



CERTIFICATION TEST REPORT

Report Number. : 12563988-E5V2

Applicant : Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeongtong-Gu,
Suwon-Si, Gyeonggi-Do, 16677, Korea

Model : SM-G975N

FCC ID : A3LSMG975KOR

EUT Description : GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax
HE20/40/80, ANT+ and NFC

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

Date Of Issue:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	1/29/2019	Initial Issue	
V2	1/30/2019	Updated Section 6.5 and 10.4	Steven Tran

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeongtong-Gu,
Suwon-Si, Gyeonggi-Do, 16677, Korea

EUT DESCRIPTION: GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax
HE20/40/80, ANT+ and NFC

MODEL: SM-G975N

SERIAL NUMBER: ORIGINAL: Conducted (Glass): R38KA093BOT, R38KA0L96BB
Radiated (Glass): R38KA0L97DV, R38KA0L971T
Radiated (Ceramic): R38KA092LGJ, R38KA0KV84N
SPOTCHECK: Radiated (Glass):R39KA0KPKH, R39KA0FDGAH,
R39KA0FDGTD
Radiated (Ceramic):R39KB0A1Z4, R39KB0A1YW,
R39KB0A1YV

DATE TESTED: November 13, 2018 – January 29, 2019 (ORIGINAL)
December 12, 2018 – December 21, 2019 (SPOTCHECK)

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. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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.

Approved & Released For
UL Verification Services Inc. By:

Reviewed By:



Dan Corona
Operations Leader
Consumer Technology Division
UL Verification Services Inc.

Steven Tran
Project Engineer
Consumer Technology Division
UL Verification Services Inc.

2. INTRODUCTION OF TEST DATA REUSE

2.1. INTRODUCTION

According to the manufacturer, FCC ID: A3LSMG975F and FCC ID: A3LSMG975KOR non-licensed radios are electrically identical. The FCC ID: A3LSMG975F test data shall remain representative of FCC ID: A3LSMG975KOR.

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

2.2. DEVICES DIFFERENCES

The FCC ID: A3LSMG975F, shares the same enclosure and circuit board as FCC ID: A3LSMG975KOR. The UNII WLAN antennas and surrounding circuitry and layout are identical between two models.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMG975F remains representative of FCC ID: A3LSMG975KOR. The test data of FCC ID: A3LSMG975F being submitted for this application to cover UNII WLAN features.

2.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device A3LSMG975KOR(Glass and Ceramic) for radiated harmonic spurious and radiated band-edge. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary below.

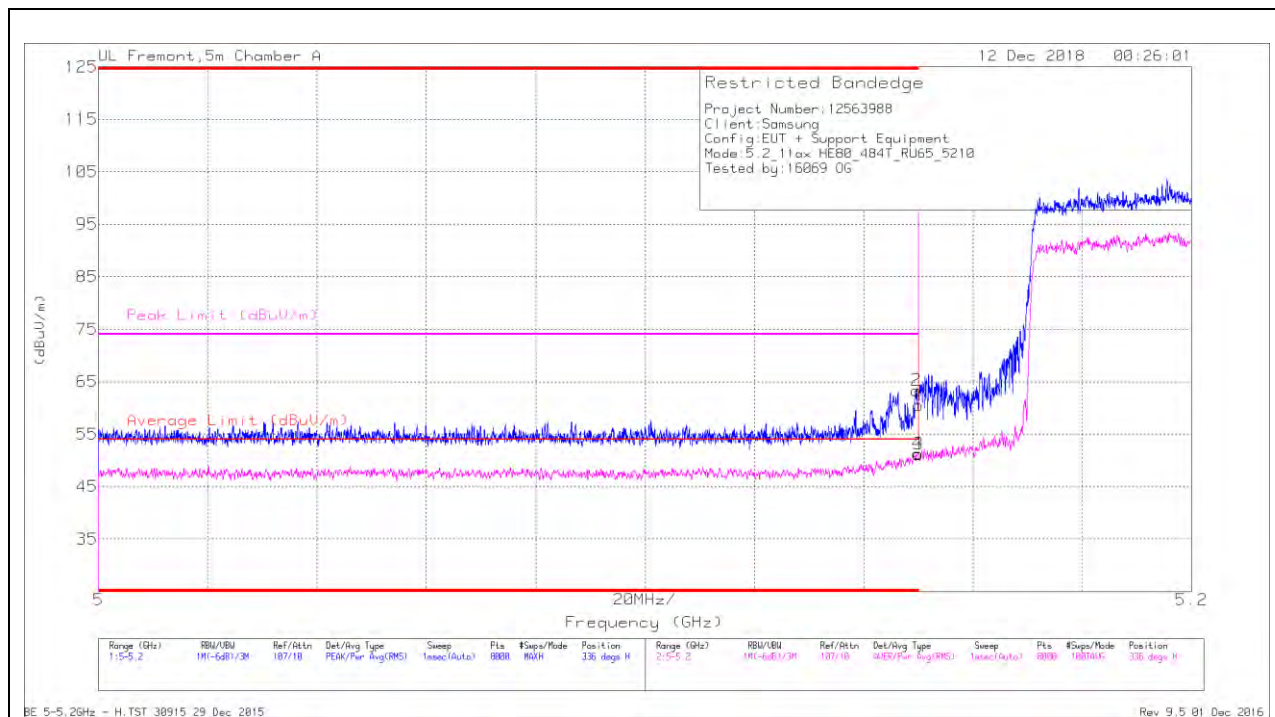
A3LSMG975KOR SPOT CHECK RESULTS										
Technology	Mode	Test Item	Channel	Measured Frequency	Original model		Spot check model		Delta (dB)	
					SM-G975F		SM-G975N			
					A3LSMG975F		A3LSMG975KOR		Peak	Ave
UNII	11ax HE80, 484T, RU65	RBE	42	5149MHz	62.73	52.03	63.29	51.25	0.56	-0.78
	11ax HE20, 242T, RU61	RSE	64	10645MHz	62.47	50.93	60.82	47.89	-1.65	-3.04

Comparison of two models, upper deviation is within 3dB range and all tests are under FCC Technical Limits.

2.3.1. SPOT CHECK DATA – SM-G975N (GLASS)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Trace Markers

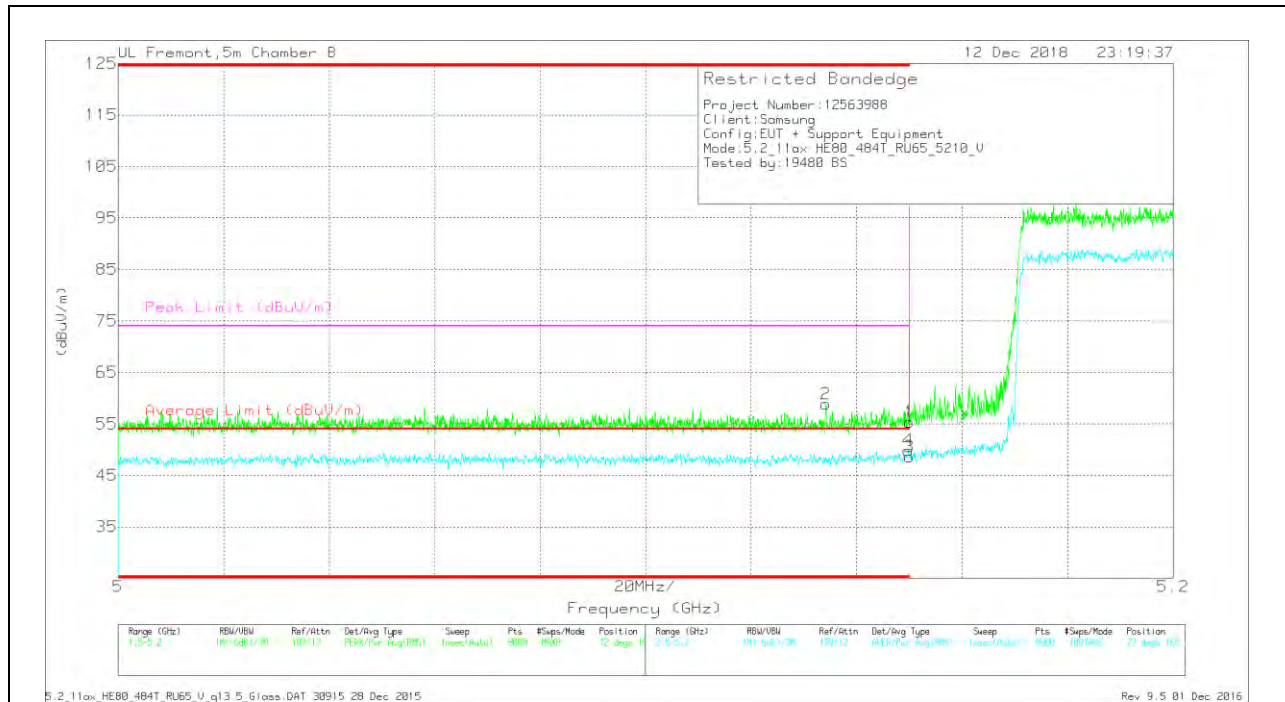
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	43.72	Pk	34.3	-17.5	0	60.52	-	-	74	-13.48	336	222	H
2	* 5.15	46.49	Pk	34.3	-17.5	0	63.29	-	-	74	-10.71	336	222	H
3	* 5.15	33.12	RMS	34.3	-17.5	1.27	51.19	54	-2.81	-	-	336	222	H
4	* 5.15	33.18	RMS	34.3	-17.5	1.27	51.25	54	-2.75	-	-	336	222	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	37.85	Pk	34.6	-17.1	0	55.35	-	-	74	-18.65	72	165	V
2	* 5.134	41.46	Pk	34.6	-17.2	0	58.86	-	-	74	-15.14	72	165	V
3	* 5.15	29.92	RMS	34.6	-17.1	1.27	48.69	54	-5.31	-	-	72	165	V
4	* 5.15	31.16	RMS	34.6	-17.1	1.27	49.93	54	-4.07	-	-	72	165	V

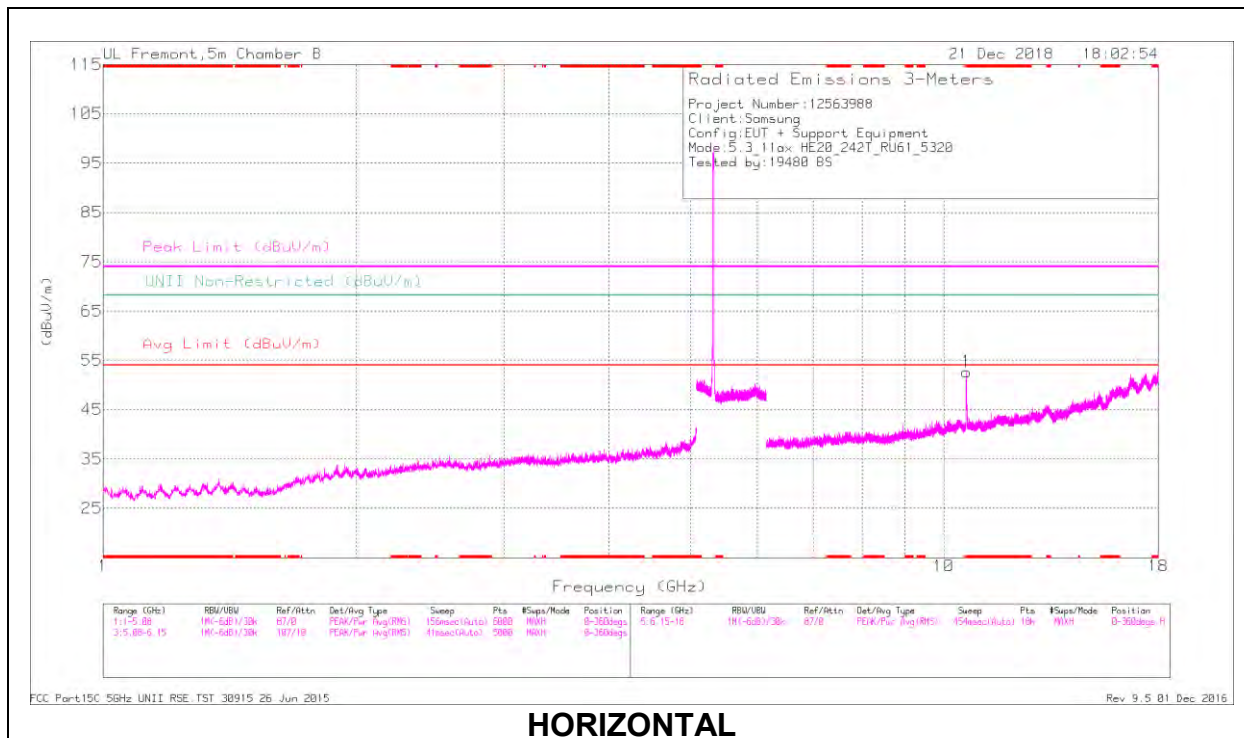
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

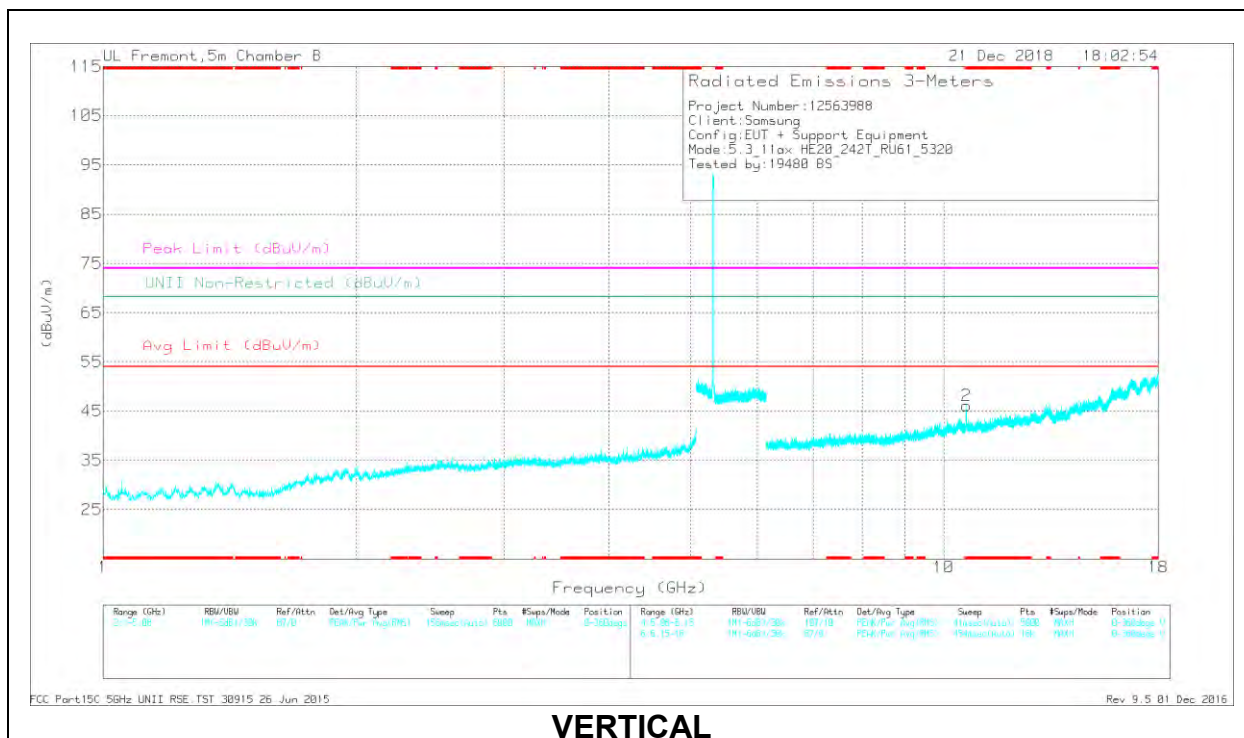
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 10.64	45.62	PK-U	37.8	-22.6	0	60.82	-	-	74	-13.18	-	-	187	104	H
	* 10.639	32.02	ADR	37.8	-22.6	.67	47.89	54	-6.11	-	-	-	-	187	104	H
2	* 10.641	38.89	PK-U	37.8	-22.6	0	54.09	-	-	74	-19.91	-	-	66	107	V
	* 10.641	26.43	ADR	37.8	-22.6	.67	42.3	54	-11.7	-	-	-	-	66	107	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

2.4. REFERENCE DETAIL

Reference application that contains the reused reference data.

Equipment Class	Reference FCC ID	Type Grant/ Permissive Change	Reference Application	Folder Test/RF Exposure	Report Title/Section
PCE	A3LSMG975F	Grant	12563708-E1	Test	FCC Report WWAN / All sections except Appendix A
DSS	A3LSMG975F	Grant	12563708-E2	Test	FCC Report BT / All sections
DTS	A3LSMG975F	Grant	12563708-E3	Test	FCC Report BLE / All sections
	A3LSMG975F	Grant	12563708-E4	Test	FCC Report DTS WLAN / All sections
NII	A3LSMG975F	Grant	12563708-E5	Test	FCC Report UNII WLAN / All sections except DFS
DXX	A3LSMG975F	Grant	12563708-E7	Test	FCC Report NFC / All sections
			12563708-E8	Test	FCC Report ANT+ / All sections
DCD	A3LSMG975F	Grant	12563708-E9	Test	FCC Report Wireless Charging / All sections

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 662911 D01 v02r01, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v02r01, FCC KDB 644545 D03 v01, ANSI C63.10-2013, FCC 06-96.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 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 type="checkbox"/> Chamber I (ISED:2324A-5)
<input checked="" type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input type="checkbox"/> Chamber J (ISED:2324A-6)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	<input type="checkbox"/> Chamber K (ISED:2324A-1)
	<input type="checkbox"/> Chamber G (ISED:22541-4)	<input type="checkbox"/> Chamber L (ISED:2324A-3)
	<input type="checkbox"/> Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

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

5. CALIBRATION AND UNCERTAINTY

5.1. 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.

5.2. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

5.3. 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%.

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax HE20/40/80, ANT+ and NFC. The test report addresses the UNII WLAN operational mode.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 0 Output Power (mW)	Chain 1 Output Power (dBm)	Chain 1 Output Power (mW)
5.2 GHz band, 1TX					
5180-5240	802.11a	17.12	51.52	17.33	54.08
5180-5240	802.11n HT20	17.22	52.72	17.30	53.70
5190-5230	802.11n HT40	16.18	41.50	16.24	42.07
5210	802.11ac VHT80	14.11	25.76	14.23	26.49
5180-5240	802.11ax HE20 OFDMA, 242-Tones	17.90	61.66	17.83	60.67
5180-5240	802.11ax HE20 OFDMA, 106-Tones	14.96	31.33	14.43	27.73
5180-5240	802.11ax HE20 OFDMA, 52-Tones	13.39	21.83	13.29	21.33
5180-5240	802.11ax HE20 OFDMA, 26-Tones	10.69	11.72	11.34	13.61
5190-5230	802.11ax HE40 OFDMA, 484-Tones	16.11	40.83	16.25	42.17
5190-5230	802.11ax HE40 OFDMA, 242-Tones	16.18	41.50	16.33	42.95
5190-5230	802.11ax HE40 OFDMA, 106-Tones	16.21	41.78	16.09	40.64
5190-5230	802.11ax HE40 OFDMA, 52-Tones	12.52	17.86	12.60	18.20
5190-5230	802.11ax HE40 OFDMA, 26-Tones	10.68	11.69	11.38	13.74
5210	802.11ax HE80 OFDMA, 996-Tones	13.68	23.33	13.72	23.55
5210	802.11ax HE80 OFDMA, 484-Tones	14.44	27.80	14.41	27.61
5210	802.11ax HE80 OFDMA, 242-Tones	15.76	37.67	15.80	38.02
5210	802.11ax HE80 OFDMA, 106-Tones	15.49	35.40	15.75	37.58
5210	802.11ax HE80 OFDMA, 52-Tones	12.91	19.54	13.20	20.89
5210	802.11ax HE80 OFDMA, 26-Tones	9.80	9.55	10.54	11.32

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 2TX			
5180-5240	802.11a CDD	20.42	110.15
5180-5240	802.11n HT20 CDD	20.38	109.14
5190-5230	802.11n HT40 CDD	19.34	85.90
5210	802.11ac VHT80 CDD	17.35	54.33
5180-5240	802.11ax HE20 SU	20.38	109.14
5180-5240	802.11ax HE20 OFDMA, 242-Tones	20.93	123.88
5180-5240	802.11ax HE20 OFDMA, 106-Tones	17.74	59.43
5180-5240	802.11ax HE20 OFDMA, 52-Tones	16.29	42.56
5180-5240	802.11ax HE20 OFDMA, 26-Tones	14.07	25.53
5190-5230	802.11ax HE40 SU	19.09	81.10
5190-5230	802.11ax HE40 OFDMA, 484-Tones	19.32	85.51
5190-5230	802.11ax HE40 OFDMA, 242-Tones	19.26	84.33
5190-5230	802.11ax HE40 OFDMA, 106-Tones	19.13	81.85
5190-5230	802.11ax HE40 OFDMA, 52-Tones	15.64	36.64
5190-5230	802.11ax HE40 OFDMA, 26-Tones	13.92	24.66
5210	802.11ax HE80 SU	16.62	45.92
5210	802.11ax HE80 OFDMA, 996-Tones	16.74	47.21
5210	802.11ax HE80 OFDMA, 484-Tones	17.50	56.23
5210	802.11ax HE80 OFDMA, 242-Tones	18.96	78.70
5210	802.11ax HE80 OFDMA, 106-Tones	18.65	73.28
5210	802.11ax HE80 OFDMA, 52-Tones	16.10	40.74
5210	802.11ax HE80 OFDMA, 26-Tones	13.25	21.13

5.3 GHz BAND

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 0 Output Power (mW)	Chain 1 Output Power (dBm)	Chain 1 Output Power (mW)
5.3 GHz band, 1TX					
5260-5320	802.11a	17.03	50.47	17.27	53.33
5260-5320	802.11n HT20	17.00	50.12	17.14	51.76
5270-5310	802.11n HT40	15.83	38.28	15.13	32.58
5290	802.11ac VHT80	14.66	29.24	13.79	23.93
5260-5320	802.11ax HE20 OFDMA, 242-Tones	17.72	59.16	17.64	58.08
5260-5320	802.11ax HE20 OFDMA, 106-Tones	15.39	34.59	14.86	30.62
5260-5320	802.11ax HE20 OFDMA, 52-Tones	12.87	19.36	12.45	17.58
5260-5320	802.11ax HE20 OFDMA, 26-Tones	9.86	9.68	9.64	9.20
5270-5310	802.11ax HE40 OFDMA, 484-Tones	15.81	38.11	15.78	37.84
5270-5310	802.11ax HE40 OFDMA, 242-Tones	16.81	47.97	16.77	47.53
5270-5310	802.11ax HE40 OFDMA, 106-Tones	15.64	36.64	15.50	35.48
5270-5310	802.11ax HE40 OFDMA, 52-Tones	13.20	20.89	13.13	20.56
5270-5310	802.11ax HE40 OFDMA, 26-Tones	10.55	11.35	10.56	11.38
5290	802.11ax HE80 OFDMA, 996-Tones	12.79	19.01	12.87	19.36
5290	802.11ax HE80 OFDMA, 484-Tones	15.85	38.46	15.89	38.82
5290	802.11ax HE80 OFDMA, 242-Tones	15.71	37.24	15.96	39.45
5290	802.11ax HE80 OFDMA, 106-Tones	15.75	37.58	15.77	37.76
5290	802.11ax HE80 OFDMA, 52-Tones	13.49	22.34	13.37	21.73
5290	802.11ax HE80 OFDMA, 26-Tones	10.81	12.05	11.69	14.76

