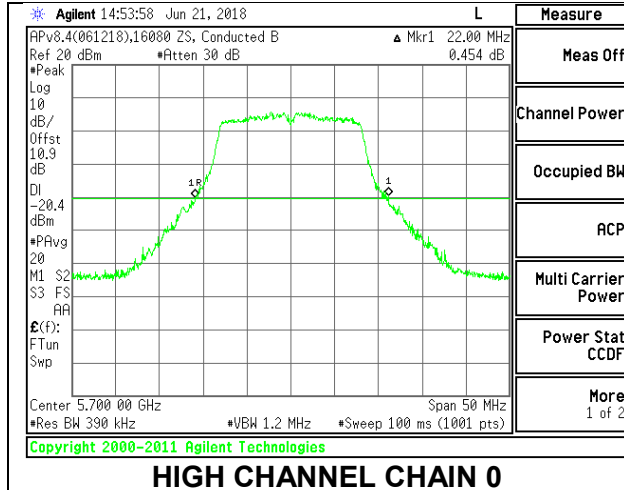
LOW CHANNEL



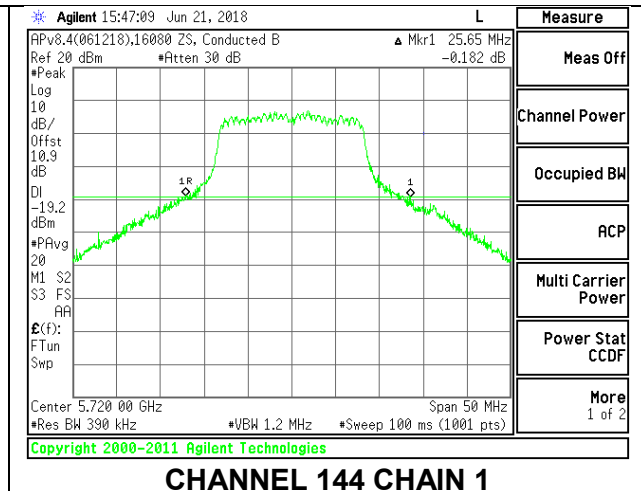
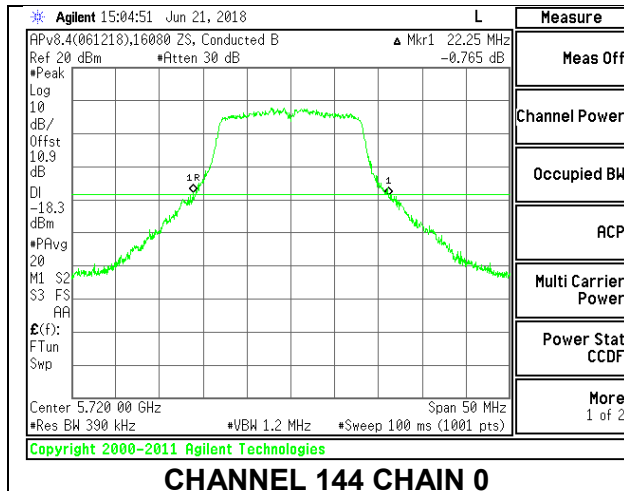
MID CHANNEL



HIGH CHANNEL



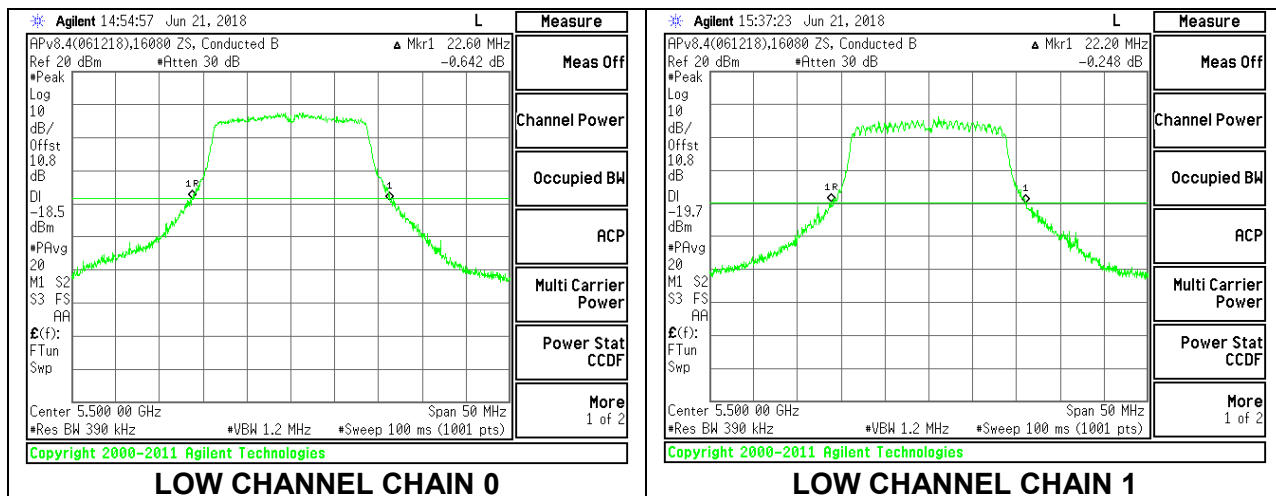
CHANNEL 144



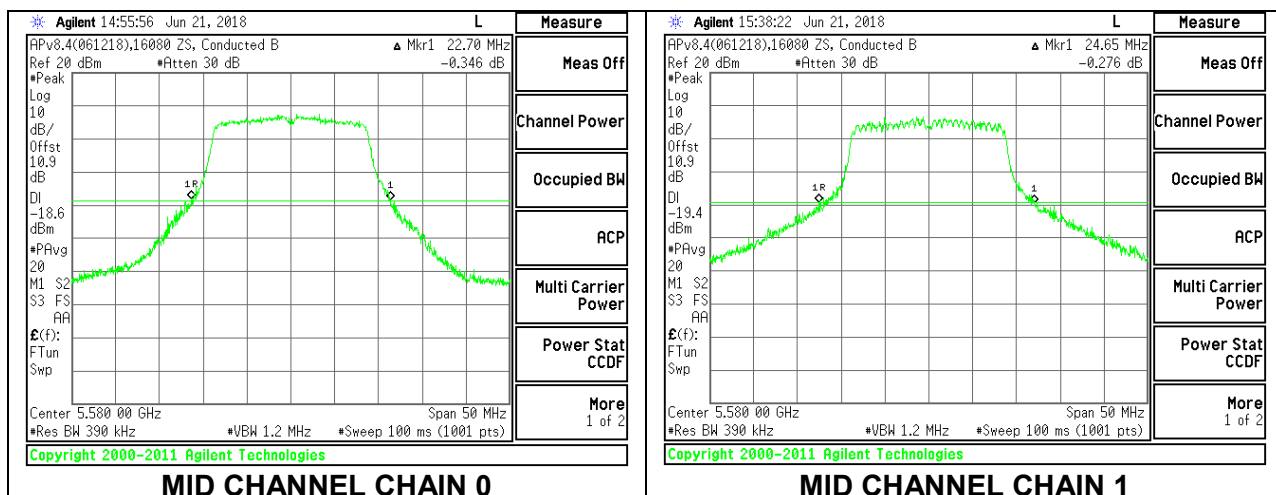
8.2.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5500	22.60	22.20
Mid	5580	22.70	24.65
High	5700	22.55	23.05
144	5720	22.95	25.80

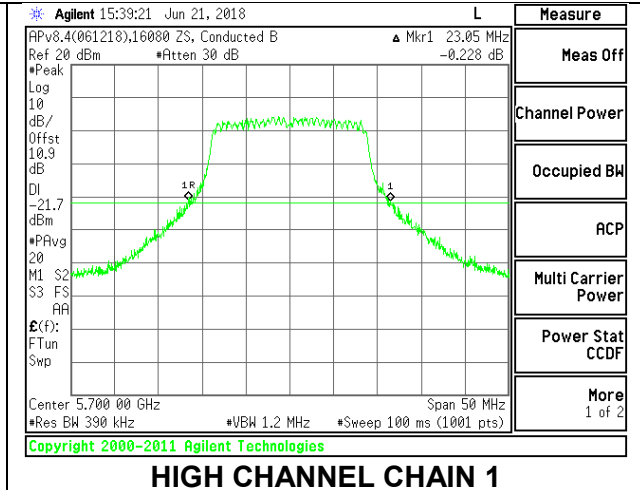
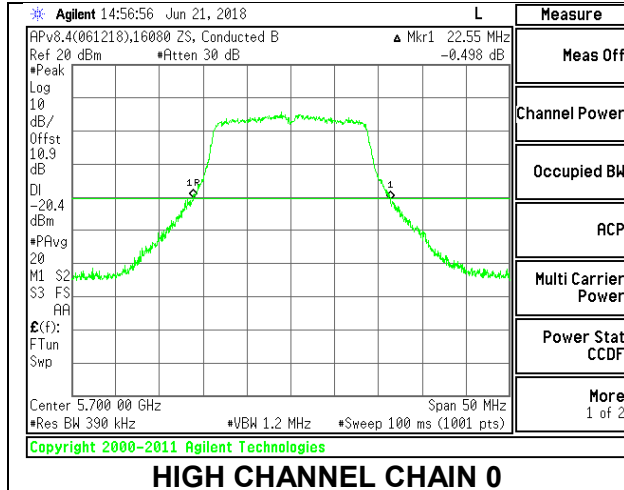
LOW CHANNEL



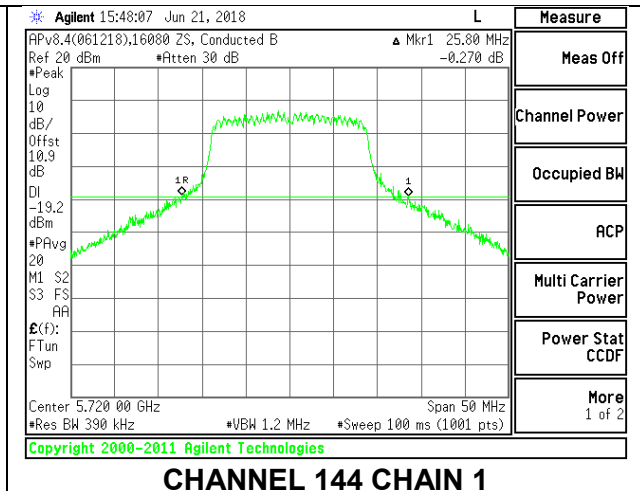
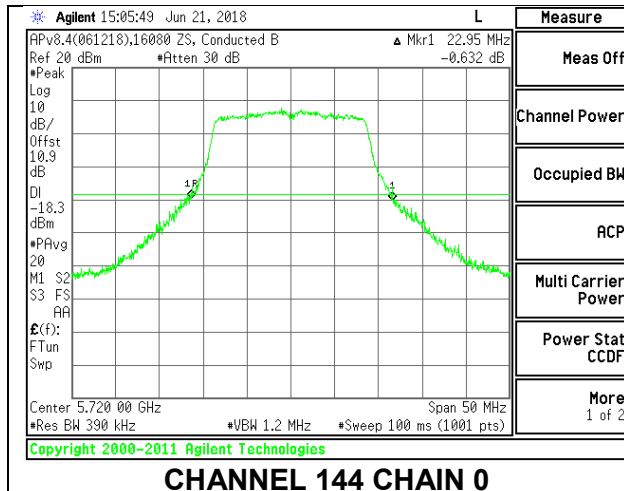
MID CHANNEL



HIGH CHANNEL



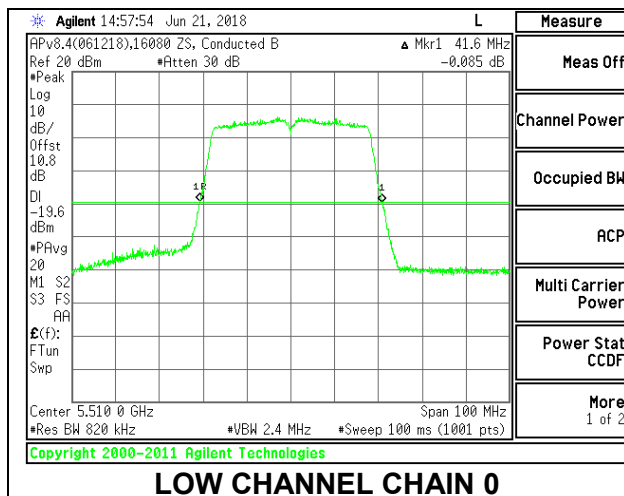
CHANNEL 144



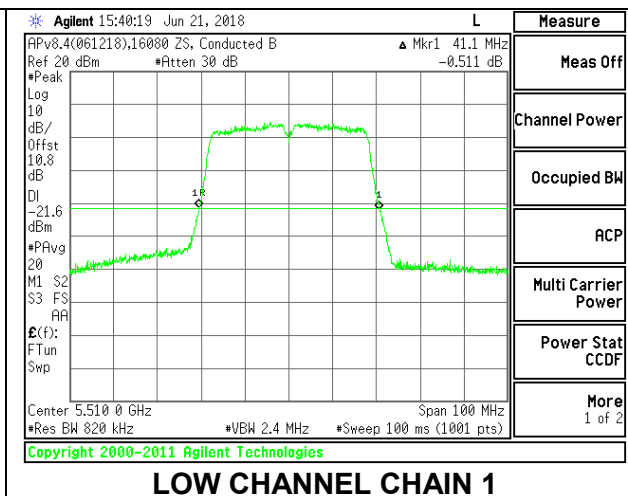
8.2.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5510	41.60	41.10
Mid	5550	41.50	41.30
High	5670	42.10	42.00
142	5710	41.70	41.90

LOW CHANNEL

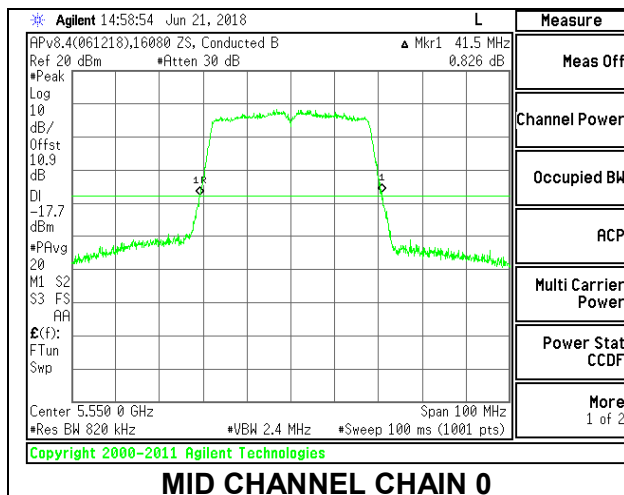


LOW CHANNEL CHAIN 0

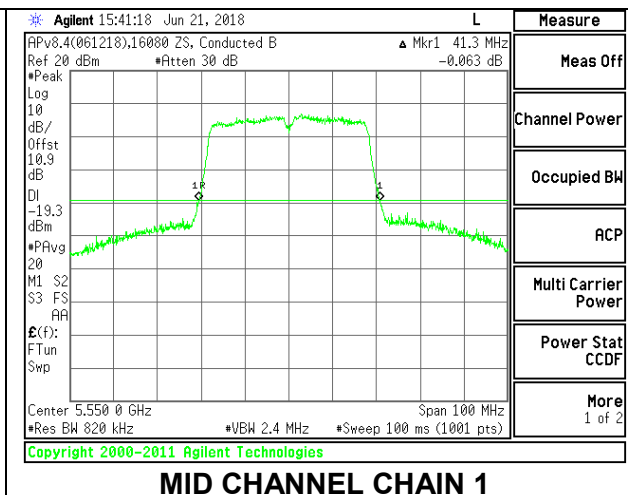


LOW CHANNEL CHAIN 1

MID CHANNEL

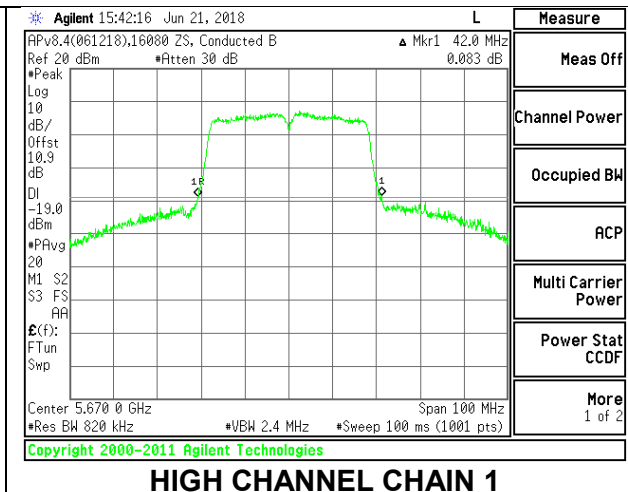
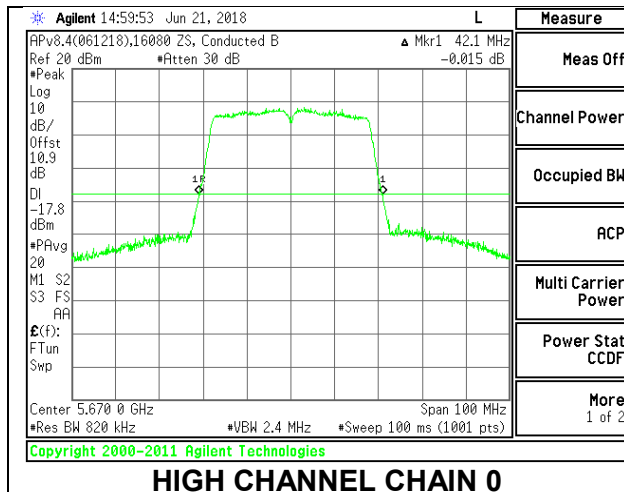


MID CHANNEL CHAIN 0

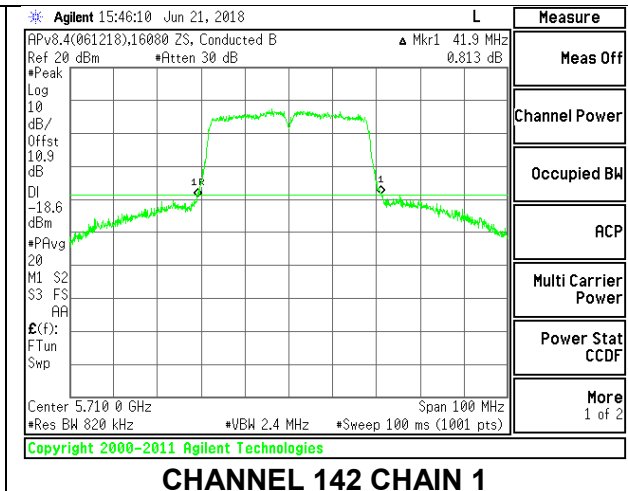
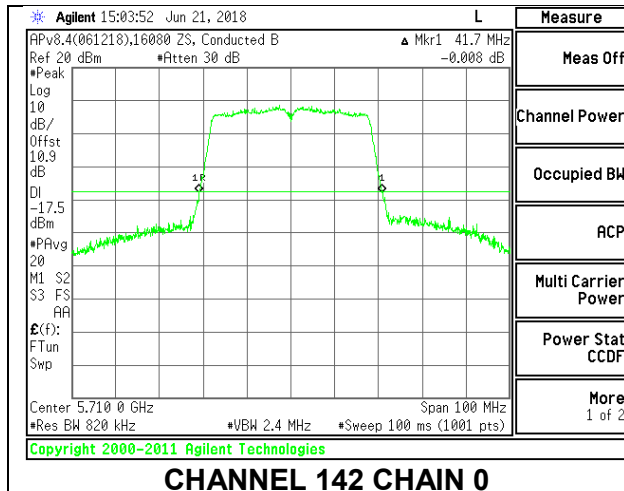


MID CHANNEL CHAIN 1

HIGH CHANNEL



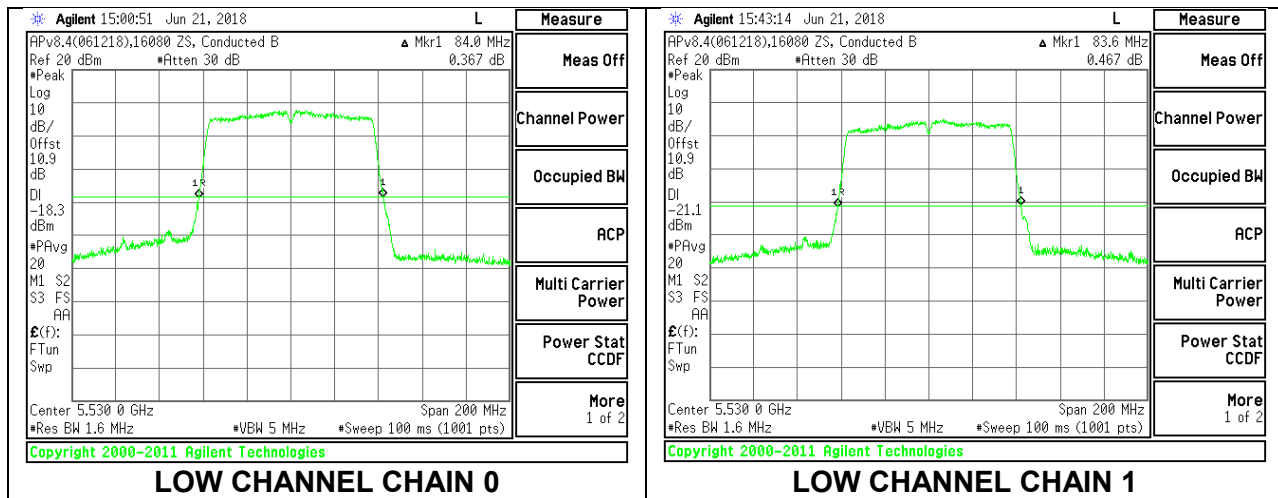
CHANNEL 142



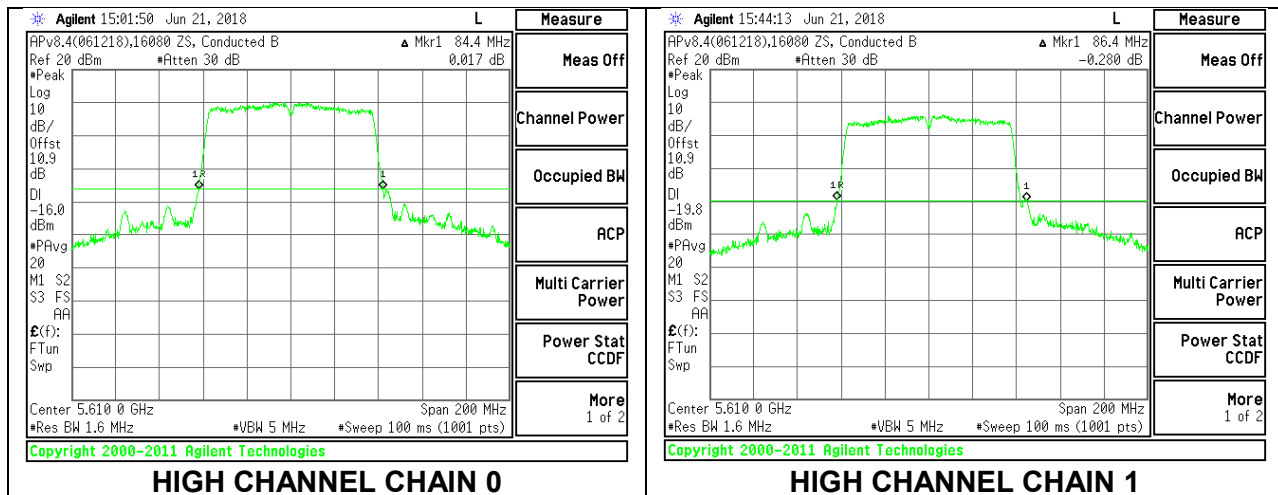
8.2.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5530	84.00	83.60
High	5610	84.40	86.40
138	5690	84.20	86.60

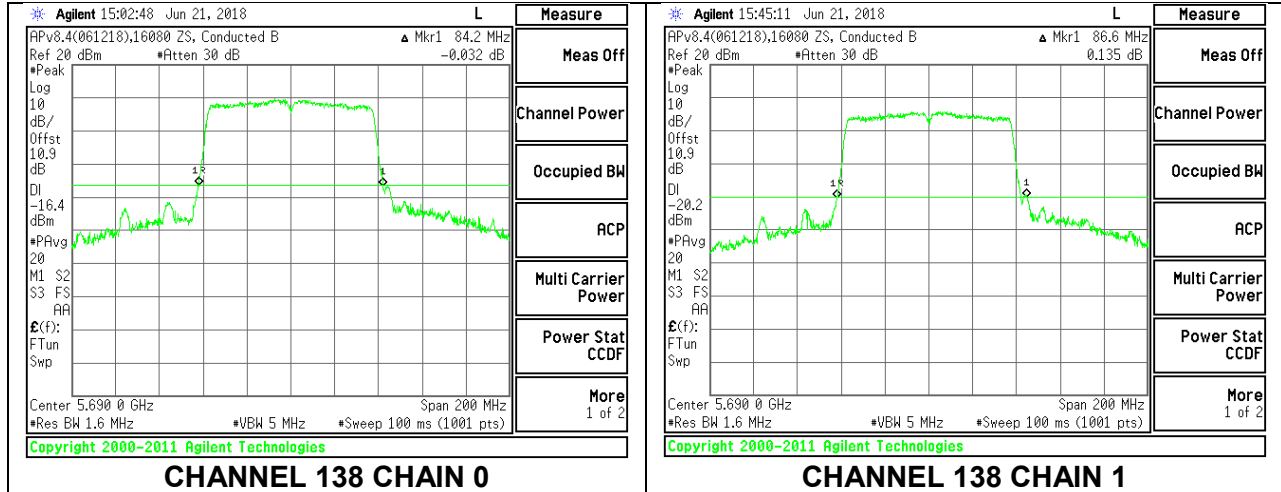
LOW CHANNEL



HIGH CHANNEL



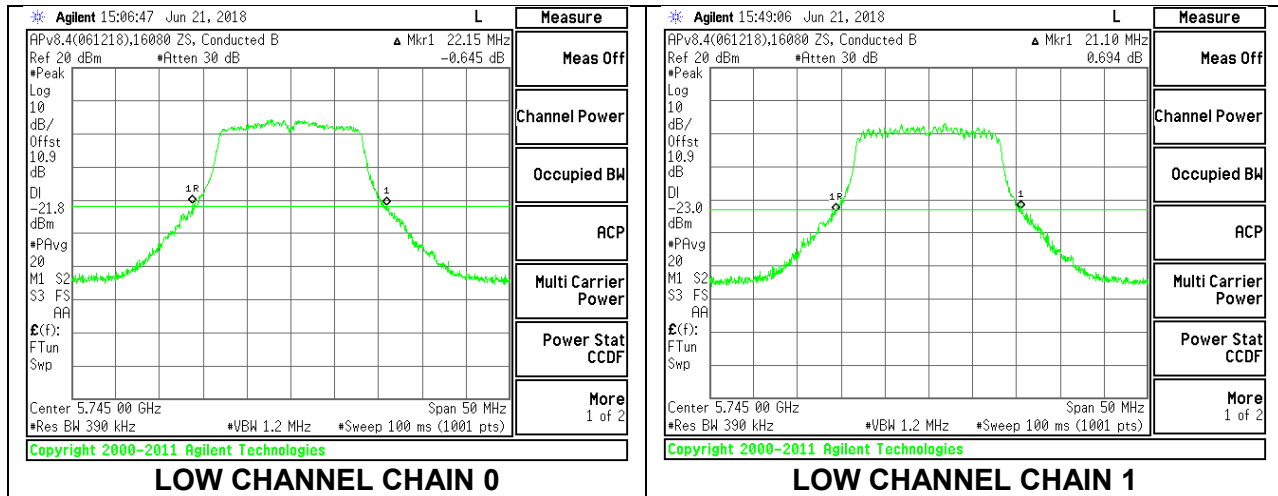
CHANNEL 138



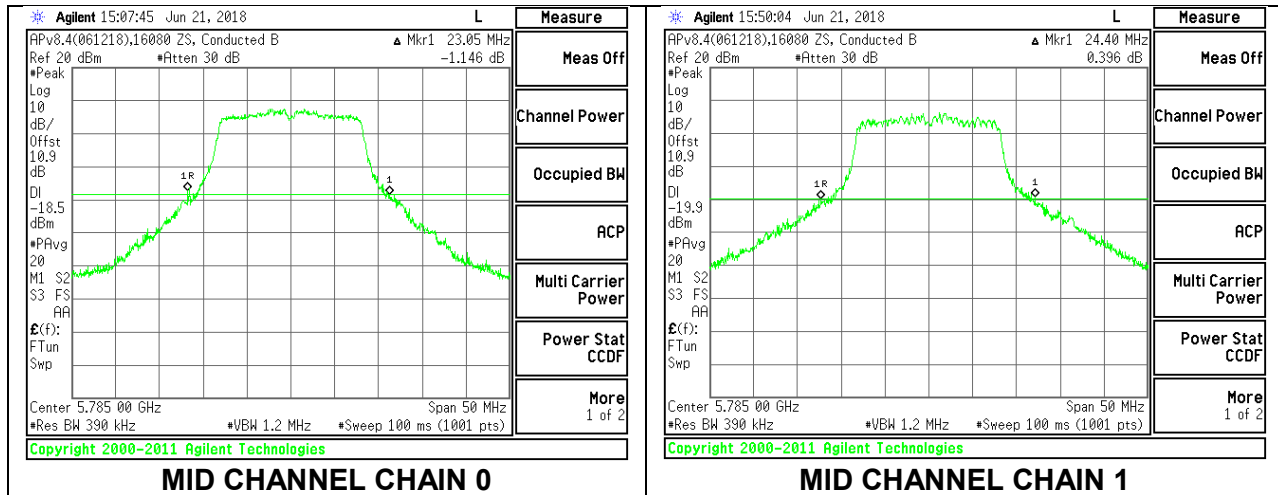
8.2.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5745	22.15	21.10
Mid	5785	23.05	24.40
High	5825	22.15	21.50