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 2TX			
5260-5320	802.11a CDD	19.77	94.84
5260-5320	802.11n HT20 CDD	20.27	106.41
5270-5310	802.11n HT40 CDD	18.62	72.78
5290	802.11ac VHT80 CDD	17.41	55.08
5260-5320	802.11ax HE20 SU	20.56	113.76
5260-5320	802.11ax HE20 OFDMA, 242-Tones	20.73	118.30
5260-5320	802.11ax HE20 OFDMA, 106-Tones	18.08	64.27
5260-5320	802.11ax HE20 OFDMA, 52-Tones	15.74	37.50
5260-5320	802.11ax HE20 OFDMA, 26-Tones	12.87	19.36
5270-5310	802.11ax HE40 SU	18.62	72.78
5270-5310	802.11ax HE40 OFDMA, 484-Tones	19.00	79.43
5270-5310	802.11ax HE40 OFDMA, 242-Tones	19.93	98.40
5270-5310	802.11ax HE40 OFDMA, 106-Tones	18.77	75.34
5270-5310	802.11ax HE40 OFDMA, 52-Tones	16.45	44.16
5270-5310	802.11ax HE40 OFDMA, 26-Tones	13.65	23.17
5290	802.11ax HE80 SU	15.80	38.02
5290	802.11ax HE80 OFDMA, 996-Tones	15.87	38.64
5290	802.11ax HE80 OFDMA, 484-Tones	18.98	79.07
5290	802.11ax HE80 OFDMA, 242-Tones	18.90	77.62
5290	802.11ax HE80 OFDMA, 106-Tones	18.85	76.74
5290	802.11ax HE80 OFDMA, 52-Tones	16.49	44.57
5290	802.11ax HE80 OFDMA, 26-Tones	14.46	27.93

5.6 GHz BAND

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 0 Output Power (mW)	Chain 1 Output Power (dBm)	Chain 1 Output Power (mW)
5.6 GHz band, 1TX					
5500-5720	802.11a	17.06	50.82	17.11	51.40
5500-5720	802.11n HT20	17.22	52.72	17.35	54.33
5510-5710	802.11n HT40	16.24	42.07	16.28	42.46
5530-5690	802.11ac VHT80	14.98	31.48	15.12	32.51
5500-5720	802.11ax HE20 OFDMA, 242-Tones	17.75	59.57	17.88	61.38
5500-5720	802.11ax HE20 OFDMA, 106-Tones	16.42	43.85	16.56	45.29
5500-5720	802.11ax HE20 OFDMA, 52-Tones	13.22	20.99	13.02	20.04
5500-5720	802.11ax HE20 OFDMA, 26-Tones	10.43	11.04	10.60	11.48
5510-5710	802.11ax HE40 OFDMA, 484-Tones	16.66	46.34	16.61	45.81
5510-5710	802.11ax HE40 OFDMA, 242-Tones	16.28	42.46	16.56	45.29
5510-5710	802.11ax HE40 OFDMA, 106-Tones	15.87	38.64	15.86	38.55
5510-5710	802.11ax HE40 OFDMA, 52-Tones	13.20	20.89	12.97	19.82
5510-5710	802.11ax HE40 OFDMA, 26-Tones	9.81	9.57	9.87	9.71
5530-5690	802.11ax HE80 OFDMA, 996-Tones	15.80	38.02	15.67	36.90
5530-5690	802.11ax HE80 OFDMA, 484-Tones	15.84	38.37	15.72	37.33
5530-5690	802.11ax HE80 OFDMA, 242-Tones	15.80	38.02	15.86	38.55
5530-5690	802.11ax HE80 OFDMA, 106-Tones	15.83	38.28	15.42	34.83
5530-5690	802.11ax HE80 OFDMA, 52-Tones	13.21	20.94	12.99	19.91
5530-5690	802.11ax HE80 OFDMA, 26-Tones	10.26	10.62	9.70	9.33

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 2TX			
5500-5720	802.11a CDD	20.26	106.17
5500-5720	802.11n HT20 CDD	20.38	109.14
5510-5710	802.11n HT40 CDD	19.40	87.10
5530-5690	802.11ac VHT80 CDD	18.16	65.46
5500-5720	802.11ax HE20 SU	20.43	110.41
5500-5720	802.11ax HE20 OFDMA, 242-Tones	20.93	123.88
5500-5720	802.11ax HE20 OFDMA, 106-Tones	19.59	90.99
5500-5720	802.11ax HE20 OFDMA, 52-Tones	16.15	41.21
5500-5720	802.11ax HE20 OFDMA, 26-Tones	13.38	21.78
5510-5710	802.11ax HE40 SU	19.56	90.36
5510-5710	802.11ax HE40 OFDMA, 484-Tones	19.81	95.72
5510-5710	802.11ax HE40 OFDMA, 242-Tones	19.57	90.57
5510-5710	802.11ax HE40 OFDMA, 106-Tones	18.98	79.07
5510-5710	802.11ax HE40 OFDMA, 52-Tones	16.16	41.30
5510-5710	802.11ax HE40 OFDMA, 26-Tones	13.02	20.04
5530-5690	802.11ax HE80 SU	18.61	72.61
5530-5690	802.11ax HE80 OFDMA, 996-Tones	18.93	78.16
5530-5690	802.11ax HE80 OFDMA, 484-Tones	18.98	79.07
5530-5690	802.11ax HE80 OFDMA, 242-Tones	19.00	79.43
5530-5690	802.11ax HE80 OFDMA, 106-Tones	18.82	76.21
5530-5690	802.11ax HE80 OFDMA, 52-Tones	16.25	42.17
5530-5690	802.11ax HE80 OFDMA, 26-Tones	13.08	20.32

5.8 GHz BAND

Frequency Range (MHz)	Mode	Chain 0 Output Power (dBm)	Chain 0 Output Power (mW)	Chain 1 Output Power (dBm)	Chain 1 Output Power (mW)
5.8 GHz band, 1TX					
5745-5825	802.11a	17.18	52.24	17.35	54.33
5745-5825	802.11n HT20	17.03	50.47	17.06	50.82
5755-5795	802.11n HT40	16.21	41.78	16.31	42.76
5775	802.11ac VHT80	15.10	32.36	15.27	33.65
5745-5825	802.11ax HE20 OFDMA, 242-Tones	17.11	51.40	17.38	54.70
5745-5825	802.11ax HE20 OFDMA, 106-Tones	17.10	51.29	17.19	52.36
5745-5825	802.11ax HE20 OFDMA, 52-Tones	17.19	52.36	17.23	52.84
5745-5825	802.11ax HE20 OFDMA, 26-Tones	14.20	26.30	14.50	28.18
5755-5795	802.11ax HE40 OFDMA, 484-Tones	15.84	38.37	16.01	39.90
5755-5795	802.11ax HE40 OFDMA, 242-Tones	16.14	41.11	16.02	39.99
5755-5795	802.11ax HE40 OFDMA, 106-Tones	16.17	41.40	15.99	39.72
5755-5795	802.11ax HE40 OFDMA, 52-Tones	15.67	36.90	15.75	37.58
5755-5795	802.11ax HE40 OFDMA, 26-Tones	13.92	24.66	13.65	23.17
5775	802.11ax HE80 OFDMA, 996-Tones	14.45	27.86	14.61	28.91
5775	802.11ax HE80 OFDMA, 484-Tones	14.65	29.17	14.98	31.48
5775	802.11ax HE80 OFDMA, 242-Tones	15.04	31.92	15.29	33.81
5775	802.11ax HE80 OFDMA, 106-Tones	14.75	29.85	14.99	31.55
5775	802.11ax HE80 OFDMA, 52-Tones	14.60	28.84	14.97	31.41
5775	802.11ax HE80 OFDMA, 26-Tones	13.91	24.60	13.95	24.83

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 2TX			
5745-5825	802.11a CDD	20.38	109.14
5745-5825	802.11n HT20 CDD	20.12	102.80
5755-5795	802.11n HT40 CDD	19.40	87.10
5775	802.11ac VHT80 CDD	18.30	67.61
5745-5825	802.11ax HE20 SU	20.13	103.04
5745-5825	802.11ax HE20 OFDMA, 242-Tones	20.29	106.91
5745-5825	802.11ax HE20 OFDMA, 106-Tones	20.22	105.20
5745-5825	802.11ax HE20 OFDMA, 52-Tones	20.31	107.40
5745-5825	802.11ax HE20 OFDMA, 26-Tones	17.48	55.98
5755-5795	802.11ax HE40 SU	18.85	76.74
5755-5795	802.11ax HE40 OFDMA, 484-Tones	19.02	79.80
5755-5795	802.11ax HE40 OFDMA, 242-Tones	19.17	82.60
5755-5795	802.11ax HE40 OFDMA, 106-Tones	19.12	81.66
5755-5795	802.11ax HE40 OFDMA, 52-Tones	18.86	76.91
5755-5795	802.11ax HE40 OFDMA, 26-Tones	17.18	52.24
5775	802.11ax HE80 SU	17.48	55.98
5775	802.11ax HE80 OFDMA, 996-Tones	17.59	57.41
5775	802.11ax HE80 OFDMA, 484-Tones	17.87	61.24
5775	802.11ax HE80 OFDMA, 242-Tones	18.24	66.68
5775	802.11ax HE80 OFDMA, 106-Tones	17.97	62.66
5775	802.11ax HE80 OFDMA, 52-Tones	17.94	62.23
5775	802.11ax HE80 OFDMA, 26-Tones	16.99	50.00

Note: After investigated on the output power,

_The 11a SISO output power, chain 0 and chain 1, is lower or equal to 11a CDD. The 11a SISO is covered by the 11a CDD testing.

_The 11n HT20 SISO output power, chain 0 and chain 1, is lower or equal to 11n HT20 CDD. The 11n HT20 SISO is covered by the 11n HT20 CDD testing.

_The 11n HT40 SISO output power, chain 0 and chain 1, is lower or equal to 11n HT40 CDD. The 11n HT40 SISO is covered by the 11n HT40 CDD testing.

_The 11ax HE20 SISO output power, chain 0 and chain 1, is lower or equal to 11ax HE20 CDD. The 11ax HE20 SISO is covered by the to 11ax HE20 CDD testing.

_The 11ax HE40 SISO output power, chain 0 and chain 1, is lower or equal to 11ax HE40 CDD. The 11ax HE40 SISO is covered by the to 11ax HE40 CDD testing.

_The 11ax HE80 SISO output power, chain 0 and chain 1, is lower or equal to 11ax HE80 CDD. The 11ax HE80 SISO is covered by the to 11ax HE80 CDD testing.

In addition, the output power for 11ax SU Mode and 11ax Full Tones (242T) were investigated and the SU Mode is lower or equal to 11ax Full Tones (242T), therefore it will be covered by the 11ax Full Tones (242T) testing.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain as below table:

Frequency Band (GHz)	Chain 0	Chain 1
	Antenna Gain (dBi)	Antenna Gain (dBi)
5.2	-4.70	-5.90
5.3	-4.00	-8.20
5.6	-4.10	-2.20
5.8	-5.80	-4.30

NOTE:

Antenna 1 = Chain 0

Antenna 2 = Chain 1

6.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was G975F.001 (SM-G975F) and G975N.001(SM-G975N).

6.5. WORST-CASE CONFIGURATION AND MODE

WORST-CASE CONFIGURATION AND MODE FOR FINAL TEST

This device may be formed with two different exterior materials: Glass and Ceramic. Glass model was set for full test and additional spot check verification was done with Ceramic model for radiated harmonic spurious and radiated band-edge as documented.

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.

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.

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

802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT80 mode: MCS0
802.11ax HE20 mode: MCS0
802.11ax HE40 mode: MCS0
802.11ax HE80 mode: MCS0

All radios that can be transmitted simultaneously have been evaluated for radiated for all possible combinations of transmission and found to be in compliance.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	EP-TA300	R3KB5B01S1SE3	N/A
USB Data Caba	Samsung	N/A	N/A	N/A
Earphone	Samsung	N/A	N/A	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	Un-shielded	1	EUT to AC Mains

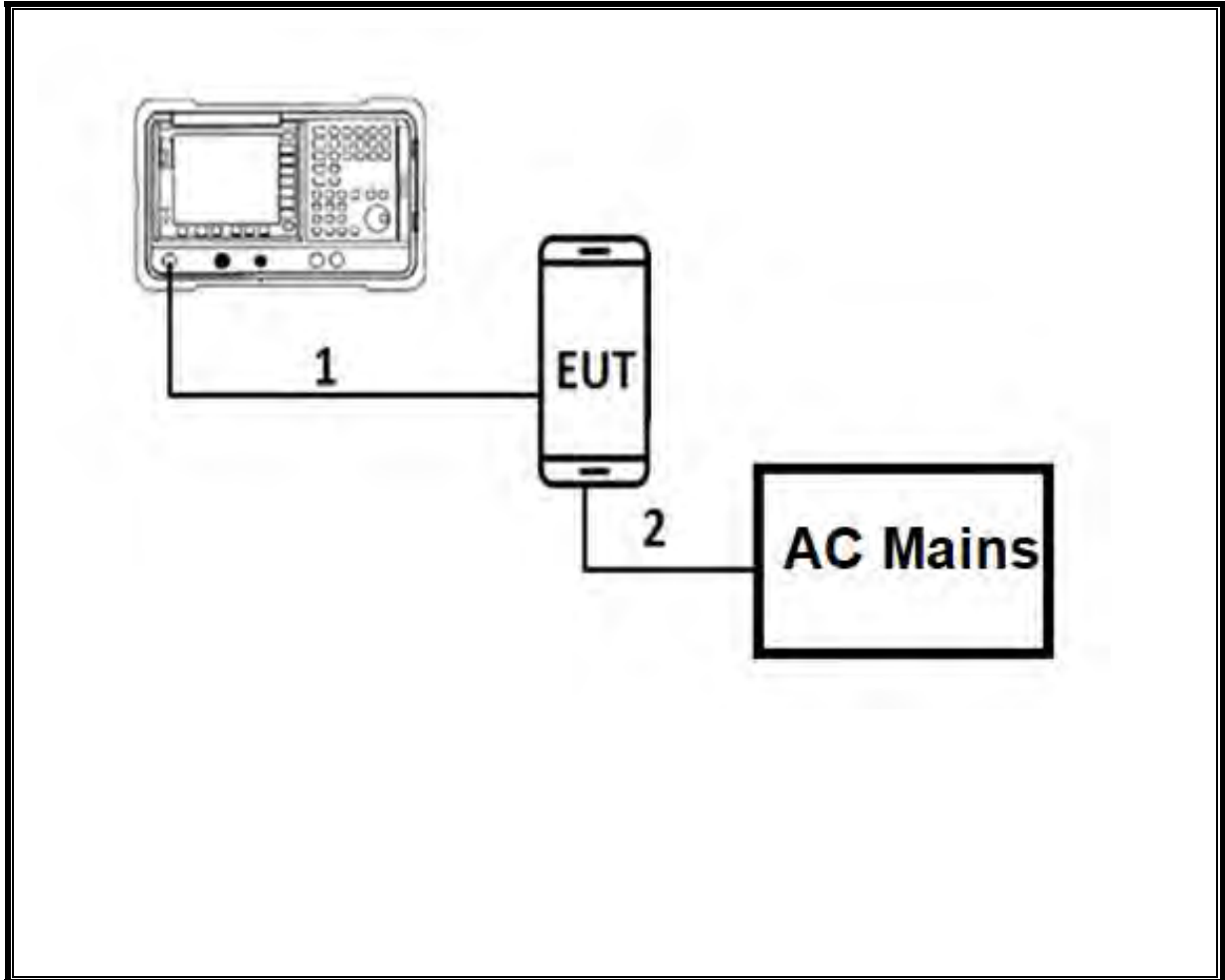
I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	1	N/A
2	earphone	1	3.5mm	Un-shielded	1	N/A

TEST SETUP

The EUT is a stand alone. Test software exercised the radio card.

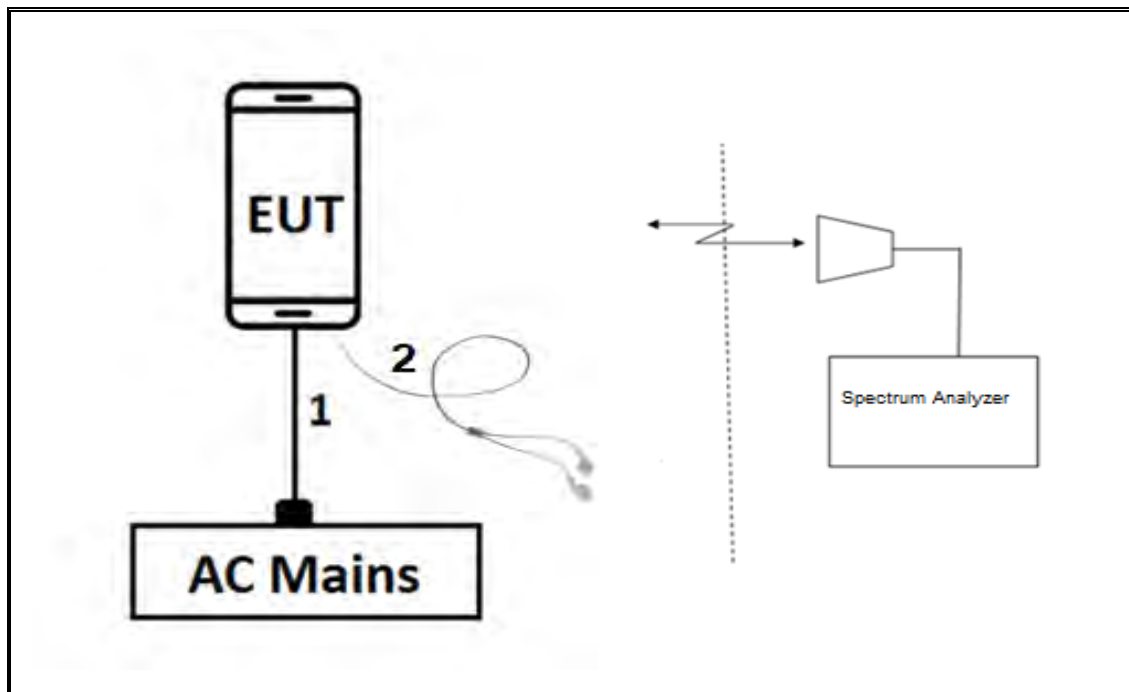
CONDUCTED TEST SETUP DIAGRAM



TEST SETUP

For conducted tests: the EUT was Stand alone. The test software exercises the radio.

RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



TEST SETUP

For radiated tests: EUT has support equipment (AC Adapter and Headset). The test software exercises the radio.

7. MEASUREMENT METHOD

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

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

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

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

Conducted Output Power: KDB 789033 D02 v02r01, Sections II.E.3.b & II.E.2.b.

Power Spectral Density: KDB 789033 D02 v02r01, Section II F.

Unwanted emissions: KDB 789033 D02 v02r01, Sections II.G.3 – II.G.6.

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

8. 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	Last Cal
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T407	05/10/2019	05/10/2018
Amplifier, 9kHz to 1GHz, 32dB	Sonoma Instrument	310	170649	11/01/2019	11/01/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	06/21/2019	06/21/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1271	07/26/2019	07/26/2018
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1224	10/09/2019	10/09/2018
Directional Coupler	Mini-Circuits	ZUDC10-183+	T1136	06/18/2019	06/18/2018
EMI Receiver	Rohde & Schwarz	ESR	T1436	02/21/2019	02/21/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T1310	06/15/2019	06/15/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T24	03/06/2019	03/06/2018
Antenna, Active Loop 9kHz-30MHz	Com-Power Corp.	AL-130R	PRE0165308	12/13/2018	12/13/2017
18 - 26.5 GHz Horn Antenna	Seavey Division	MWH-1826/B	T89	01/18/2019	01/18/2018
26.5 - 40 GHz Horn Antenna	ARA	MWH-2640/B	T446	8/9/2019	8/9/2018
Pre-Amp 26-40GHz	MITEQ	NSTTA2640-35-HG	T1864	03/09/2019	03/09/2018
Pre-Amp 1-26.5 GHz	Agilent	8449B	T404	03/09/2019	03/09/2018
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T493	10/13/2019	10/13/2018
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T1165	10/20/2019	10/20/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1113	12/21/2018	12/21/2017
Spectrum Analyzer	Agilent (Keysight) Technologies	E4446A	T146	08/13/2019	08/13/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019	01/08/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T908	01/29/2020	01/29/2019

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016
Antenna Port Software	UL	UL RF	Ver 9.3, Dec 06, 2018

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

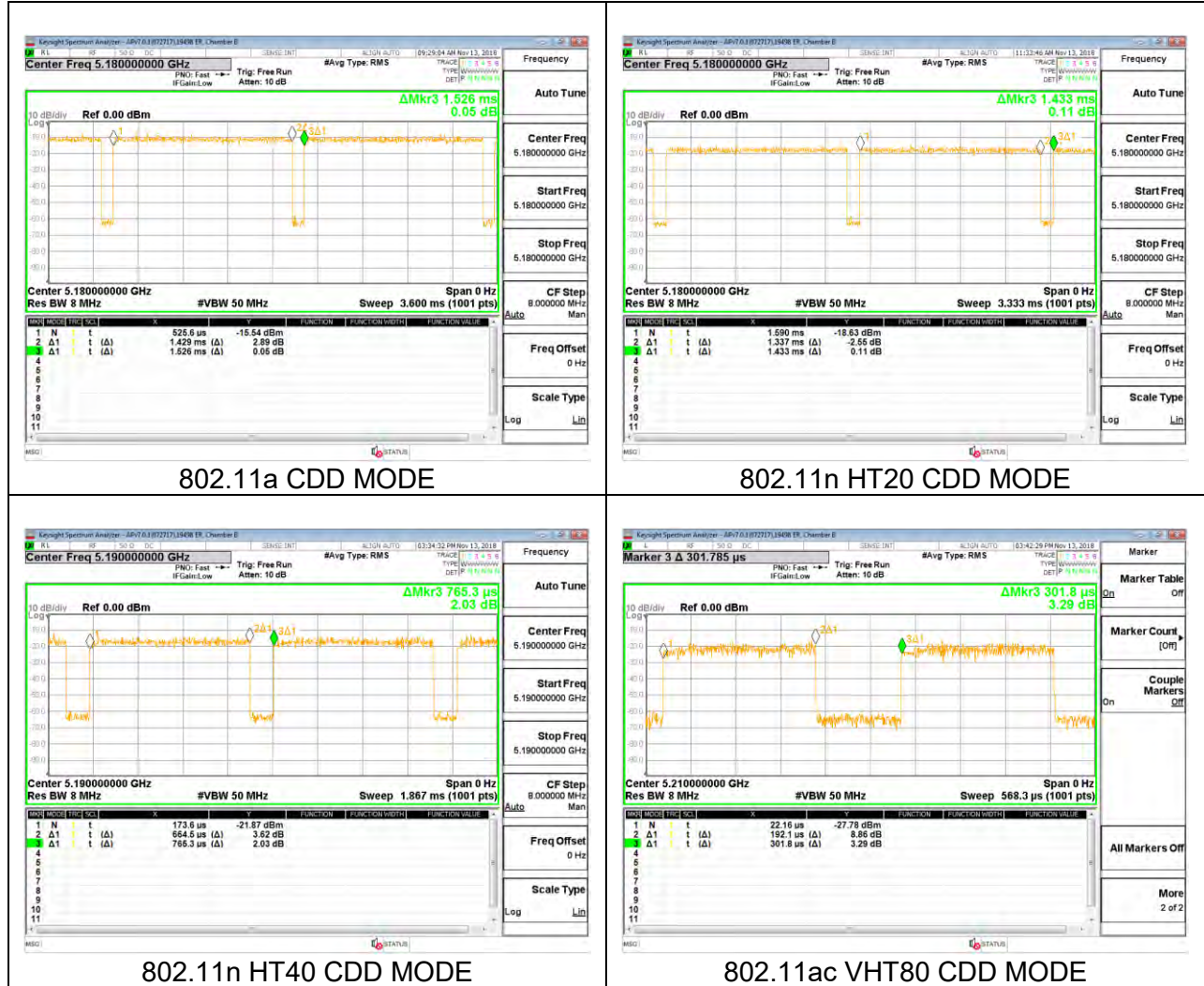
PROCEDURE

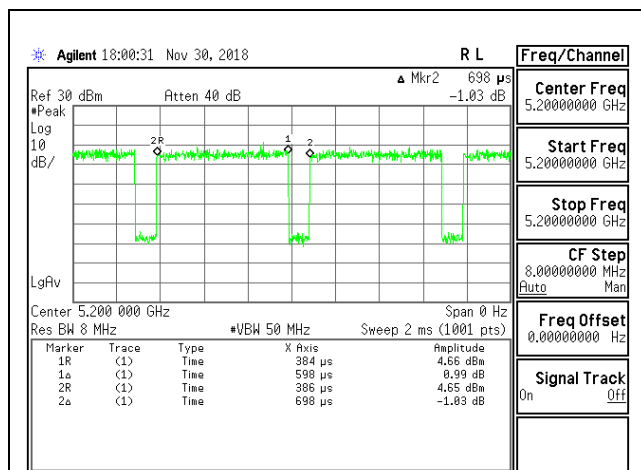
KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

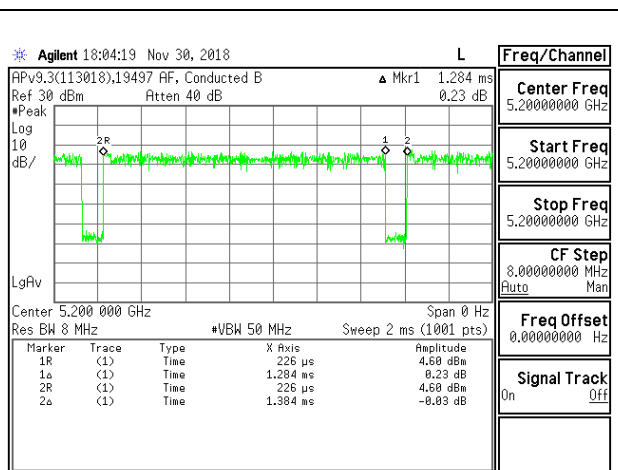
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a CDD	1.429	1.526	0.936	93.64%	0.29	0.700
802.11n HT20 CDD	1.337	1.433	0.933	93.30%	0.30	0.748
802.11n HT40 CDD	0.6645	0.7653	0.868	86.83%	0.61	1.505
802.11ac VHT80 CDD	0.1921	0.3018	0.637	63.65%	1.96	5.206
802.11ax HE20 OFDMA, RU size 242T	0.598	0.698	0.857	85.67%	0.67	1.672
802.11ax HE20 OFDMA, RU size 106T	1.284	1.384	0.928	92.77%	0.33	0.779
802.11ax HE20 OFDMA, RU size 52T	2.645	2.750	0.962	96.18%	0.17	0.378
802.11ax HE20 OFDMA, RU size 26T	5.180	5.320	0.974	97.37%	0.12	0.193
802.11ax HE40 OFDMA, RU size 484T	0.336	0.436	0.771	77.06%	1.13	2.976
802.11ax HE40 OFDMA, RU size 242T	0.600	0.702	0.855	85.47%	0.68	1.667
802.11ax HE40 OFDMA, RU size 106T	1.250	1.400	0.893	89.29%	0.49	0.800
802.11ax HE40 OFDMA, RU size 52T	2.615	2.745	0.953	95.26%	0.21	0.382
802.11ax HE40 OFDMA, RU size 26T	5.190	5.320	0.976	97.56%	0.11	0.193
802.11ax HE80 OFDMA, RU size 996T	0.200	0.311	0.643	64.31%	1.92	5.000
802.11ax HE80 OFDMA, RU size 484T	0.336	0.450	0.747	74.67%	1.27	2.976
802.11ax HE80 OFDMA, RU size 242T	0.600	0.710	0.845	84.51%	0.73	1.667
802.11ax HE80 OFDMA, RU size 106T	1.264	1.394	0.907	90.67%	0.43	0.791
802.11ax HE80 OFDMA, RU size 52T	2.600	2.750	0.945	94.55%	0.24	0.385
802.11ax HE80 OFDMA, RU size 26T	5.180	5.330	0.972	97.19%	0.12	0.193

DUTY CYCLE PLOTS

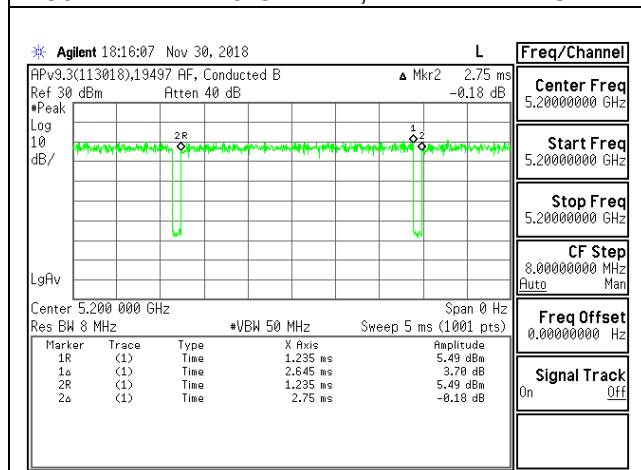




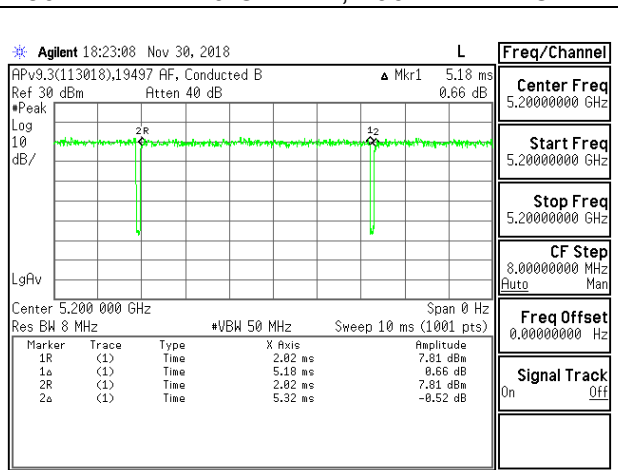
802.11ax HE20 OFDMA, 242-Tones MODE



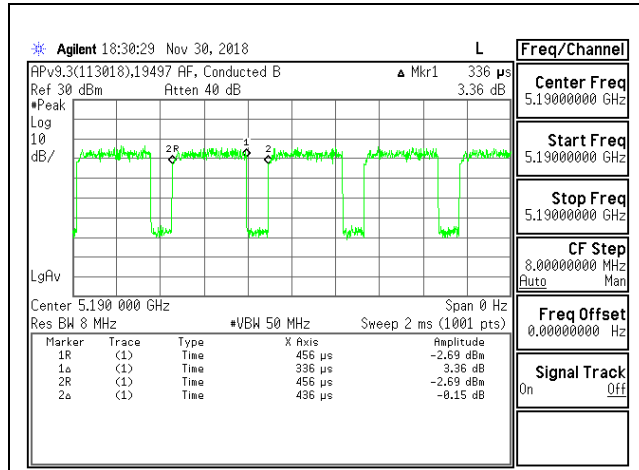
802.11ax HE20 OFDMA, 106-Tones MODE



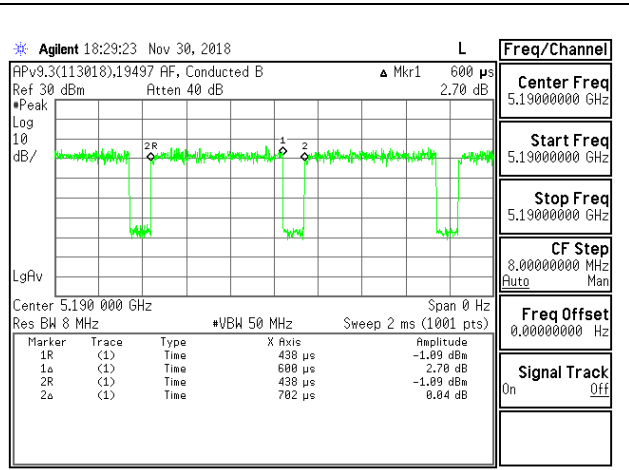
802.11ax HE20 OFDMA, 52-Tones MODE



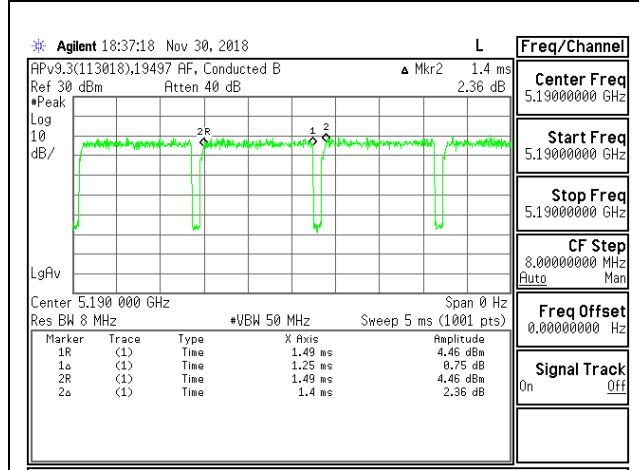
802.11ax HE20 OFDMA, 26-Tones MODE



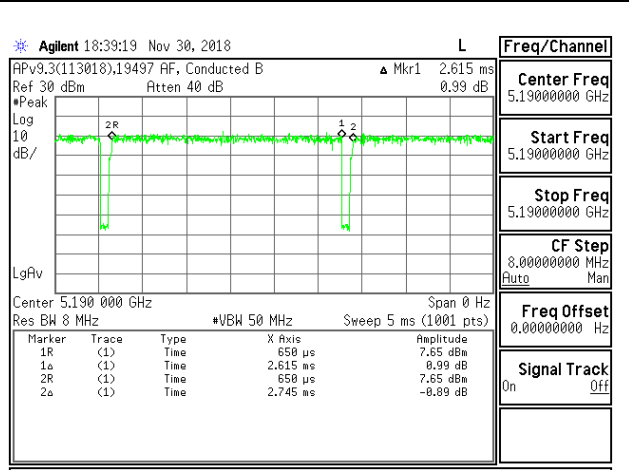
802.11ax HE40 OFDMA, 484-Tones MODE



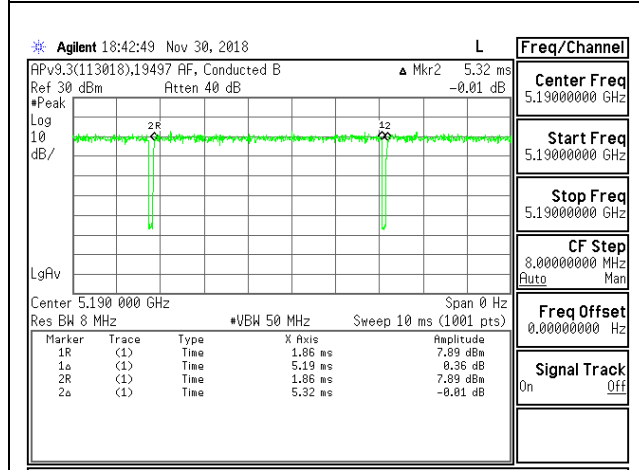
802.11ax HE40 OFDMA, 242-Tones MODE



802.11ax HE40 OFDMA, 106-Tones MODE

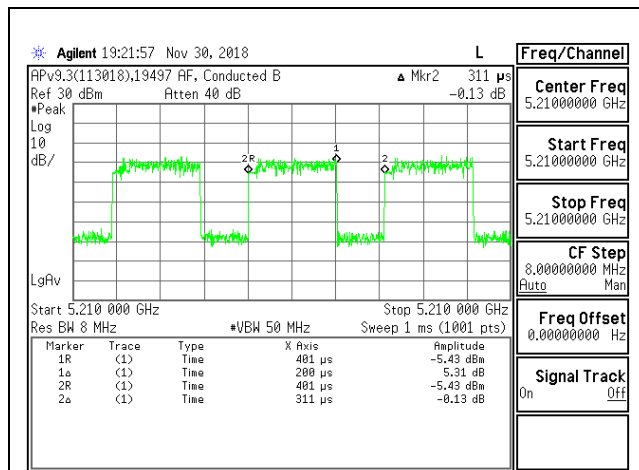


802.11ax HE40 OFDMA, 52-Tones MODE

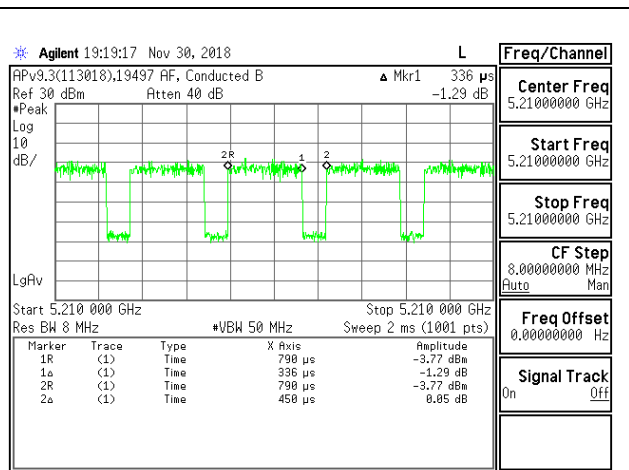


802.11ax HE40 OFDMA, 26-Tones MODE

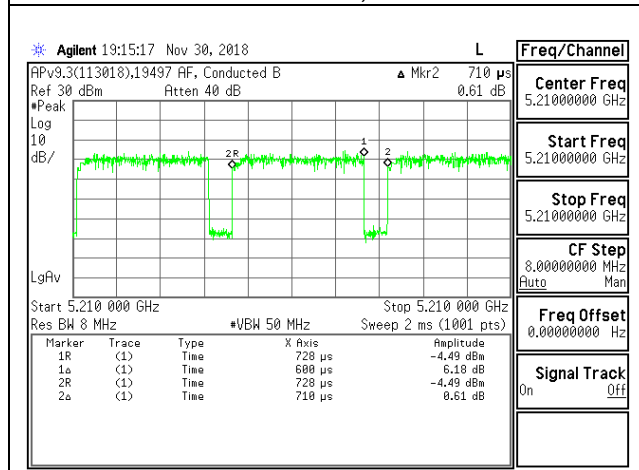
Intentionally Left Blank



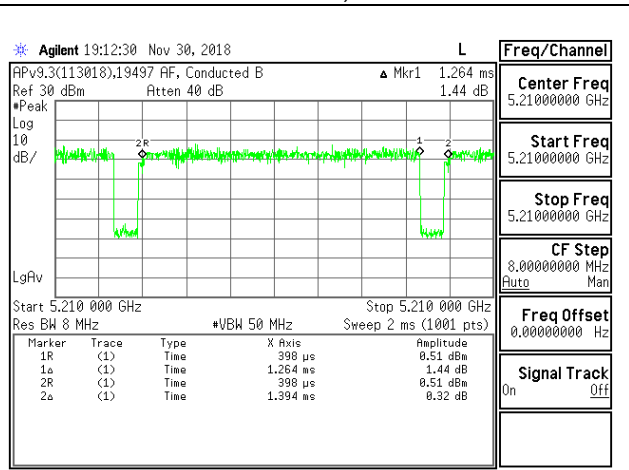
802.11ax HE80 OFDMA, 996-Tones MODE



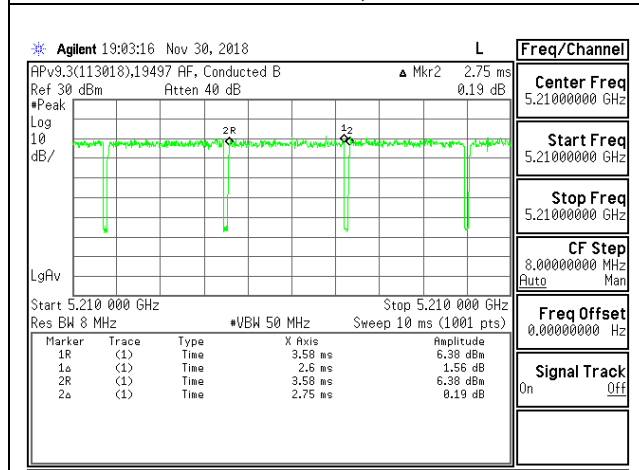
802.11ax HE80 OFDMA, 484-Tones MODE



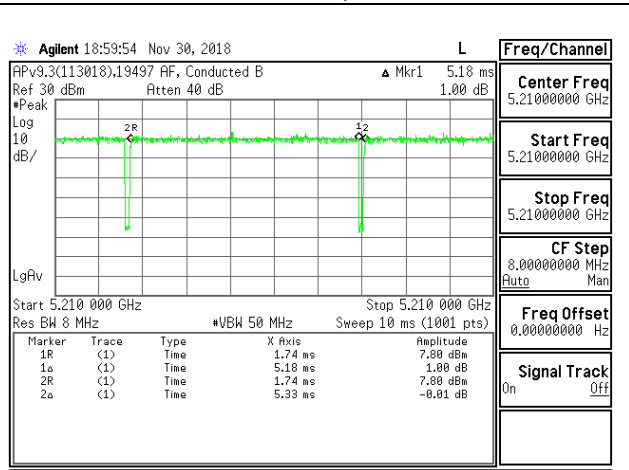
802.11ax HE80 OFDMA, 242-Tones MODE



802.11ax HE80 OFDMA, 106-Tones MODE



802.11ax HE80 OFDMA, 52-Tones MODE



802.11ax HE80 OFDMA, 26-Tones MODE

9.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

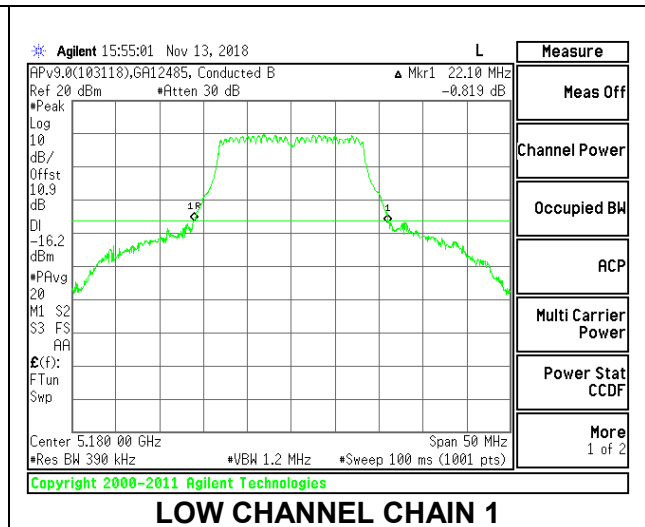
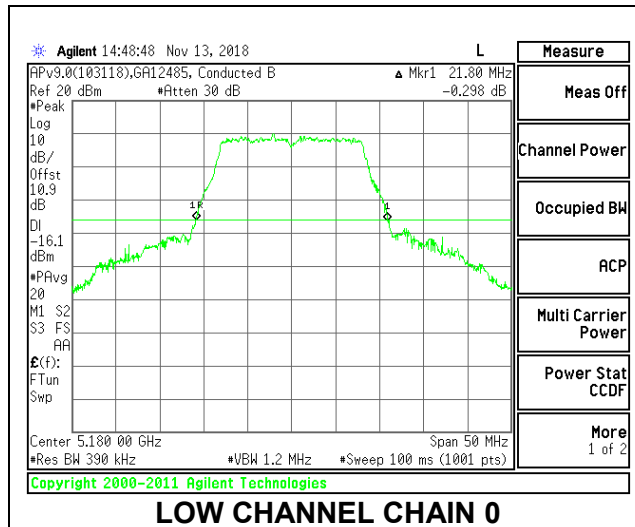
RESULTS

9.2.1. 802.11a MODE IN THE 5.2 GHz BAND

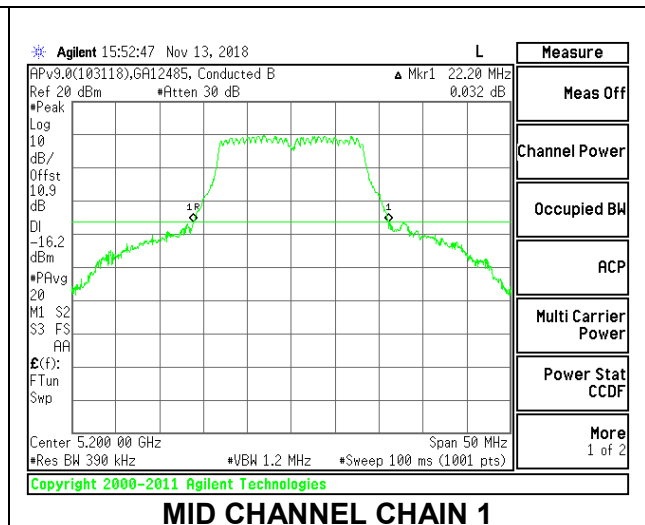
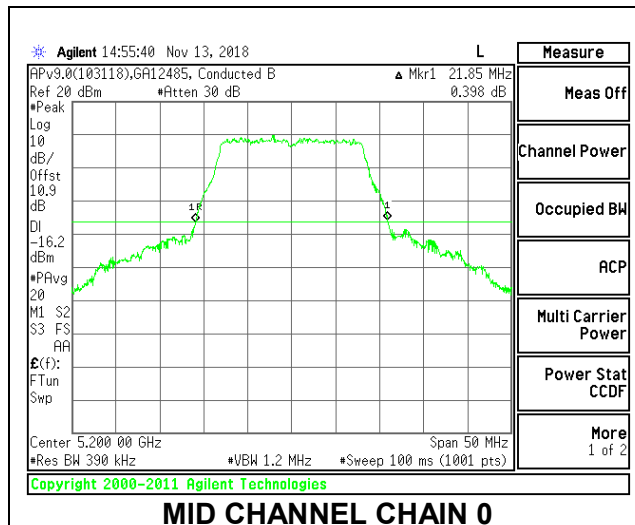
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.80	22.10
Mid	5200	21.85	22.20
High	5240	21.85	24.05