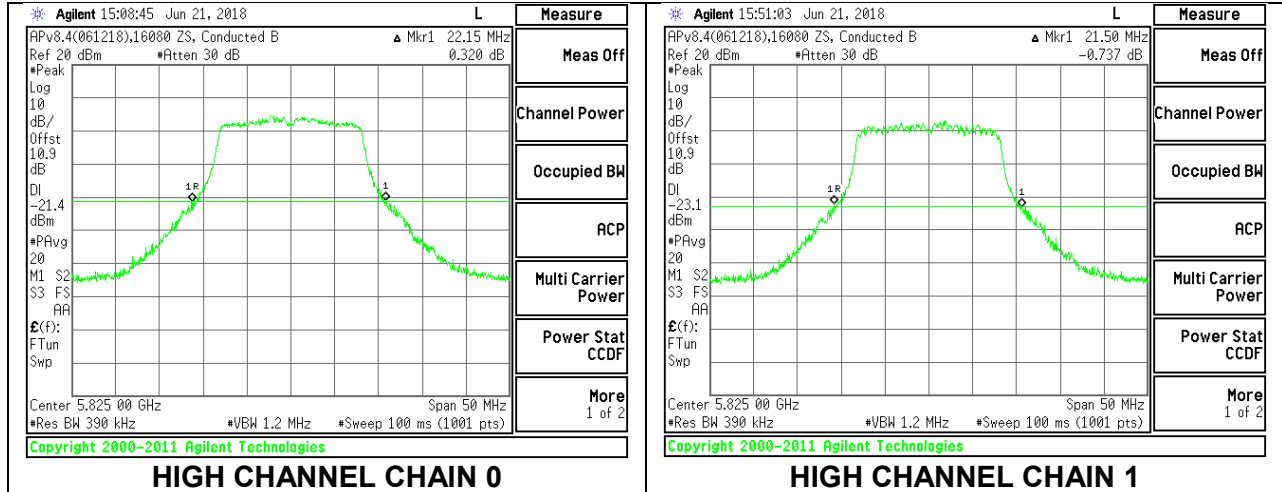
LOW CHANNEL



MID CHANNEL



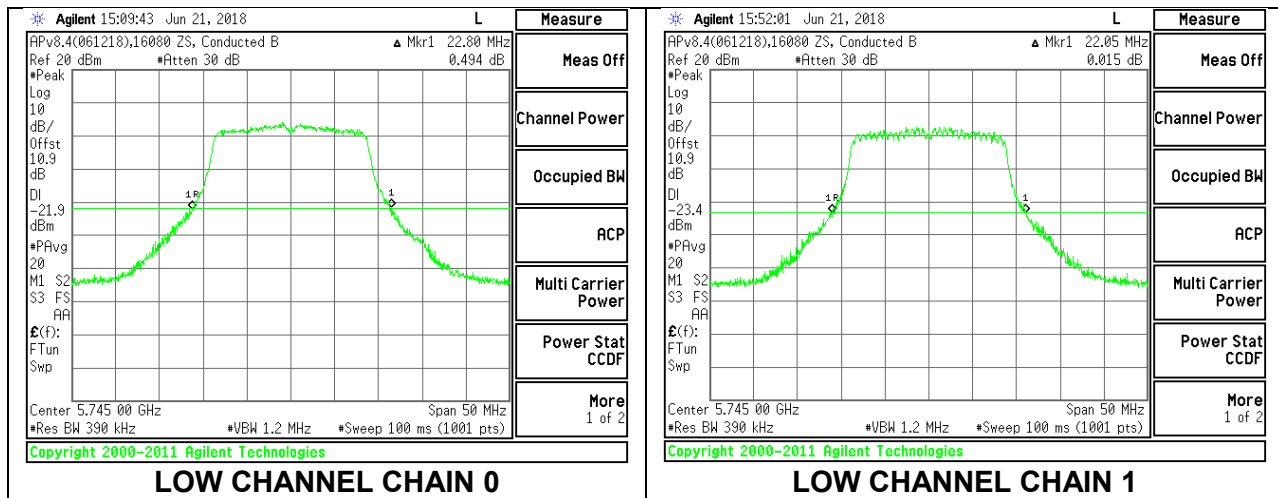
HIGH CHANNEL



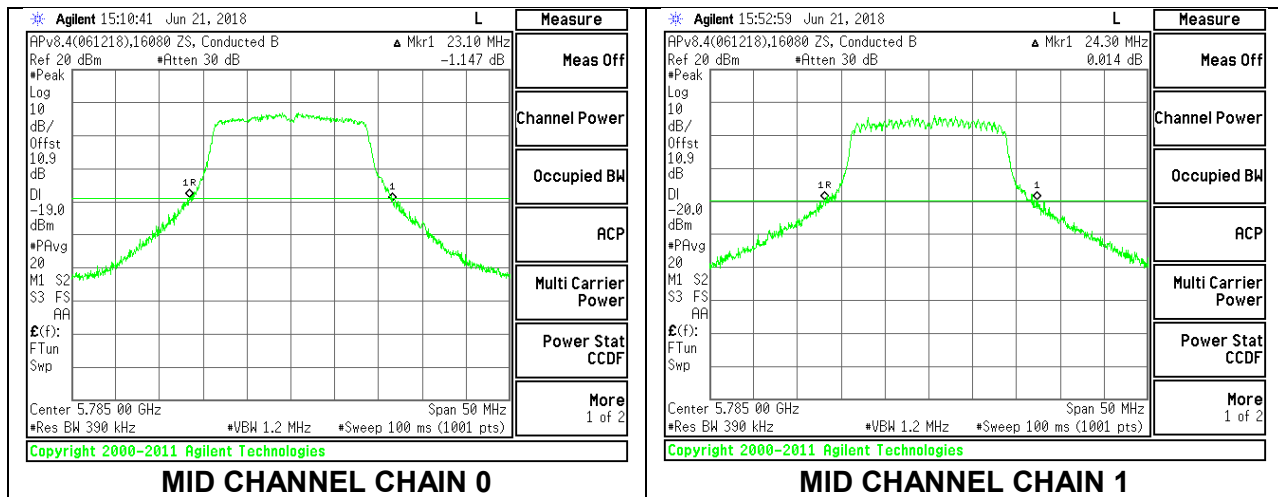
8.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5745	22.80	22.05
Mid	5785	23.10	24.30
High	5825	23.20	22.35

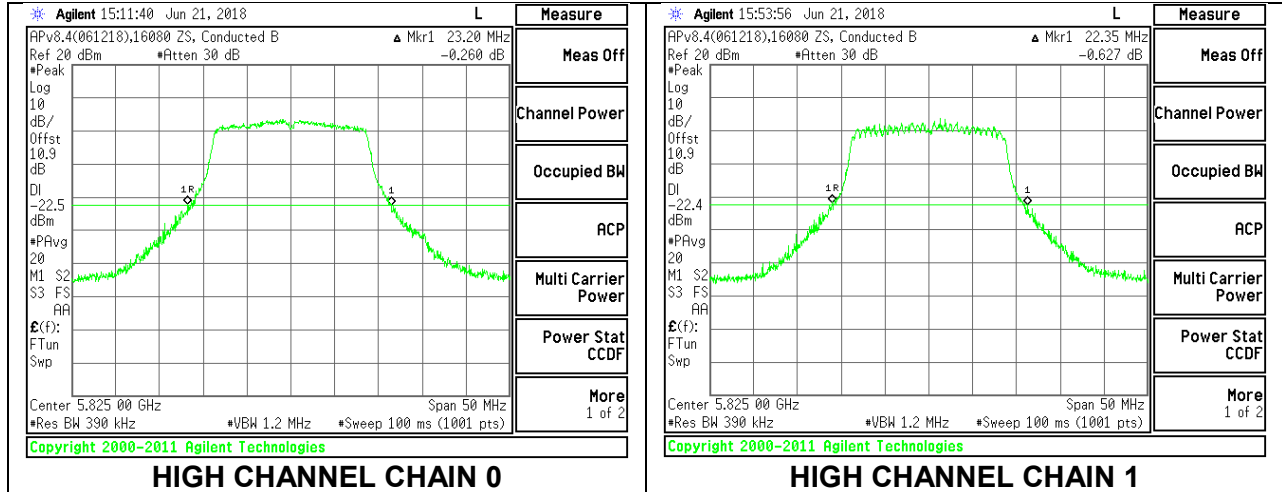
LOW CHANNEL



MID CHANNEL



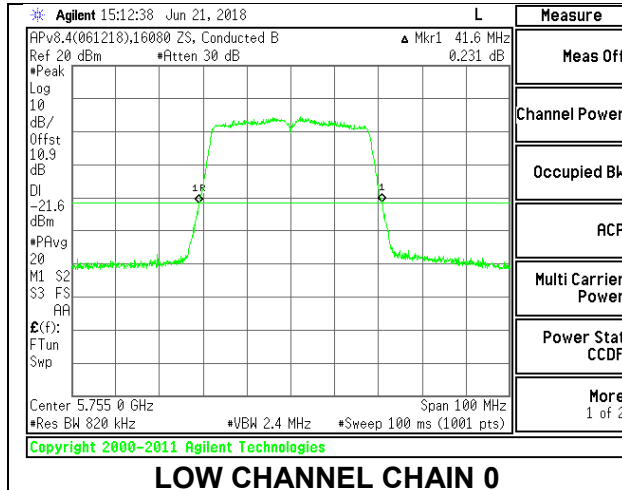
HIGH CHANNEL



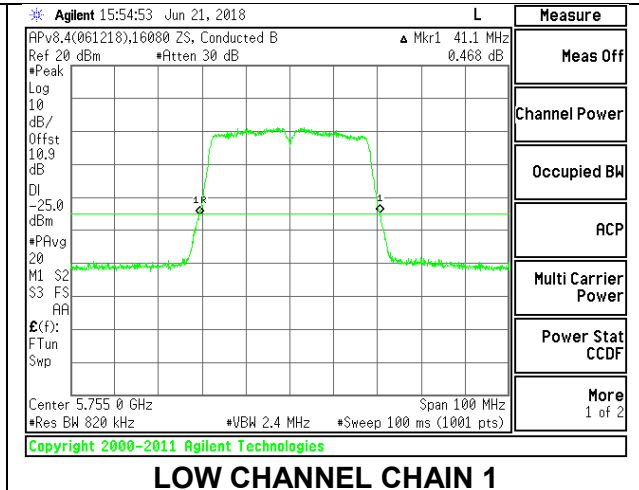
8.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5755	41.60	41.10
High	5795	41.90	41.40

LOW CHANNEL

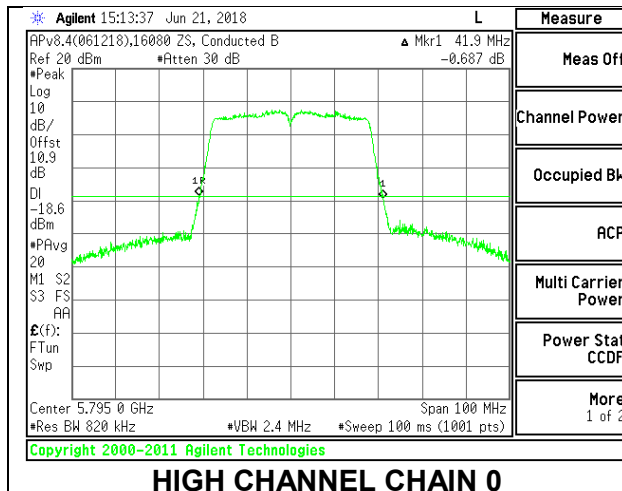


LOW CHANNEL CHAIN 0

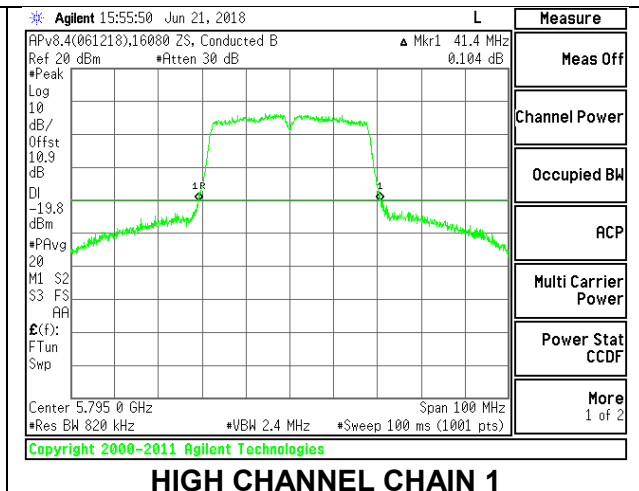


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

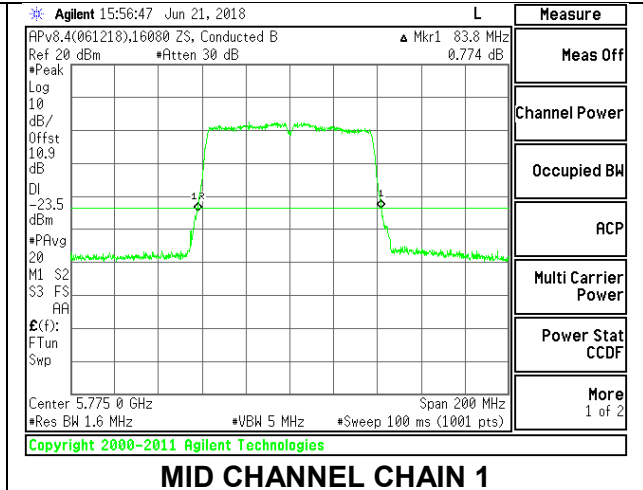
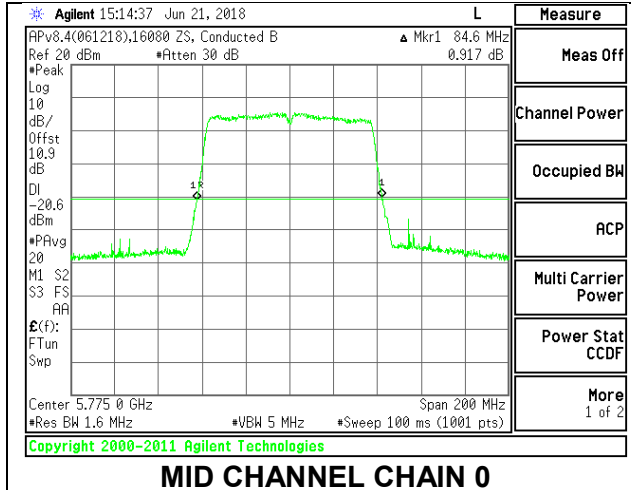


HIGH CHANNEL CHAIN 1

8.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5775	84.60	83.80

MID CHANNEL



8.3. 99% BANDWIDTH

LIMITS

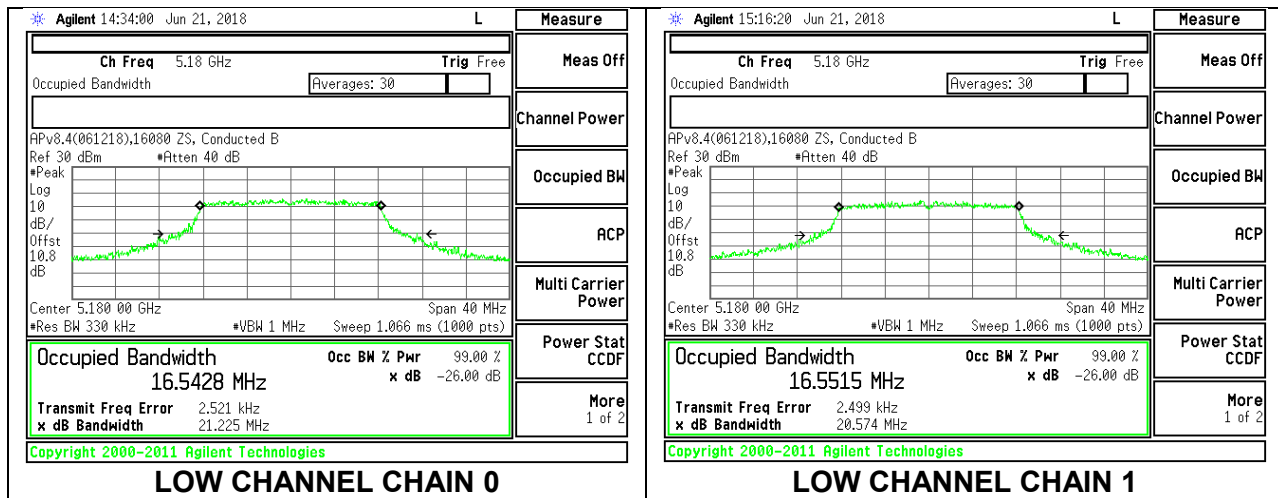
None; for reporting purposes only.

RESULTS

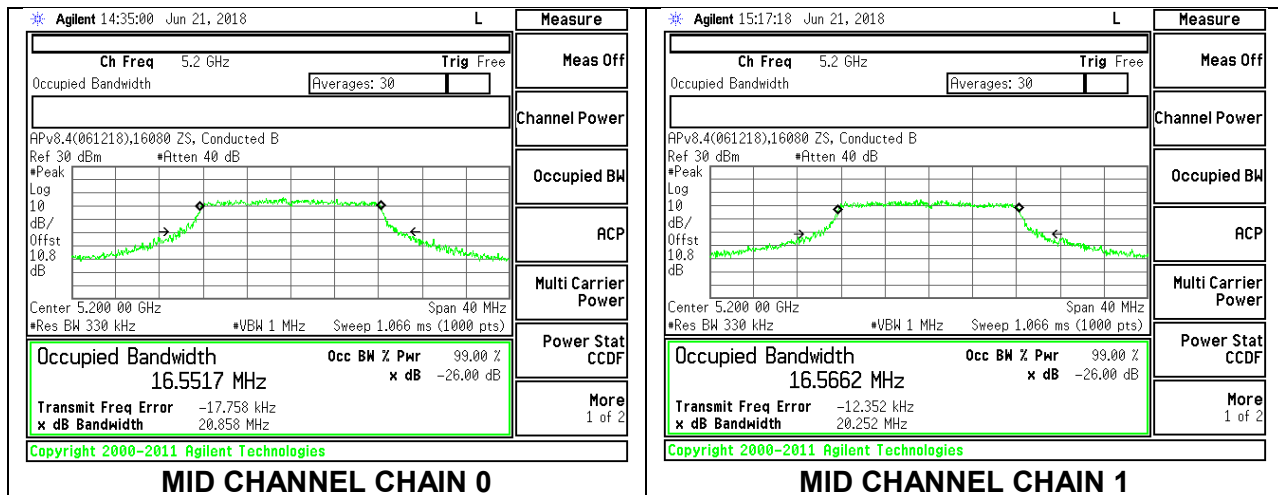
8.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5180	16.5428	16.5515
Mid	5200	16.5517	16.5662
High	5240	16.5086	16.5424

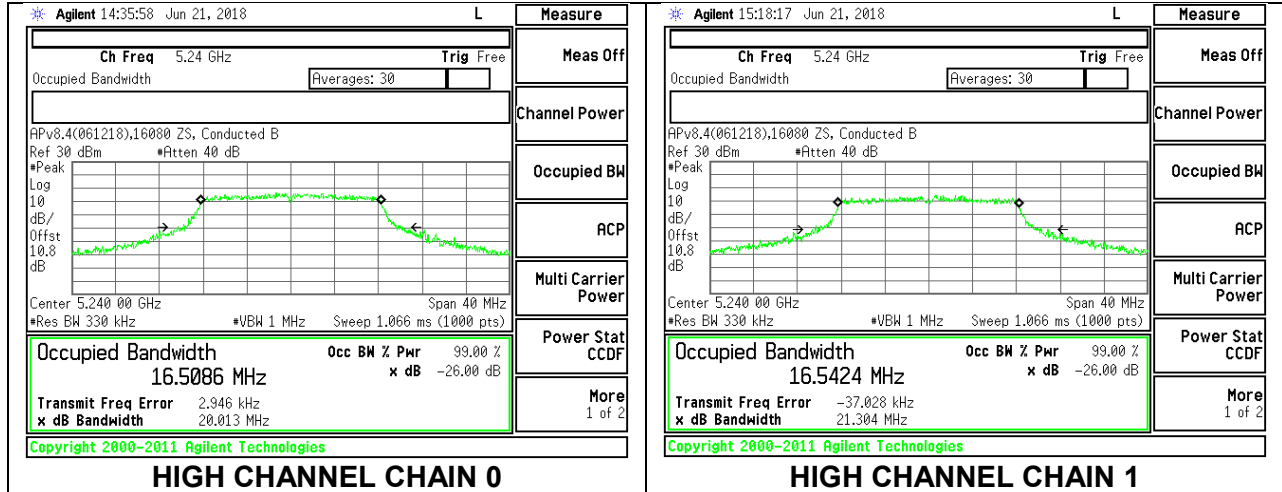
LOW CHANNEL



MID CHANNEL



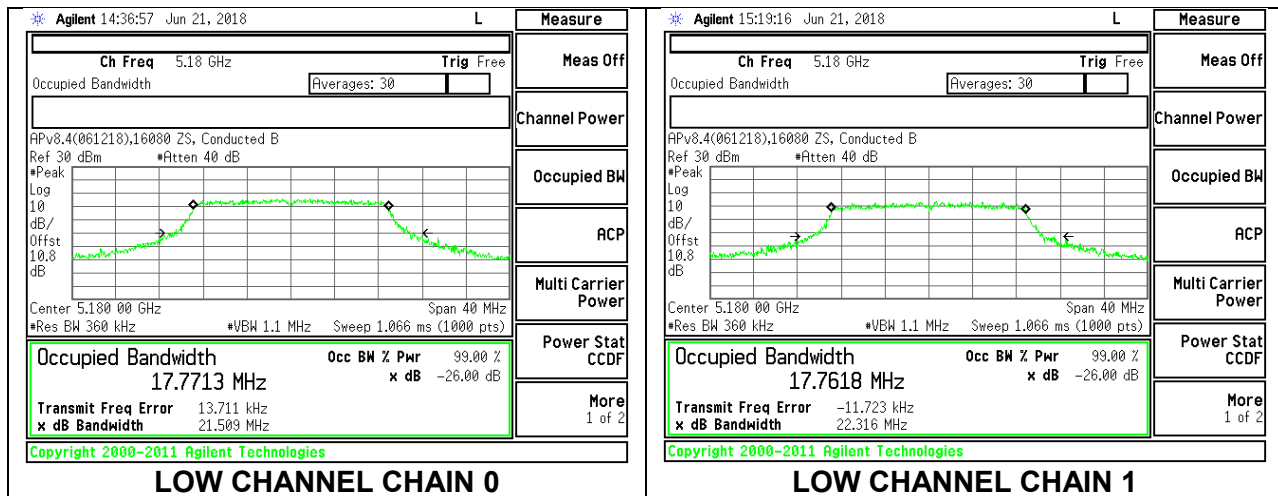
HIGH CHANNEL



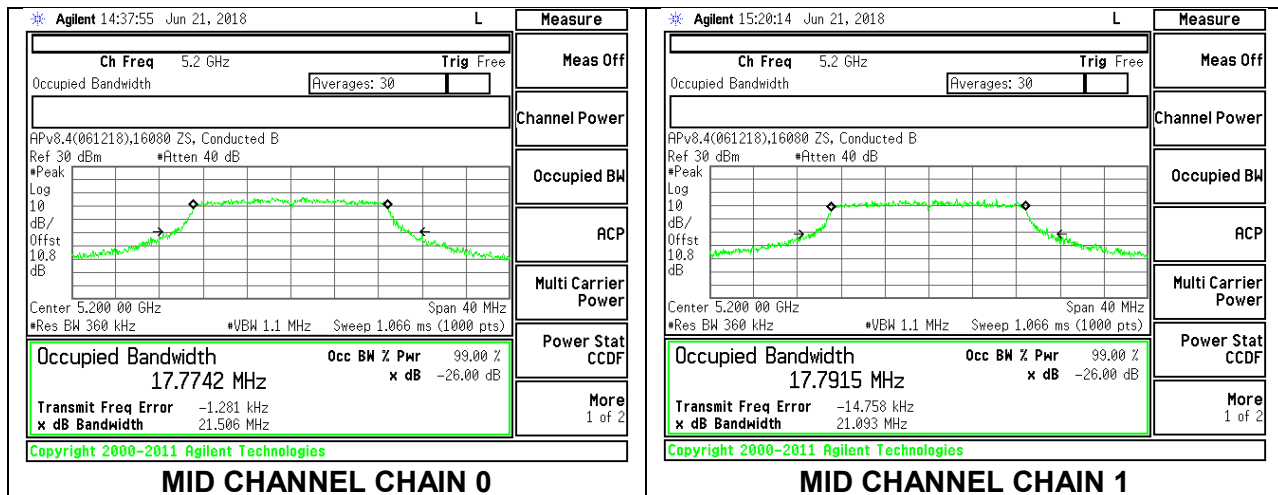
8.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5180	17.7713	17.7618
Mid	5200	17.7742	17.7915
High	5240	17.7255	17.7909

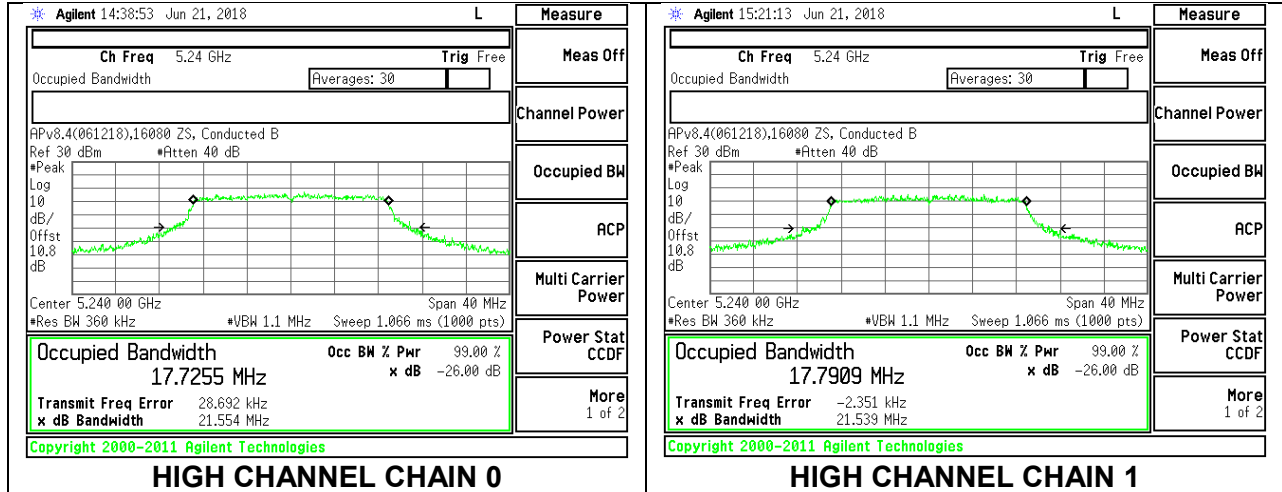
LOW CHANNEL



MID CHANNEL



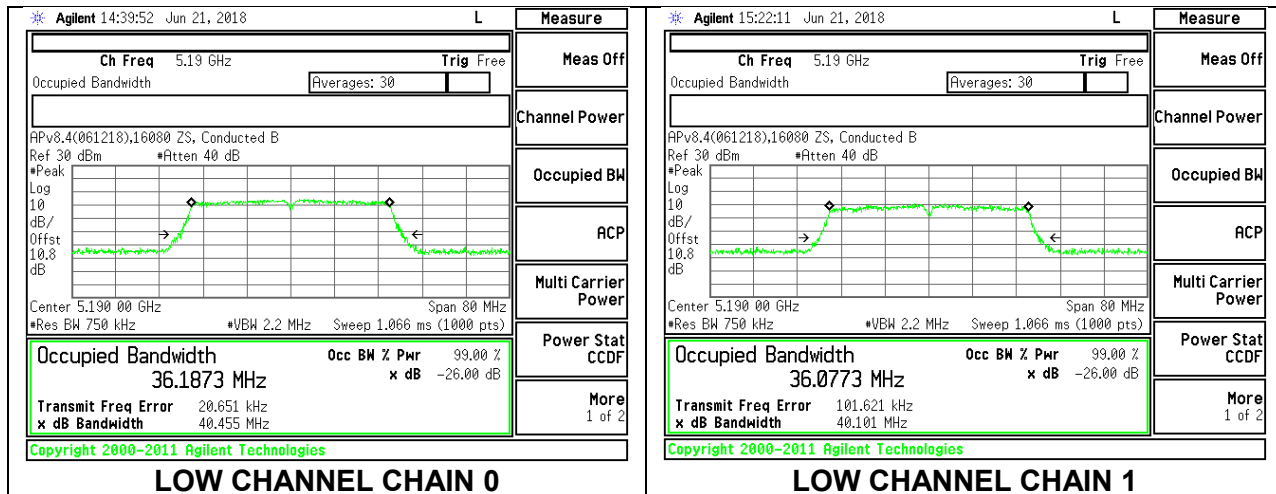
HIGH CHANNEL



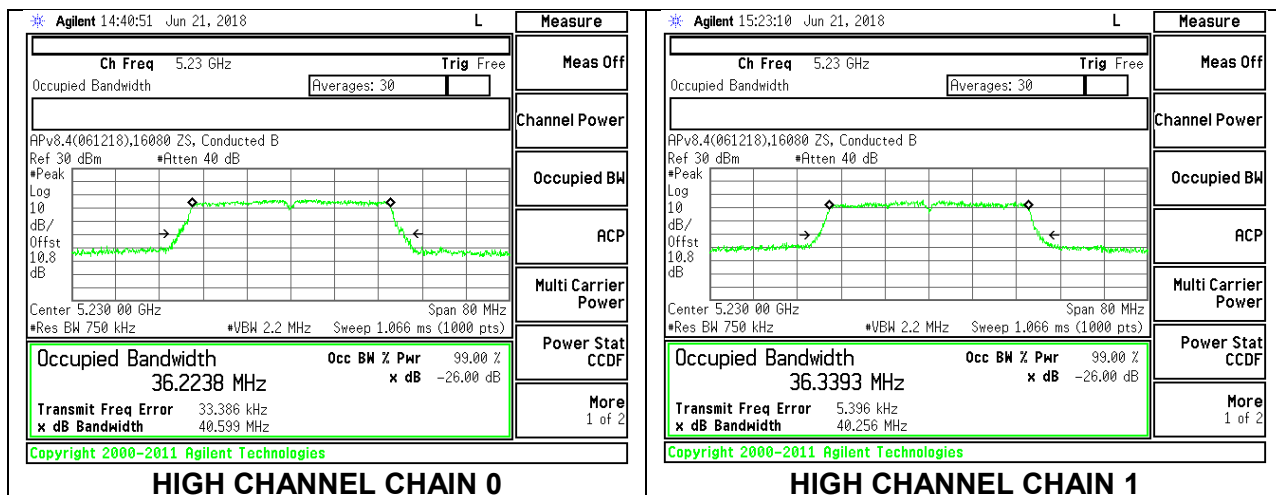
8.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5190	36.1873	36.0773
High	5230	36.2238	36.3393

LOW CHANNEL



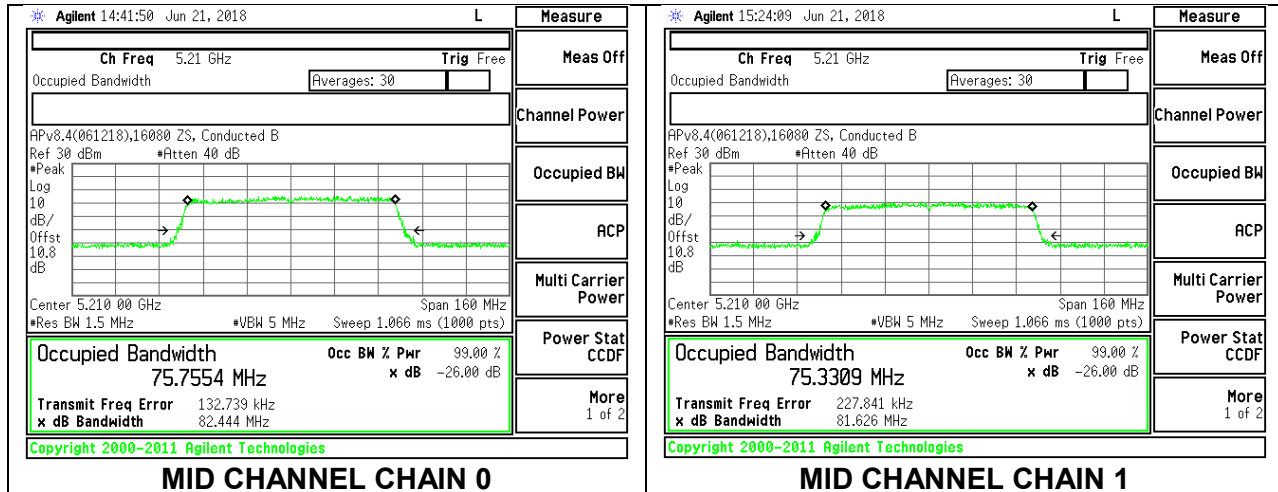
HIGH CHANNEL



8.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5210	75.7554	75.3309

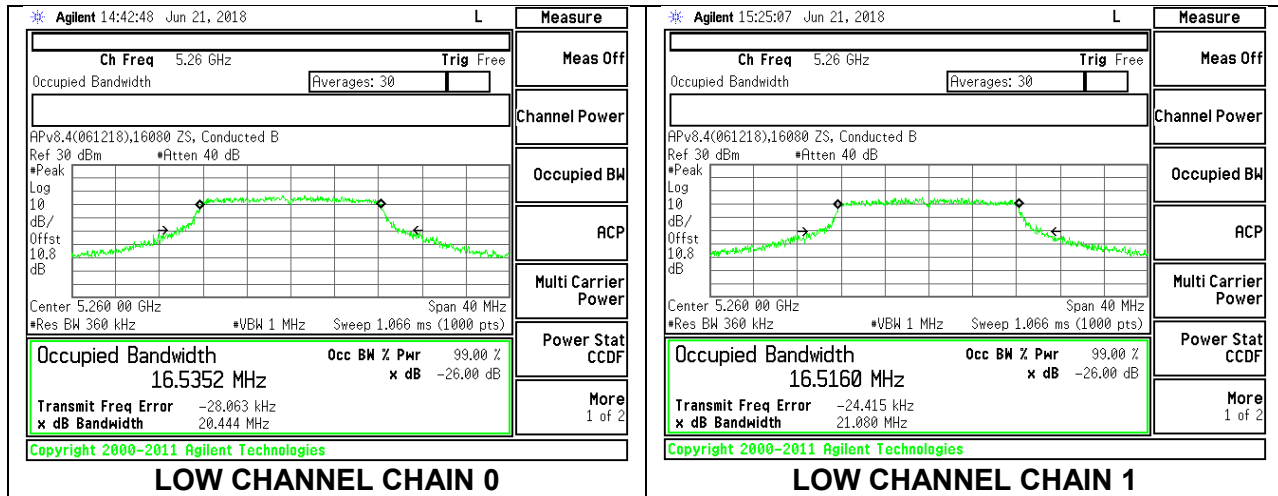
MID CHANNEL



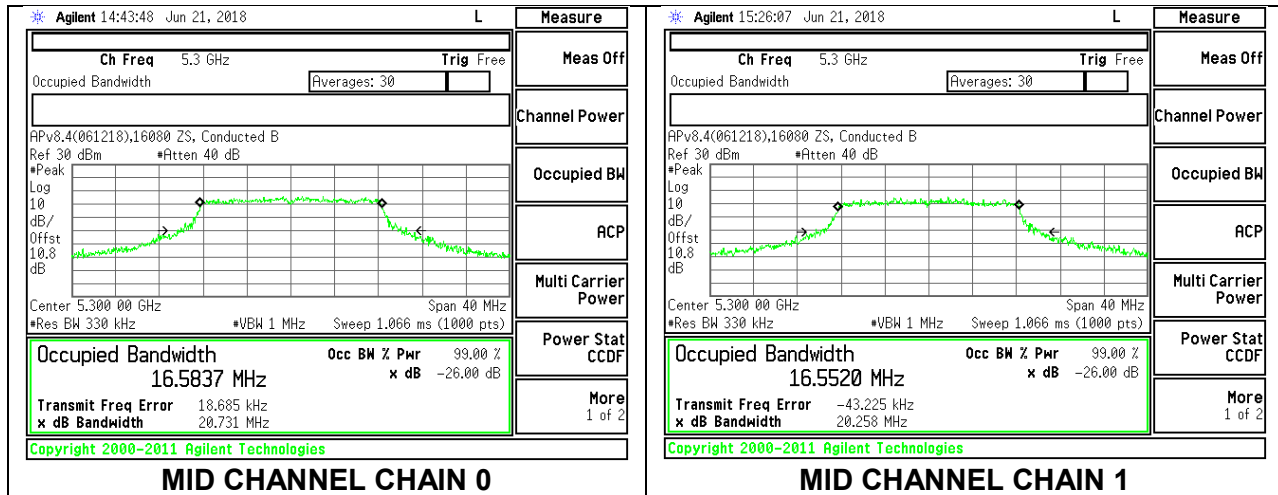
8.3.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5260	16.5352	16.5160
Mid	5300	16.5837	16.5520
High	5320	16.5841	16.5844