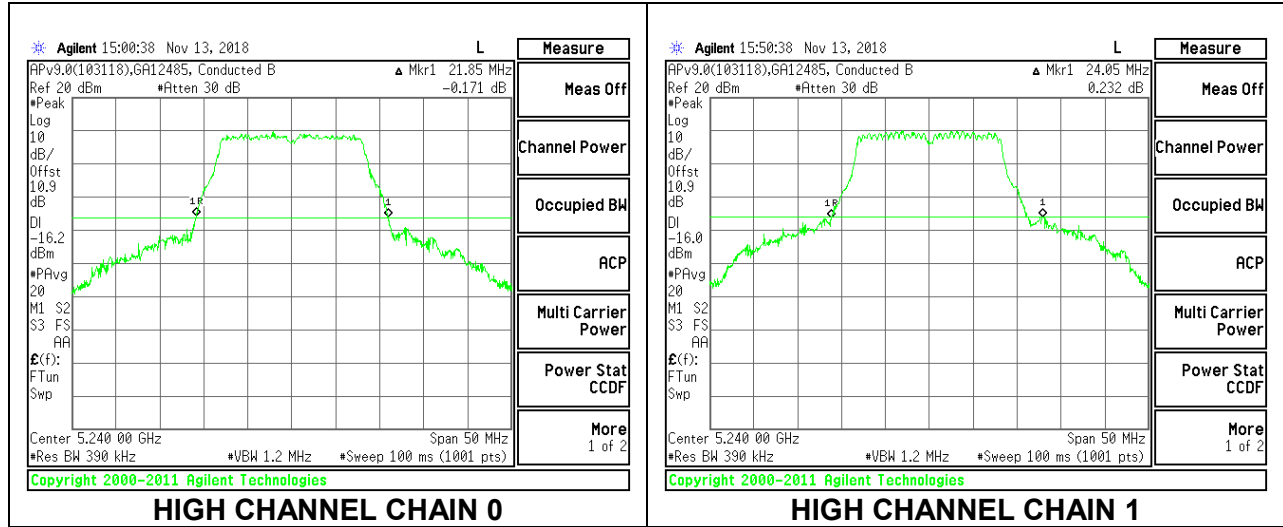
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

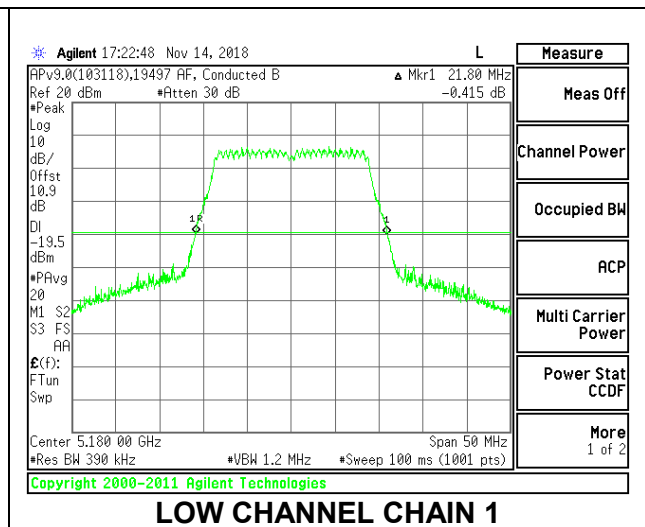
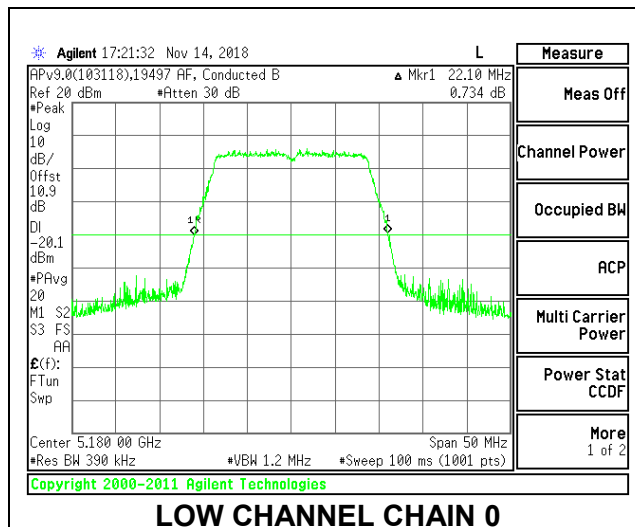


9.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

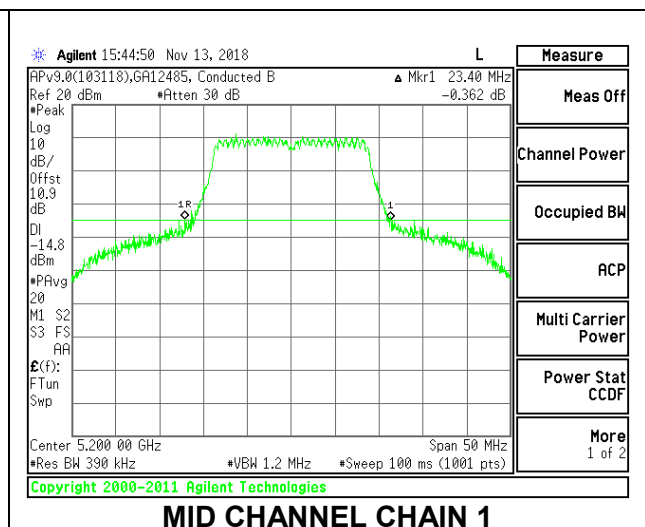
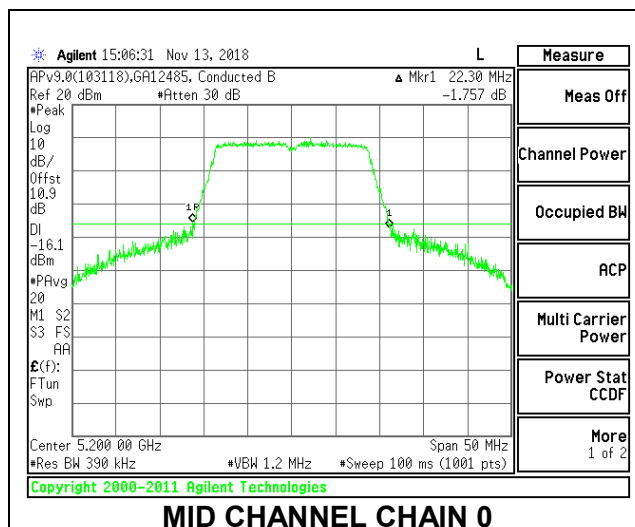
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	22.10	21.80
Mid	5200	22.30	23.40
High	5240	23.90	25.20

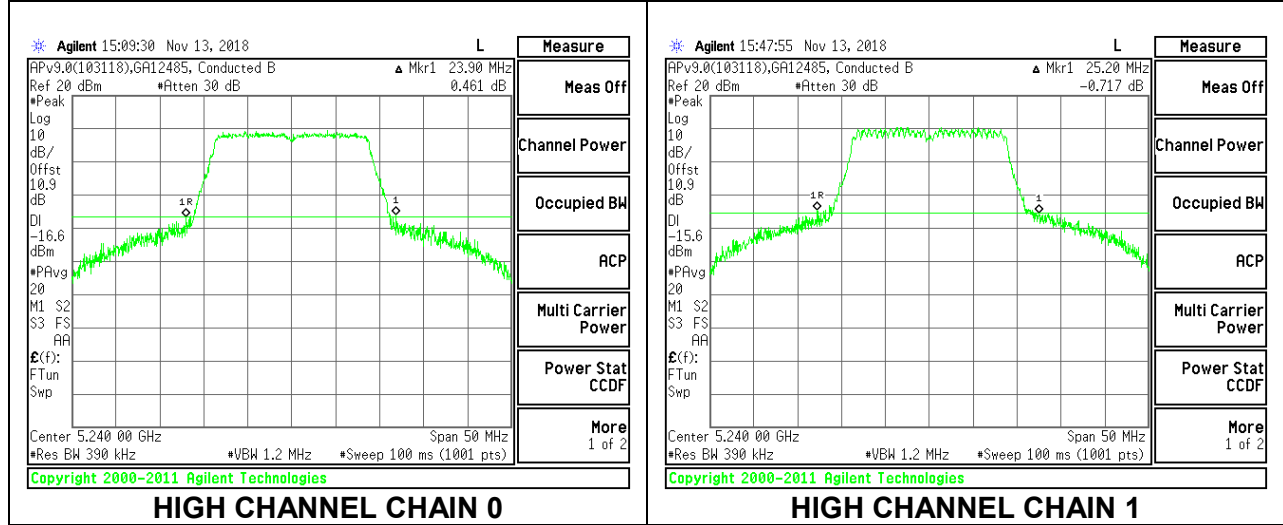
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

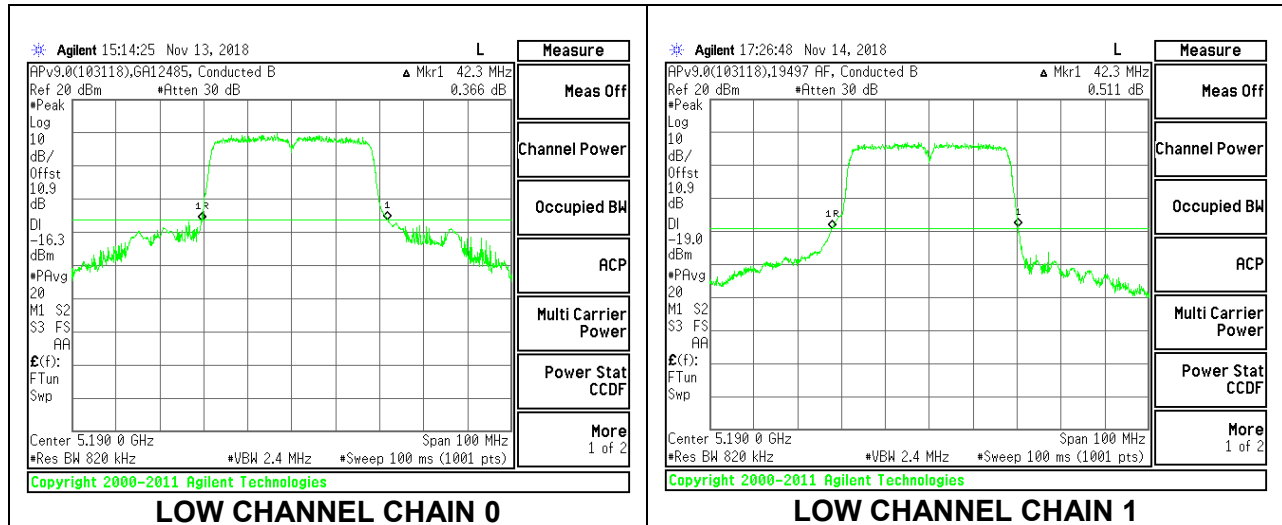


9.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

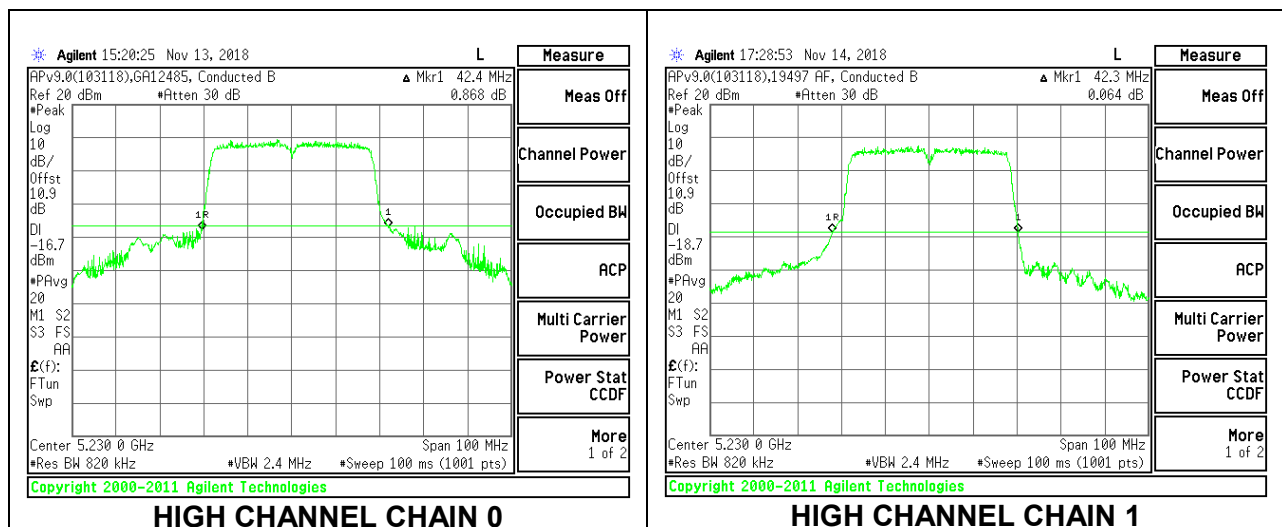
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	42.30	42.30
High	5230	42.40	42.30

LOW CHANNEL



HIGH CHANNEL

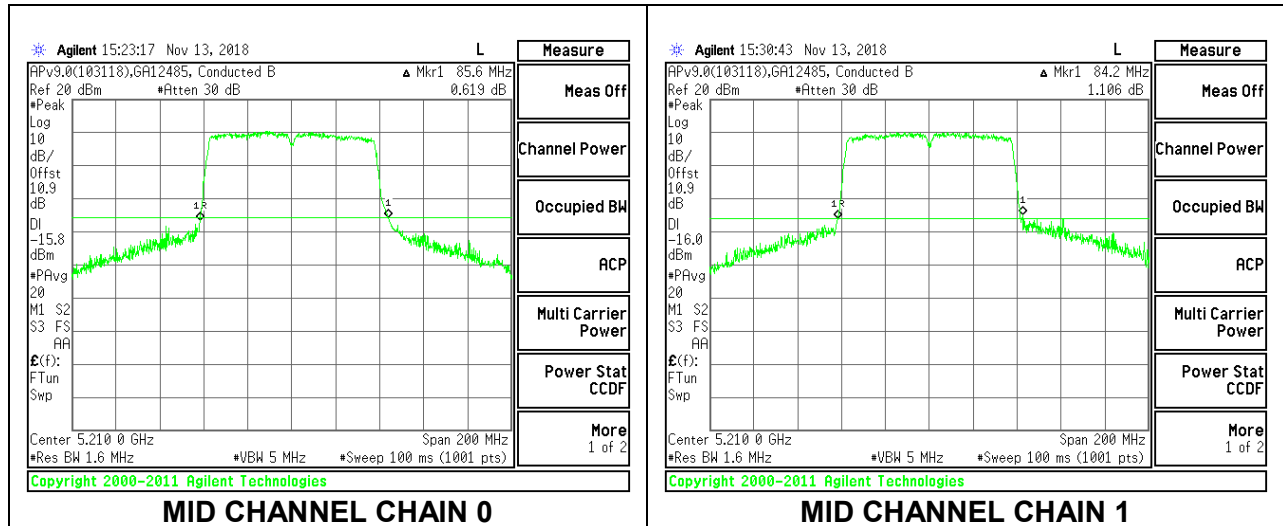


9.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	85.60	84.20

MID CHANNEL

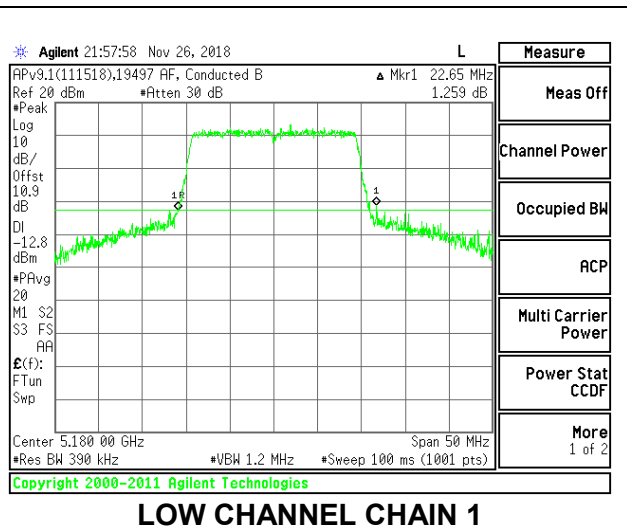
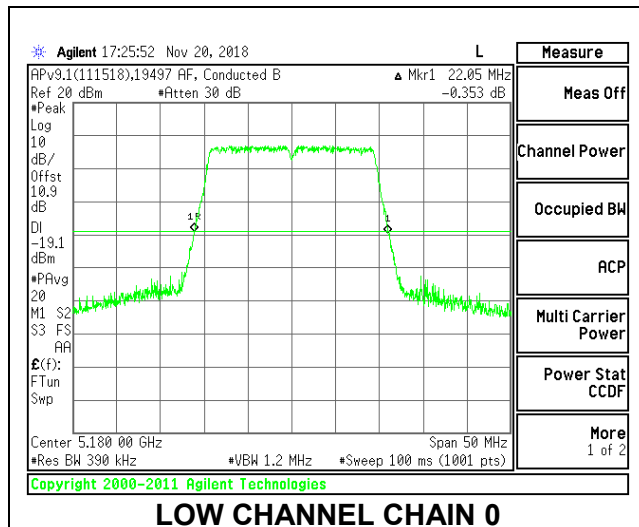


9.2.5. 802.11ax HE20 MODE IN THE 5.2 GHz BAND

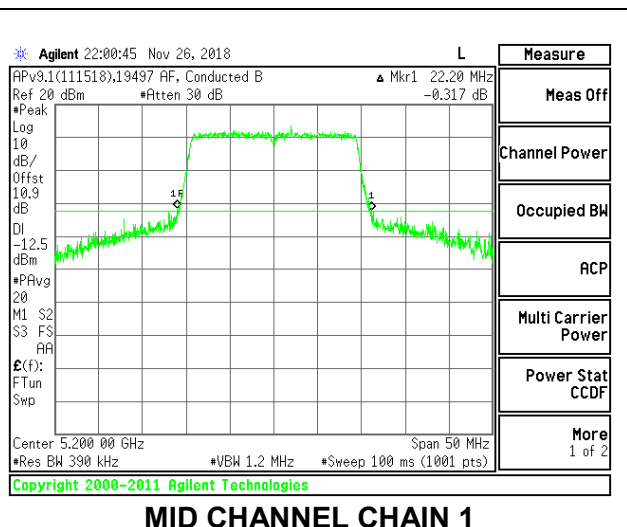
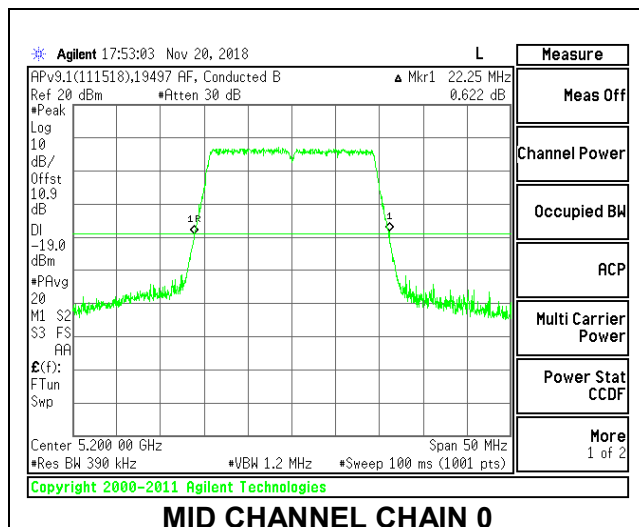
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5180	22.05	22.65
Mid	5200	22.25	22.20
High	5240	22.35	23.40

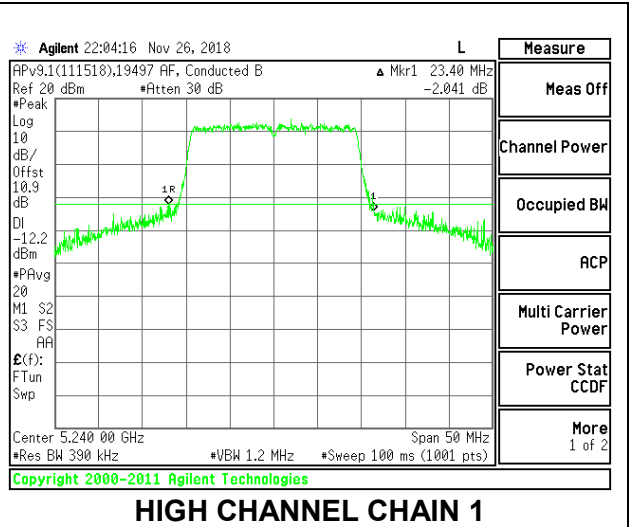
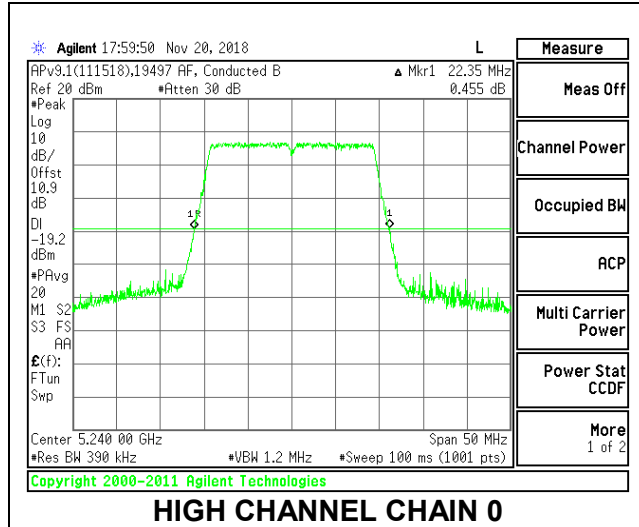
LOW CHANNEL