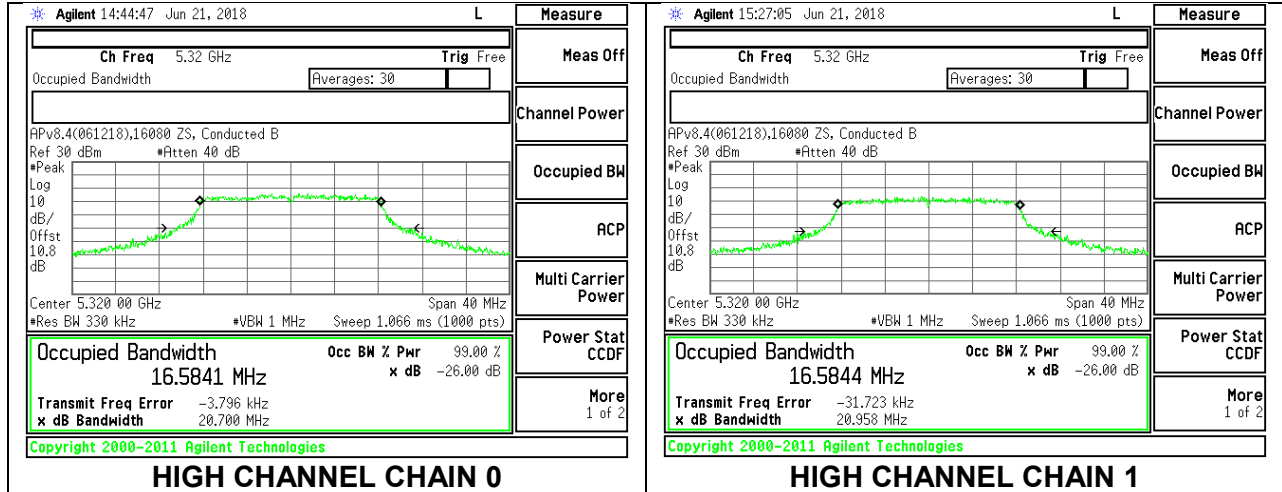
LOW CHANNEL



MID CHANNEL



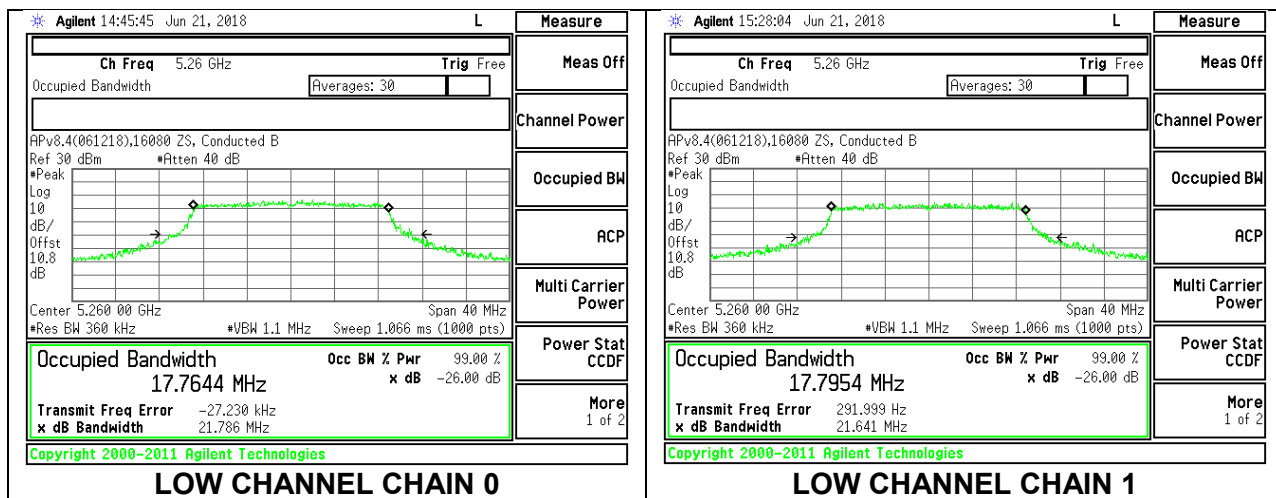
HIGH CHANNEL



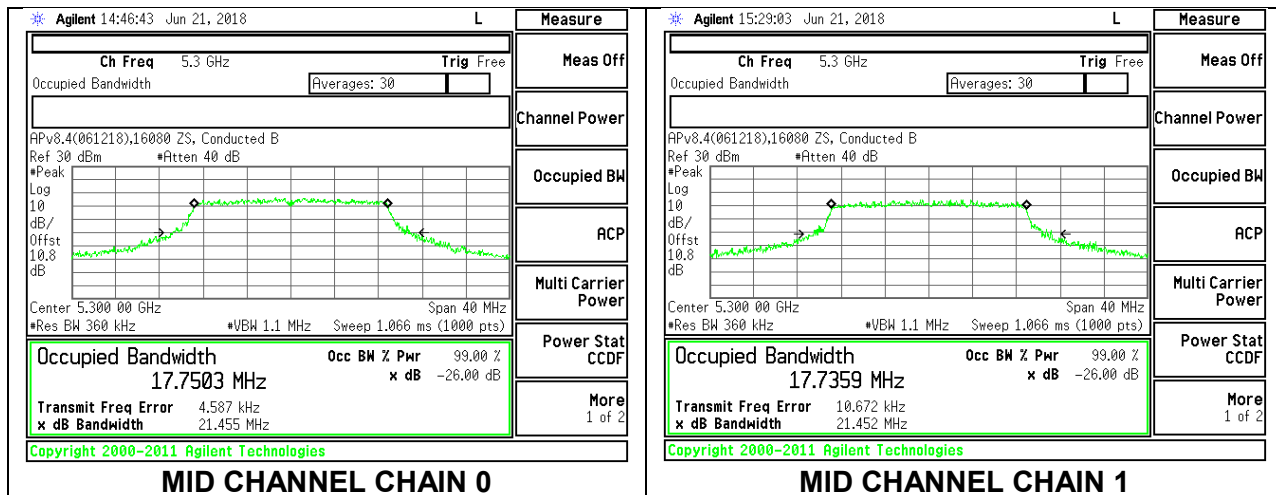
8.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5260	17.7644	17.7954
Mid	5300	17.7503	17.7359
High	5320	17.7622	17.7815

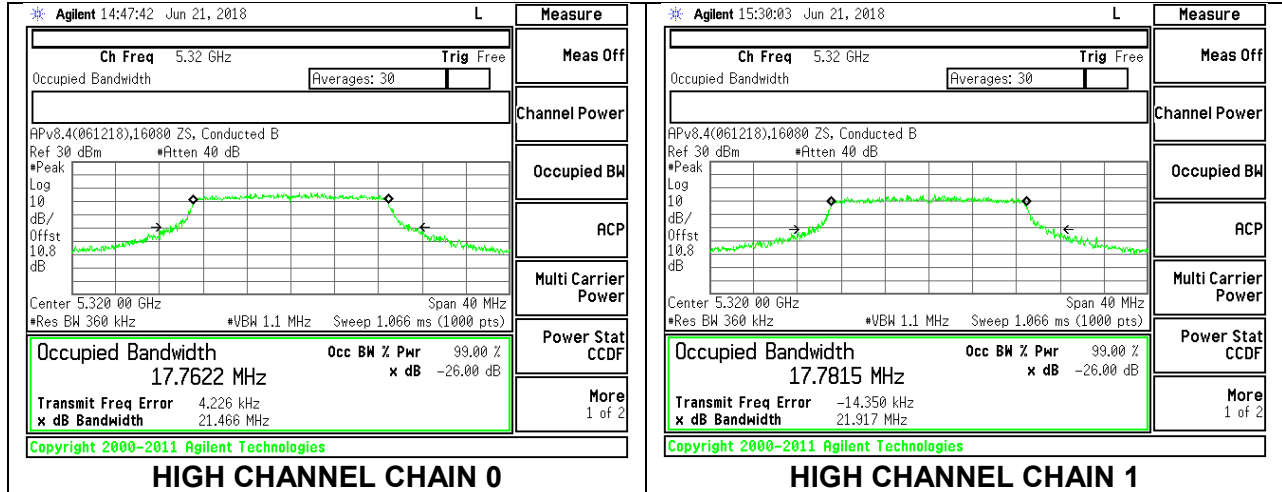
LOW CHANNEL



MID CHANNEL



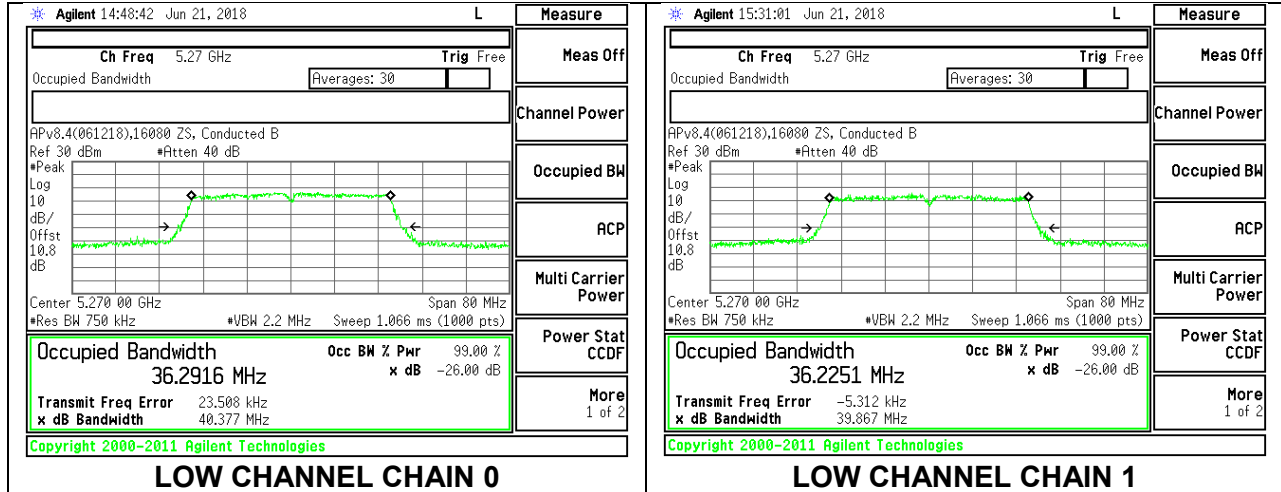
HIGH CHANNEL



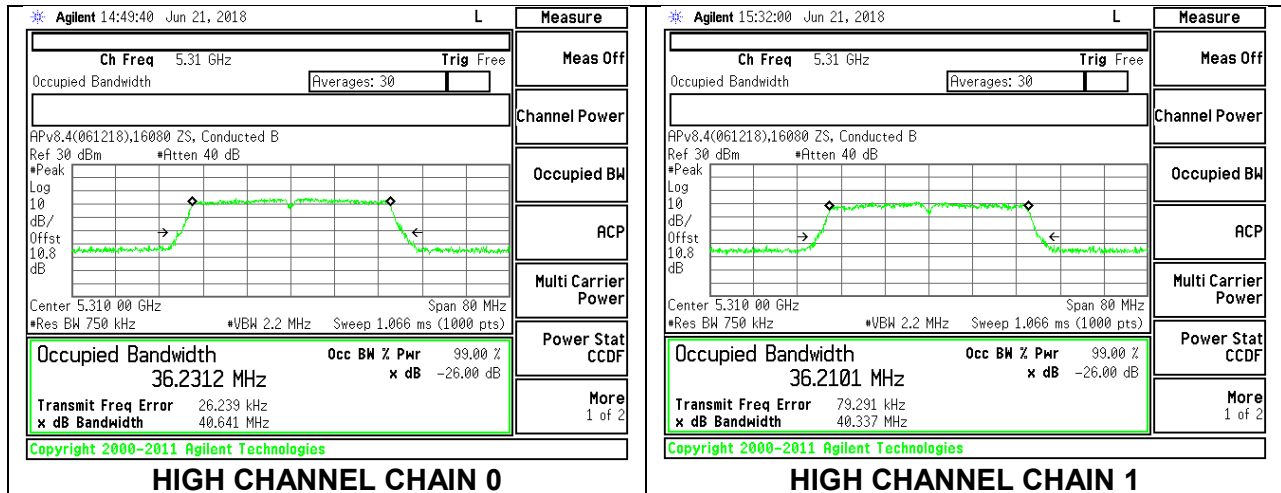
8.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5270	36.2916	36.2251
High	5310	36.2312	36.2101

LOW CHANNEL



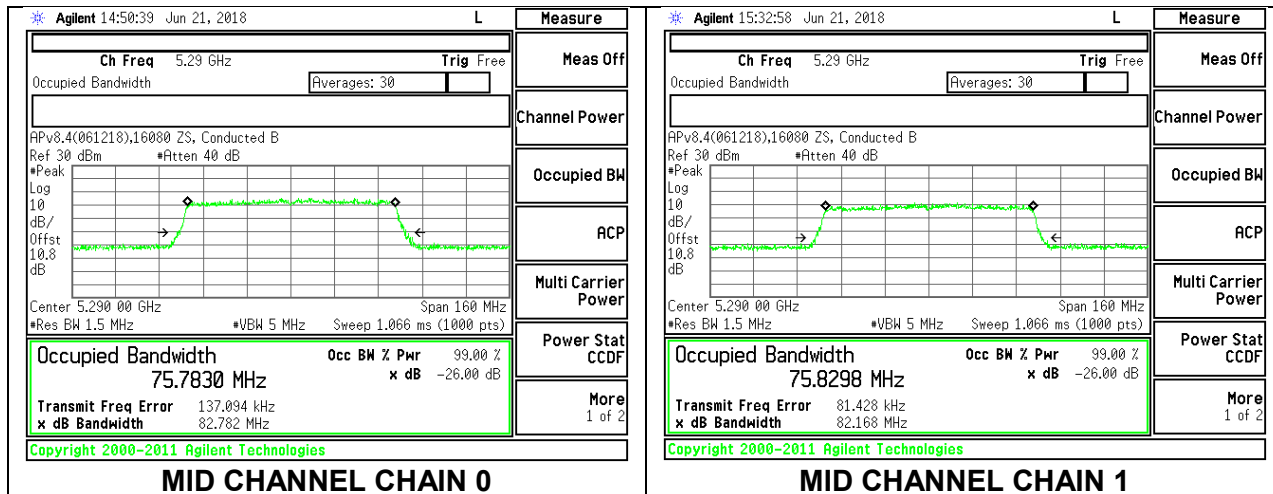
HIGH CHANNEL



8.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5290	75.7830	75.8298

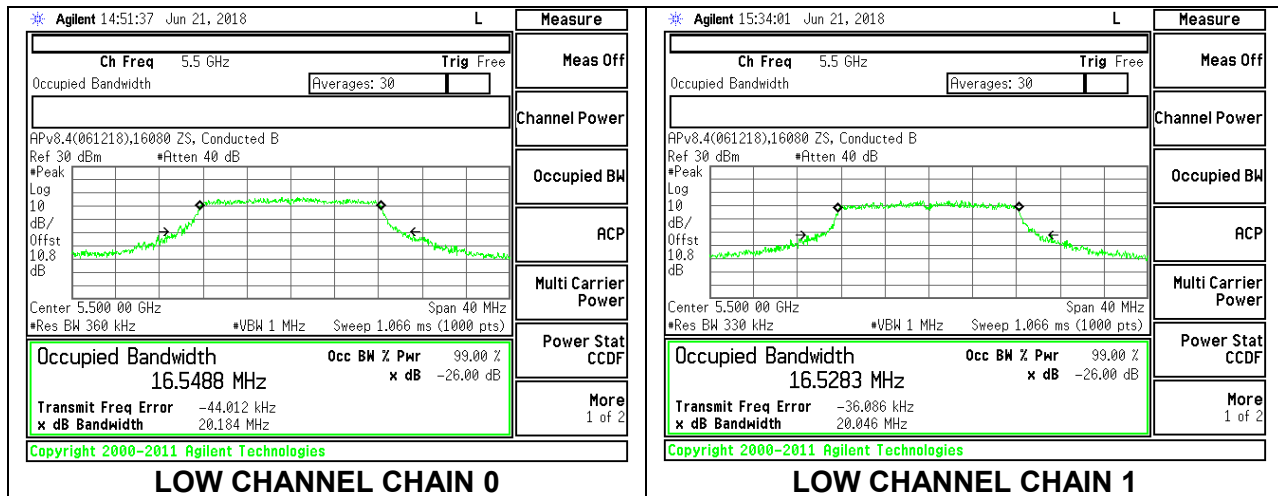
MID CHANNEL



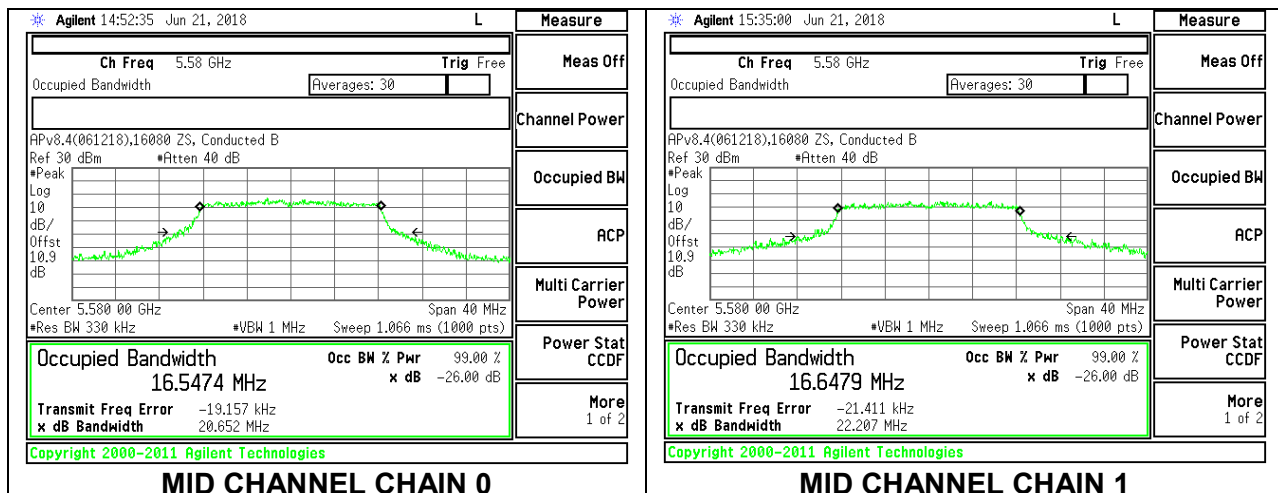
8.3.9. 802.11a MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5500	16.5488	16.5283
Mid	5580	16.5474	16.6479
High	5700	16.4904	16.5422
144	5720	16.5532	16.6814

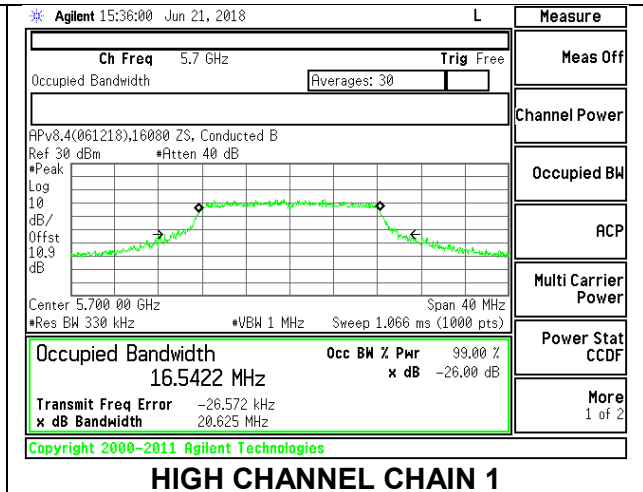
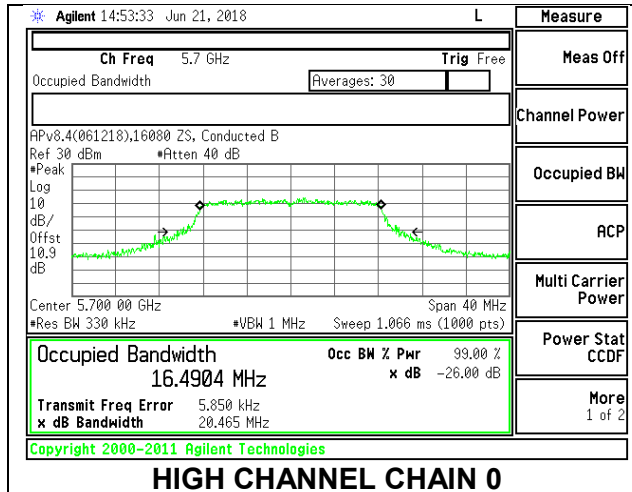
LOW CHANNEL



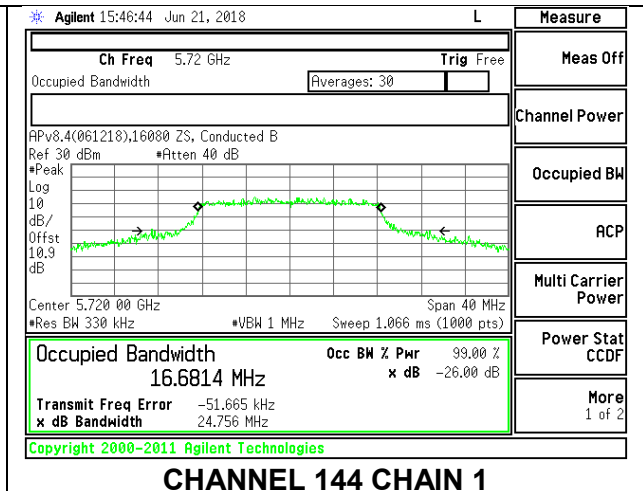
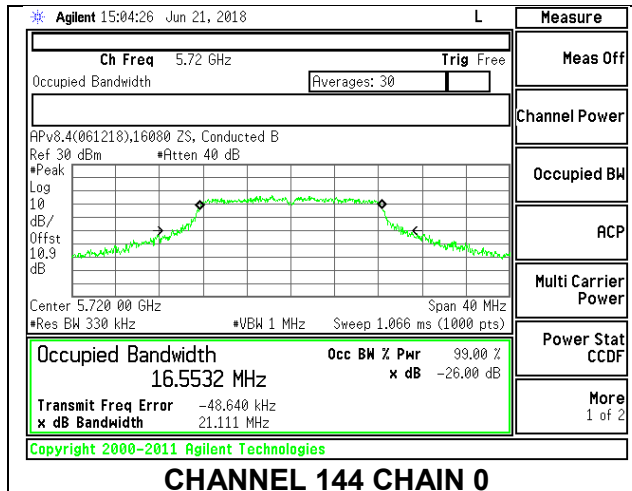
MID CHANNEL



HIGH CHANNEL



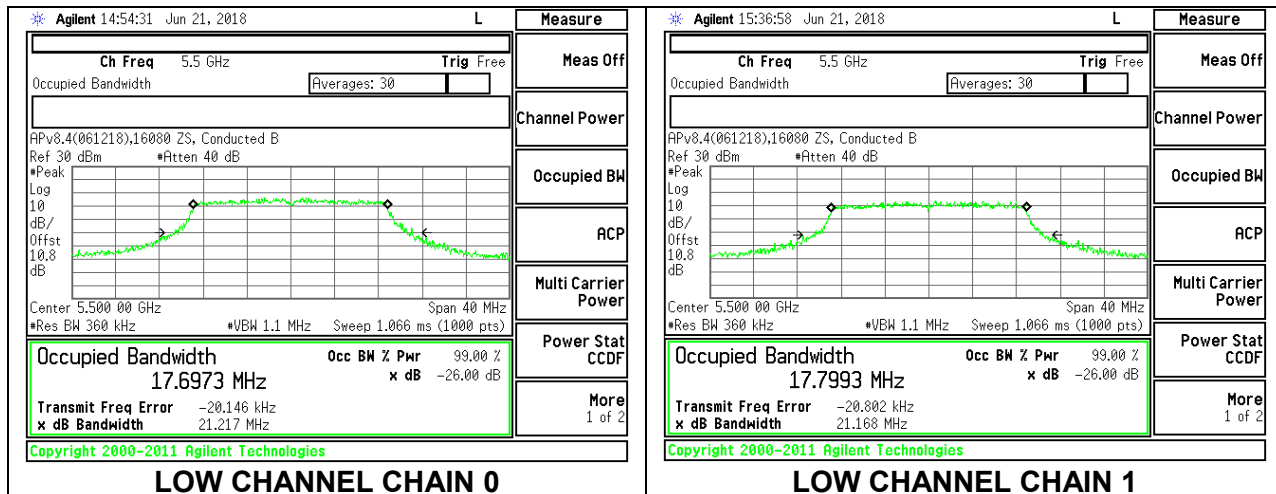
CHANNEL 144



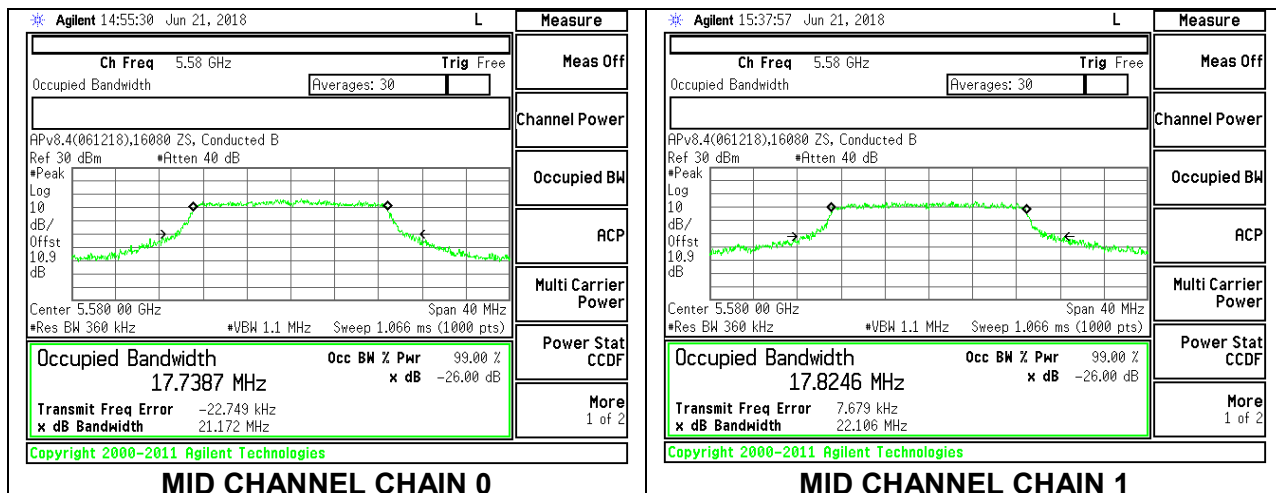
8.3.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5500	17.6973	17.7993
Mid	5580	17.7387	17.8246
High	5700	17.7485	17.7465
144	5720	17.7515	17.8081

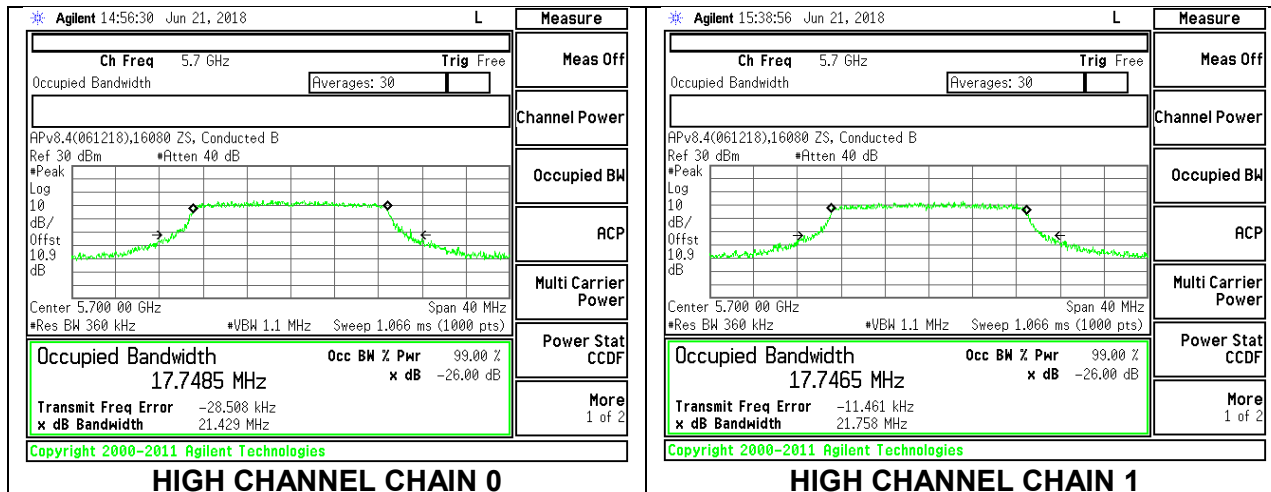
LOW CHANNEL



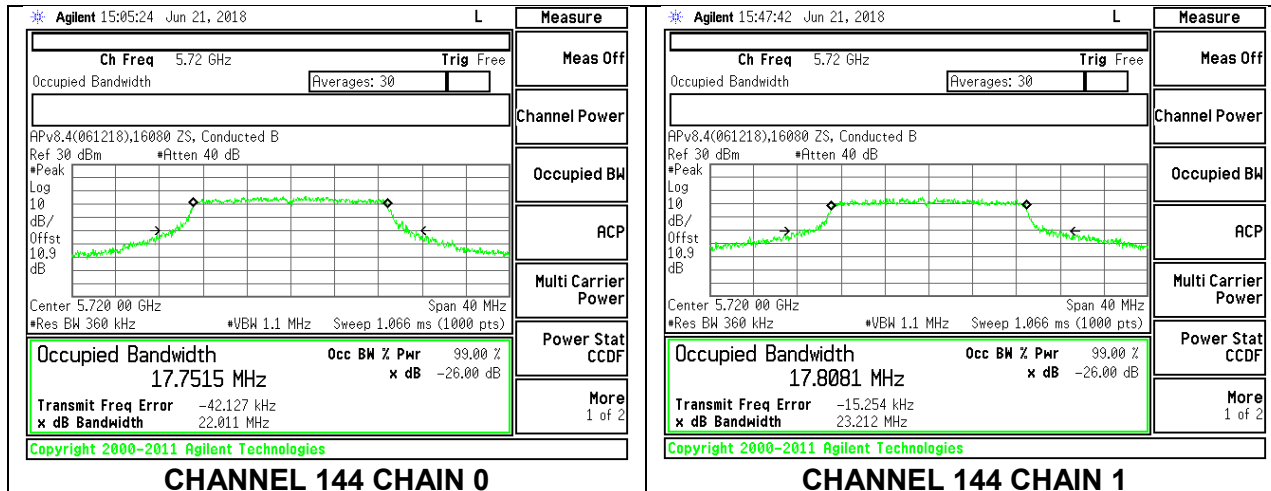
MID CHANNEL



HIGH CHANNEL



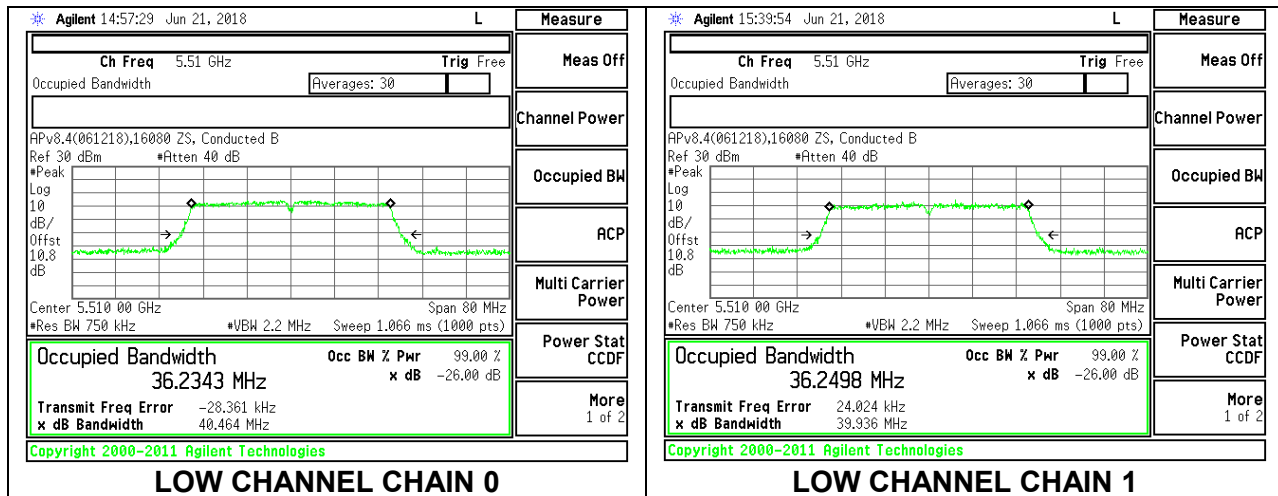
CHANNEL 144



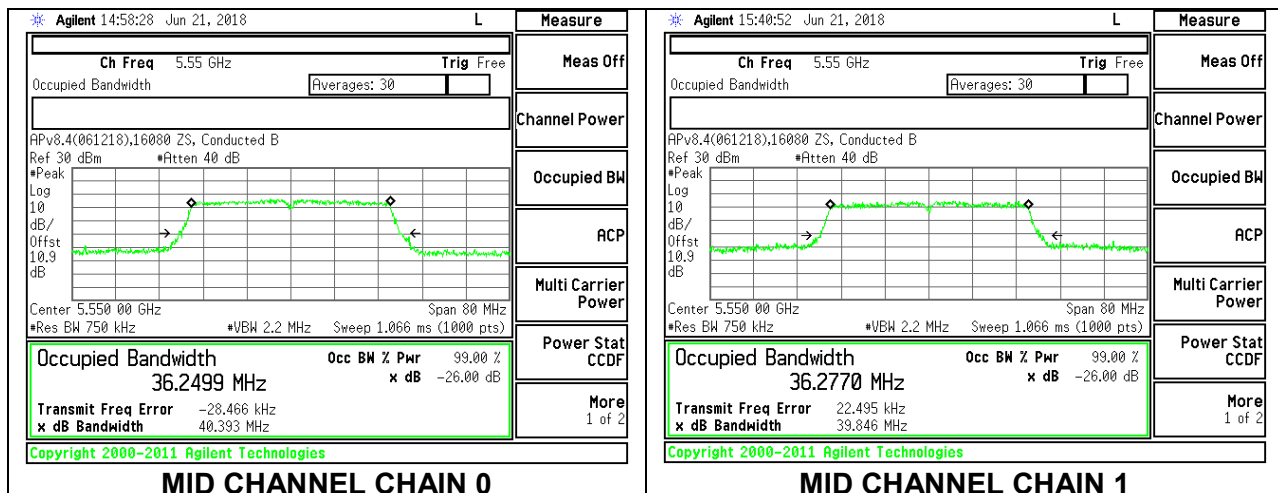
8.3.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5510	36.2343	36.2498
Mid	5550	36.2499	36.2770
High	5670	36.2457	36.2804
142	5710	36.2492	36.3780

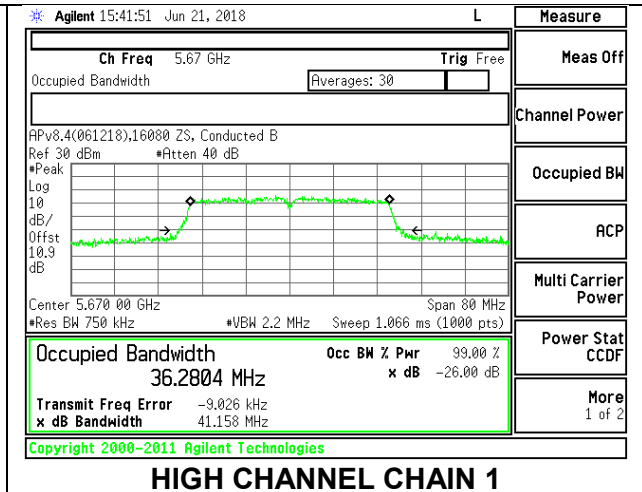
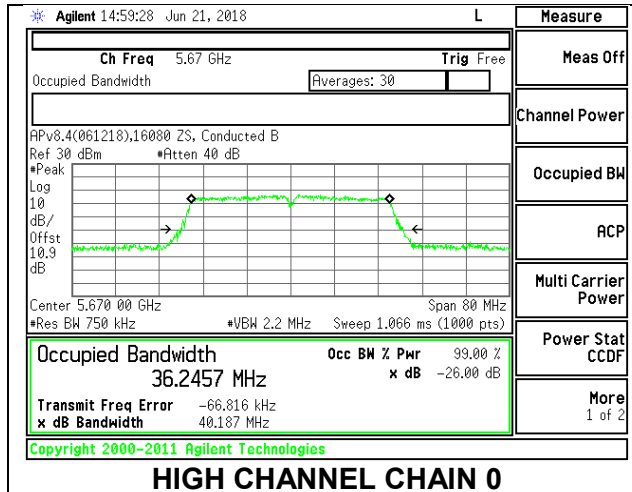
LOW CHANNEL



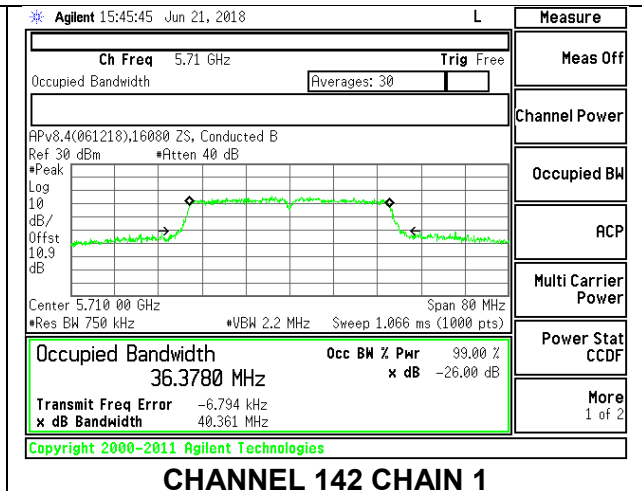
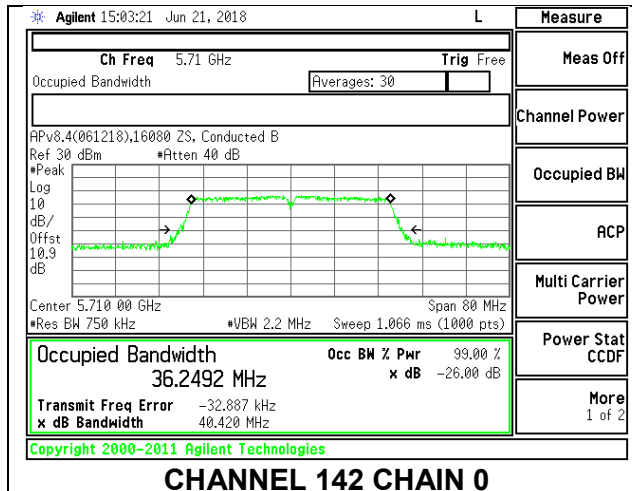
MID CHANNEL



HIGH CHANNEL



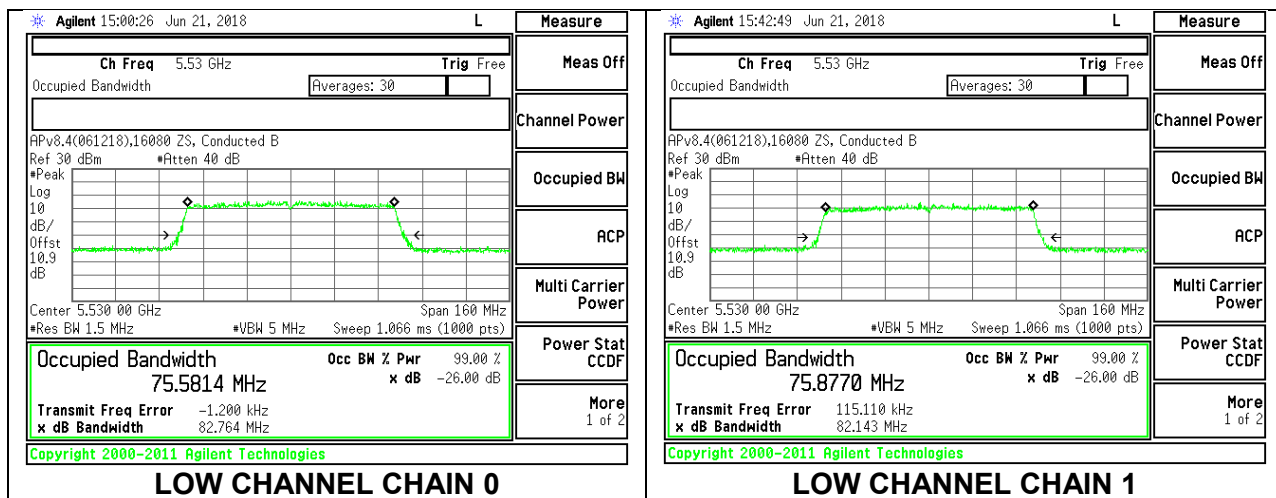
CHANNEL 142



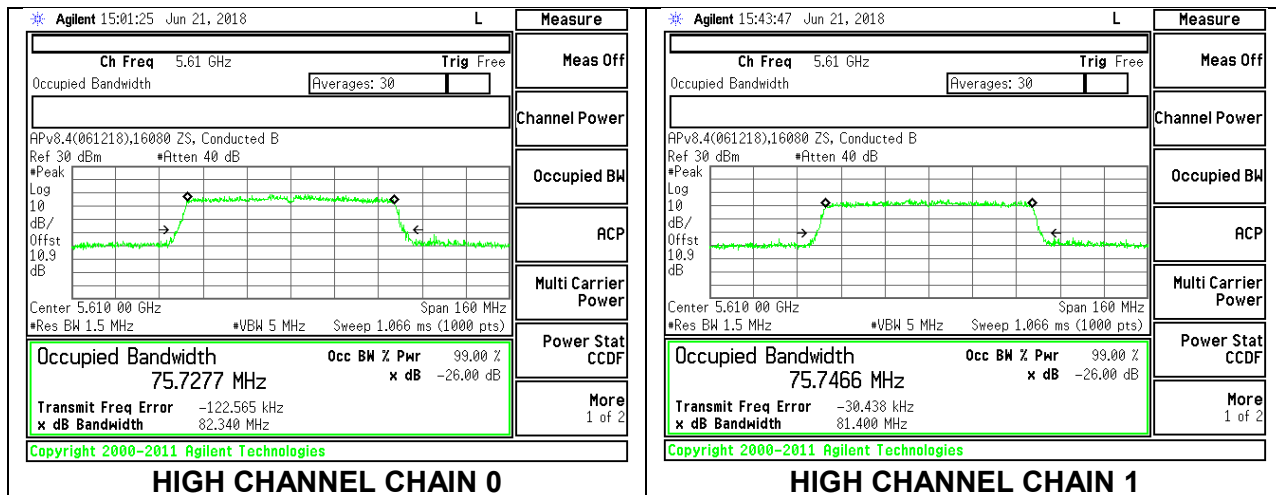
8.3.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5530	75.5814	75.8770
High	5610	75.7277	75.7466
138	5690	75.5399	75.8747

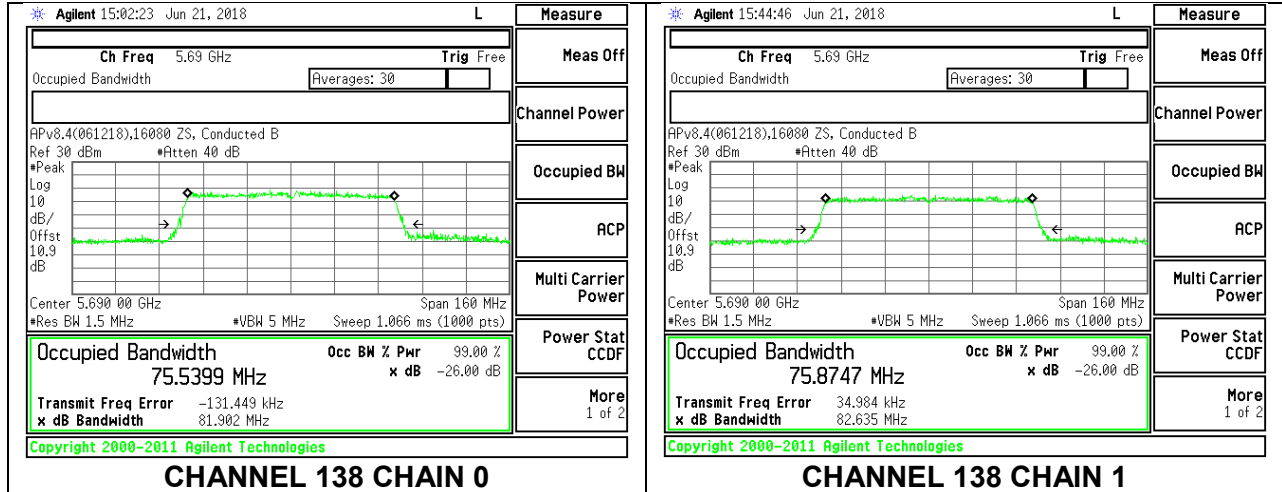
LOW CHANNEL



HIGH CHANNEL



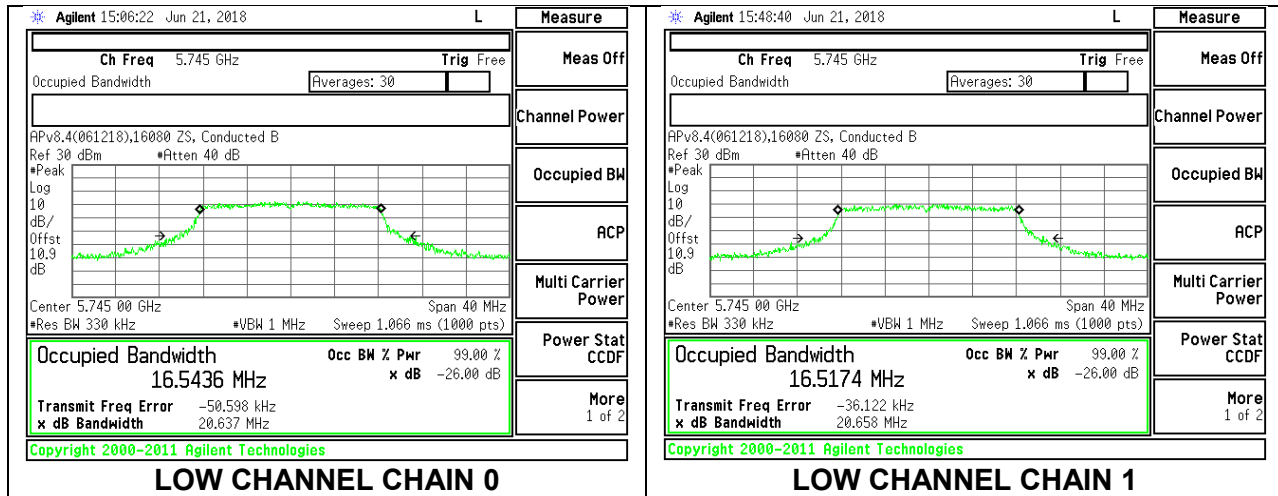
CHANNEL 138



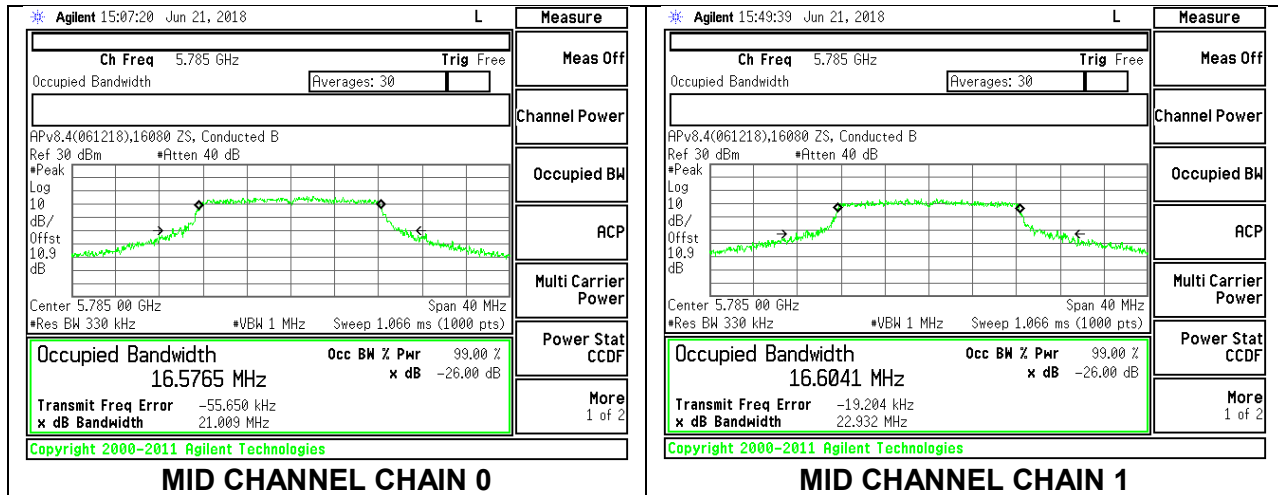
8.3.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5745	16.5436	16.5174
Mid	5785	16.5765	16.6041
High	5825	16.5470	16.5335

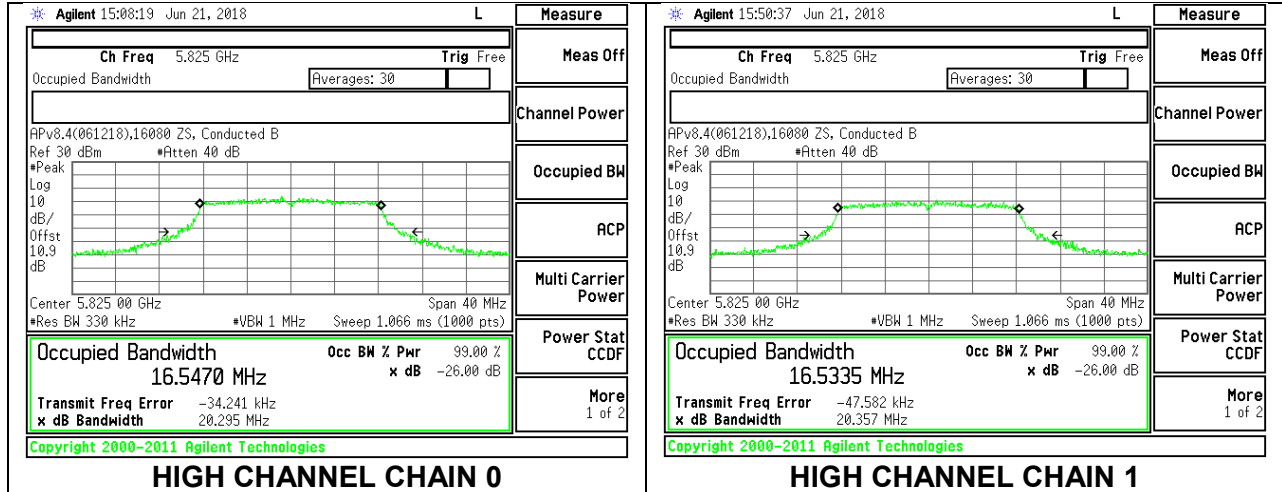
LOW CHANNEL



MID CHANNEL



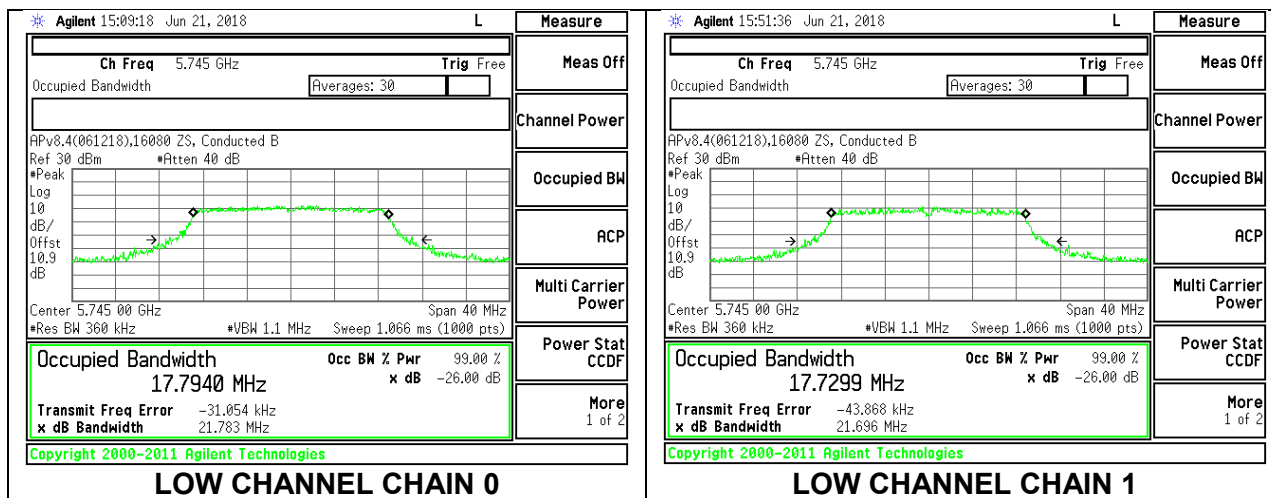
HIGH CHANNEL



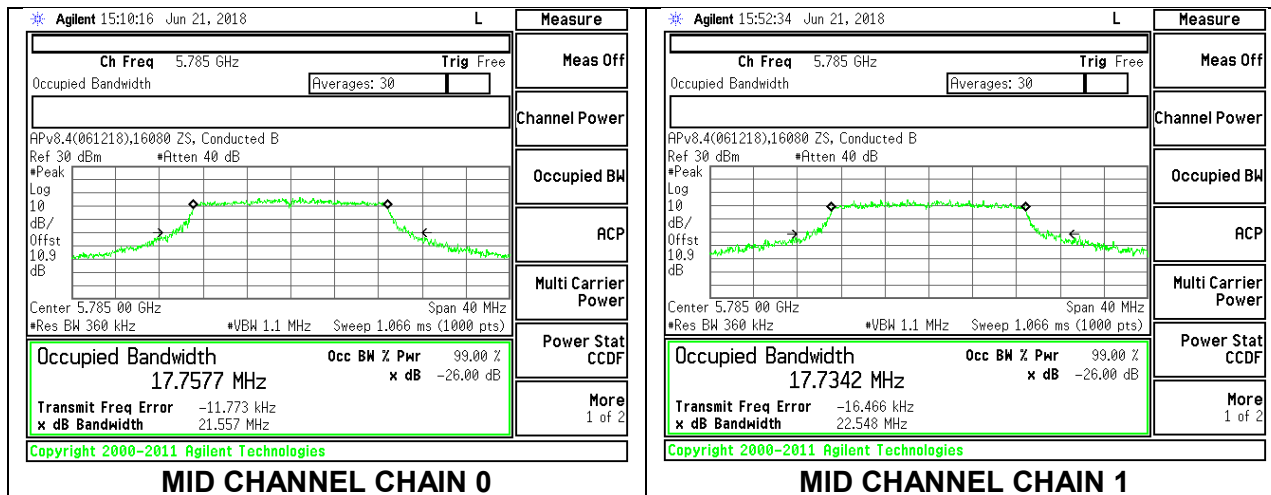
8.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5745	17.7940	17.7299
Mid	5785	17.7577	17.7342
High	5825	17.8073	17.7035

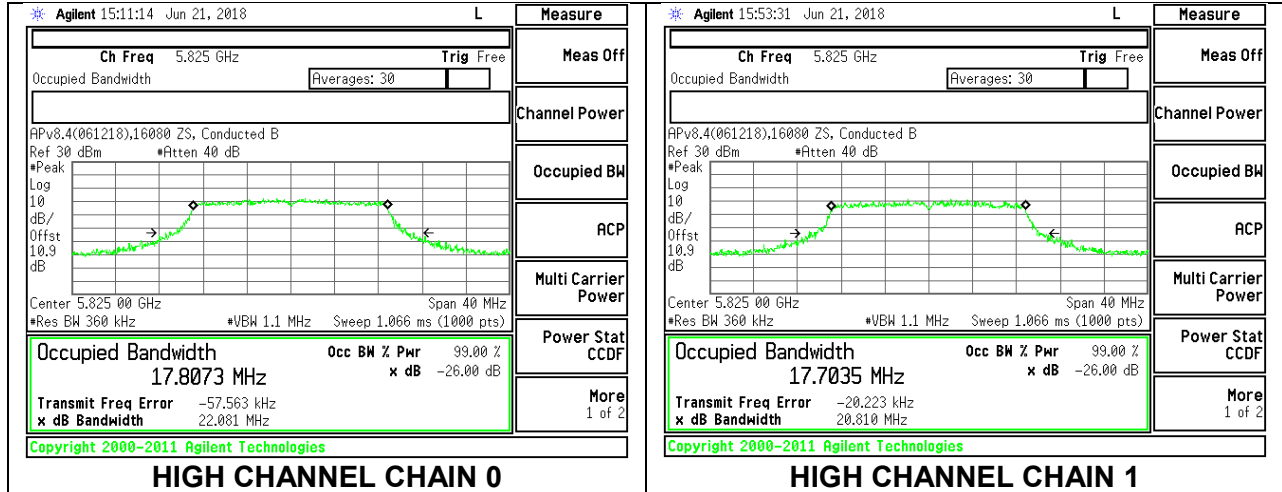
LOW CHANNEL



MID CHANNEL



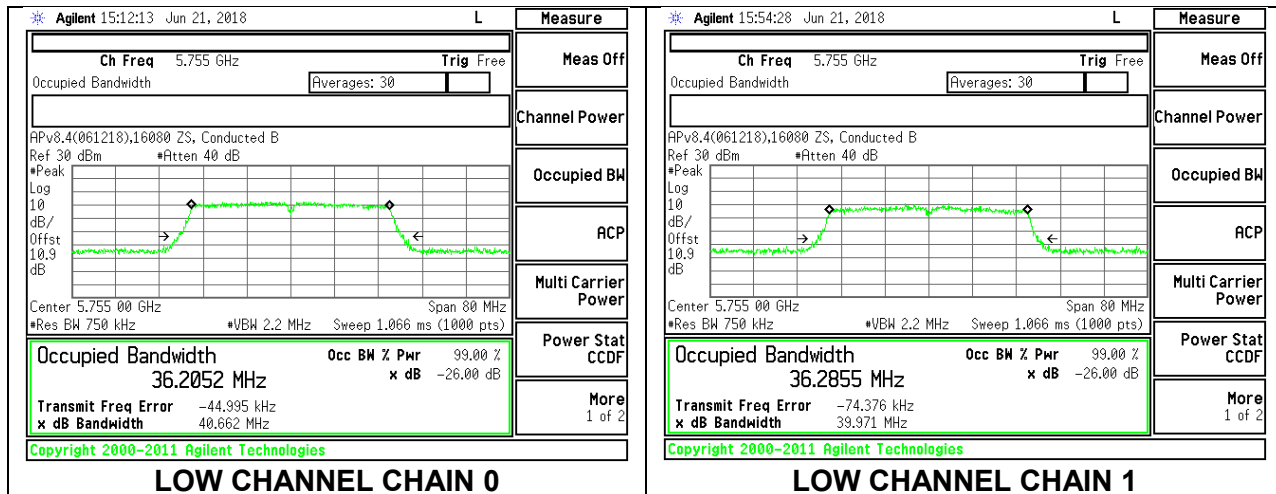
HIGH CHANNEL



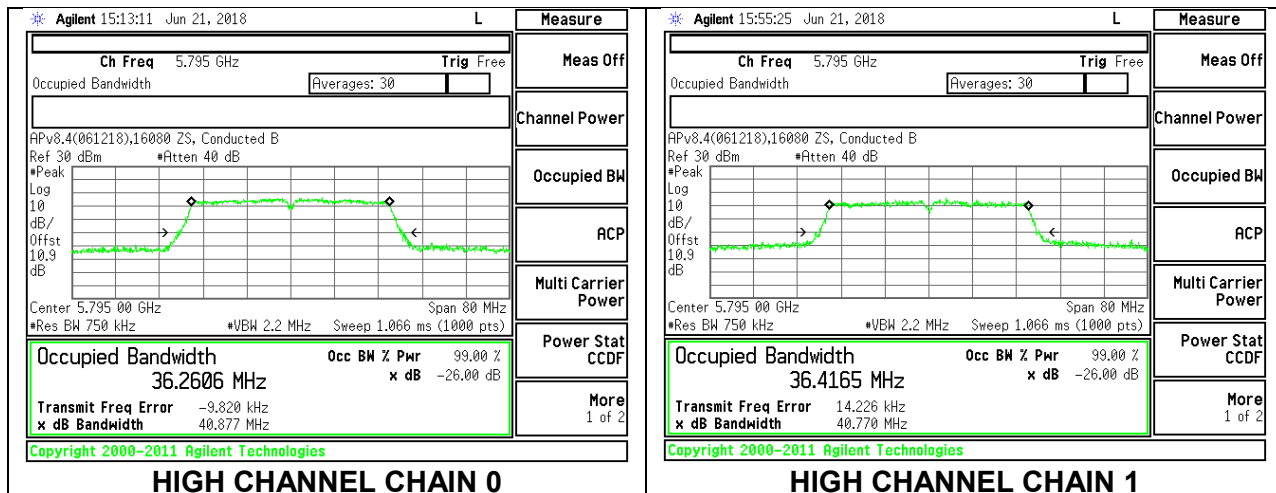
8.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5755	36.2052	36.2855
High	5795	36.2606	36.4165