MID CHANNEL



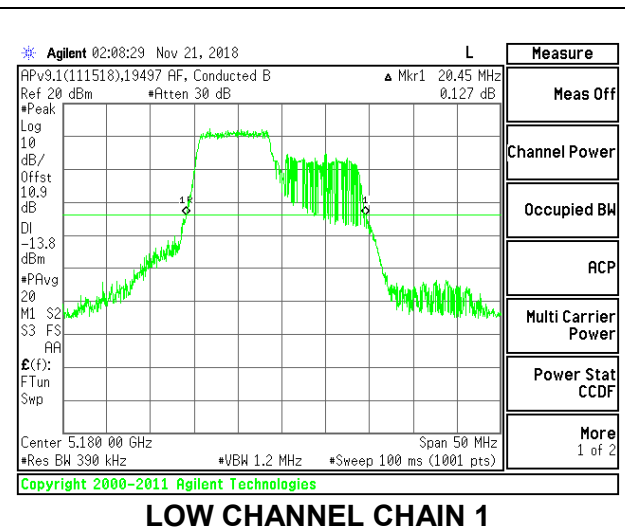
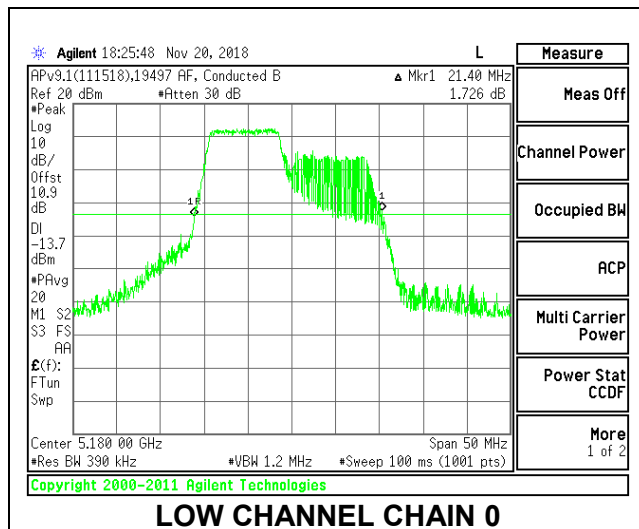
HIGH CHANNEL



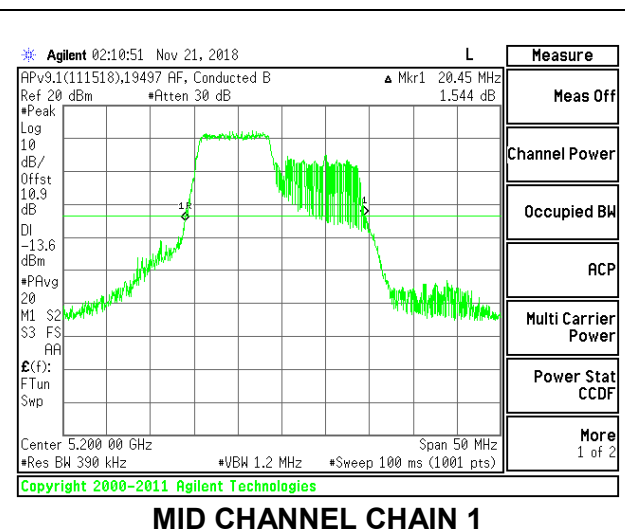
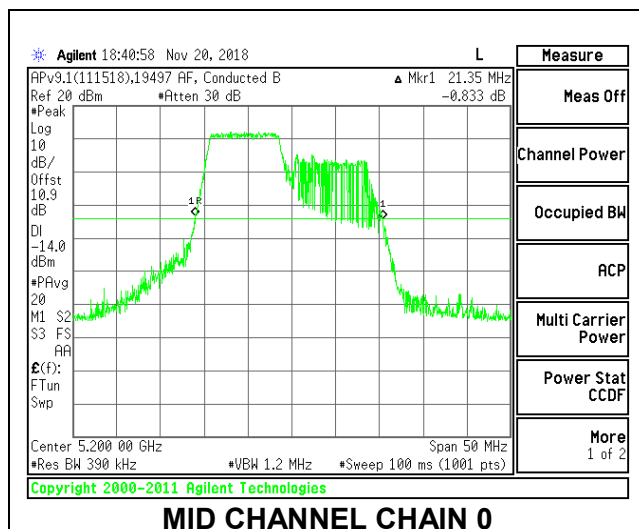
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.40	20.45
Mid	5200	21.35	20.45
High	5240	21.35	20.40

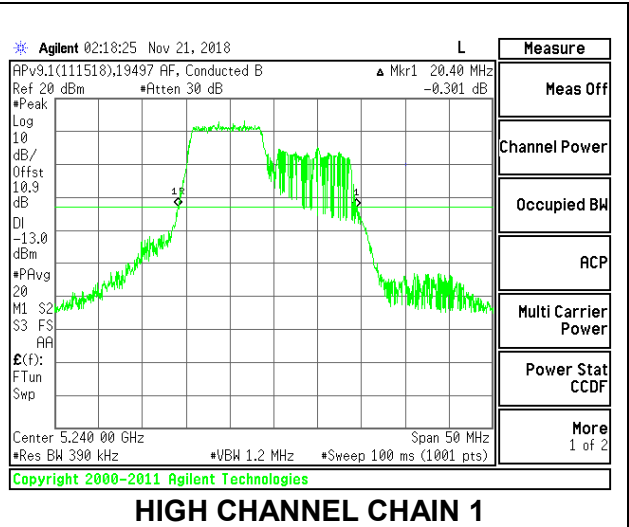
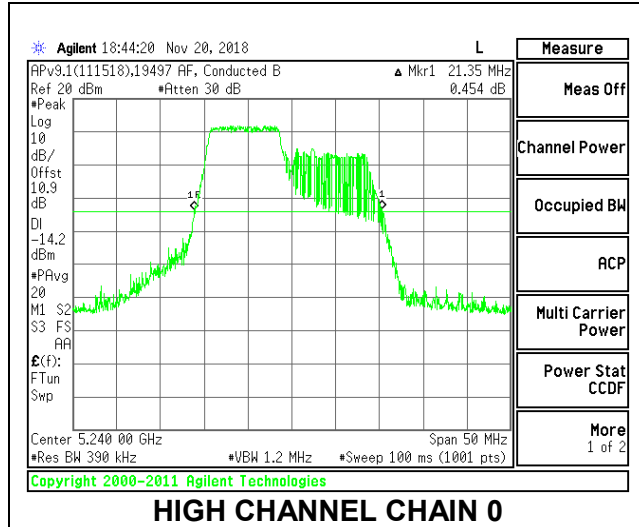
LOW CHANNEL



MID CHANNEL



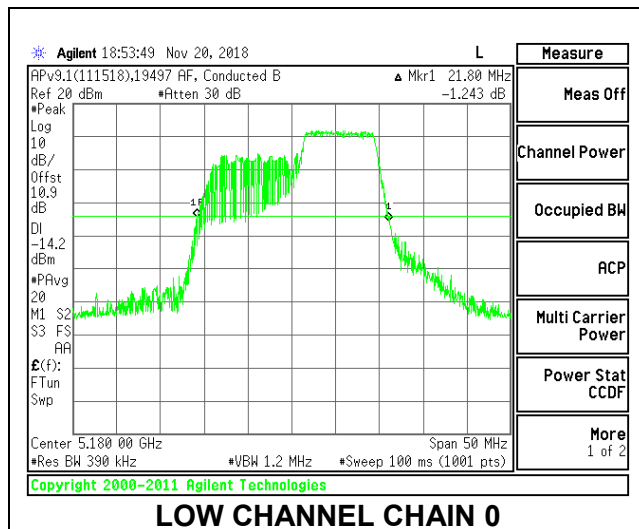
HIGH CHANNEL



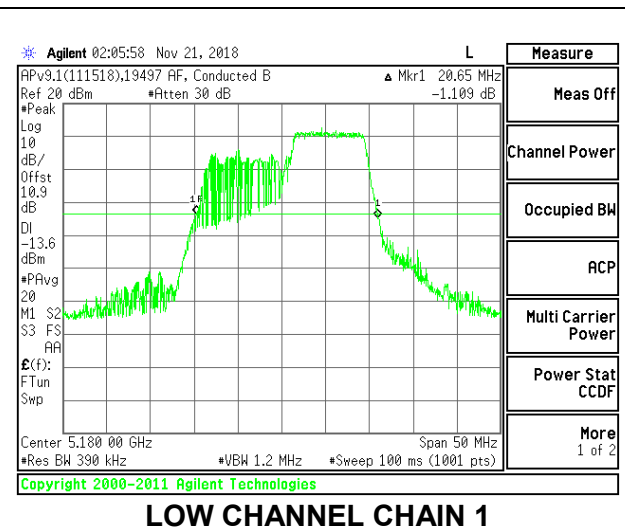
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.80	20.65
Mid	5200	21.95	20.90
High	5240	21.60	20.75

LOW CHANNEL

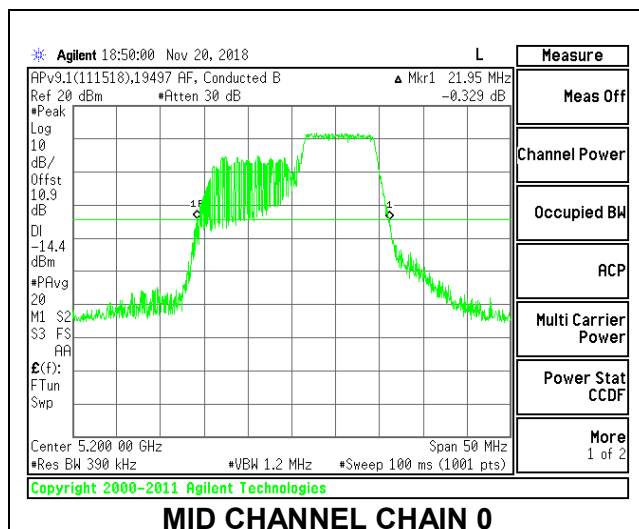


LOW CHANNEL CHAIN 0

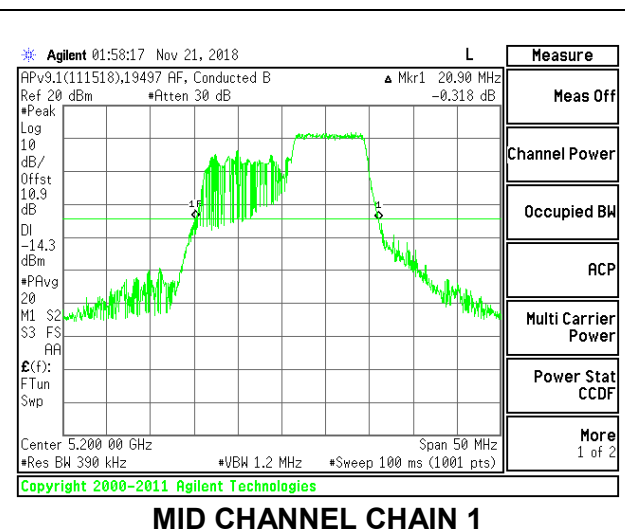


LOW CHANNEL CHAIN 1

MID CHANNEL

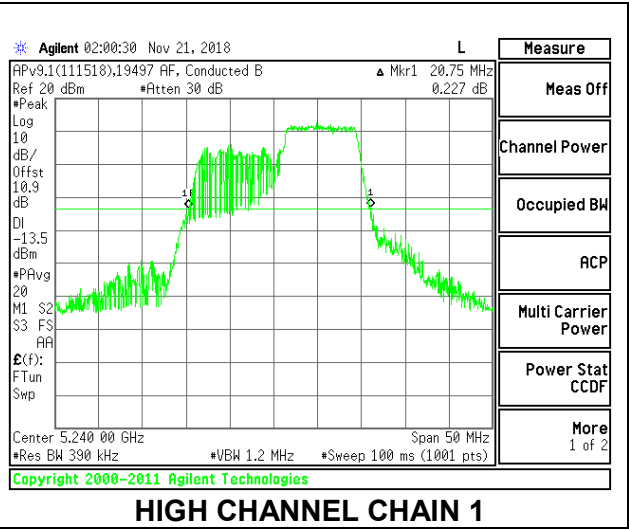
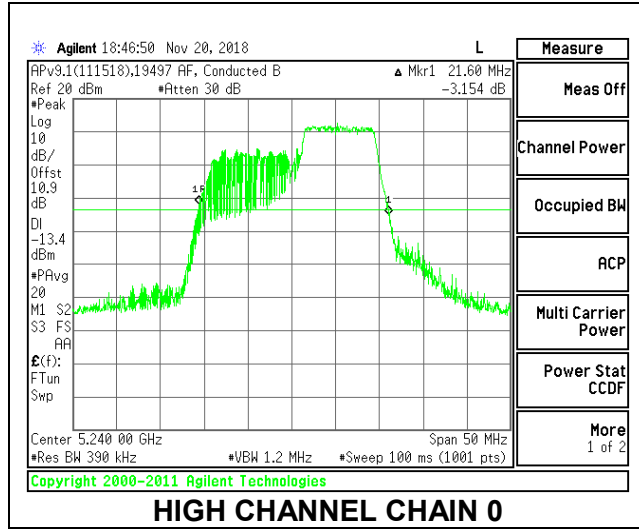


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

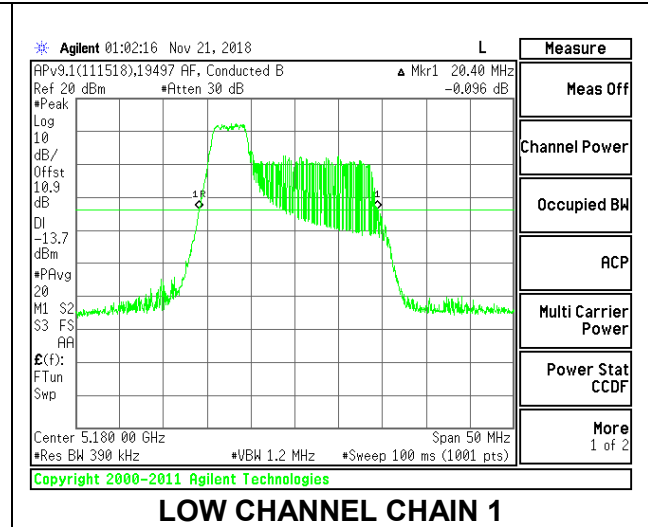
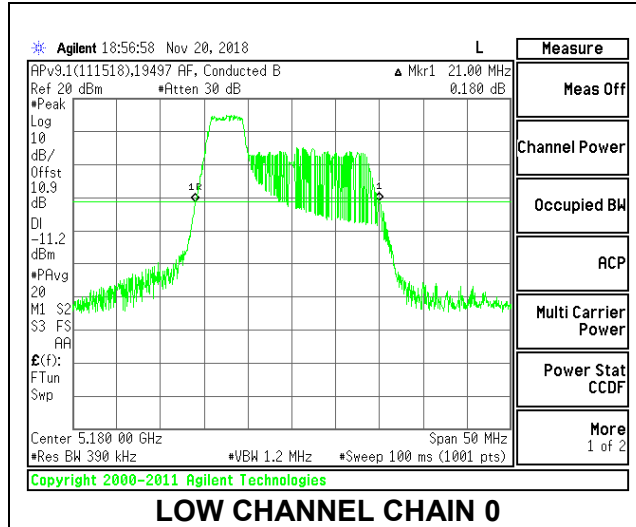
HIGH CHANNEL



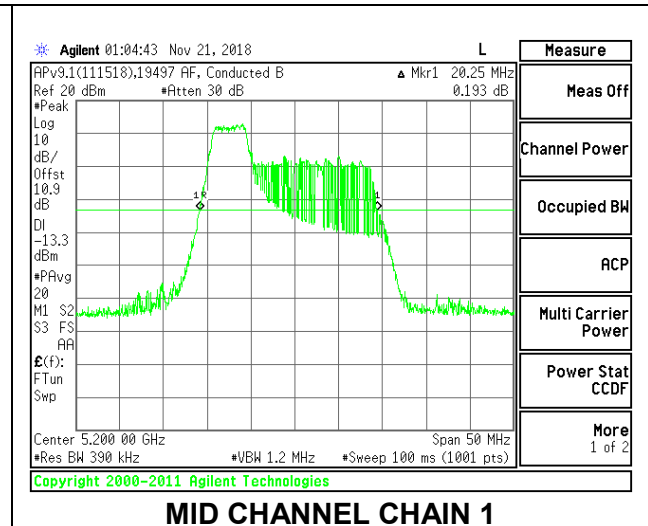
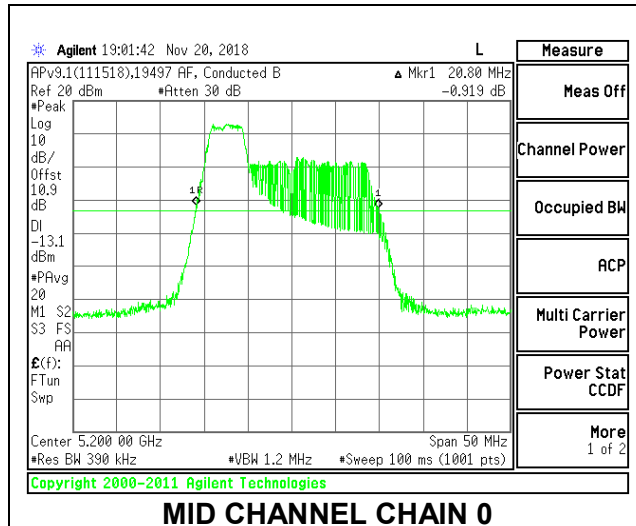
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 37

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.00	20.40
Mid	5200	20.80	20.25
High	5240	20.90	20.35

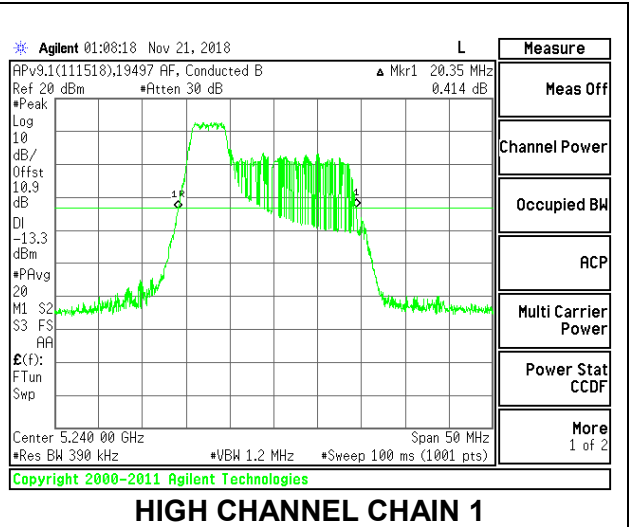
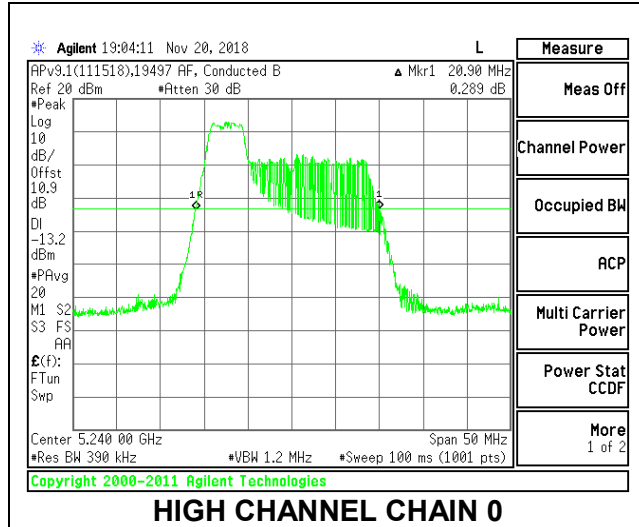
LOW CHANNEL



MID CHANNEL



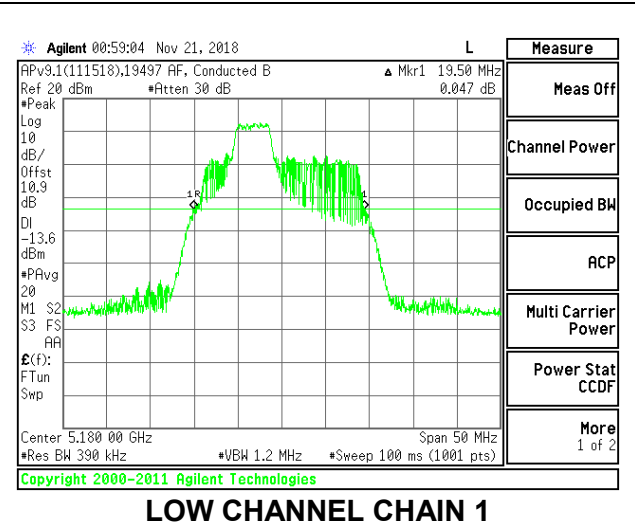
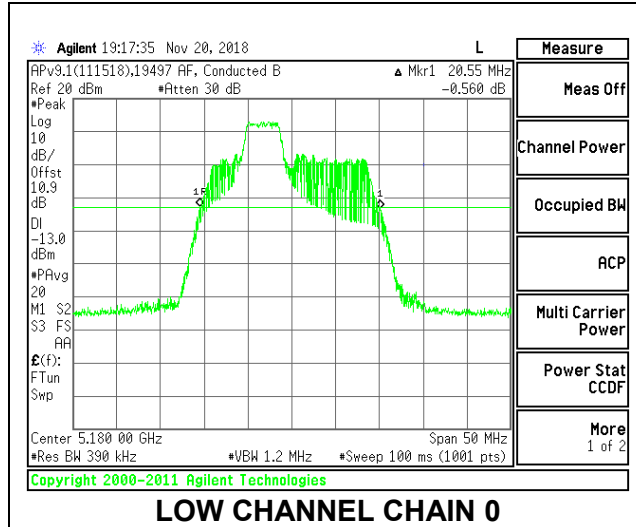
HIGH CHANNEL



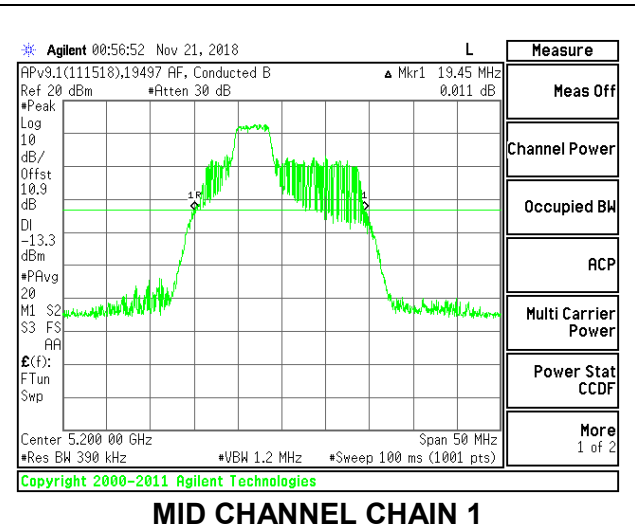
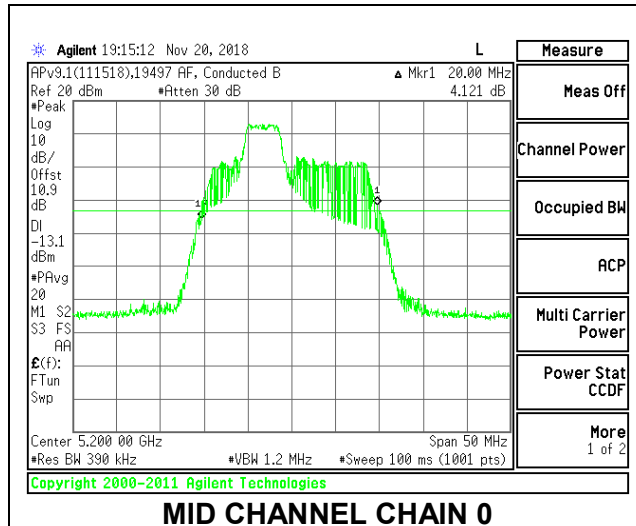
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 38