LOW CHANNEL



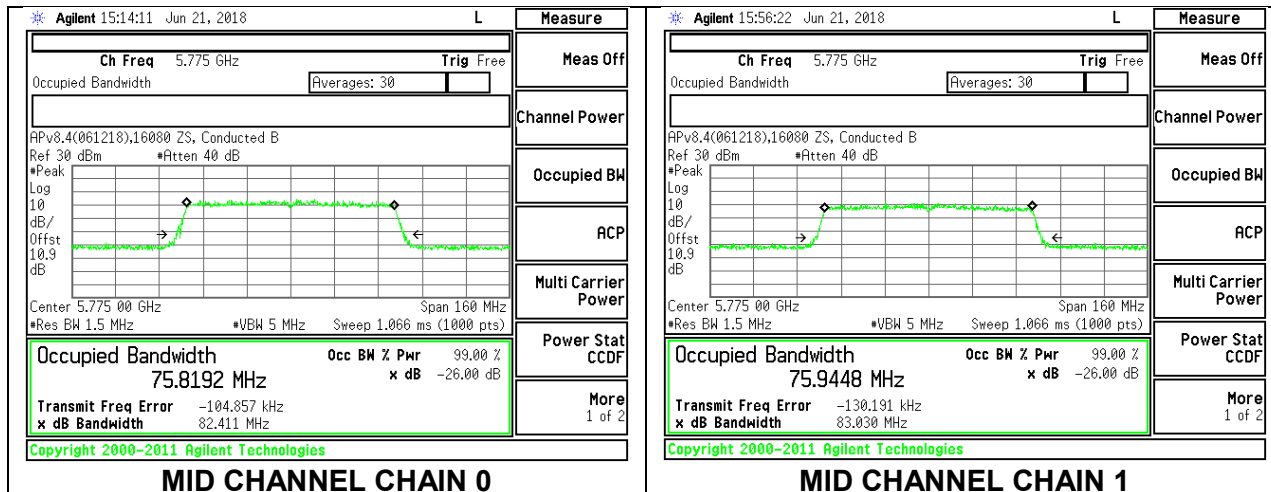
HIGH CHANNEL



8.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5775	75.8192	75.9448

MID CHANNEL



8.4. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

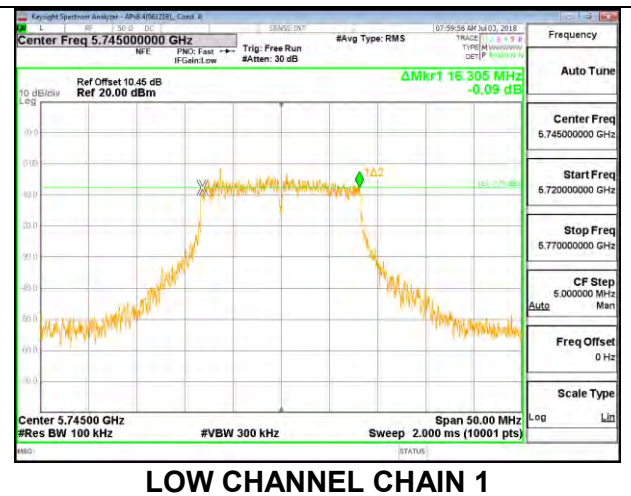
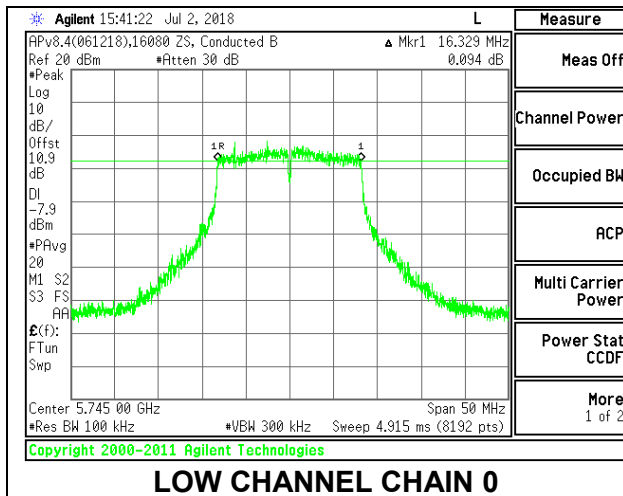
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

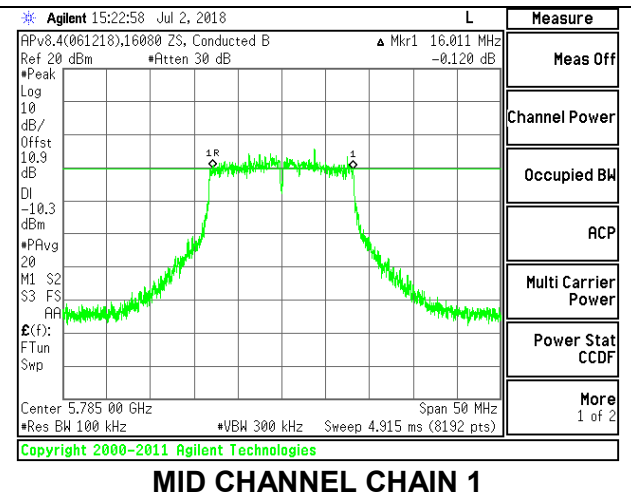
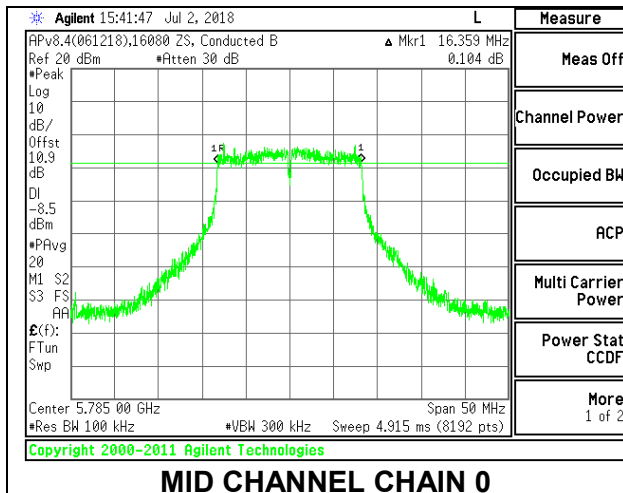
8.4.1. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	16.329	16.305	0.5
Mid	5785	16.359	16.011	0.5
High	5825	16.360	16.366	0.5
144	5720	3.213	3.238	0.5

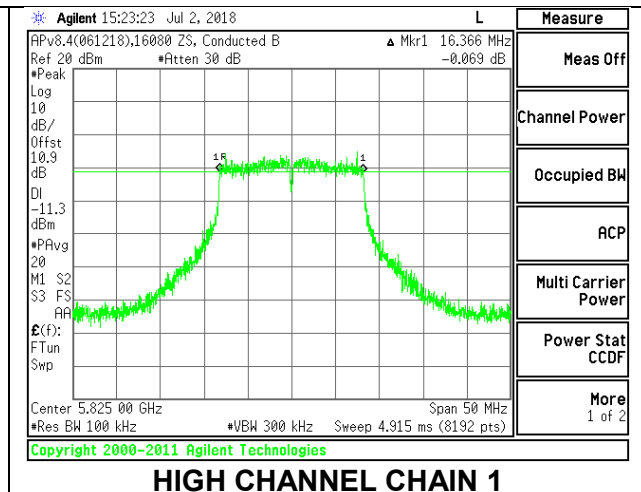
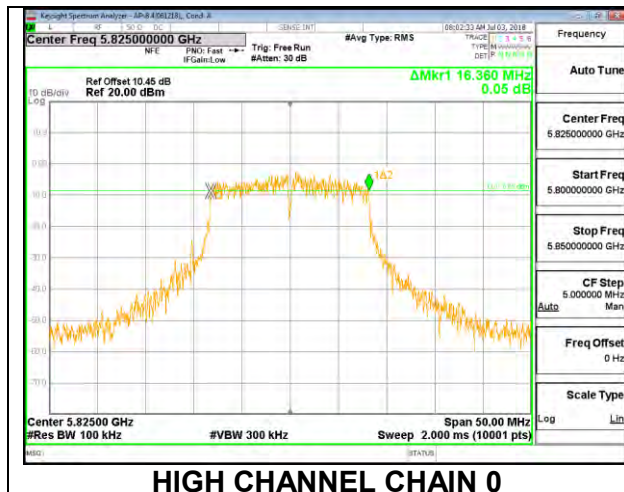
LOW CHANNEL



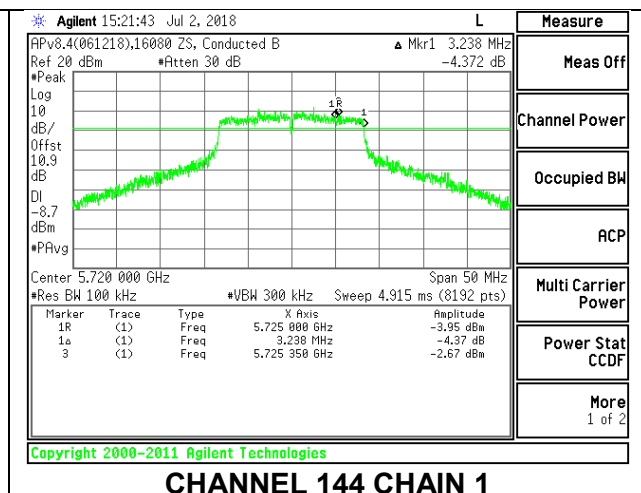
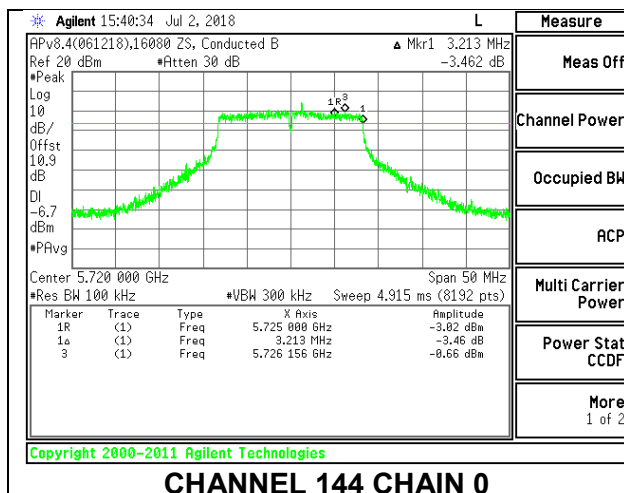
MID CHANNEL



HIGH CHANNEL



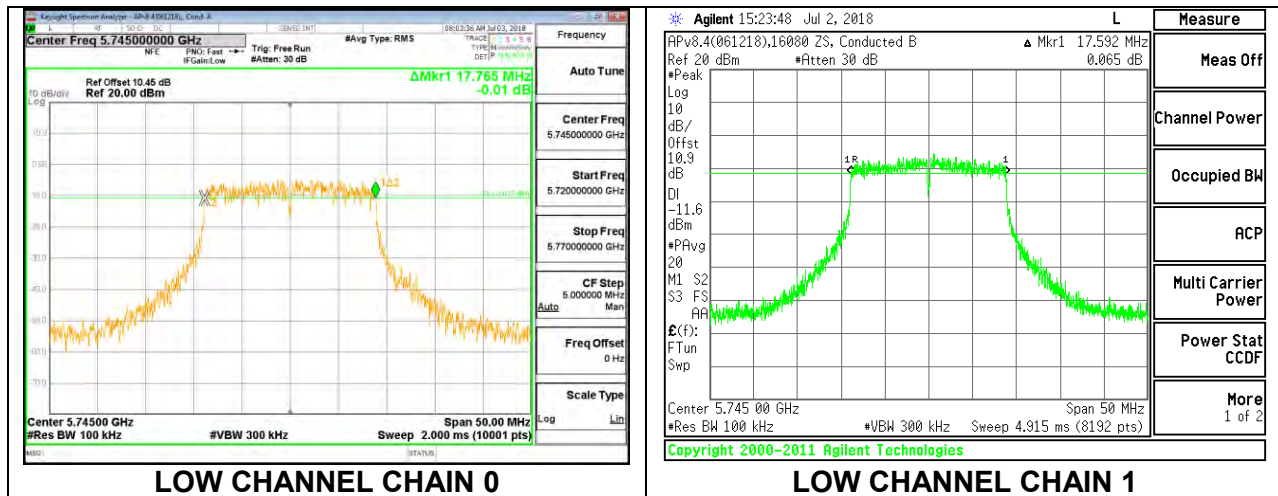
CHANNEL 144



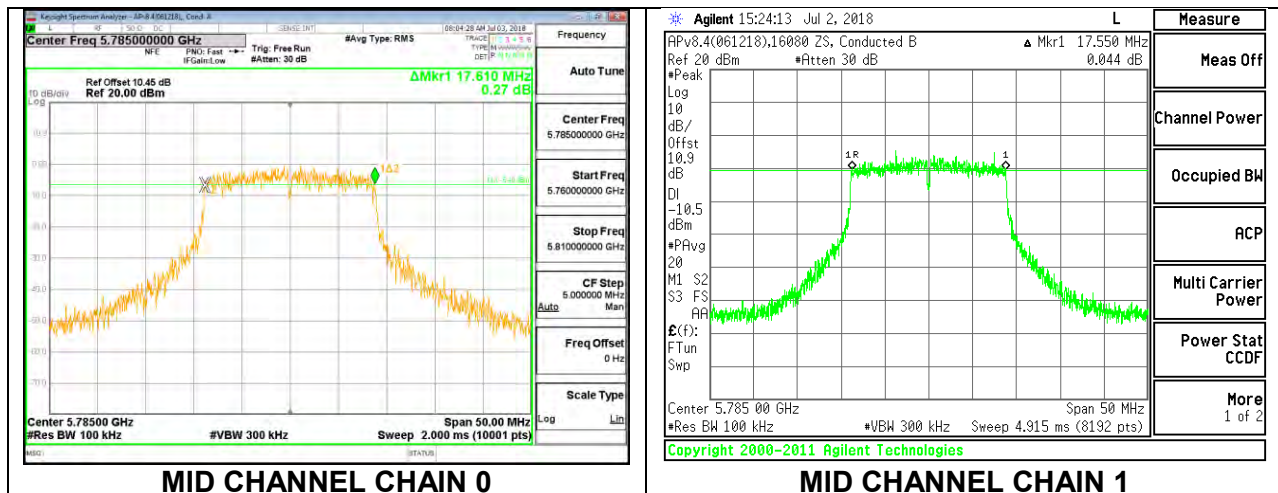
8.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.765	17.592	0.5
Mid	5785	17.610	17.550	0.5
High	5825	17.544	17.544	0.5
144	5720	3.818	3.848	0.5

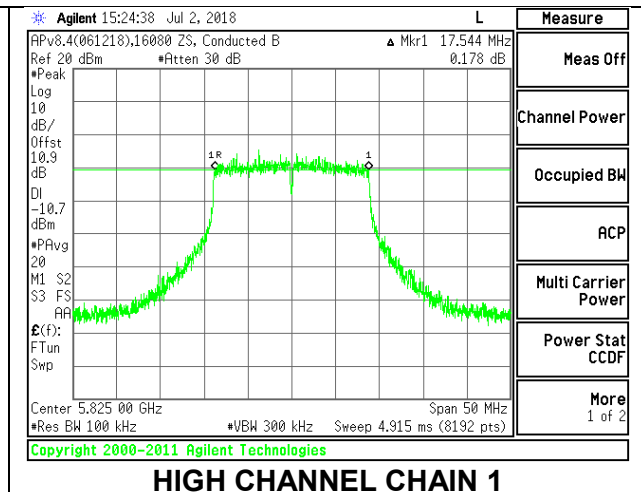
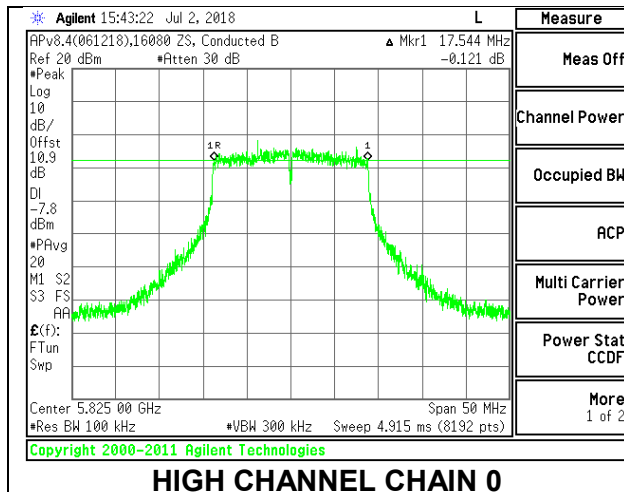
LOW CHANNEL



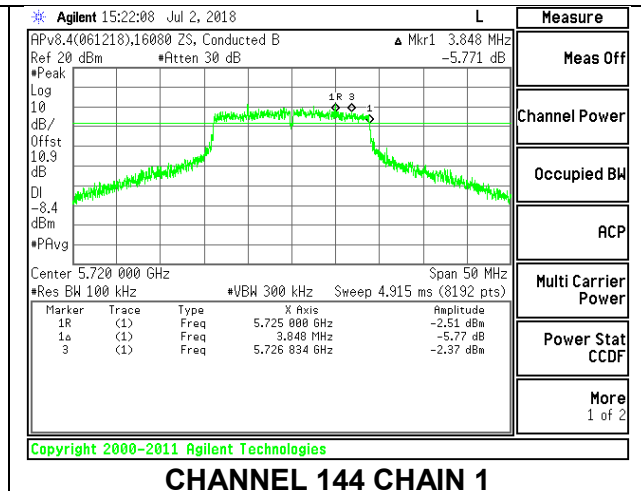
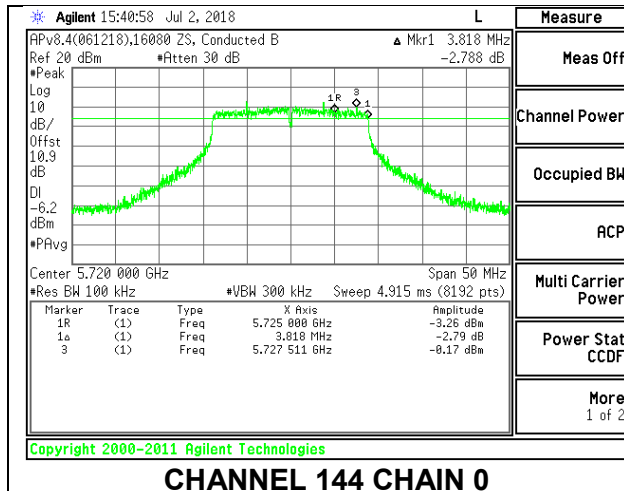
MID CHANNEL



HIGH CHANNEL



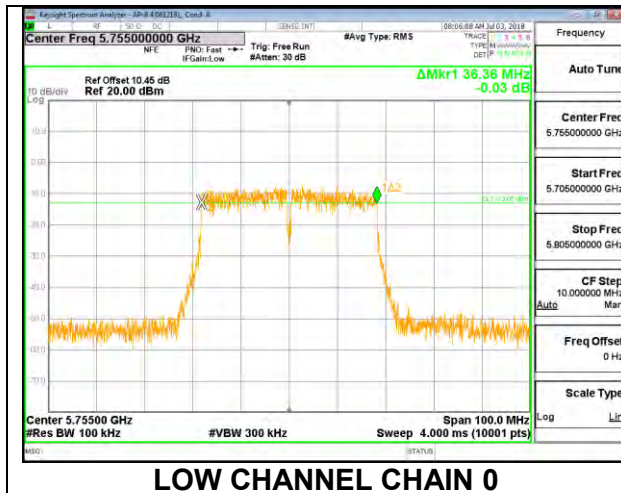
CHANNEL 144



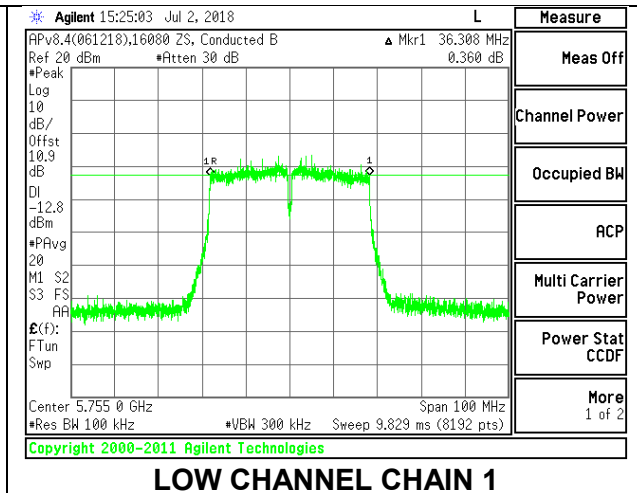
8.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5755	36.360	36.308	0.5
High	5795	36.040	36.040	0.5
142	5710	3.136	3.160	0.5

LOW CHANNEL

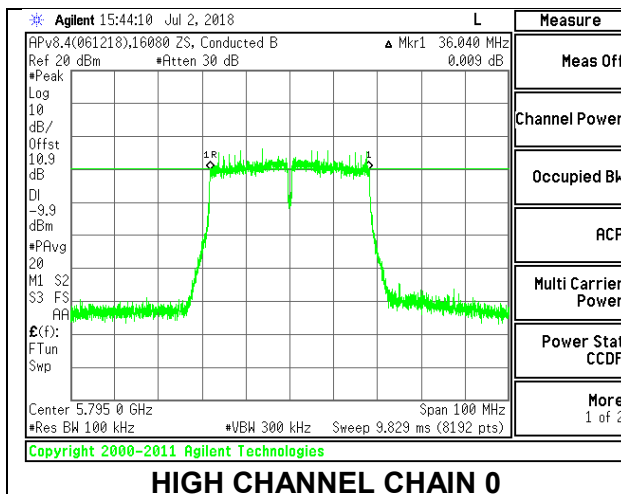


LOW CHANNEL CHAIN 0

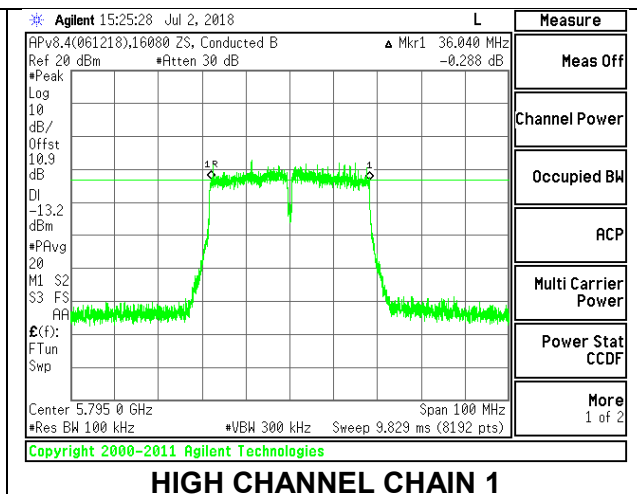


LOW CHANNEL CHAIN 1

HIGH CHANNEL

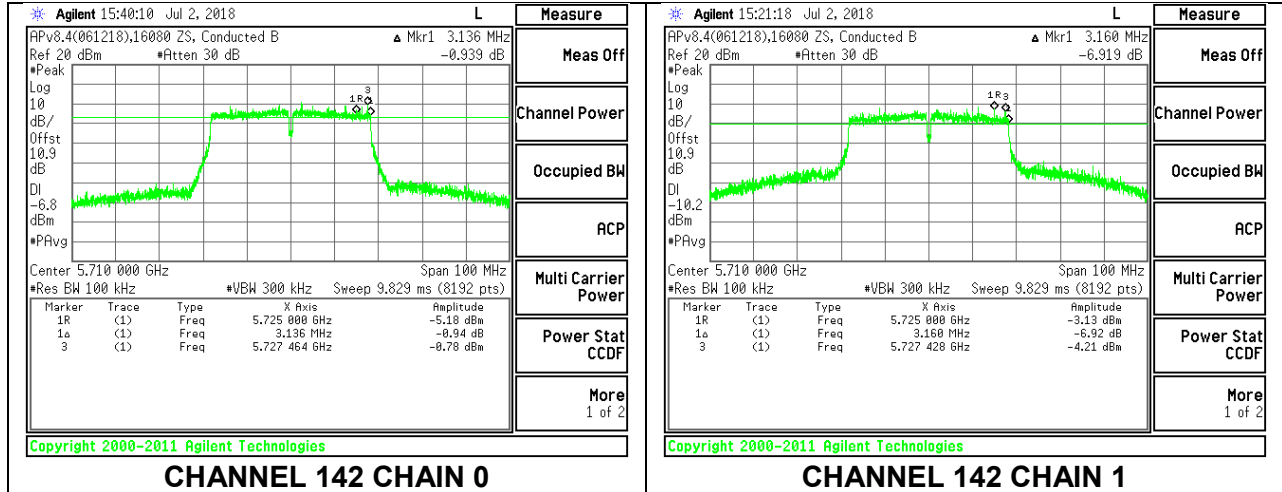


HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

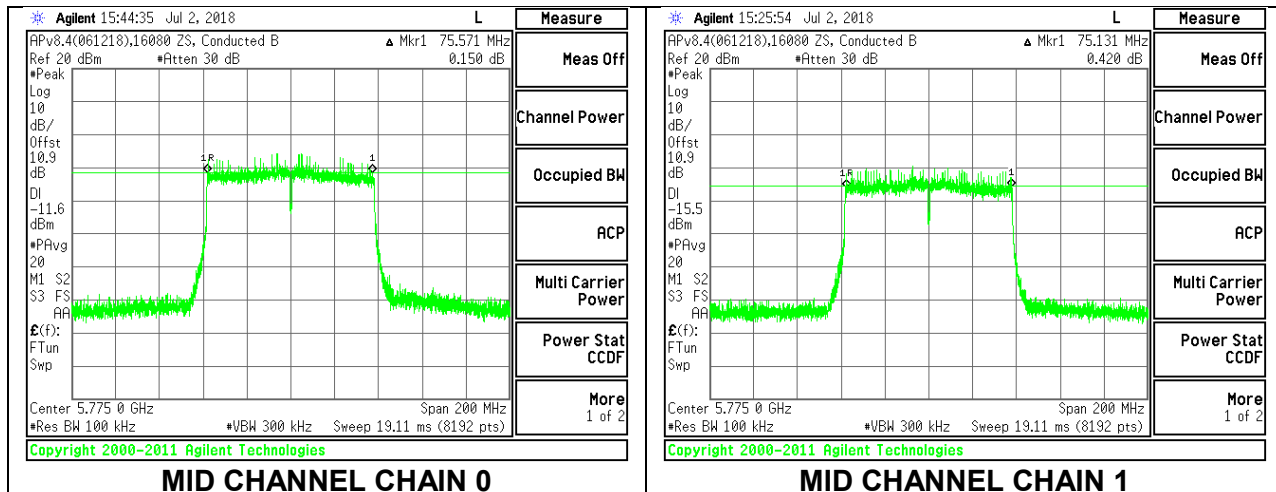
CHANNEL 142



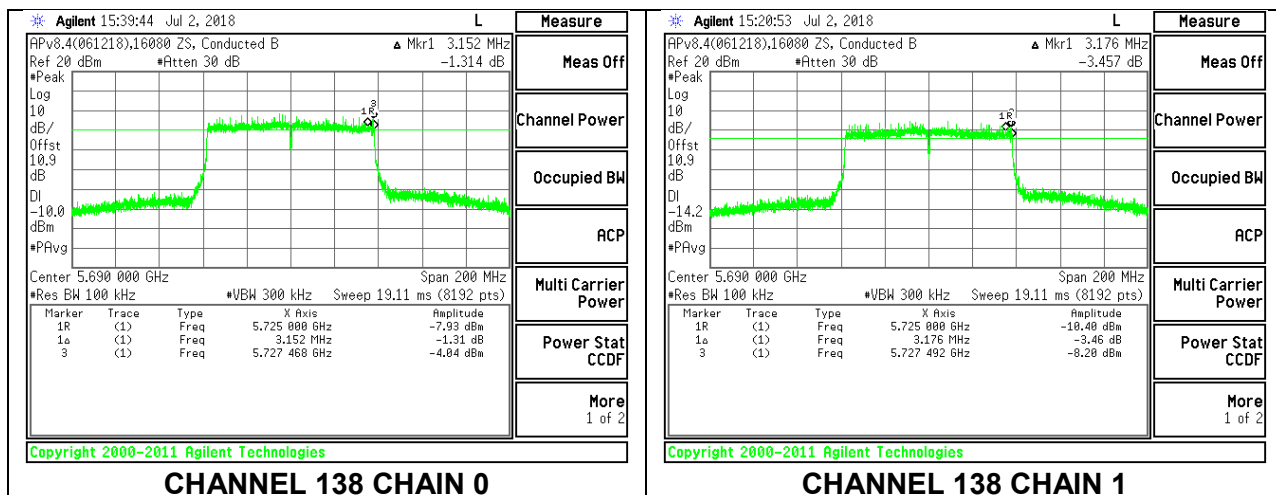
8.4.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Mid	5775	75.571	75.131	0.5
138	5690	3.152	3.176	0.5

MID CHANNEL



CHANNEL 138



8.5. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 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 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Bands 5.25-5.35 GHz and 5.47-5.725 GHz

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

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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G) and for straddles channels KDB 789033 D02 v02r01, Section E.2.b (Method SA-1) was used.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F

DIRECTIONAL ANTENNA GAIN

For 2 TX:

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting CDD in all MIMO modes. The directional gains are as follows:

Band (GHz)	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.2	-4.3	-2.9	-3.54	-0.56
5.3	-4.3	-2.9	-3.54	-0.56
5.6	-4.2	-4.1	-4.15	-1.14
5.8	-4.5	-4.9	-4.70	-1.69

RESULTS

8.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5180	-3.54	-0.56	24.00	11.00
Mid	5200	-3.54	-0.56	24.00	11.00
High	5240	-3.54	-0.56	24.00	11.00

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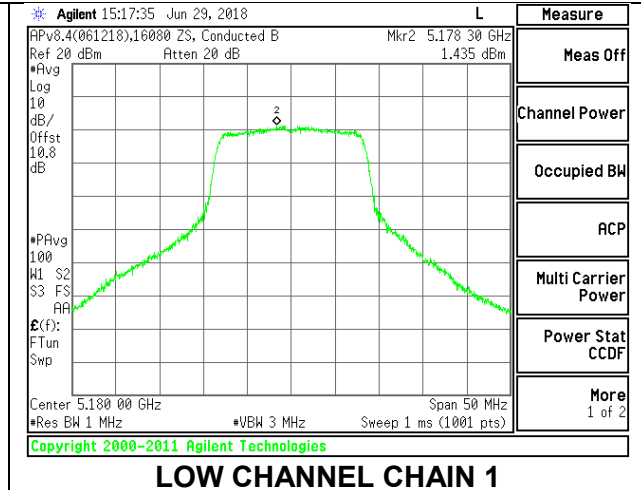
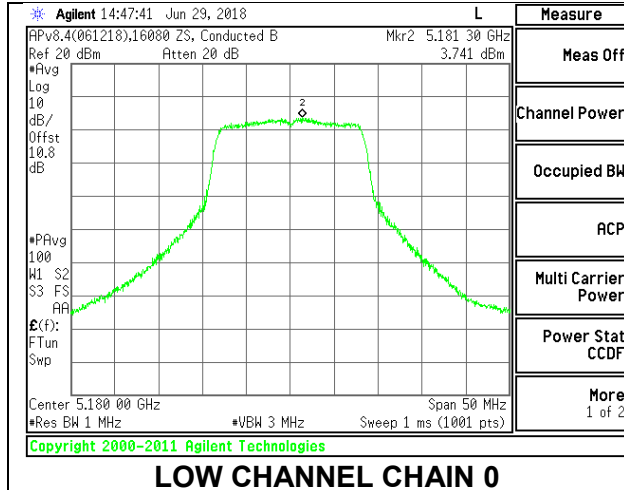
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.28	11.77	16.21	24.00	-7.79
Mid	5200	14.15	12.28	16.33	24.00	-7.67
High	5240	14.65	12.07	16.56	24.00	-7.44

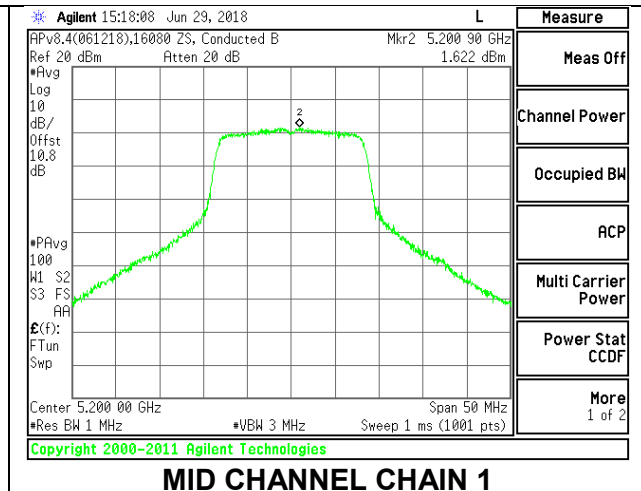
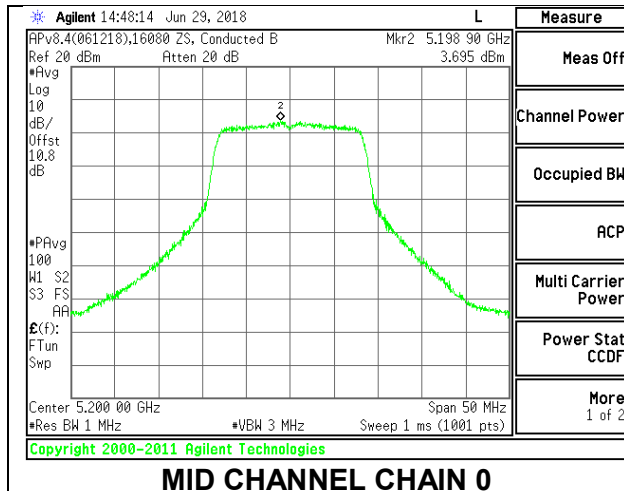
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5180	3.741	1.435	5.75	11.00	-5.25
Mid	5200	3.695	1.622	5.79	11.00	-5.21
High	5240	3.877	2.059	6.07	11.00	-4.93

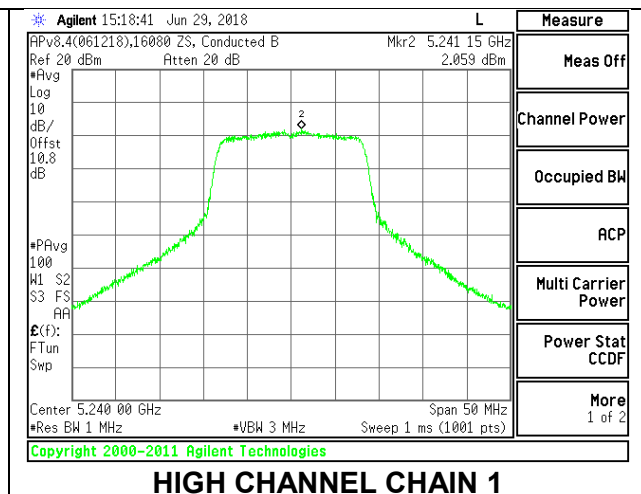
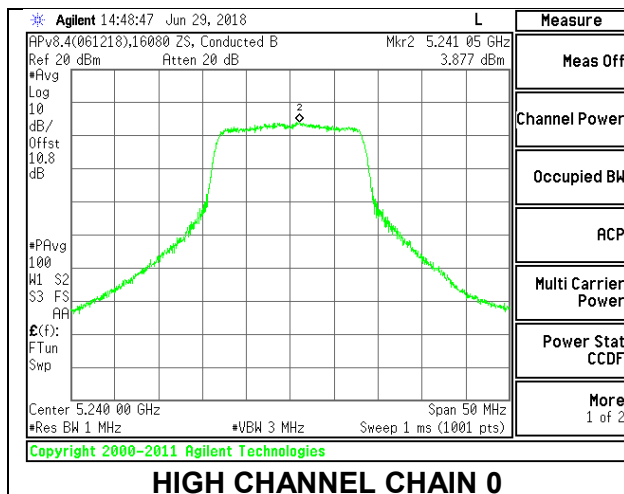
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	-3.54	-0.56	24.00	11.00
Mid	5200	-3.54	-0.56	24.00	11.00
High	5240	-3.54	-0.56	24.00	11.00

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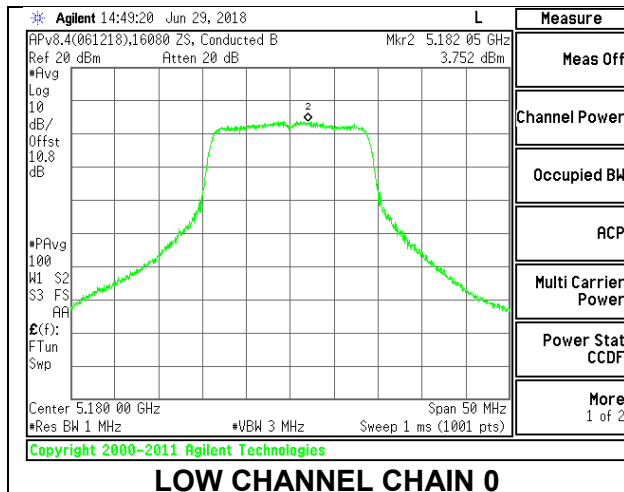
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.54	12.01	16.47	24.00	-7.53
Mid	5200	14.56	12.26	16.57	24.00	-7.43
High	5240	14.49	12.47	16.61	24.00	-7.39

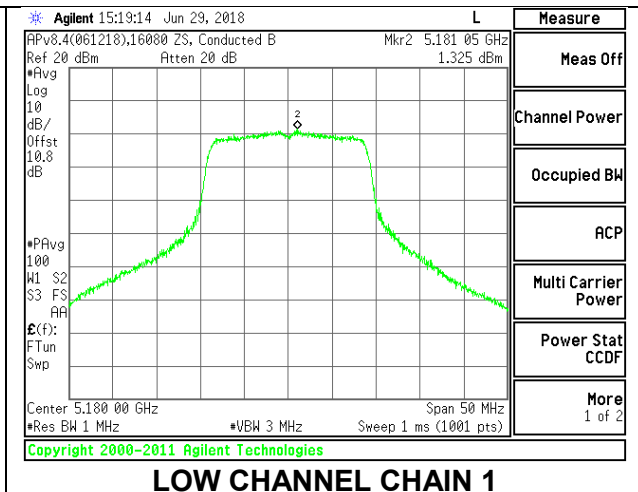
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	3.752	1.325	5.72	11.00	-5.28
Mid	5200	3.705	1.426	5.72	11.00	-5.28
High	5240	4.077	2.062	6.20	11.00	-4.80

LOW CHANNEL

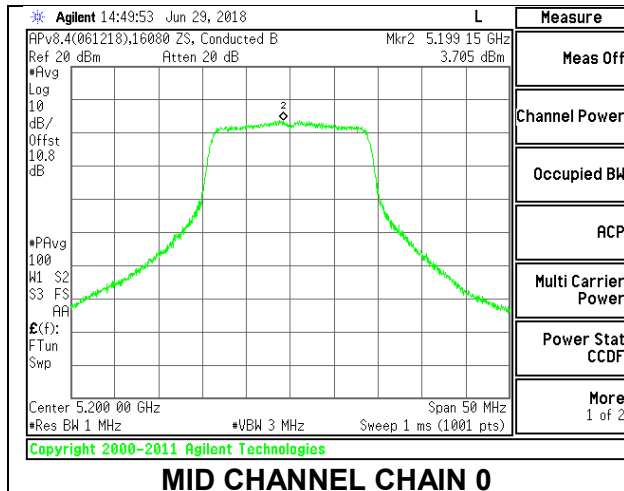


LOW CHANNEL CHAIN 0

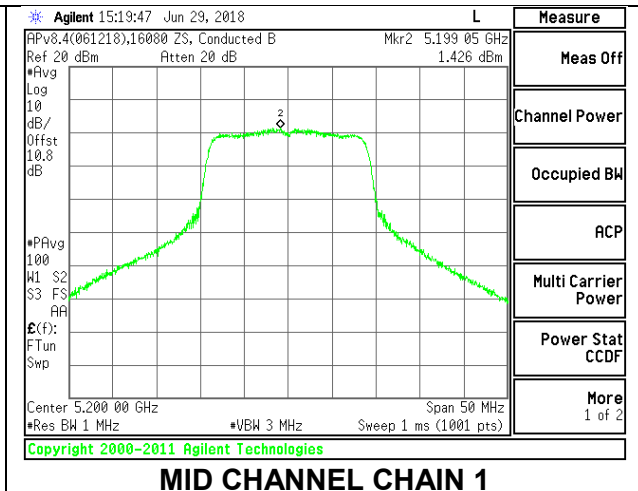


LOW CHANNEL CHAIN 1

MID CHANNEL

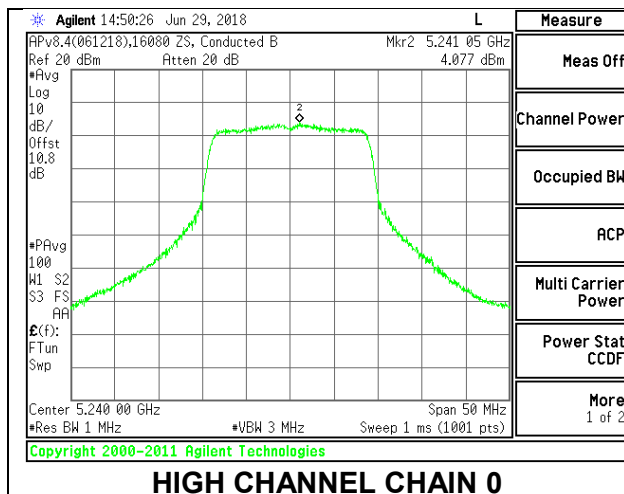


MID CHANNEL CHAIN 0

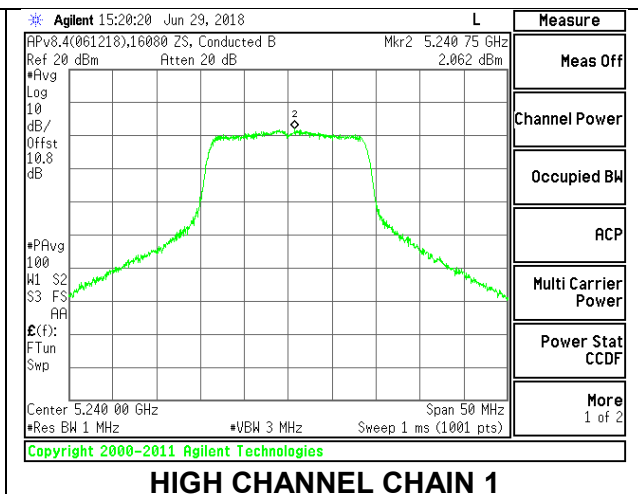


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5190	-3.54	-0.56	24.00	11.00
High	5230	-3.54	-0.56	24.00	11.00

Duty Cycle CF (dB)	0.27	Included in Calculations of Corr'd Power & PSD
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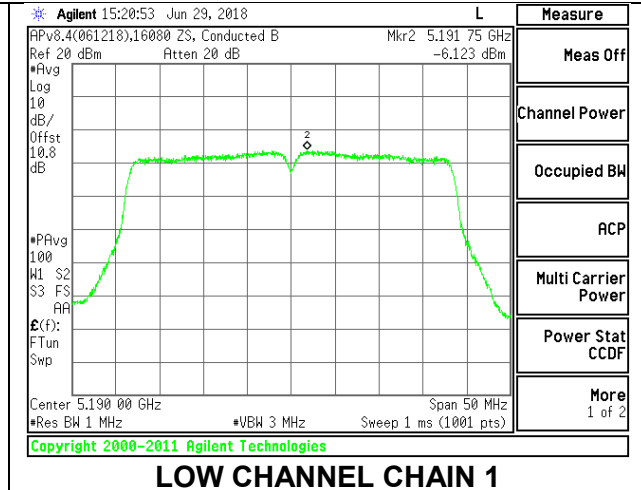
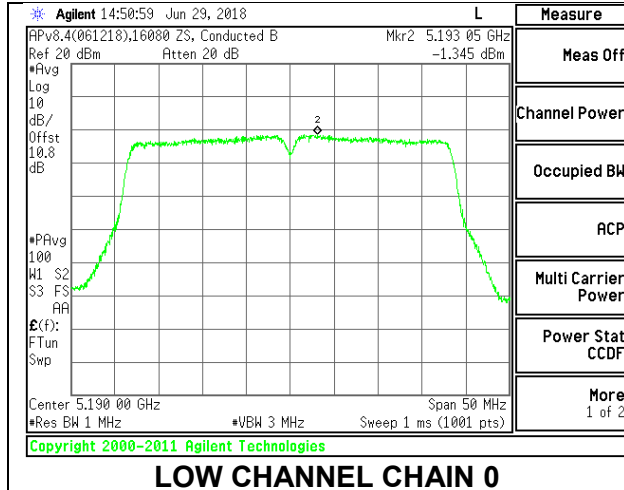
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	12.48	7.68	13.99	24.00	-10.01
High	5230	14.41	12.47	16.83	24.00	-7.17

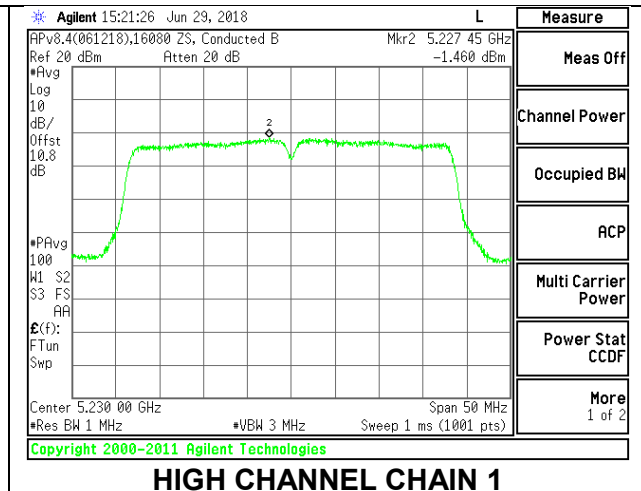
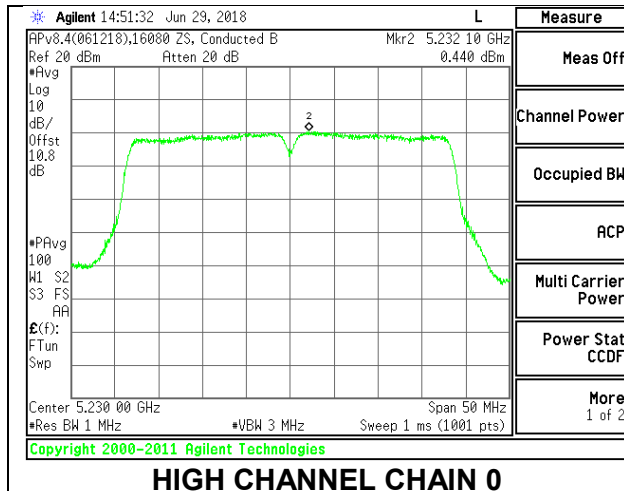
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5190	-1.345	-6.123	0.17	11.00	-10.83
High	5230	0.440	-1.460	2.87	11.00	-8.13

LOW CHANNEL



HIGH CHANNEL



8.5.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Mid	5210	-3.54	-0.56	24.00	11.00

Duty Cycle CF (dB)	0.53	Included in Calculations of Corr'd Power & PSD
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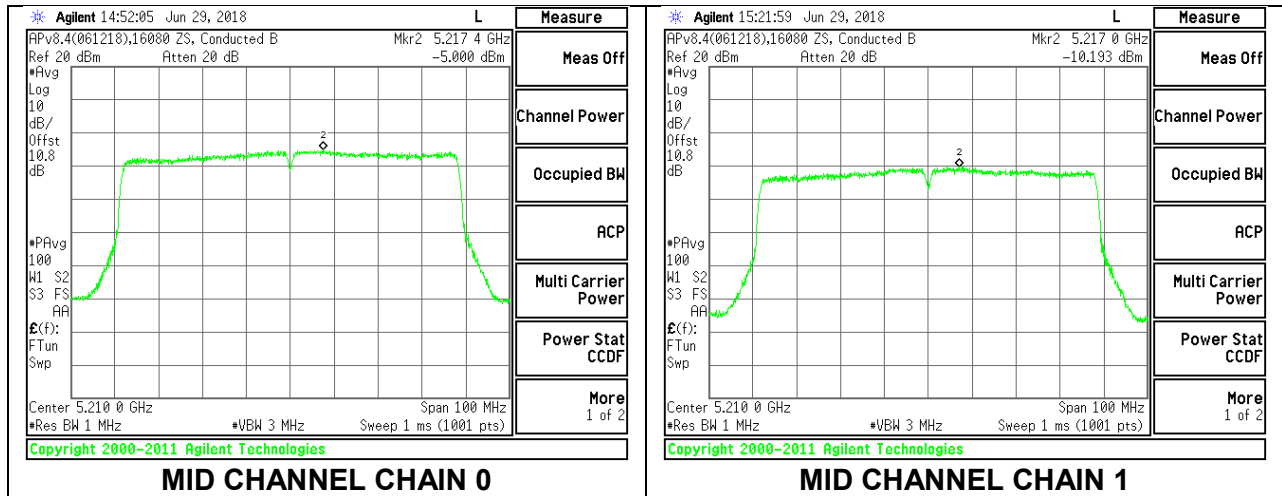
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.23	6.97	13.89	24.00	-10.11

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5210	-5.000	-10.193	-3.32	11.00	-14.32

MID CHANNEL



8.5.5. 802.11a MODE IN THE 5.3 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	21.75	-3.54	-0.56	24.00	11.00
Mid	5300	22.10	-3.54	-0.56	24.00	11.00
High	5320	22.05	-3.54	-0.56	24.00	11.00

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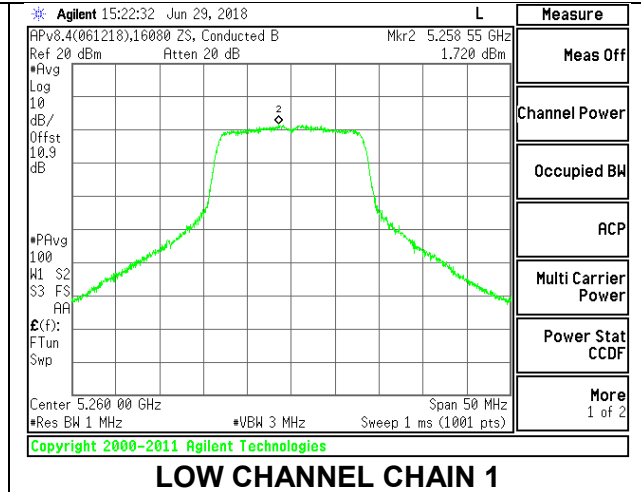
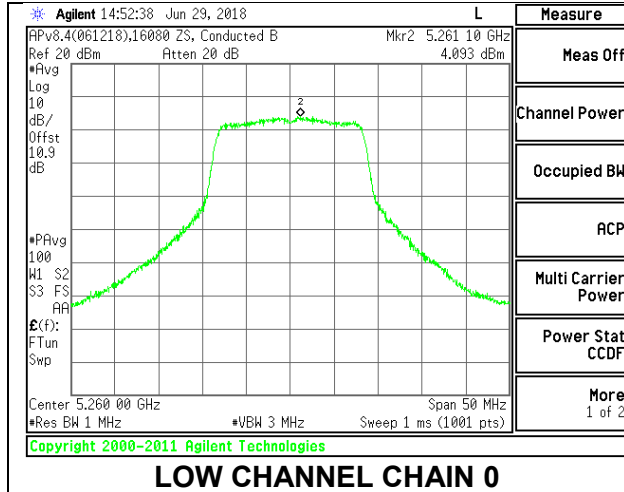
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.35	12.09	16.38	24.00	-7.62
Mid	5300	14.15	12.97	16.61	24.00	-7.39
High	5320	14.18	12.26	16.34	24.00	-7.66

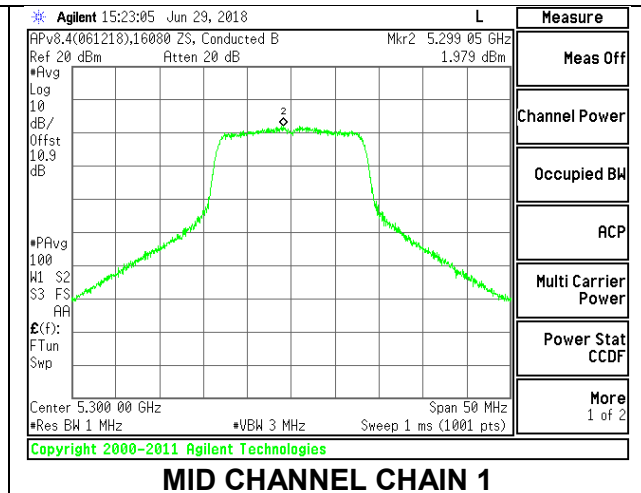
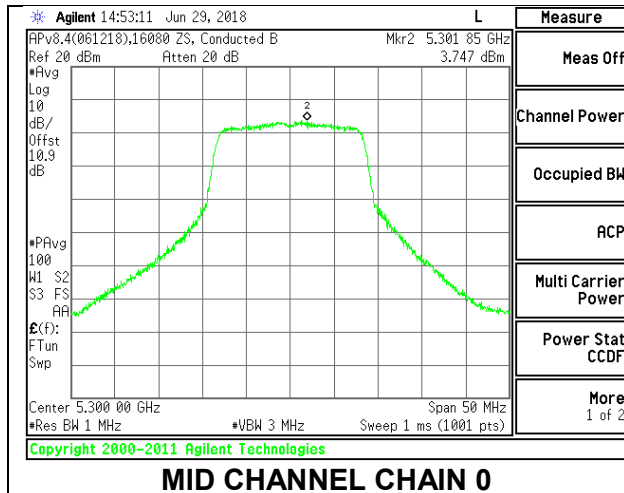
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	4.093	1.720	6.08	11.00	-4.92
Mid	5300	3.747	1.979	5.96	11.00	-5.04
High	5320	3.552	1.341	5.60	11.00	-5.40

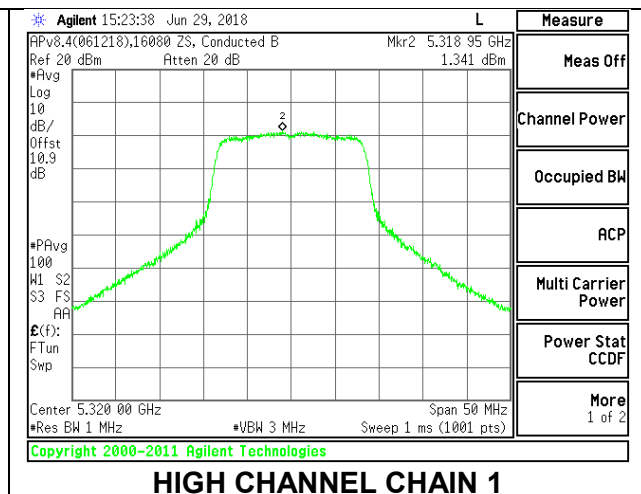
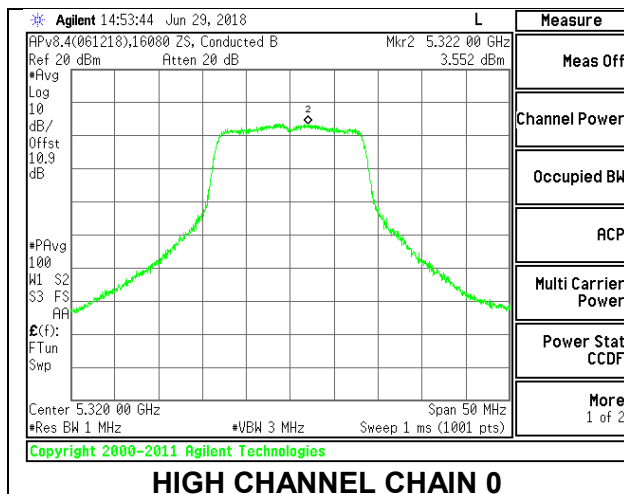
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	22.65	-3.54	-0.56	24.00	11.00
Mid	5300	22.20	-3.54	-0.56	24.00	11.00
High	5320	23.05	-3.54	-0.56	24.00	11.00

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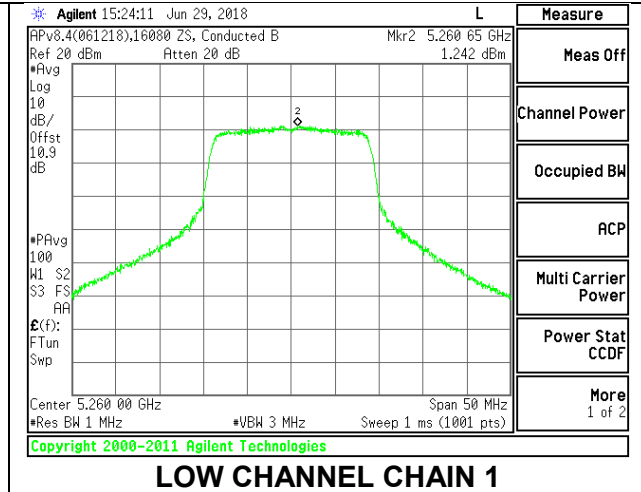
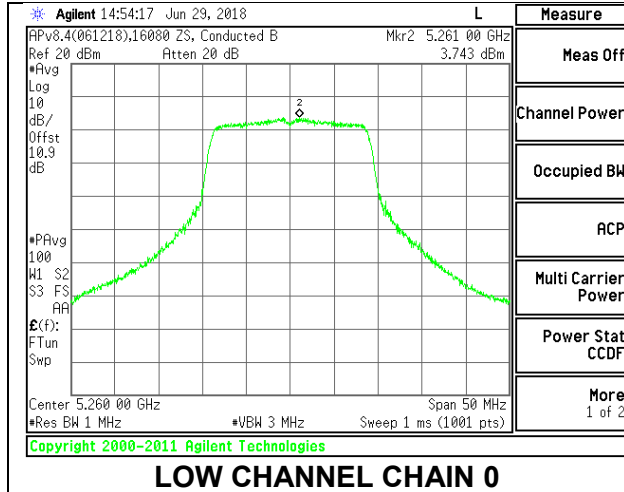
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.27	12.07	16.32	24.00	-7.68
Mid	5300	14.64	12.07	16.55	24.00	-7.45
High	5320	14.61	11.97	16.50	24.00	-7.50

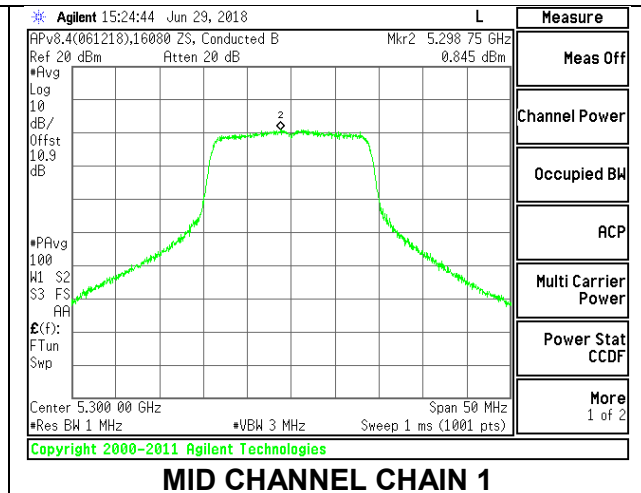
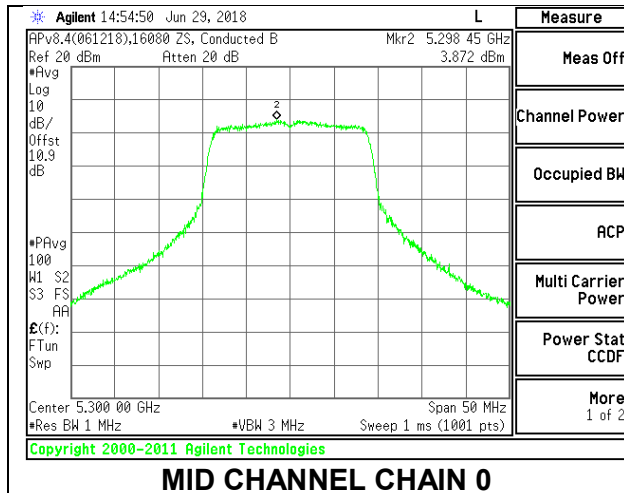
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	3.743	1.242	5.68	11.00	-5.32
Mid	5300	3.872	0.845	5.63	11.00	-5.37
High	5320	3.703	1.337	5.69	11.00	-5.31

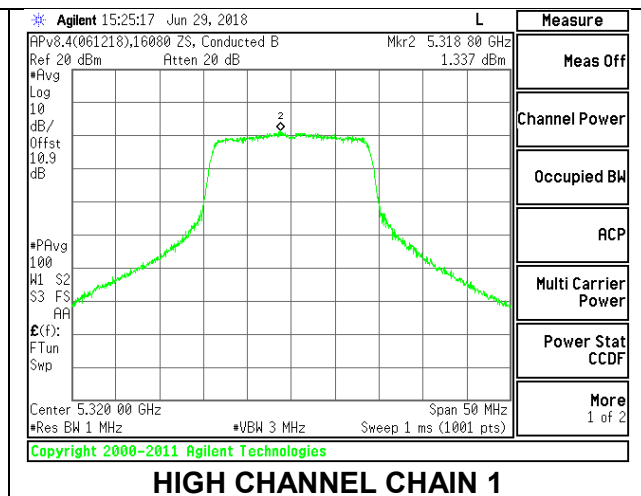
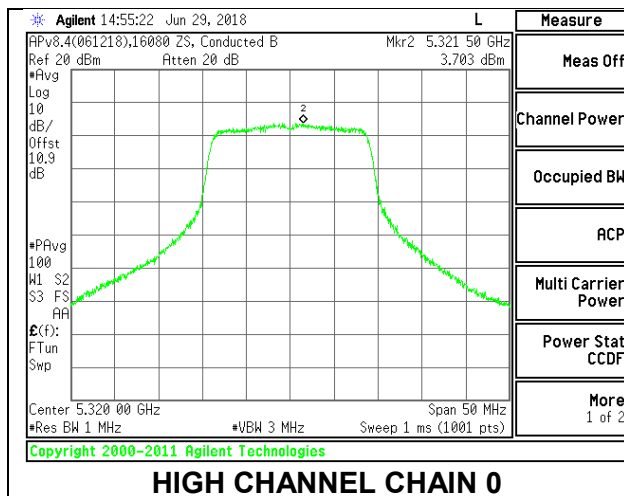
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5270	41.30	-3.54	-0.56	24.00	11.00
High	5310	41.10	-3.54	-0.56	24.00	11.00

Duty Cycle CF (dB)	0.27	Included in Calculations of Corr'd PSD
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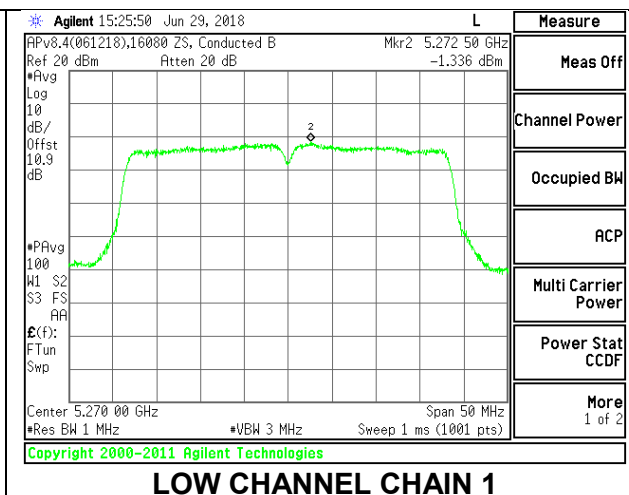
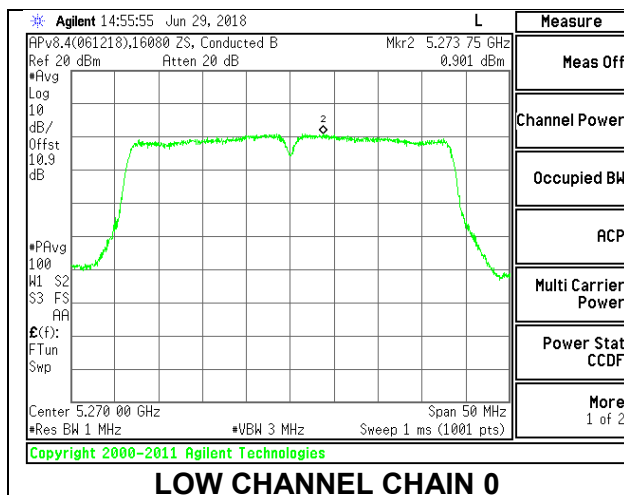
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	14.64	12.01	16.53	24.00	-7.47
High	5310	12.52	9.02	14.12	24.00	-9.88

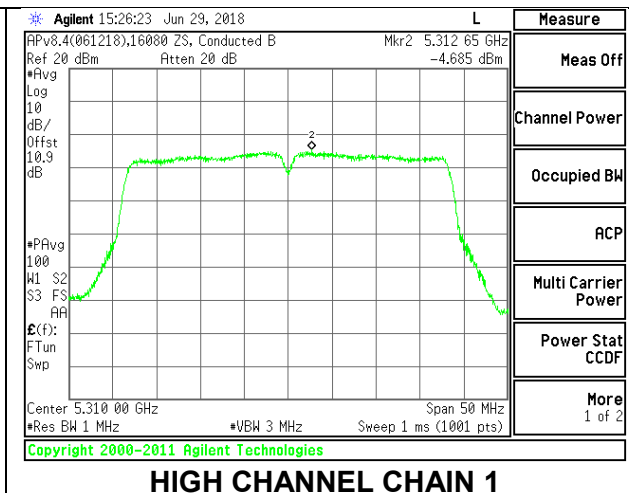
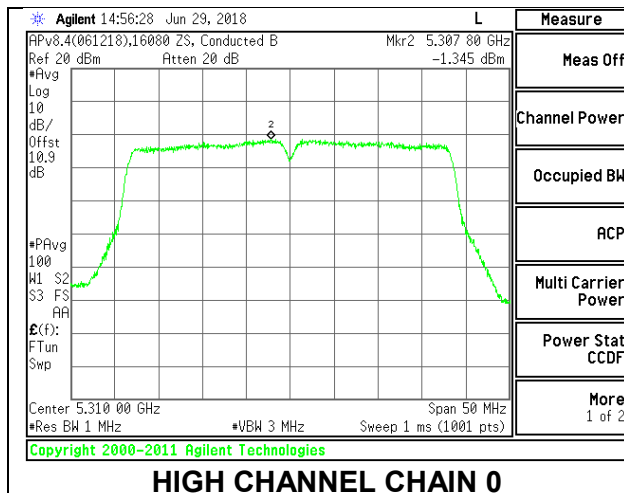
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5270	0.901	-1.336	3.21	11.00	-7.79
High	5310	-1.345	-4.685	0.58	11.00	-10.42

LOW CHANNEL



HIGH CHANNEL



8.5.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Mid	5290	84.40	-3.54	-0.56	24.00	11.00

Duty Cycle CF (dB)	0.53	Included in Calculations of Corr'd PSD
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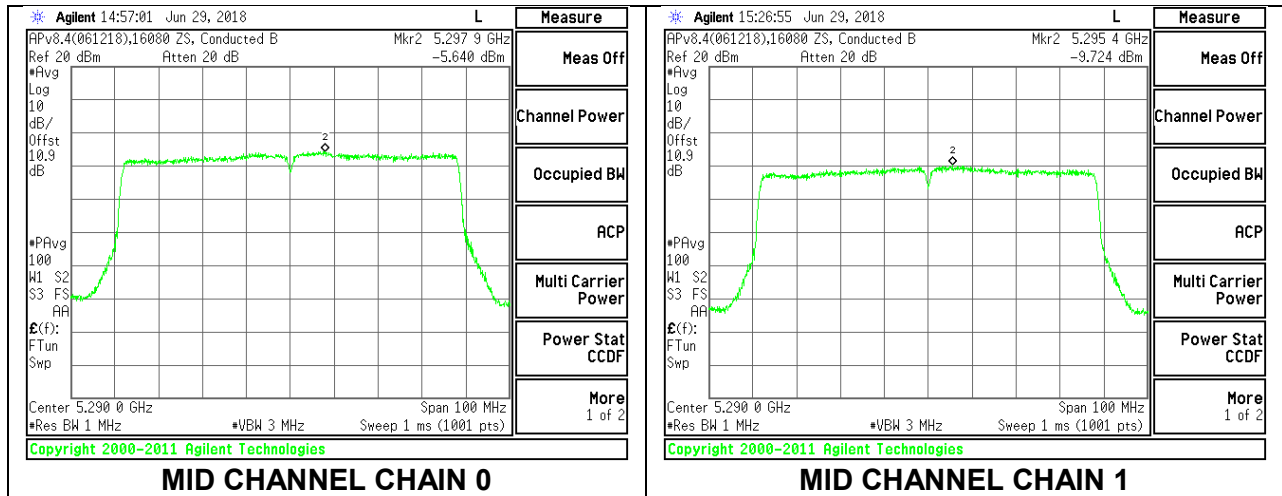
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.67	7.39	13.05	24.00	-10.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Mid	5290	-5.64	-9.72	-3.68	11.00	-14.68

MID CHANNEL



8.5.9. 802.11a MODE IN THE 5.6 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5500	21.50	-4.15	-1.14	24.00	11.00
Mid	5580	22.35	-4.15	-1.14	24.00	11.00
High	5700	21.95	-4.15	-1.14	24.00	11.00
144	5720	22.25	-4.15	-1.14	24.00	11.00

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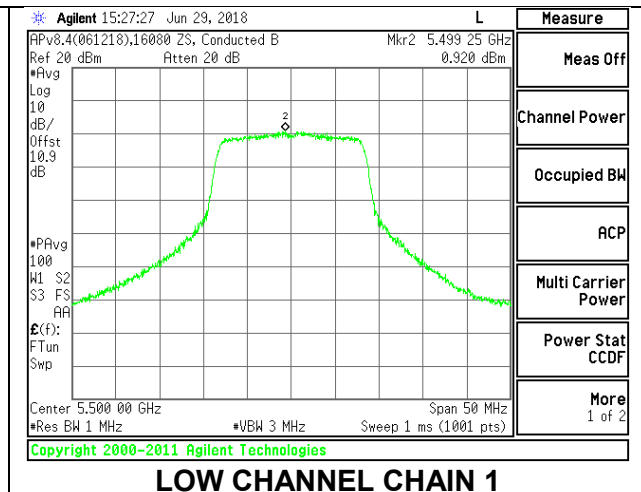
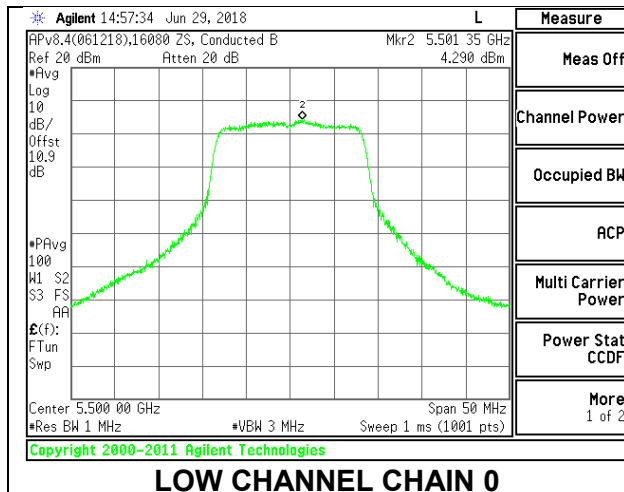
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.66	11.21	16.28	24.00	-7.72
Mid	5580	14.27	12.23	16.38	24.00	-7.62
High	5700	12.43	10.24	14.48	24.00	-9.52
144	5720	14.16	12.29	16.34	24.00	-7.66

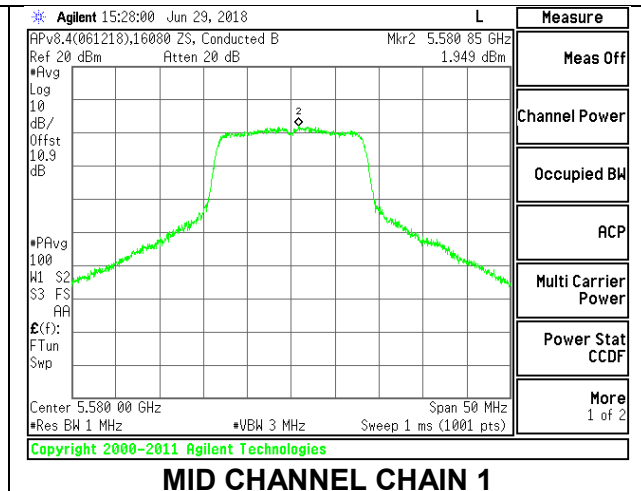
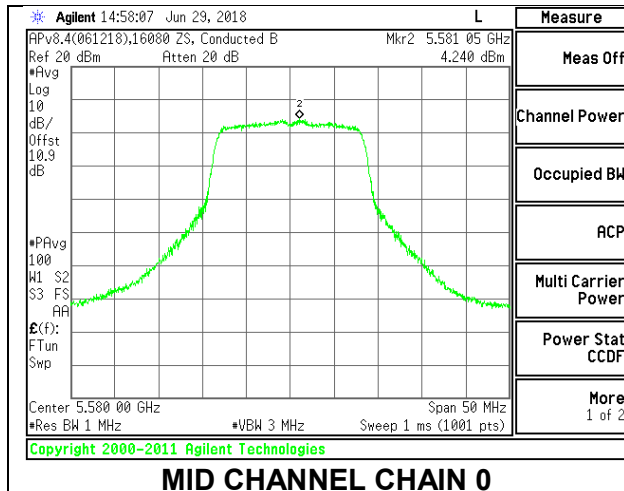
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	4.290	0.920	5.93	11.00	-5.07
Mid	5580	4.240	1.949	6.25	11.00	-4.75
High	5700	1.984	0.016	4.12	11.00	-6.88
144	5720	4.031	1.697	6.03	11.00	-4.97

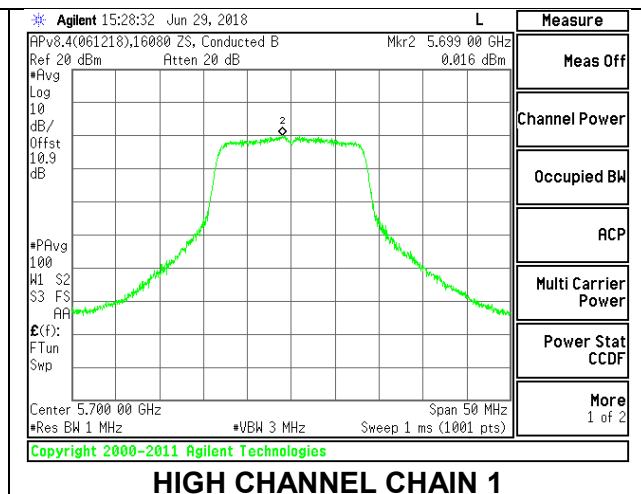
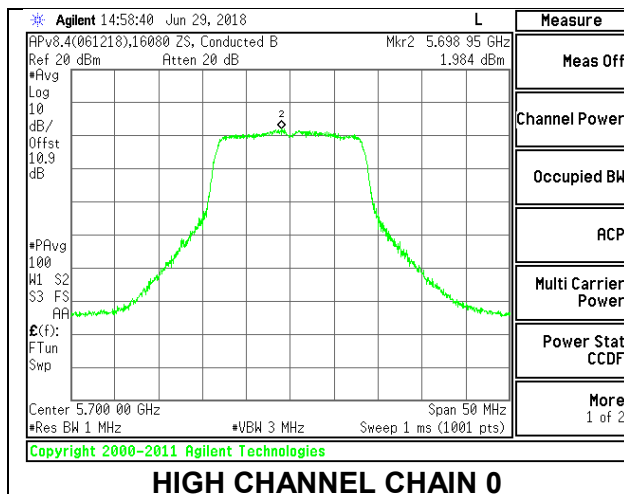
LOW CHANNEL



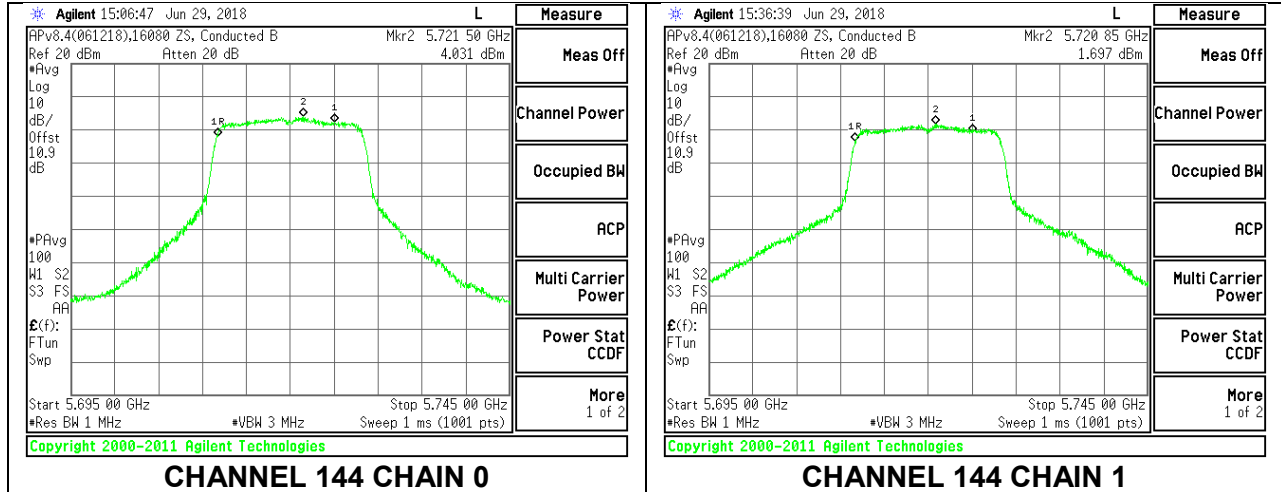
MID CHANNEL



HIGH CHANNEL



CHANNEL 144



8.5.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5500	22.20	-4.15	-1.14	24.00	11.00
Mid	5580	22.70	-4.15	-1.14	24.00	11.00
High	5700	22.55	-4.15	-1.14	24.00	11.00
144	5720	22.95	-4.15	-1.14	24.00	11.00

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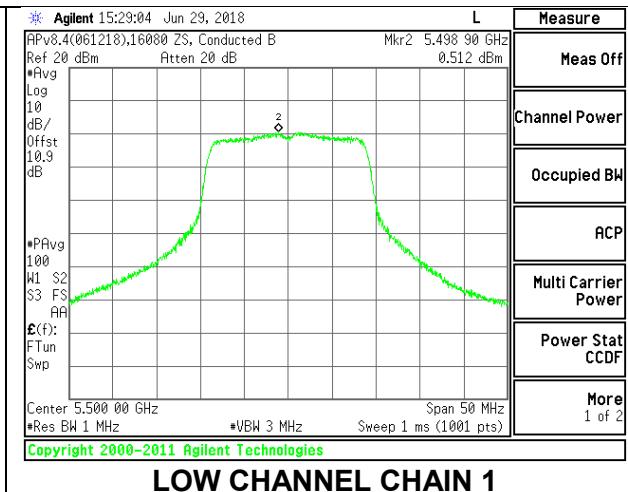
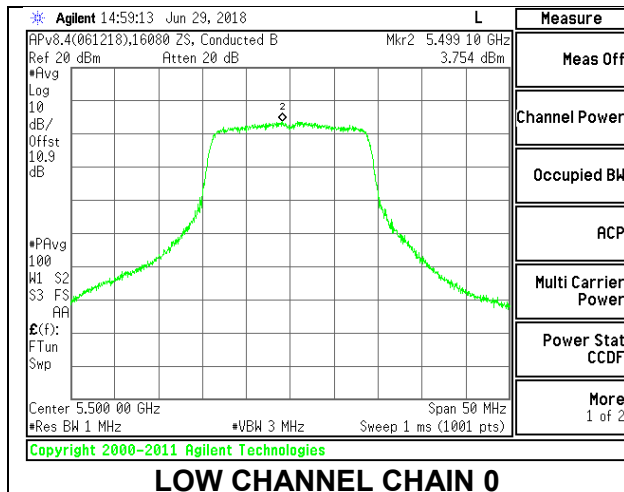
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.52	11.27	16.20	24.00	-7.80
Mid	5580	14.25	12.35	16.41	24.00	-7.59
High	5700	12.19	10.22	14.33	24.00	-9.67
144	5720	14.07	12.25	16.26	24.00	-7.74

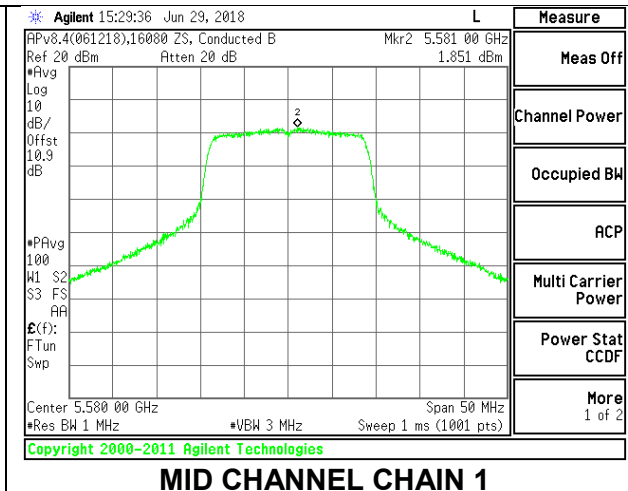
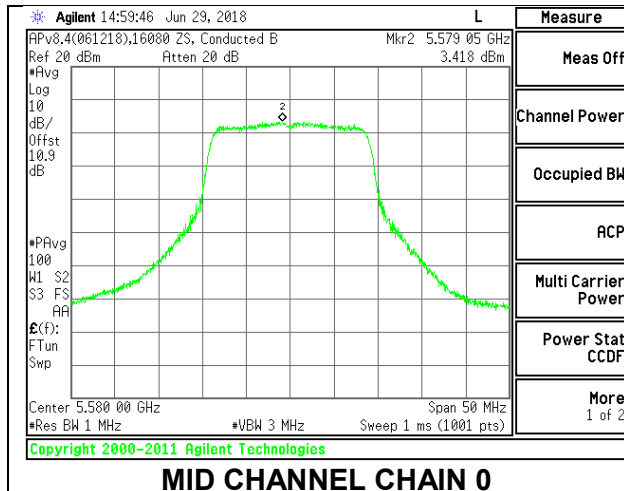
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	3.754	0.512	5.44	11.00	-5.56
Mid	5580	3.418	1.851	5.72	11.00	-5.28
High	5700	1.641	-0.292	3.79	11.00	-7.21
144	5720	3.690	1.174	5.62	11.00	-5.38

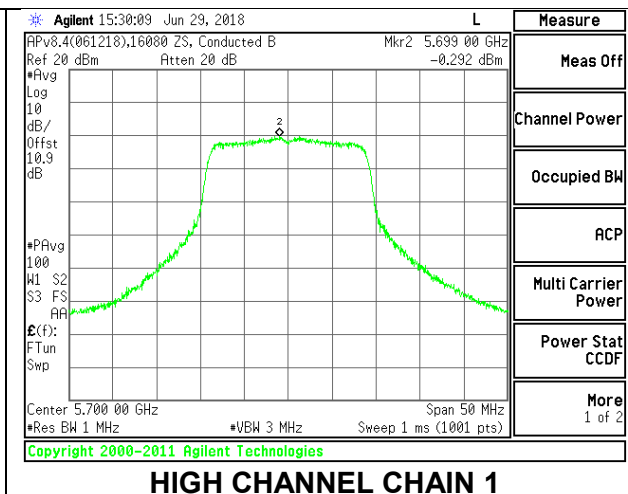
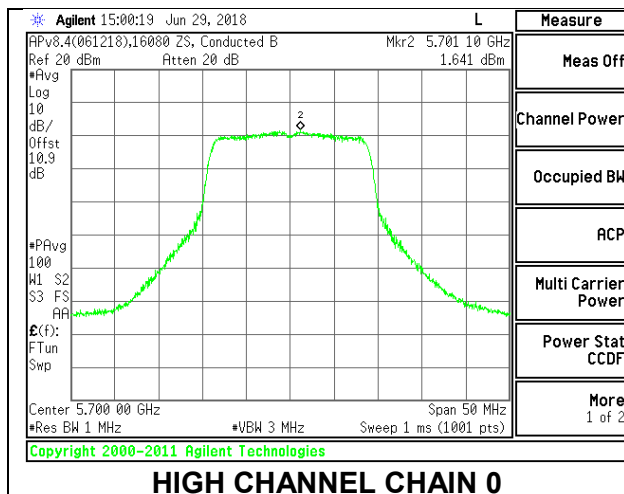
LOW CHANNEL



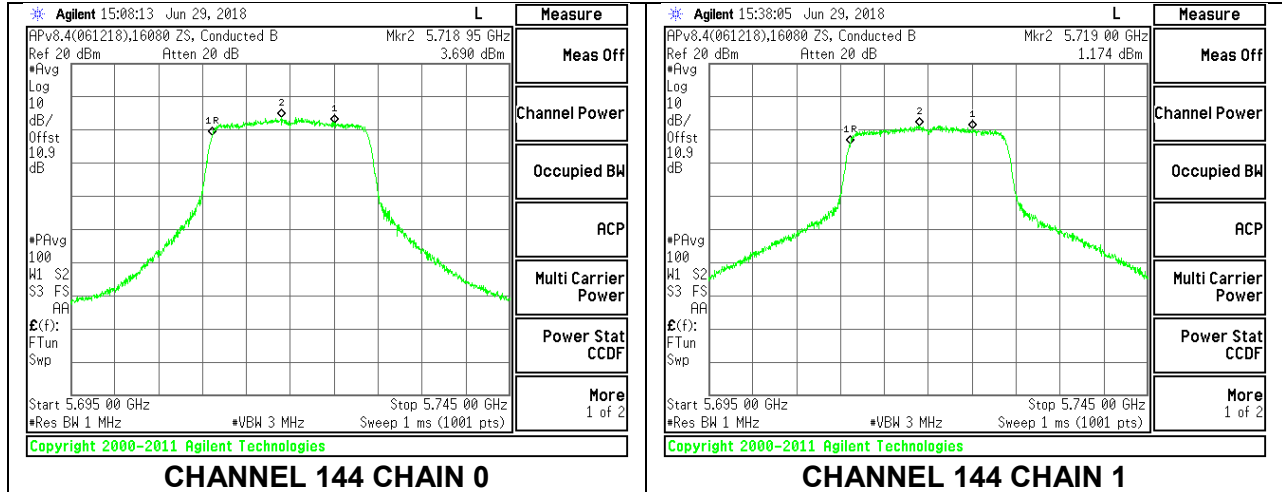
MID CHANNEL



HIGH CHANNEL



CHANNEL 144



8.5.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5510	41.10	-4.15	-1.14	24.00	11.00
Mid	5550	41.30	-4.15	-1.14	24.00	11.00
High	5670	42.00	-4.15	-1.14	24.00	11.00
142	5710	41.70	-4.15	-1.14	24.00	11.00

Duty Cycle CF (dB)	0.27	Included in Calculations of Corr'd Power & PSD
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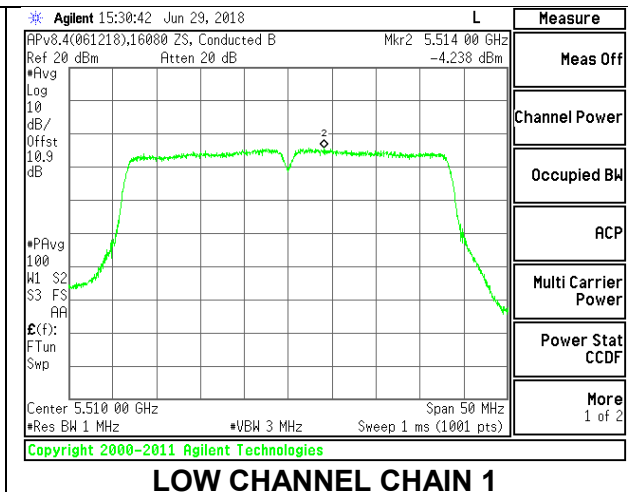
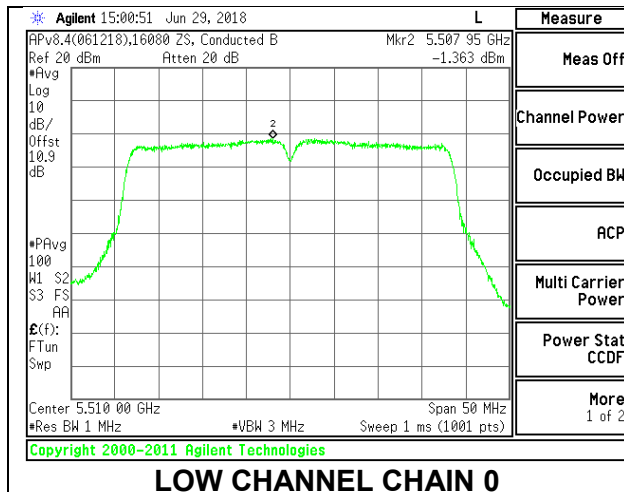
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	12.41	9.72	14.28	24.00	-9.72
Mid	5550	14.16	12.53	16.43	24.00	-7.57
High	5670	14.34	12.06	16.36	24.00	-7.64
142	5710	14.58	12.18	16.82	24.00	-7.18

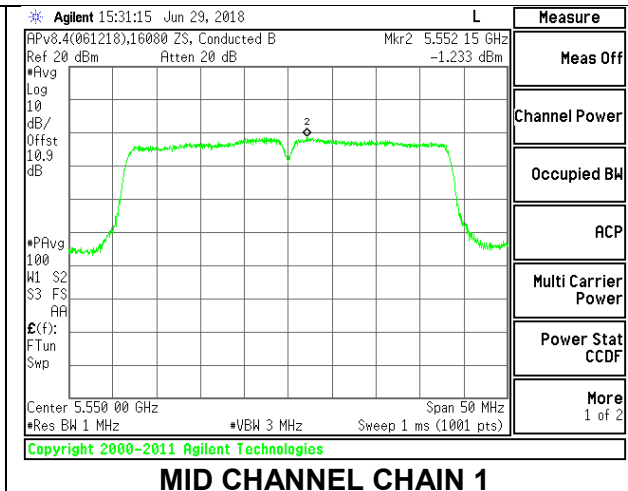
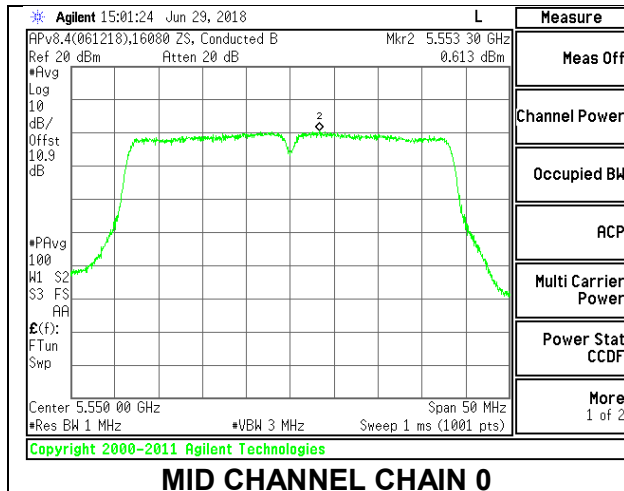
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5510	-1.363	-4.238	0.71	11.00	-10.29
Mid	5550	0.613	-1.233	3.07	11.00	-7.93
High	5670	1.000	-1.664	3.15	11.00	-7.85
142	5710	1.201	-1.537	3.32	11.00	-7.68

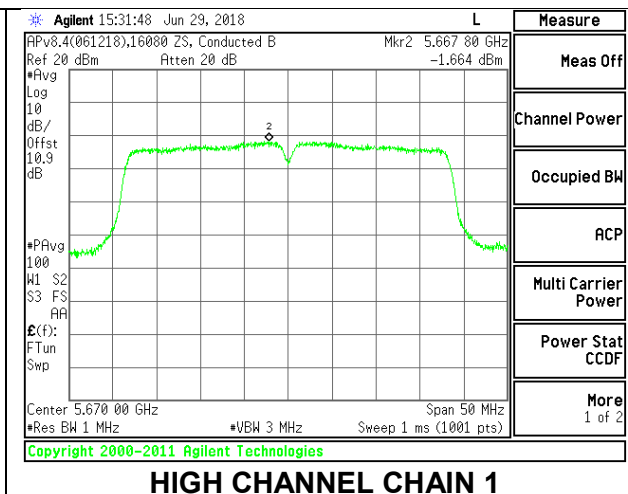
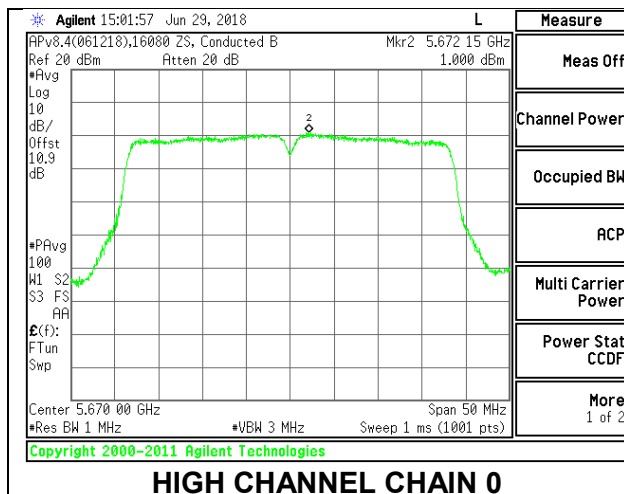
LOW CHANNEL



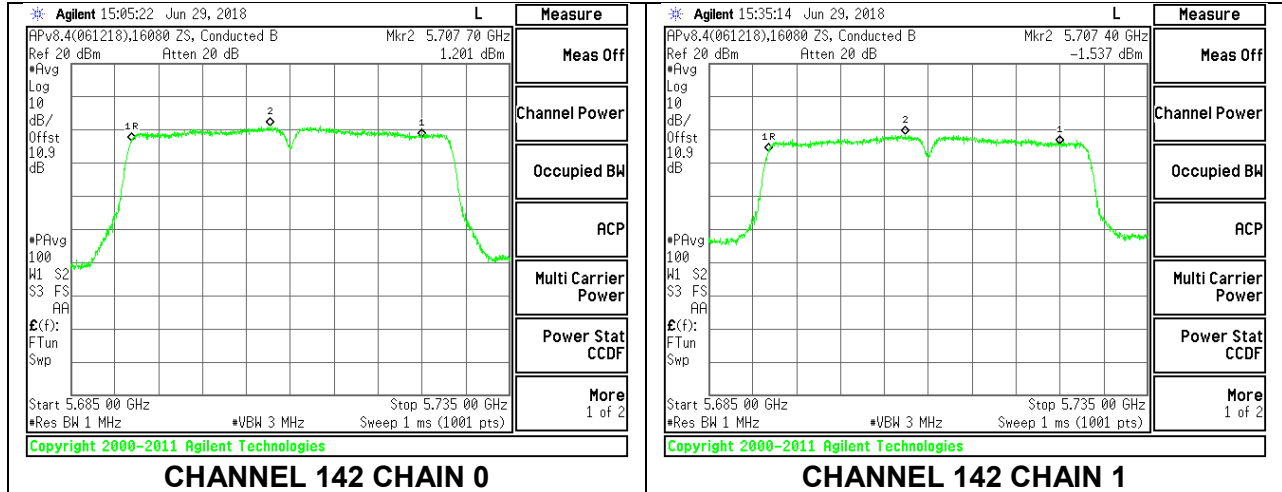
MID CHANNEL



HIGH CHANNEL



CHANNEL 142



8.5.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5530	83.60	-4.15	-1.14	24.00	11.00
High	5610	84.40	-4.15	-1.14	24.00	11.00
138	5690	84.20	-4.15	-1.14	24.00	11.00

Duty Cycle CF (dB)	0.53	Included in Calculations of Corr'd Power & PSD
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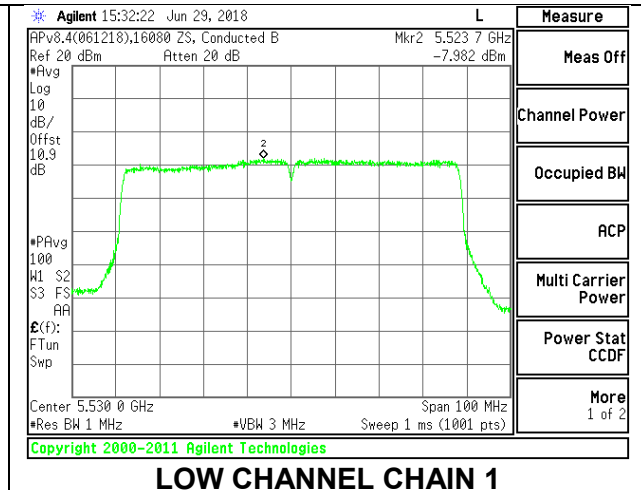
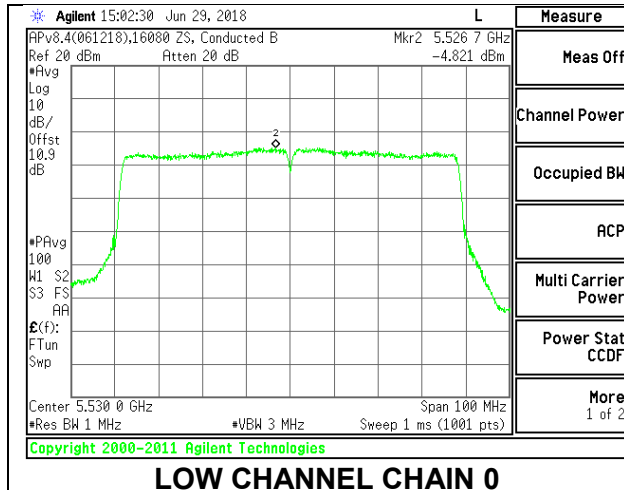
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	12.49	9.48	14.25	24.00	-9.75
High	5610	14.68	10.83	16.18	24.00	-7.82
138	5690	14.39	11.26	16.64	24.00	-7.36

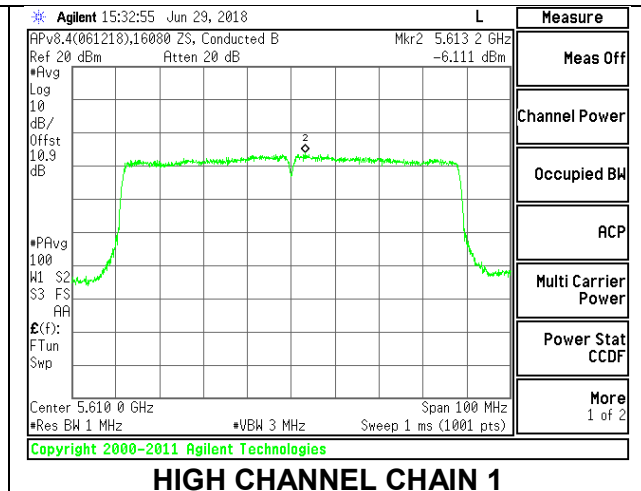
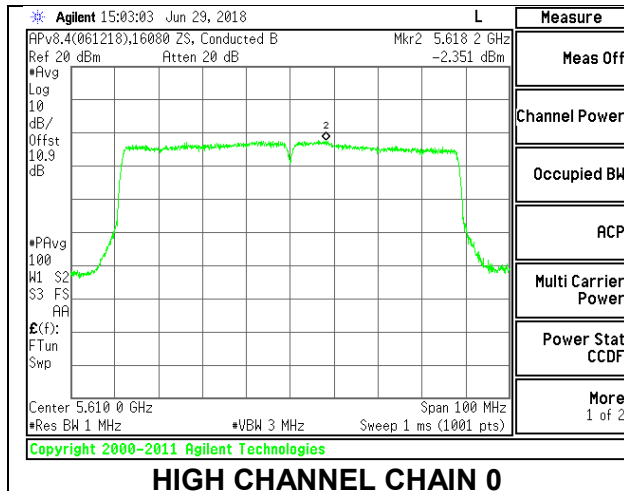
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5530	-4.821	-7.982	-2.58	11.00	-13.58
High	5610	-2.351	-6.111	-0.30	11.00	-11.30
138	5690	-2.201	-5.798	-0.10	11.00	-11.10

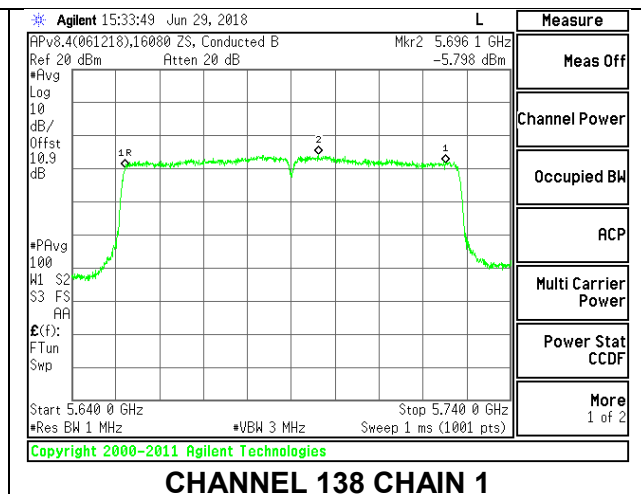
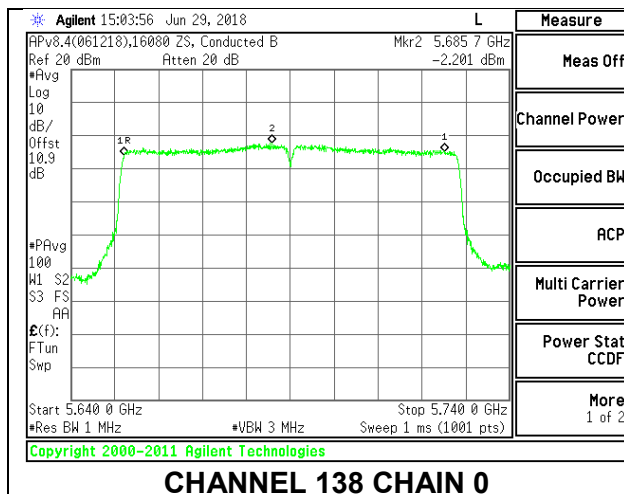
LOW CHANNEL



HIGH CHANNEL



CHANNEL 138



8.5.13. 802.11a MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5745	-4.70	-1.69	30.00	30.00
Mid	5785	-4.70	-1.69	30.00	30.00
High	5825	-4.70	-1.69	30.00	30.00

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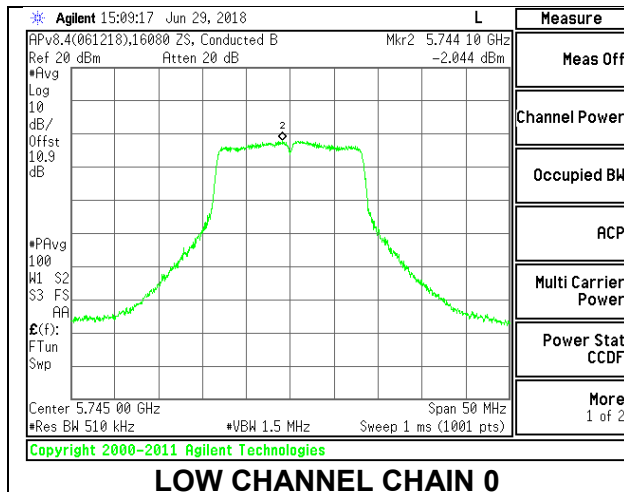
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	11.06	9.04	13.18	30.00	-16.82
Mid	5785	14.05	12.19	16.23	30.00	-13.77
High	5825	11.03	8.95	13.12	30.00	-16.88

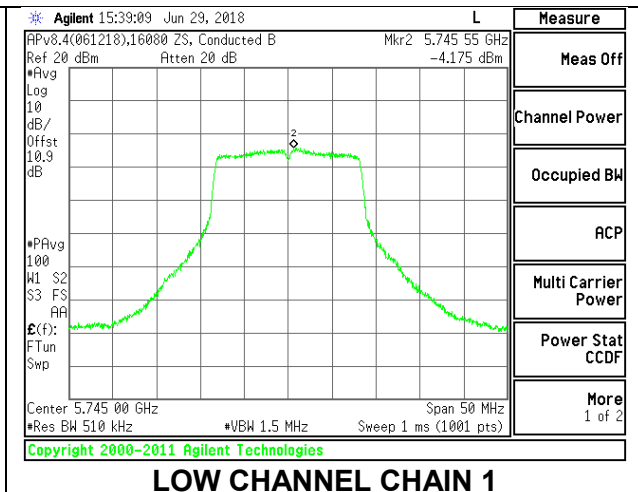
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5745	-2.044	-4.175	0.03	30.00	-29.97
Mid	5785	0.829	-1.296	2.91	30.00	-27.09
High	5825	-2.382	-4.481	-0.30	30.00	-30.30

LOW CHANNEL

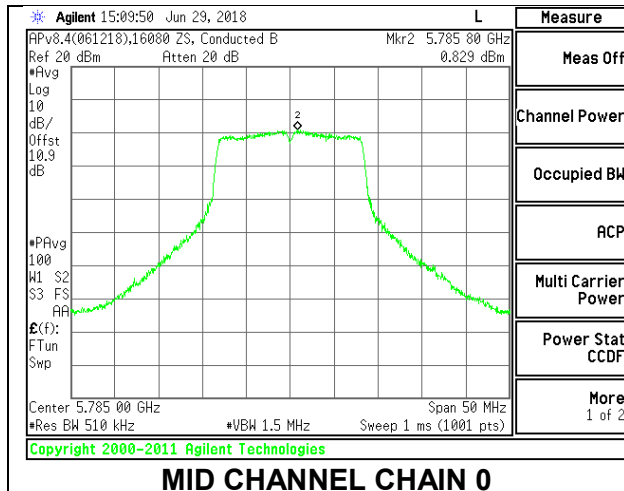


LOW CHANNEL CHAIN 0

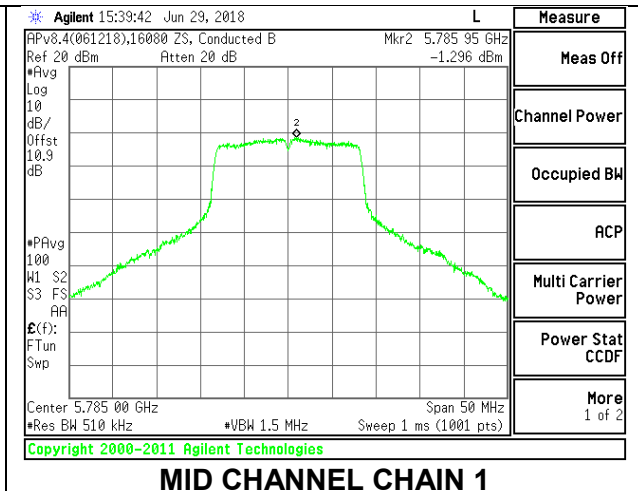


LOW CHANNEL CHAIN 1

MID CHANNEL

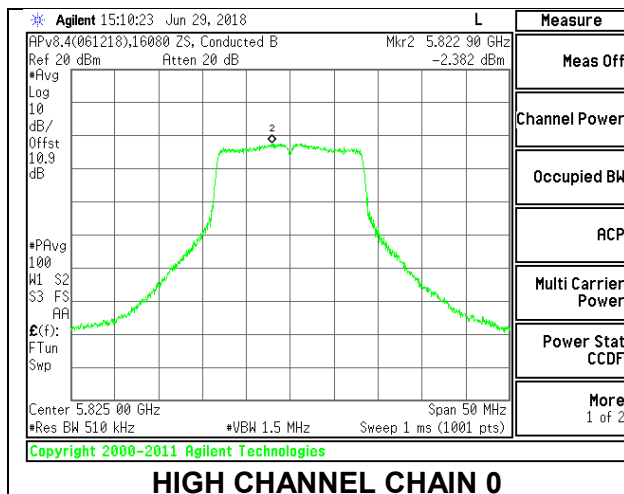


MID CHANNEL CHAIN 0

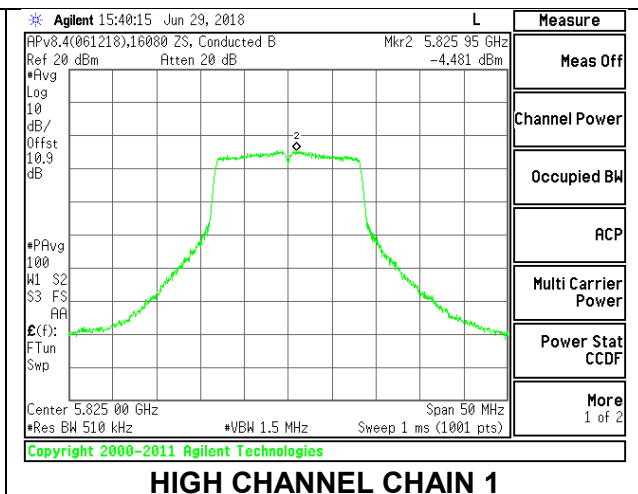


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5745	-4.70	-1.69	30.00	30.00
Mid	5785	-4.70	-1.69	30.00	30.00
High	5825	-4.70	-1.69	30.00	30.00

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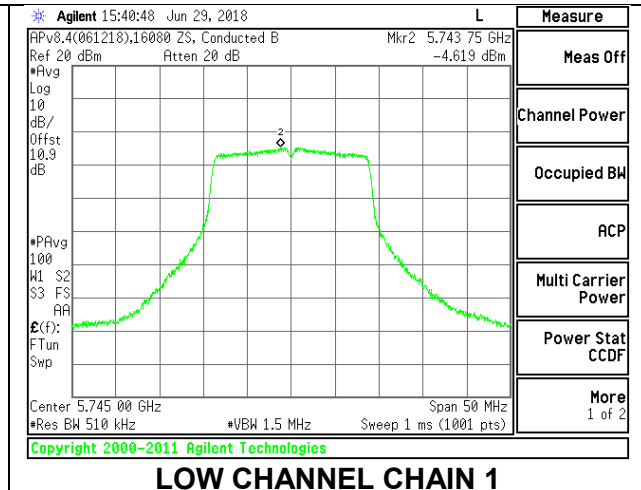
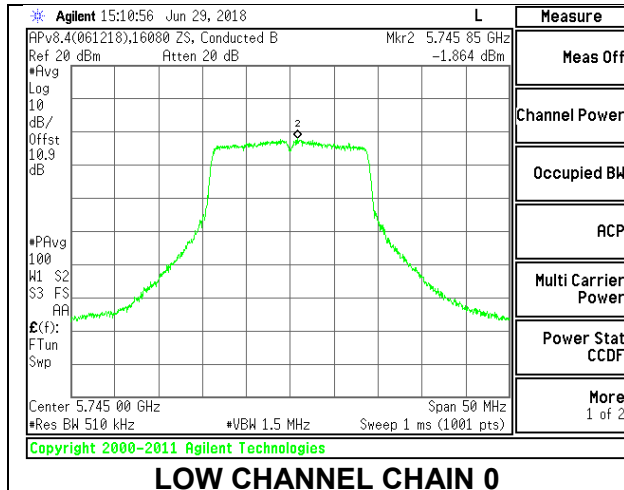
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	10.92	8.97	13.06	30.00	-16.94
Mid	5785	14.12	12.38	16.35	30.00	-13.65
High	5825	11.06	8.42	12.95	30.00	-17.05

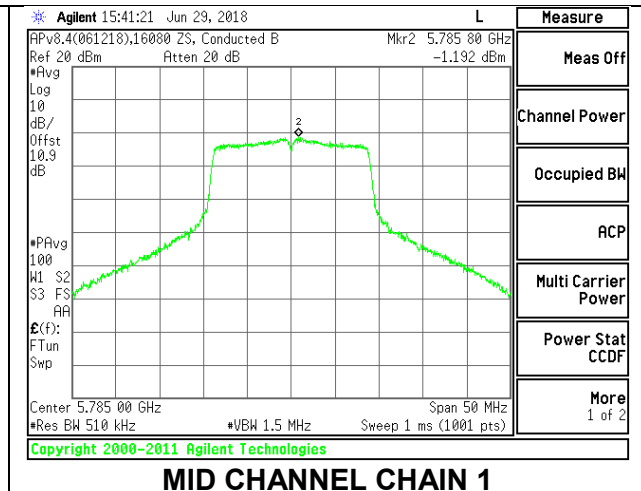
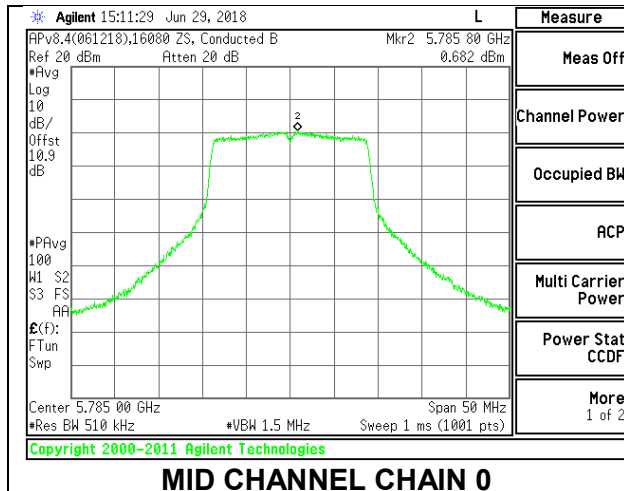
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5745	-1.864	-4.619	-0.02	30.00	-30.02
Mid	5785	0.682	-1.192	2.86	30.00	-27.14
High	5825	-2.318	-4.943	-0.42	30.00	-30.42

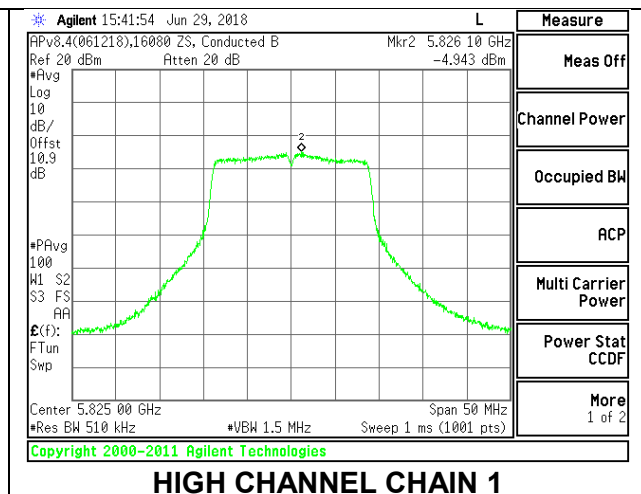
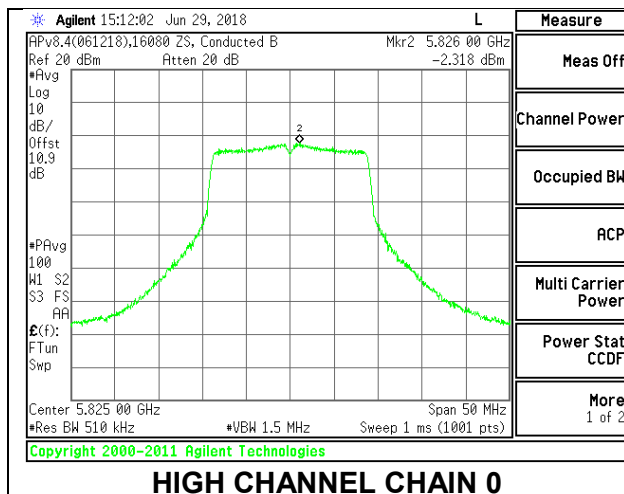
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.5.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5755	-4.70	-1.69	30.00	30.00
High	5795	-4.70	-1.69	30.00	30.00

Duty Cycle CF (dB)	0.27	Included in Calculations of Corr'd Power & PSD
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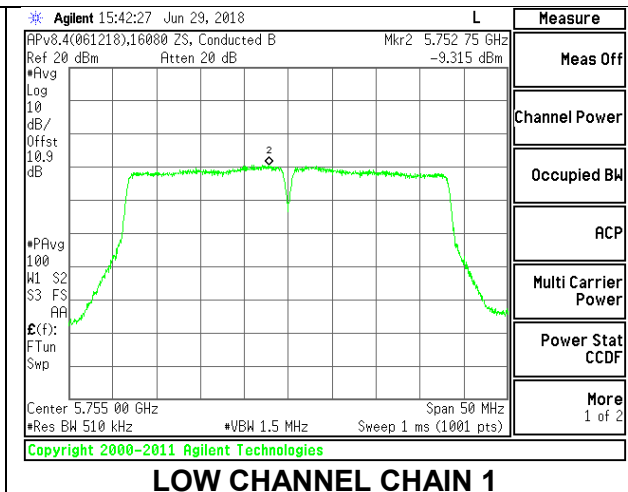
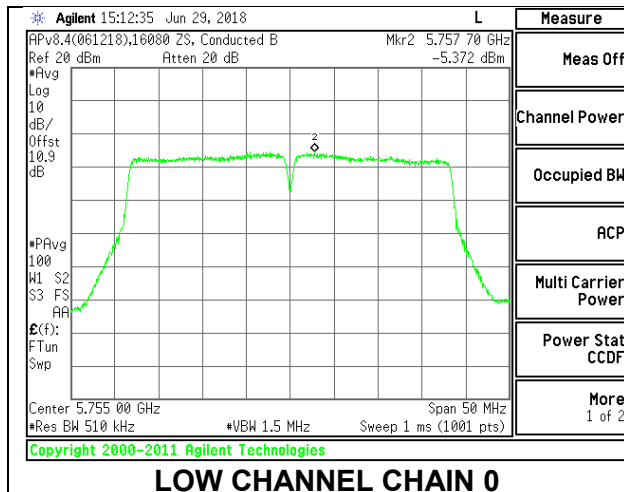
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	10.95	7.25	12.49	30.00	-17.51
High	5795	14.02	12.69	16.42	30.00	-13.58

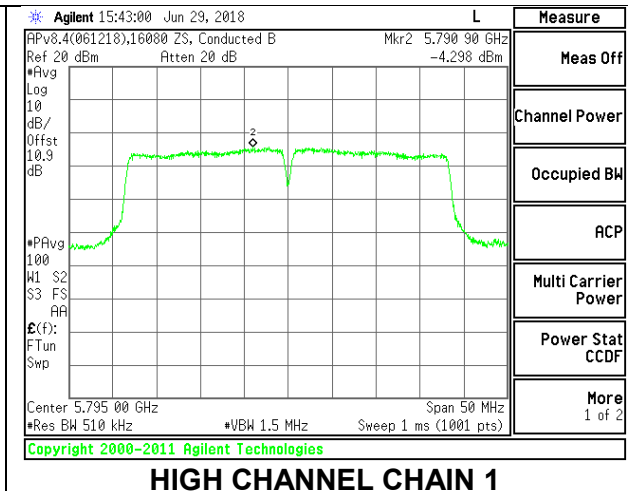
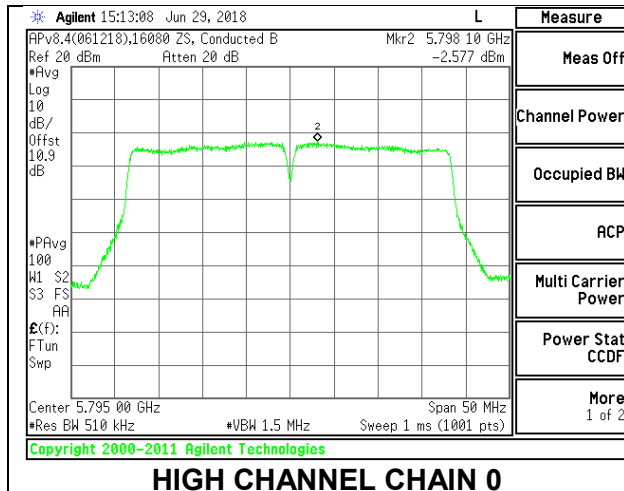
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5755	-5.37	-9.32	-3.63	30.00	-33.63
High	5795	-2.58	-4.30	-0.07	30.00	-30.07

LOW CHANNEL



HIGH CHANNEL



8.5.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Mid	5755	-4.70	-1.69	30.00	30.00

Duty Cycle CF (dB)	0.53	Included in Calculations of Corr'd Power & PSD
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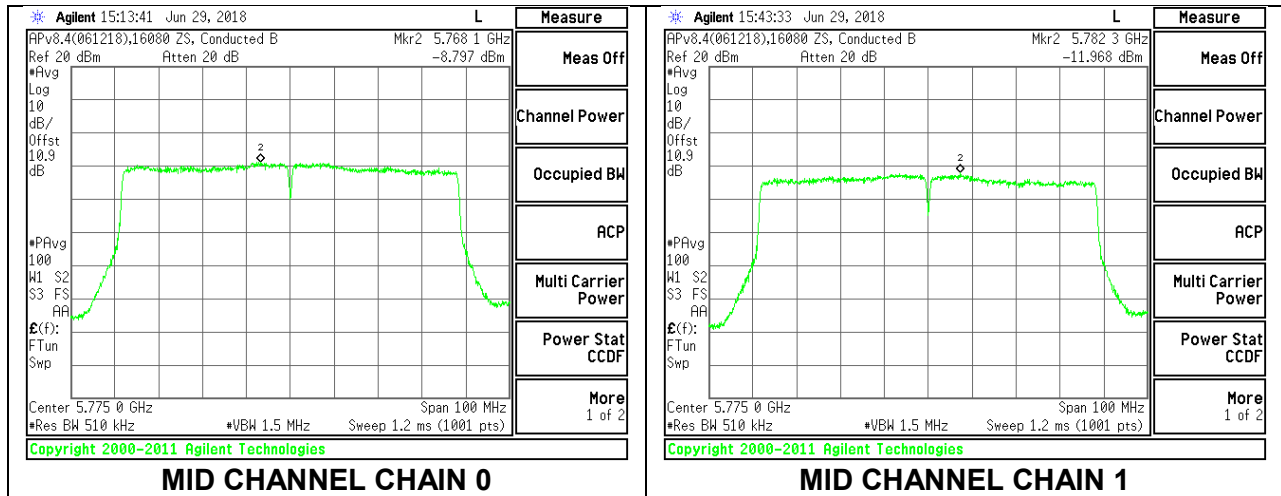
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5755	10.84	7.79	12.59	30.00	-17.41

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5755	-8.797	-11.968	-6.56	30.00	-36.56

MID CHANNEL



9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209 -Restricted bands

FCC §15.407(b)(1-3) -Un-Restricted bands

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

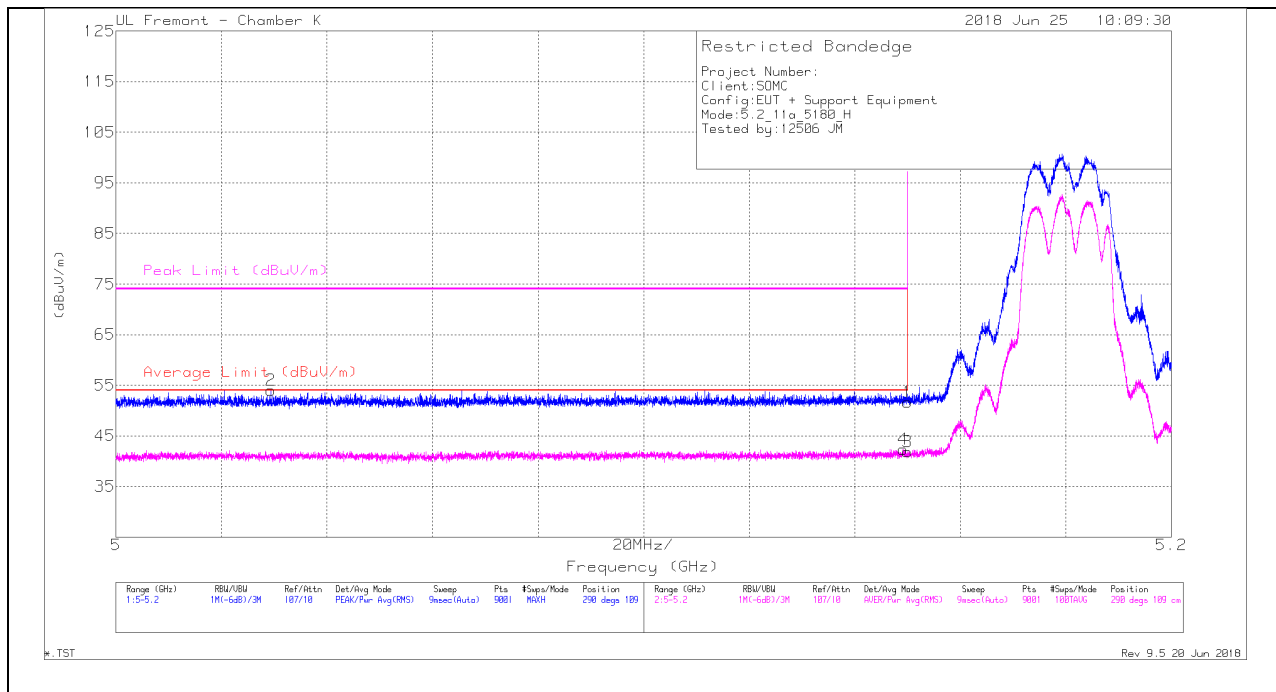
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.1. TRANSMITTER ABOVE 1 GHz

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

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Trace Markers

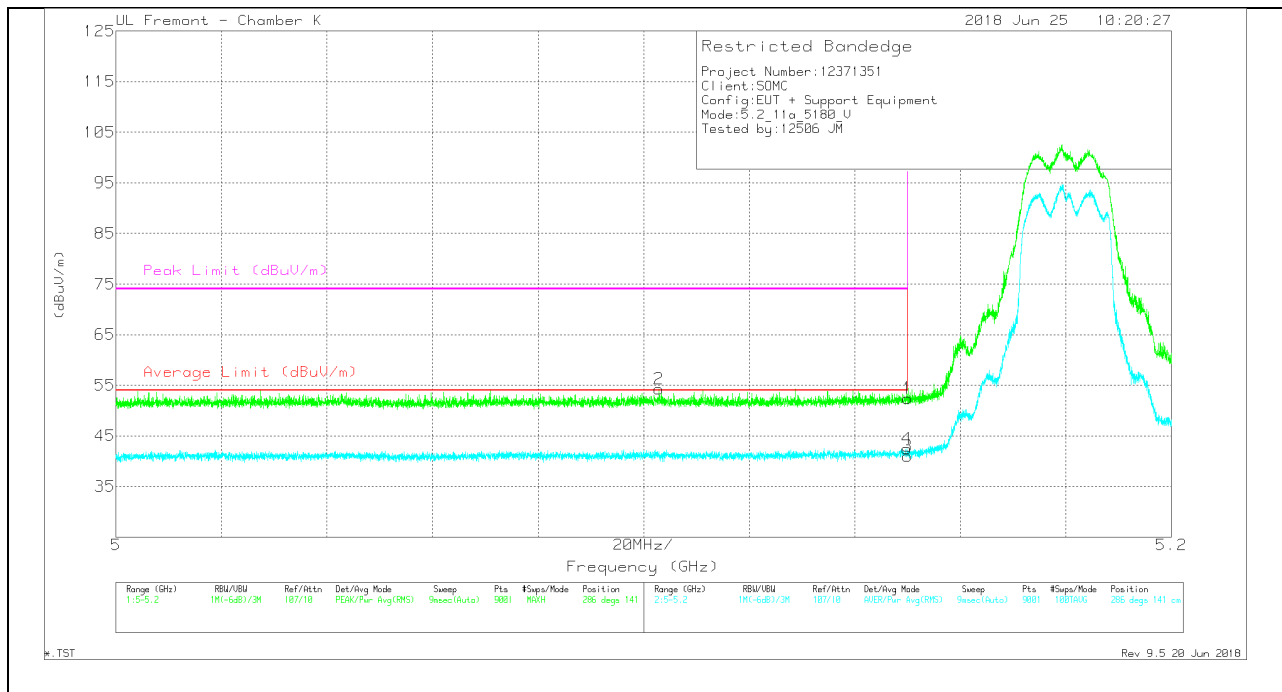
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	38.36	Pk	34.4	-21.1	51.66	-	-	74	-22.34	290	109	H
2	* 5.029	41.35	Pk	34.3	-21.6	54.05	-	-	74	-19.95	290	109	H
3	* 5.15	28.54	RMS	34.4	-21.1	41.84	54	-12.16	-	-	290	109	H
4	* 5.149	29.02	RMS	34.4	-21.1	42.32	54	-11.68	-	-	290	109	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	39.16	Pk	34.4	-21.1	52.46	-	-	74	-21.54	286	141	V
2	* 5.103	41.12	Pk	34.4	-21.2	54.32	-	-	74	-19.68	286	141	V
3	* 5.15	27.68	RMS	34.4	-21.1	40.98	54	-13.02	-	-	286	141	V
4	* 5.15	29.21	RMS	34.4	-21.1	42.51	54	-11.49	-	-	286	141	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS