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	20.55	19.50
Mid	5200	20.00	19.45
High	5240	20.40	19.35

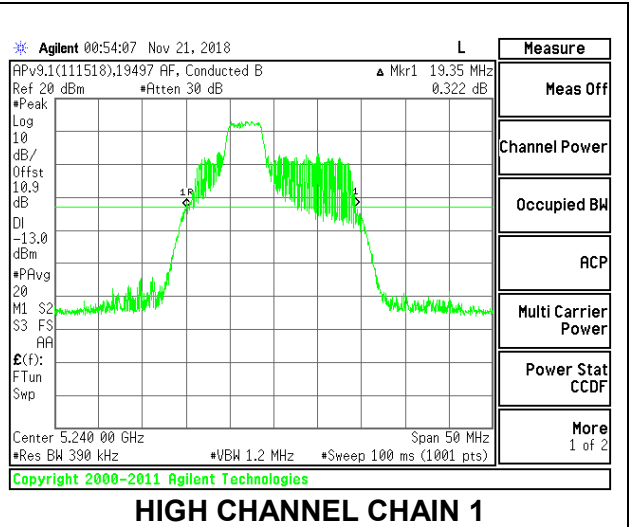
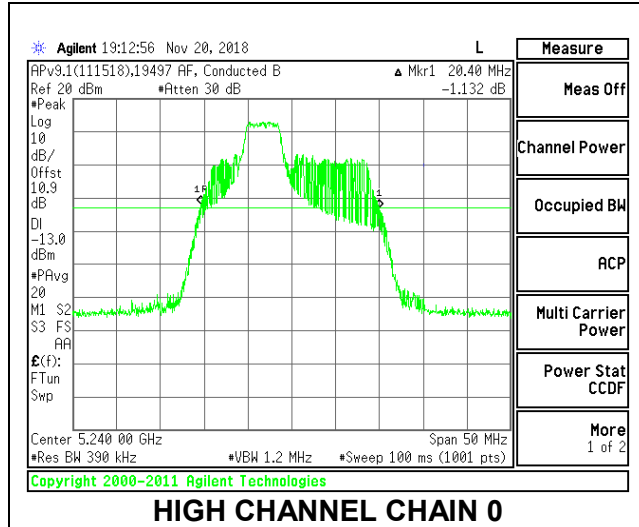
LOW CHANNEL



MID CHANNEL



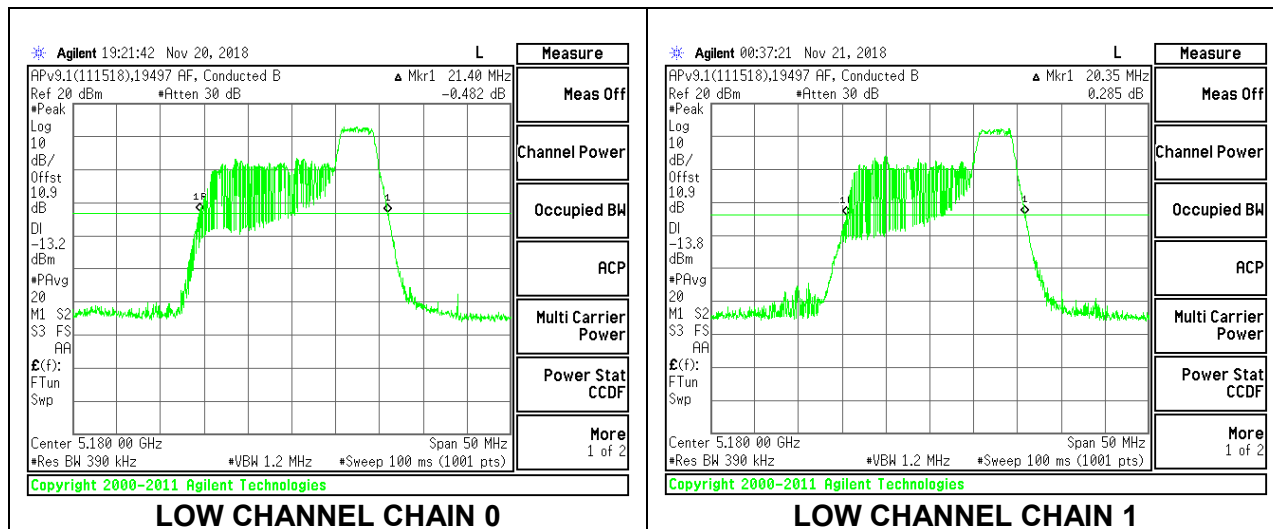
HIGH CHANNEL



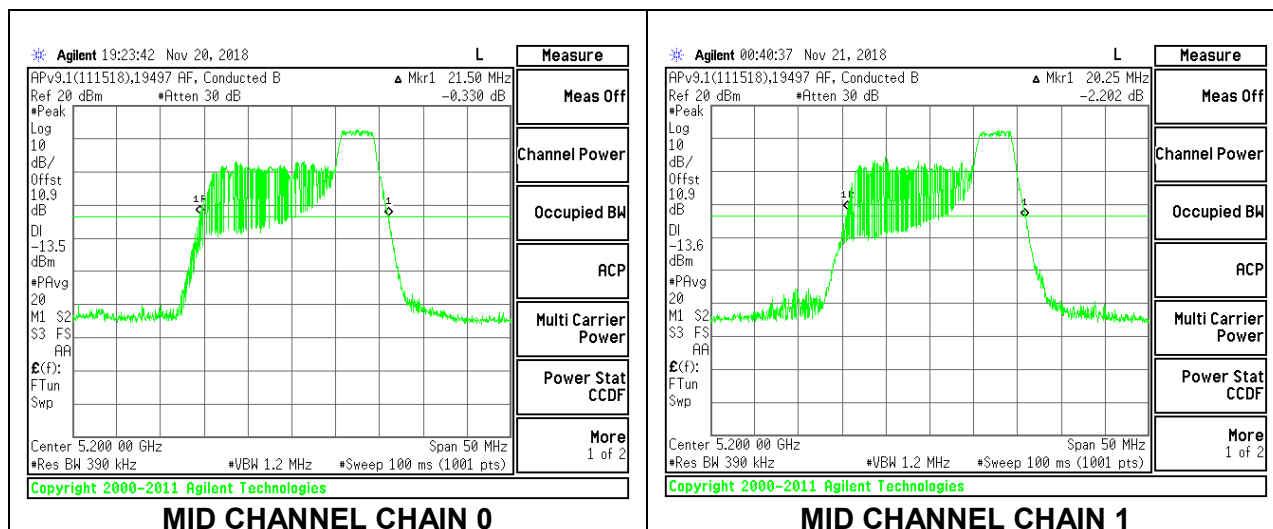
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 40

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.40	20.35
Mid	5200	21.50	20.25
High	5240	21.45	20.50

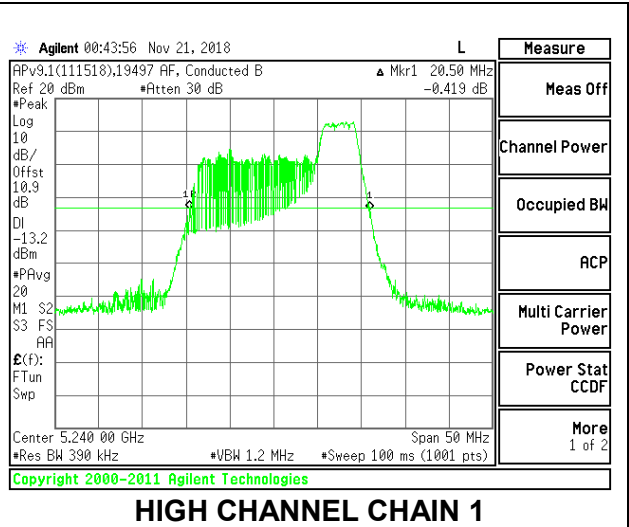
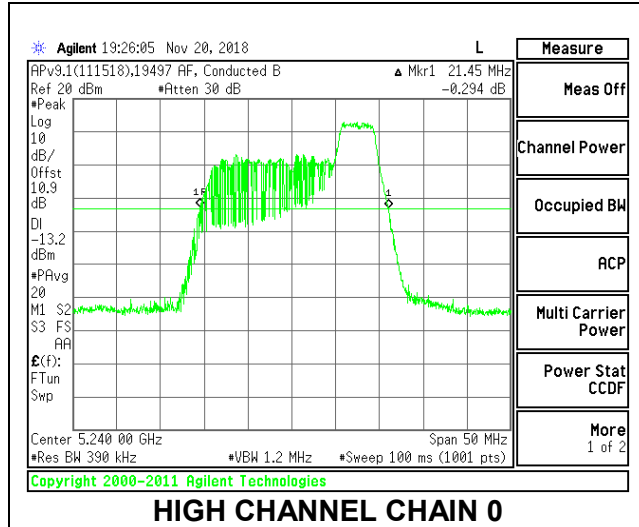
LOW CHANNEL



MID CHANNEL



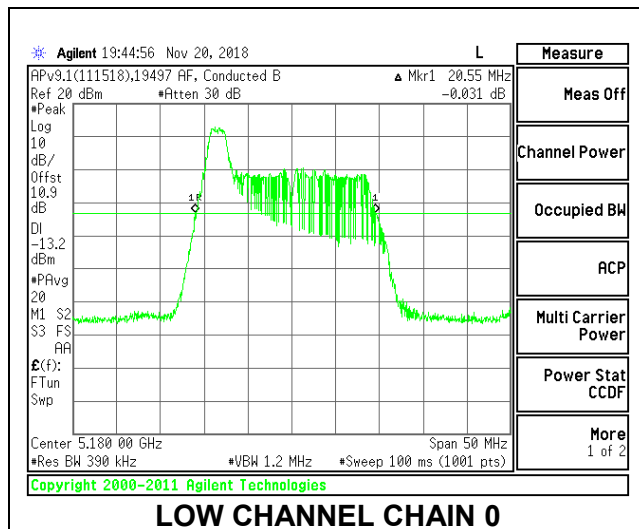
HIGH CHANNEL



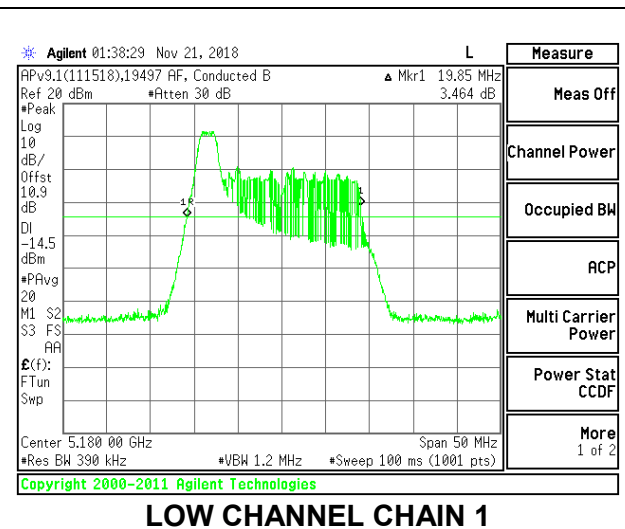
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	20.55	19.85
Mid	5200	20.50	20.05
High	5240	20.45	20.20

LOW CHANNEL

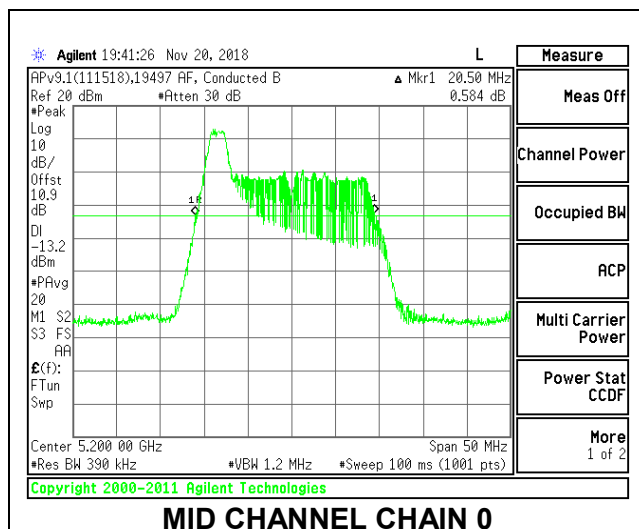


LOW CHANNEL CHAIN 0

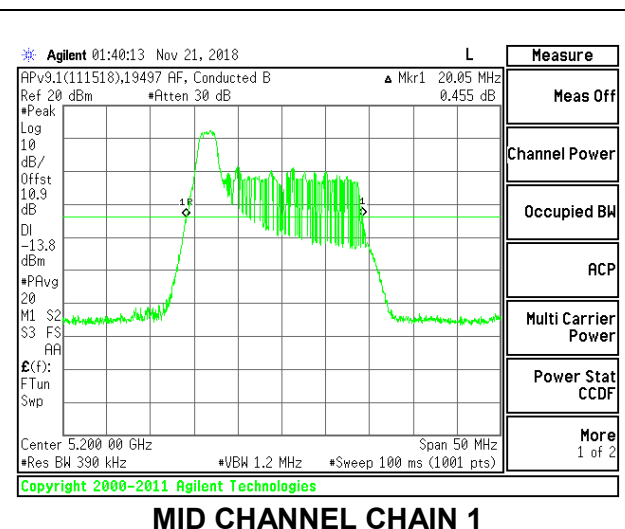


LOW CHANNEL CHAIN 1

MID CHANNEL

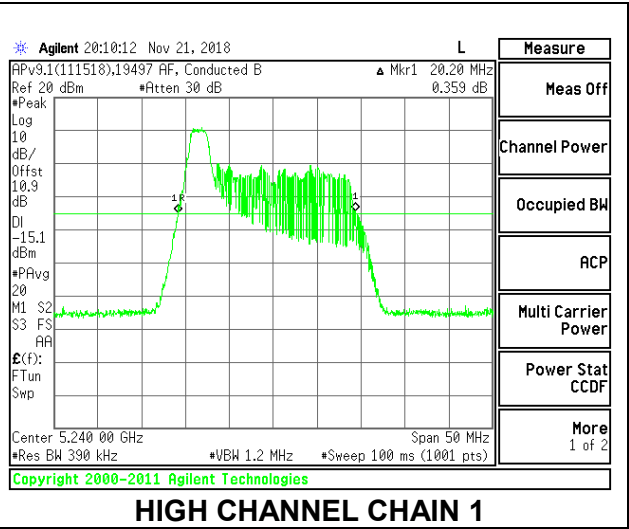
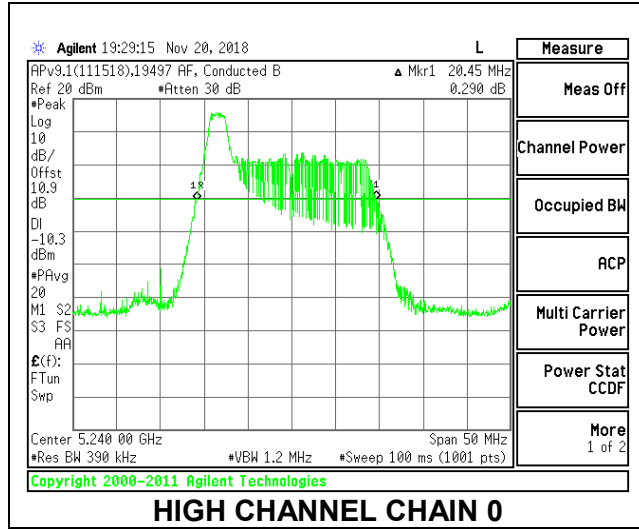


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

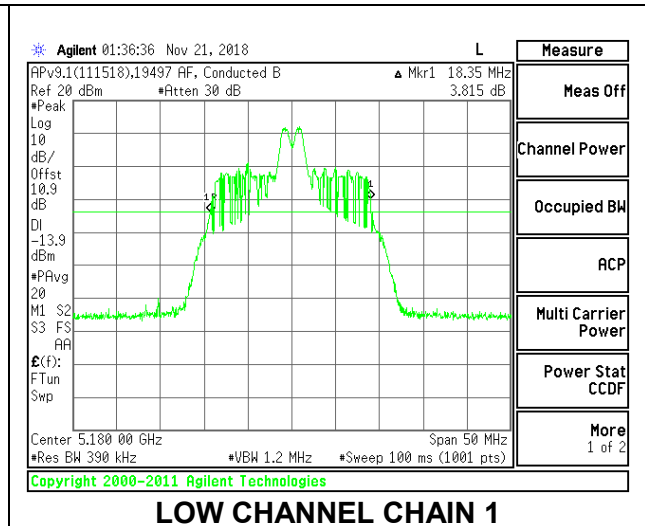
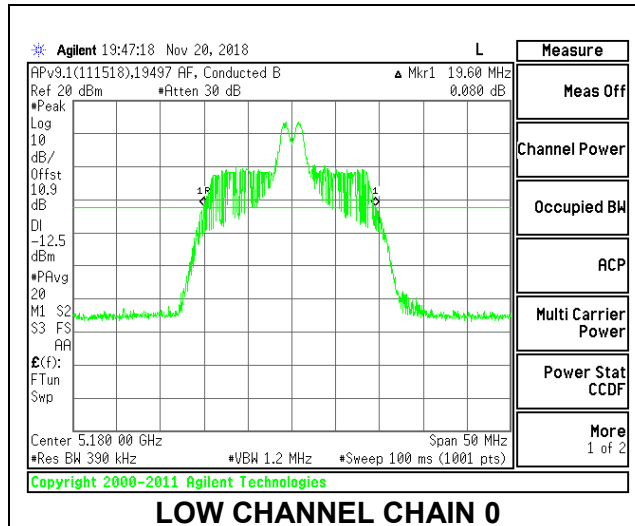
HIGH CHANNEL



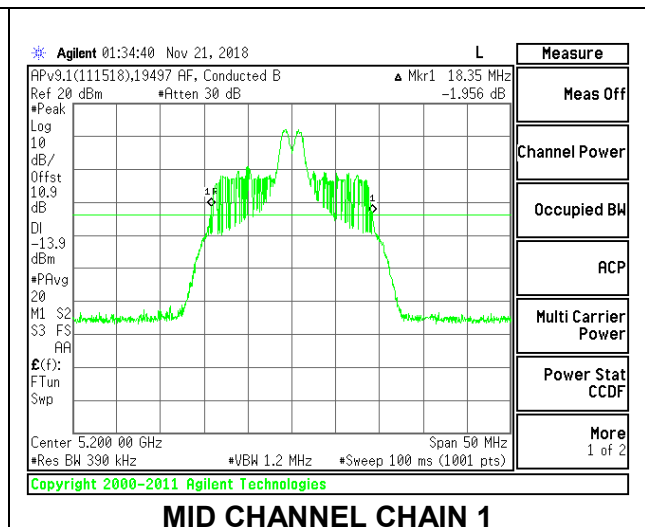
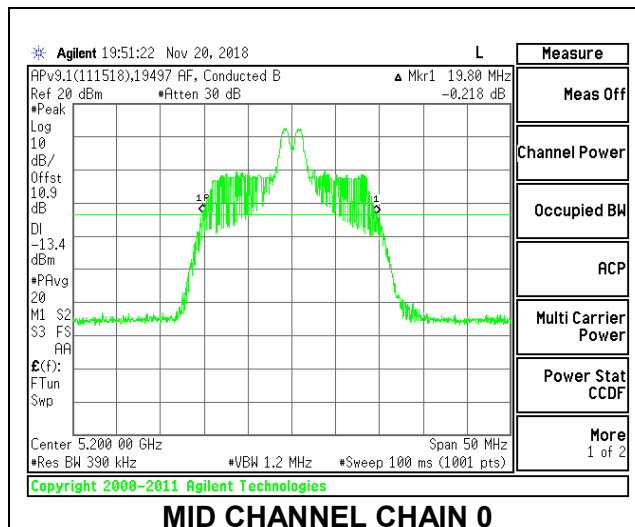
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	19.60	18.35
Mid	5200	19.80	18.35
High	5240	19.75	18.50

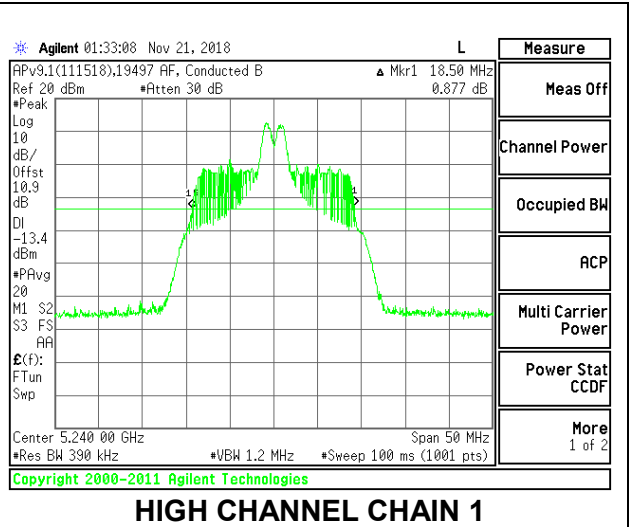
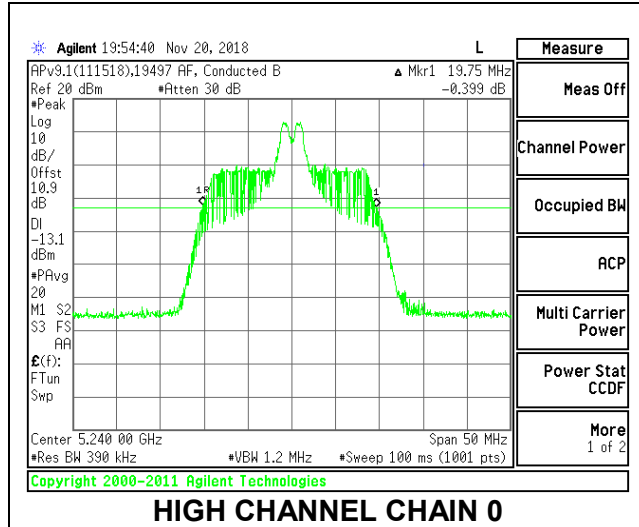
LOW CHANNEL



MID CHANNEL



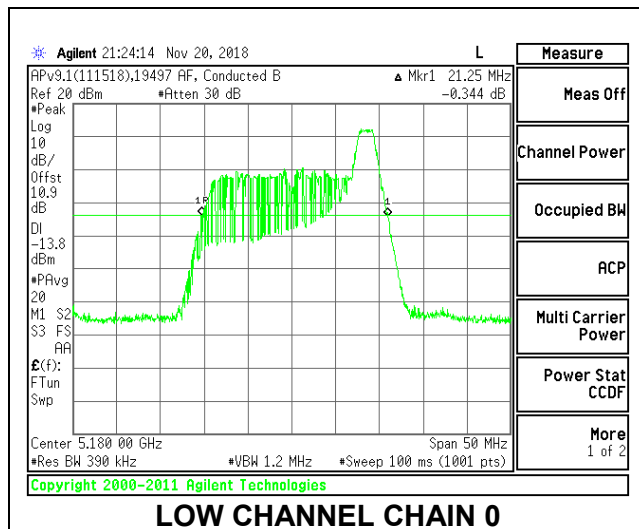
HIGH CHANNEL



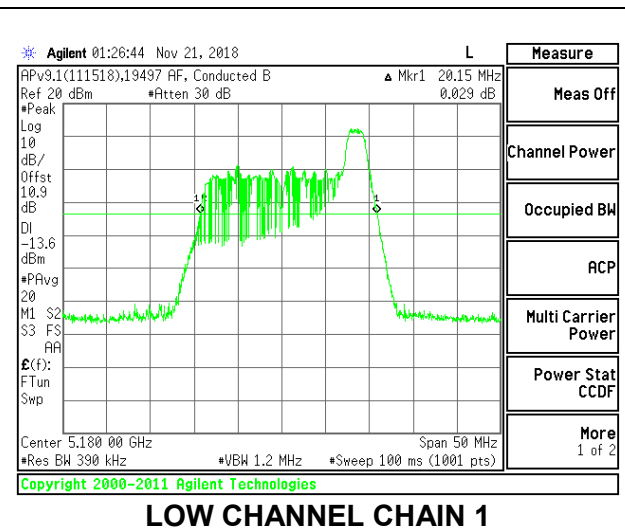
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.25	20.15
Mid	5200	21.15	20.20
High	5240	21.15	20.25

LOW CHANNEL

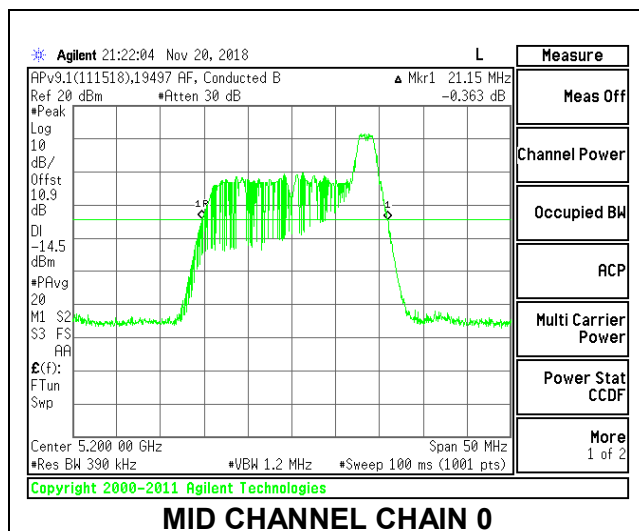


LOW CHANNEL CHAIN 0

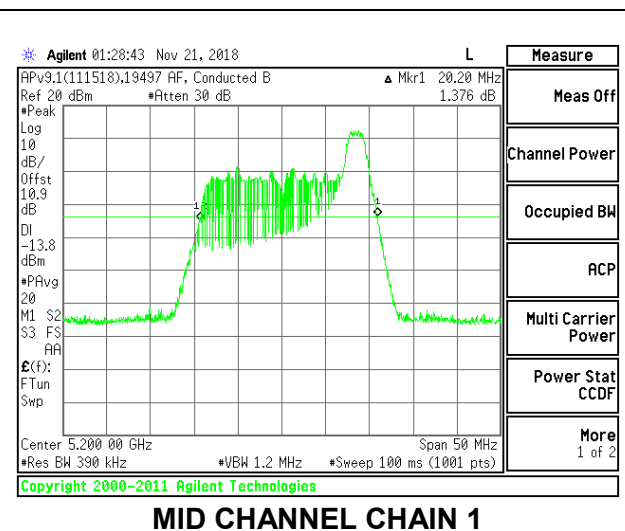


LOW CHANNEL CHAIN 1

MID CHANNEL

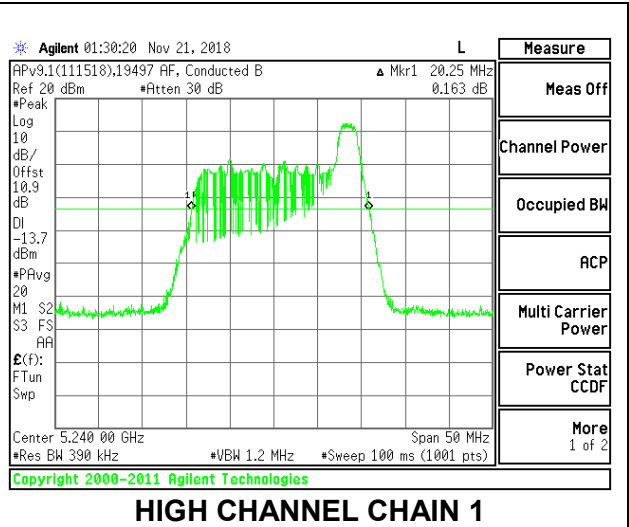
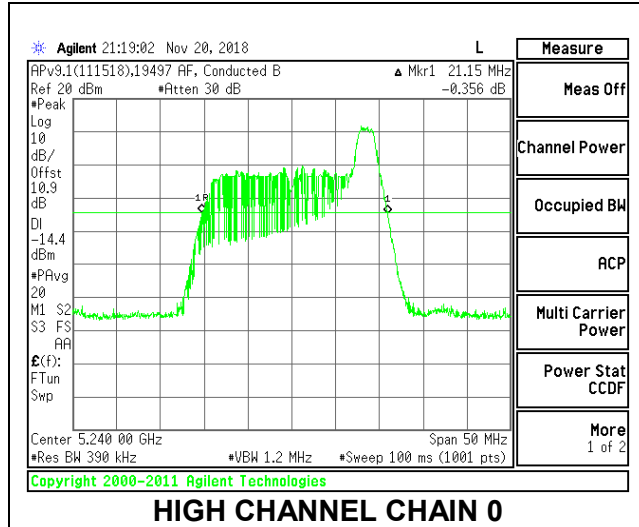


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

HIGH CHANNEL

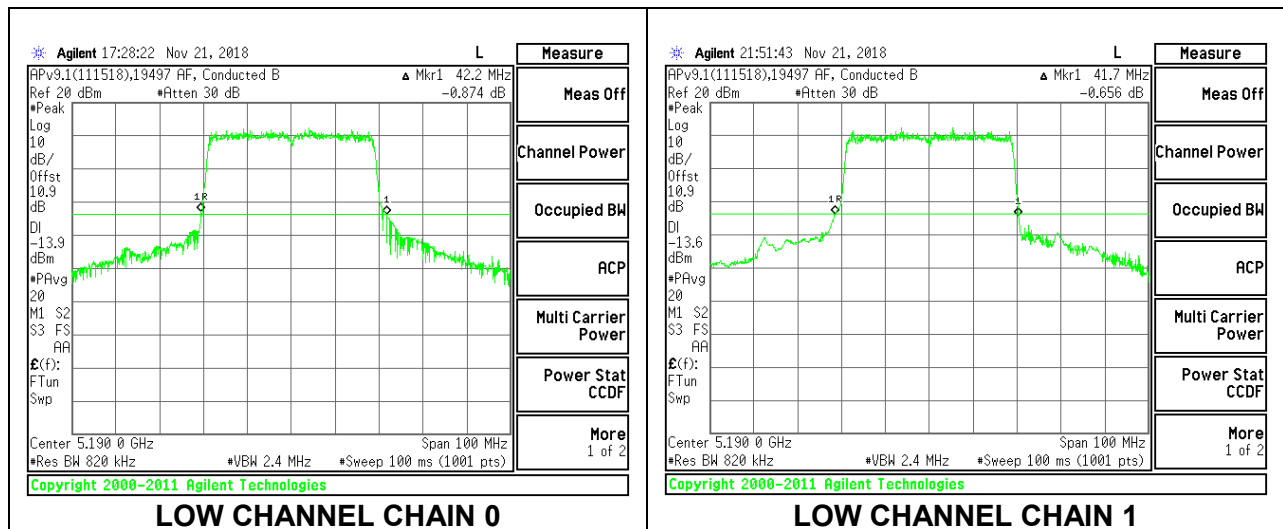


9.2.6. 802.11ax HE40 MODE IN THE 5.2 GHz BAND

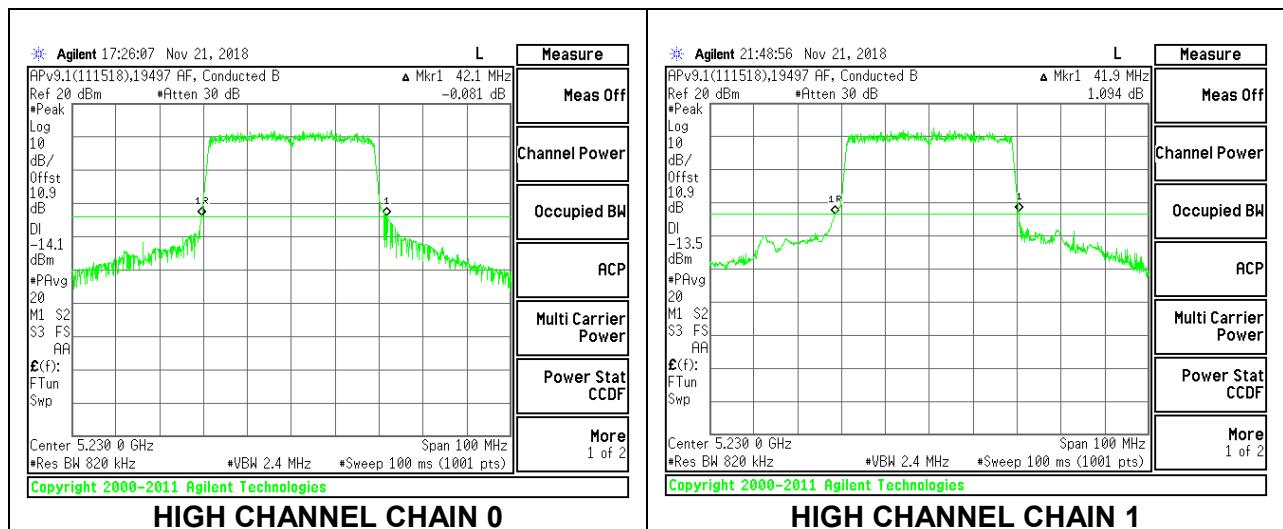
2TX Antenna 1 + Antenna 2 OFDMA MODE – 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	42.20	41.70
High	5230	42.10	41.90

LOW CHANNEL



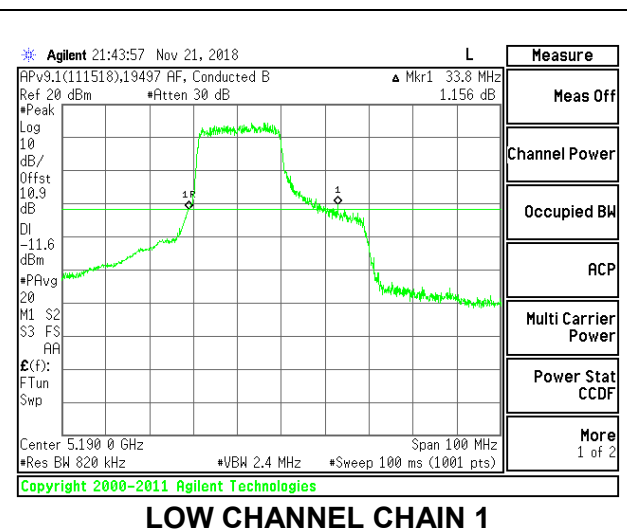
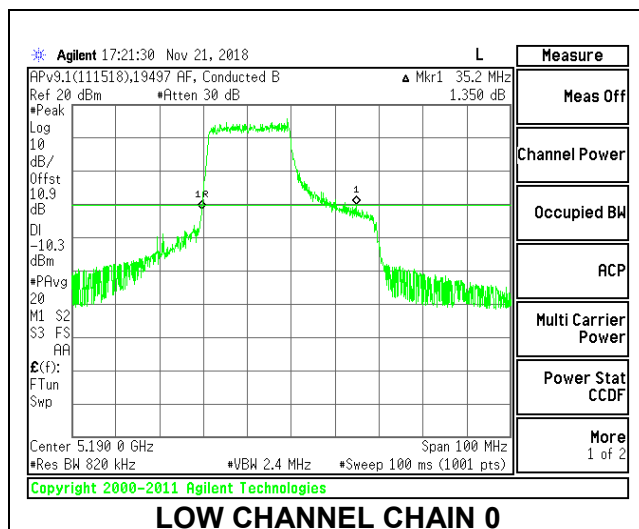
HIGH CHANNEL



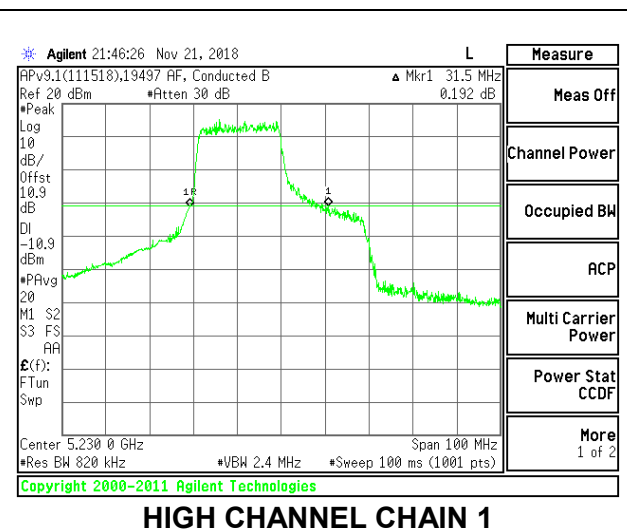
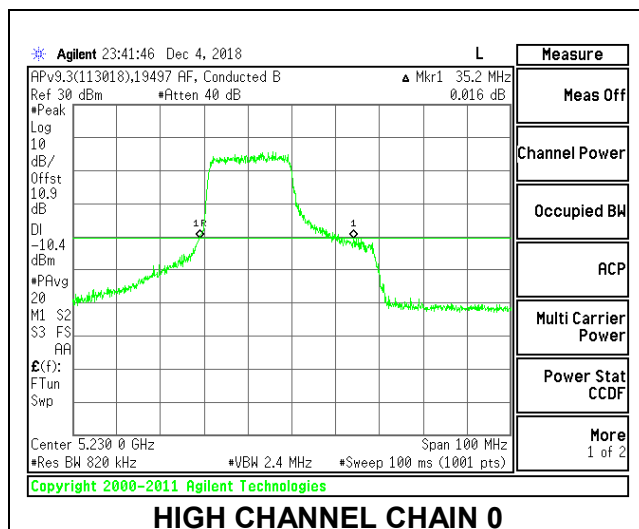
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	35.20	33.80
High	5230	35.20	31.50

LOW CHANNEL



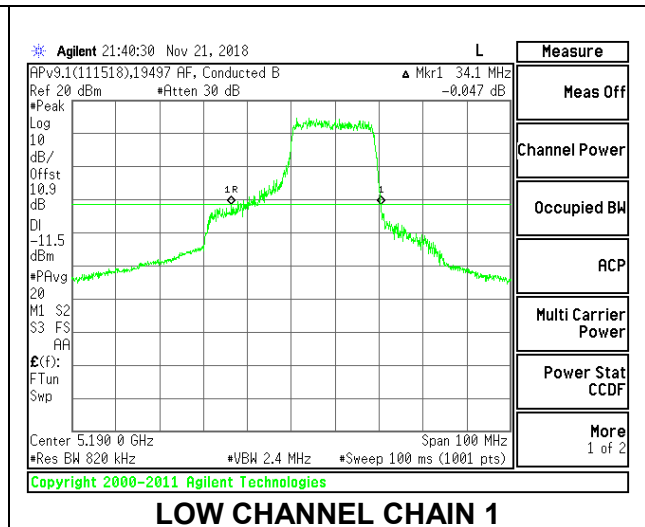
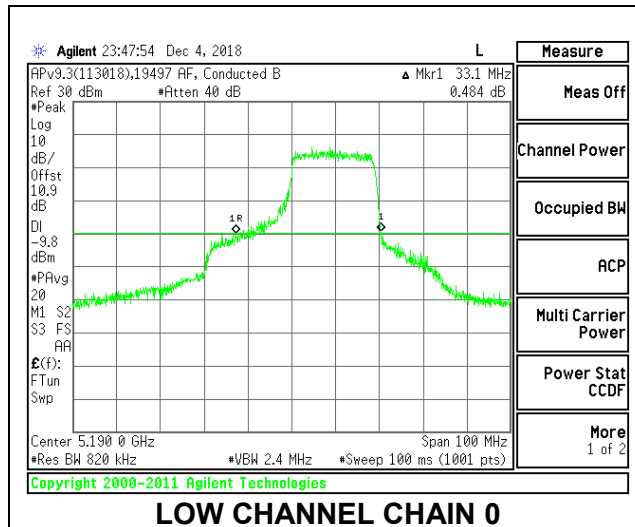
HIGH CHANNEL



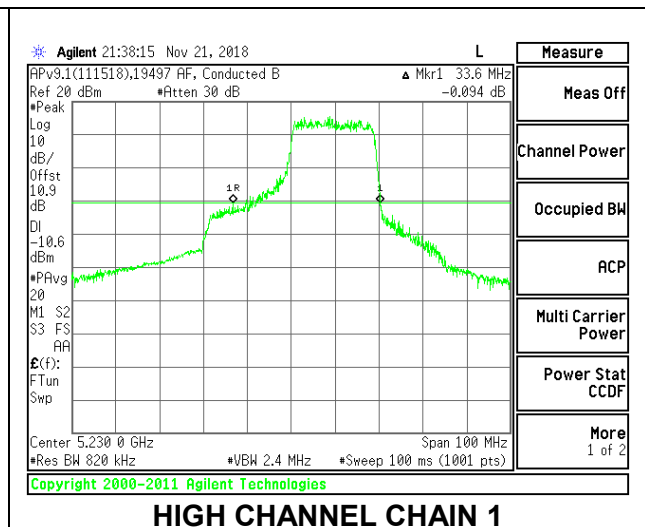
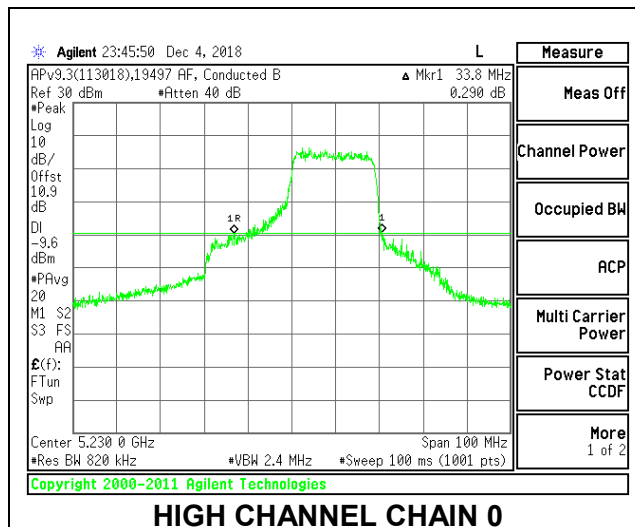
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 62

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	33.10	34.10
High	5230	33.80	33.60

LOW CHANNEL



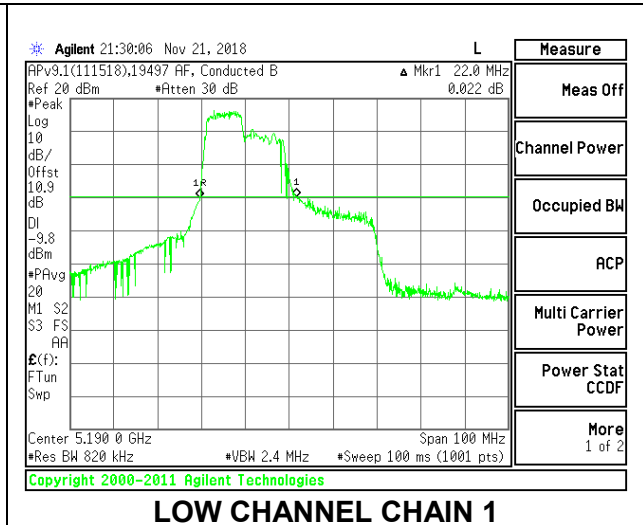
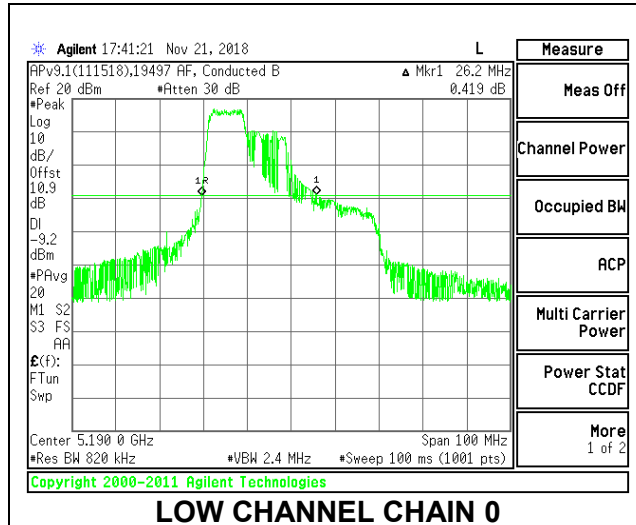
HIGH CHANNEL



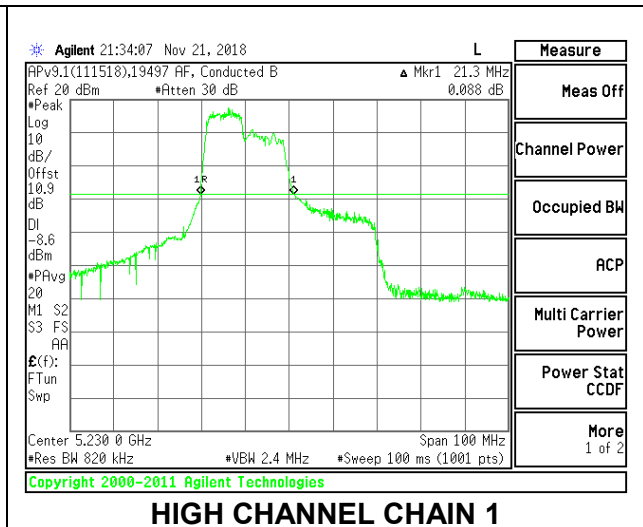
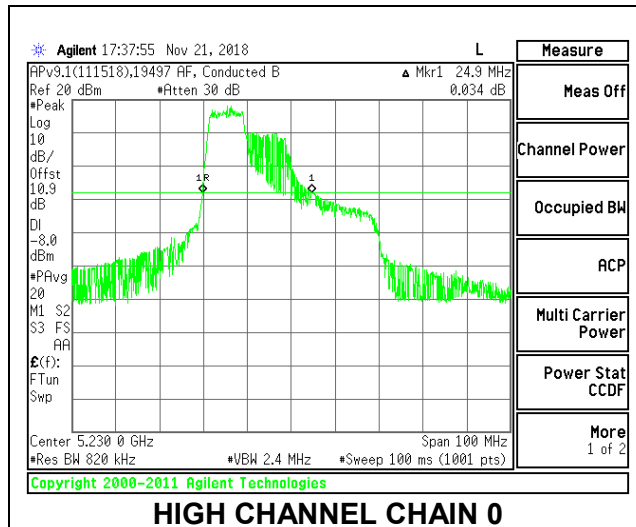
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	26.20	22.00
High	5230	24.90	21.30

LOW CHANNEL



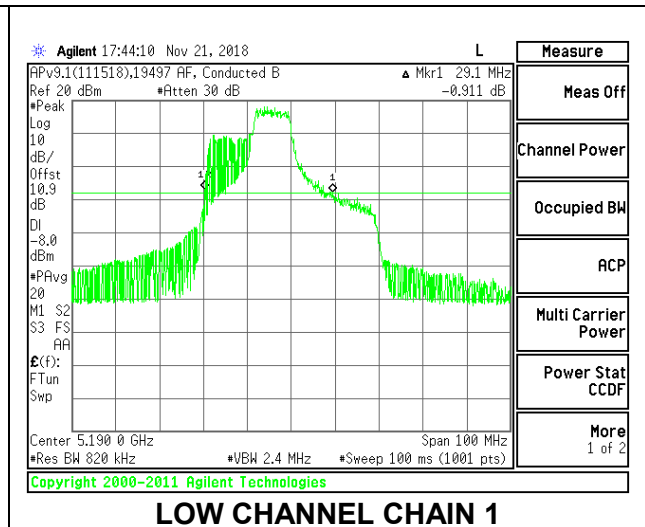
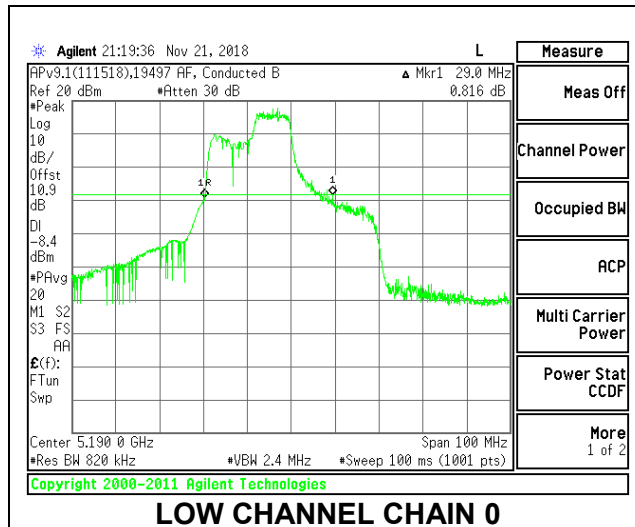
HIGH CHANNEL



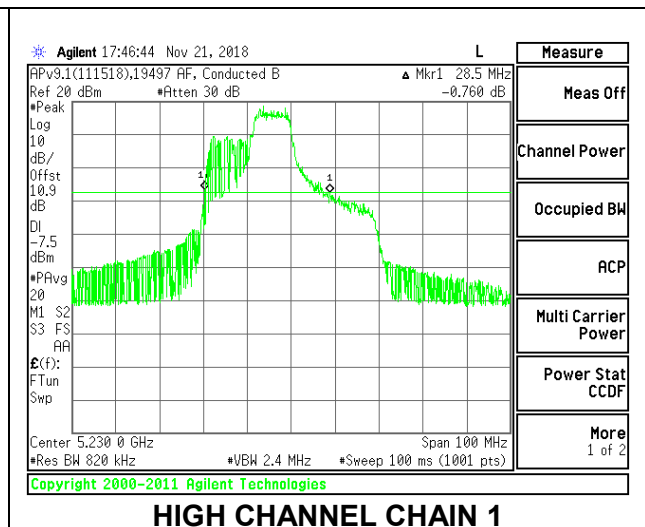
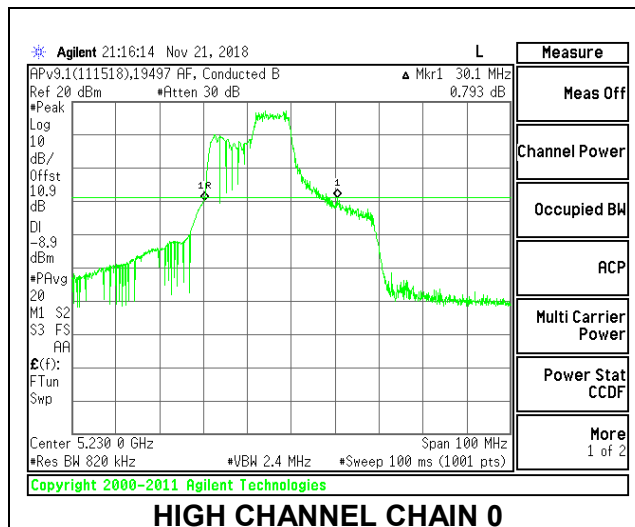
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	29.00	29.10
High	5230	30.10	28.50

LOW CHANNEL



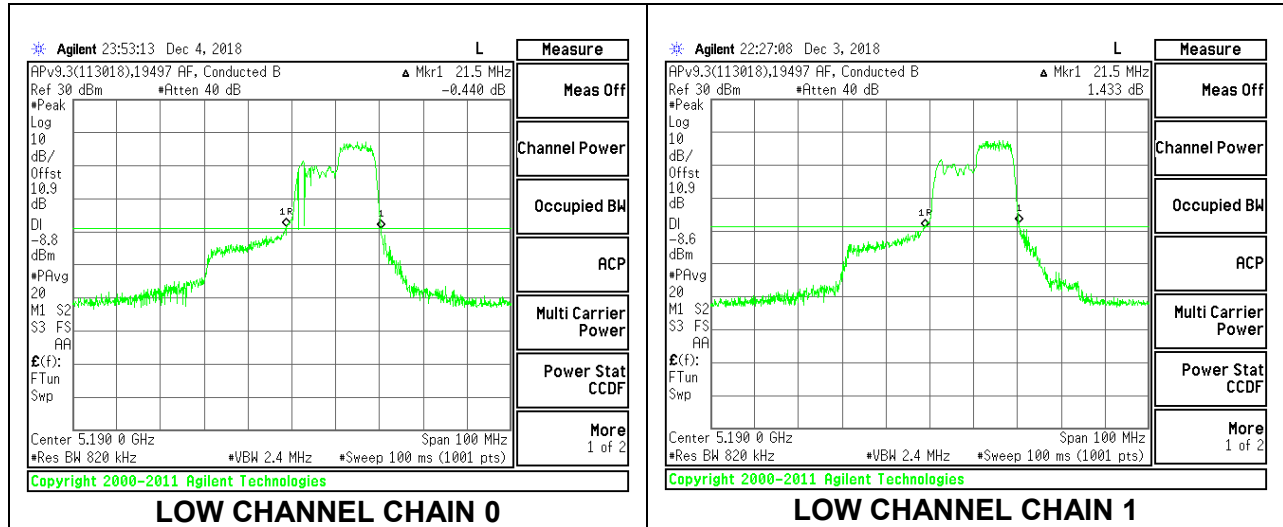
HIGH CHANNEL



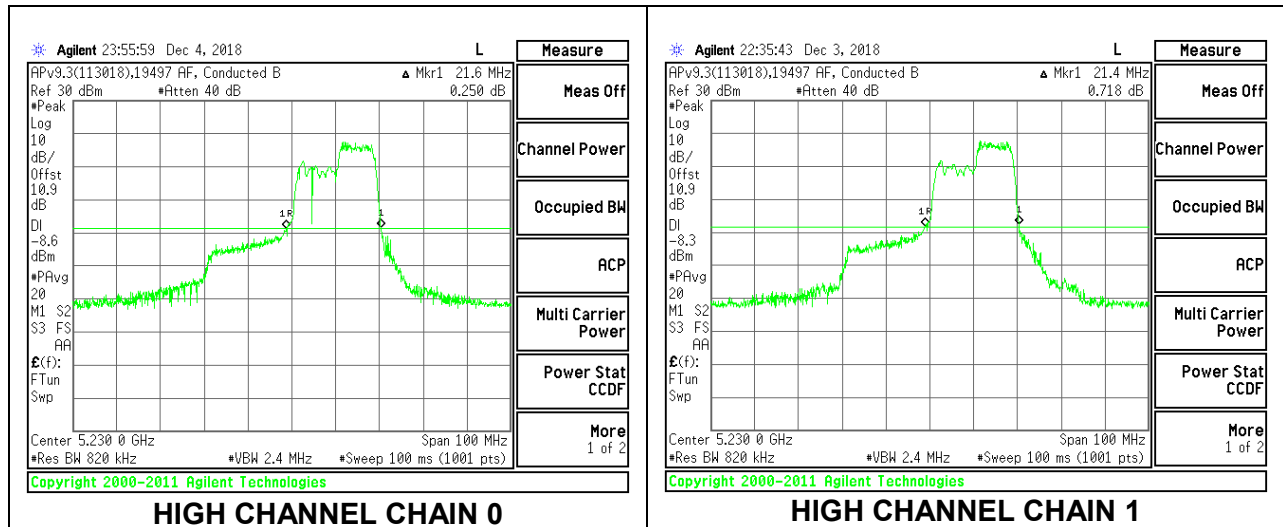
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	21.50	21.50
High	5230	21.60	21.40

LOW CHANNEL



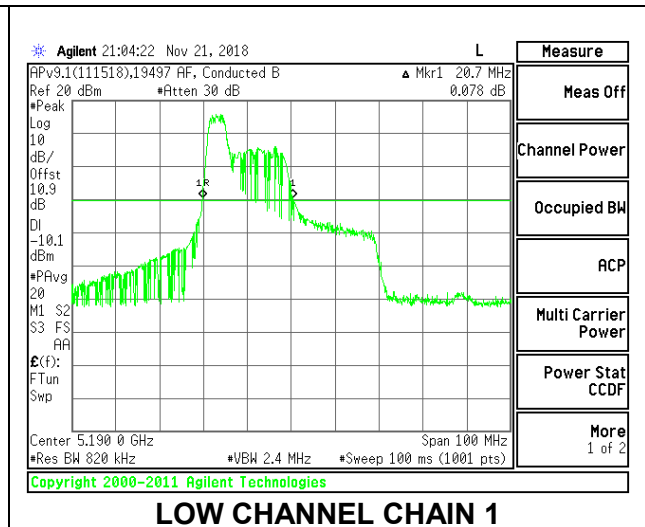
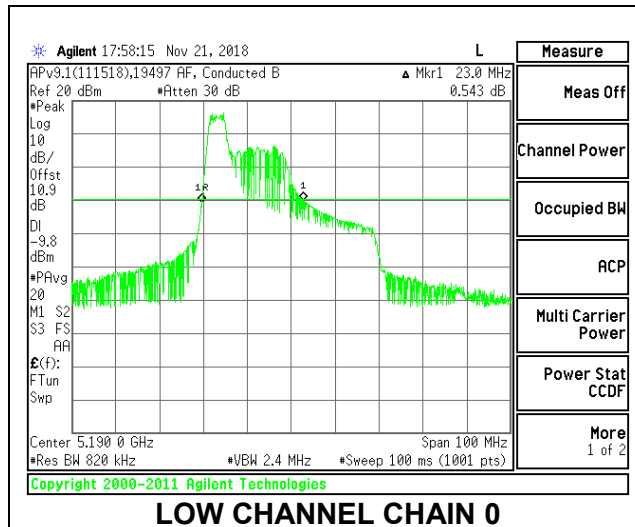
HIGH CHANNEL



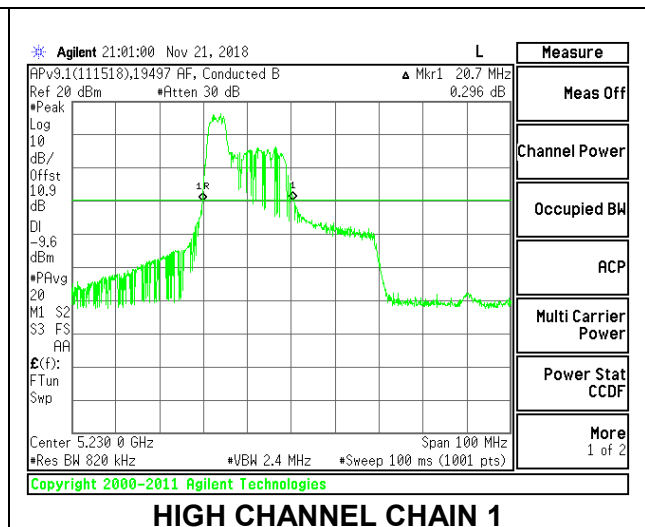
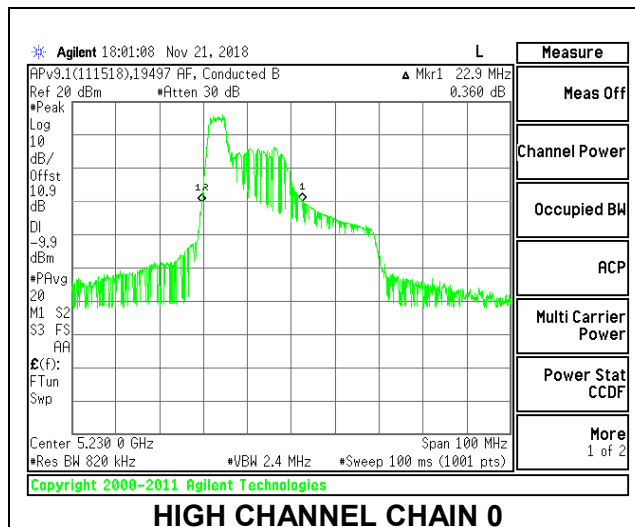
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 37

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	23.00	20.70
High	5230	22.90	20.70

LOW CHANNEL



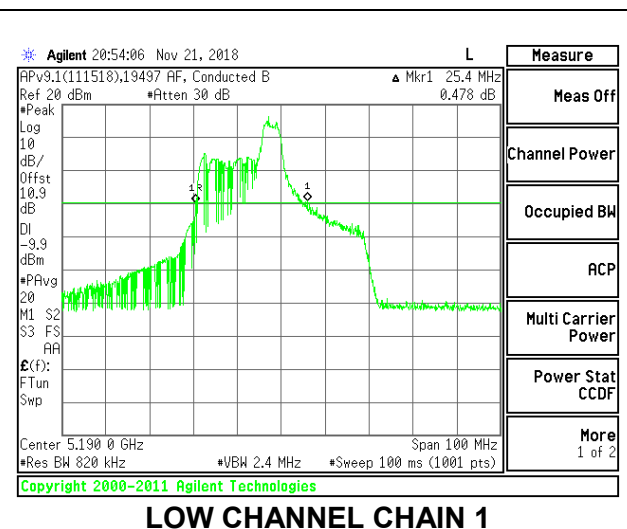
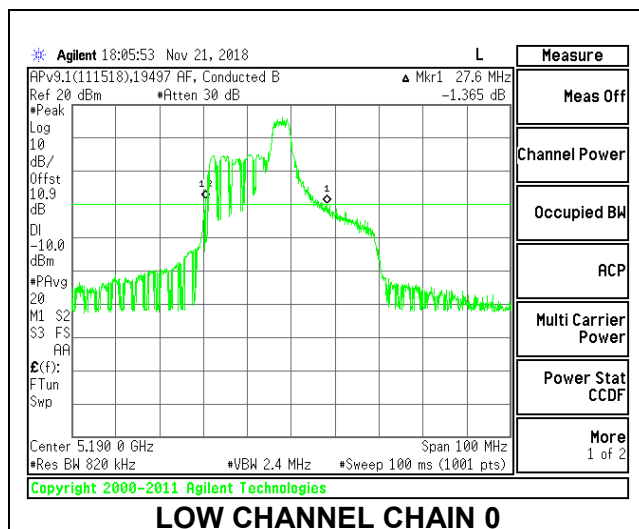
HIGH CHANNEL



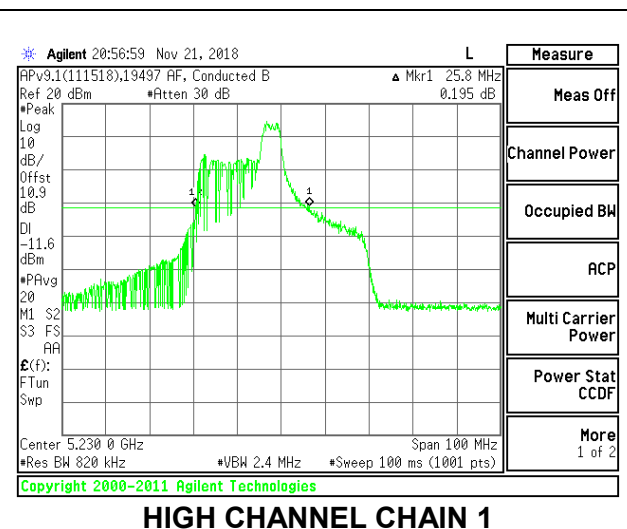
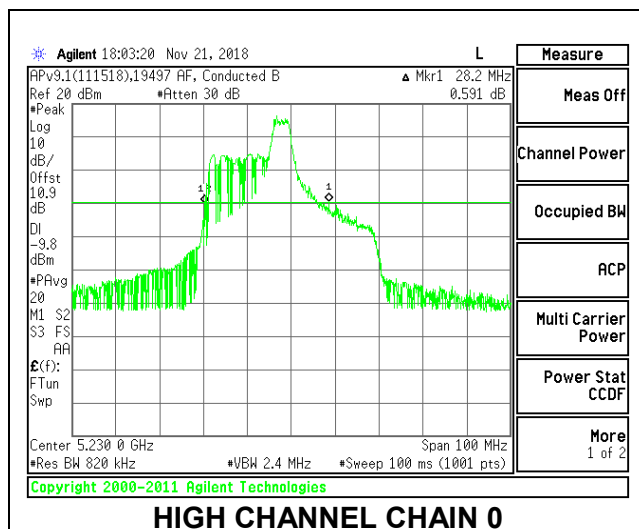
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 40

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	27.60	25.40
High	5230	28.20	25.80

LOW CHANNEL



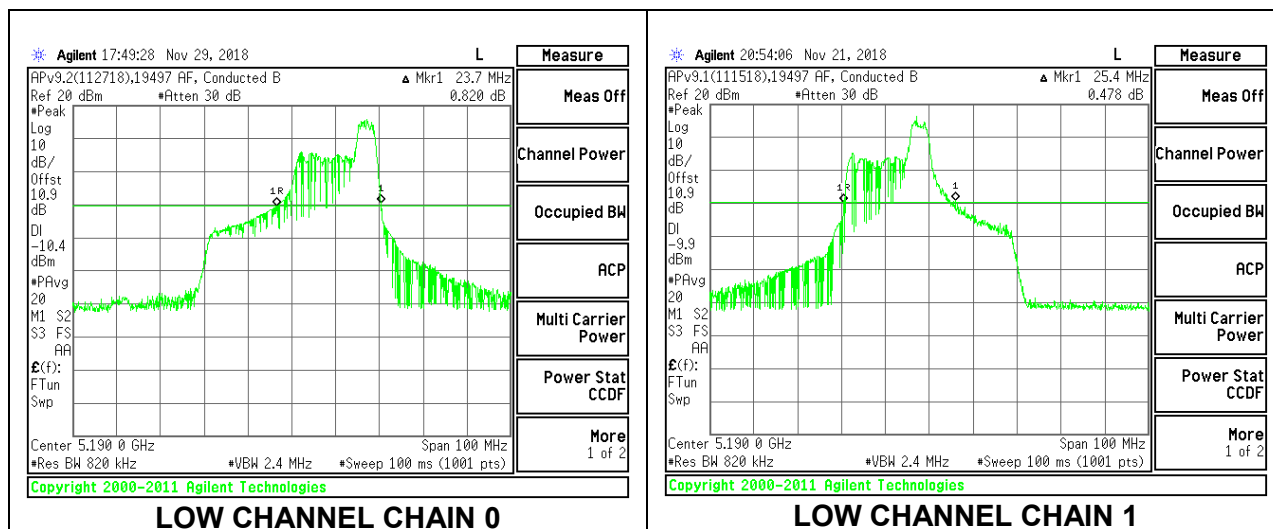
HIGH CHANNEL



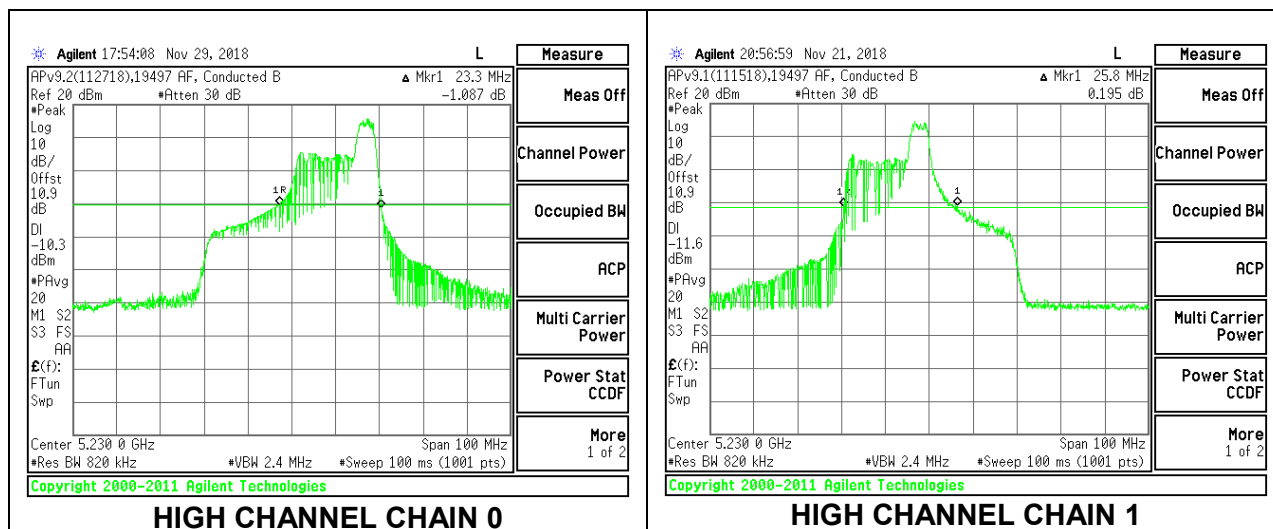
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 44

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	23.70	25.40
High	5230	23.30	25.80

LOW CHANNEL



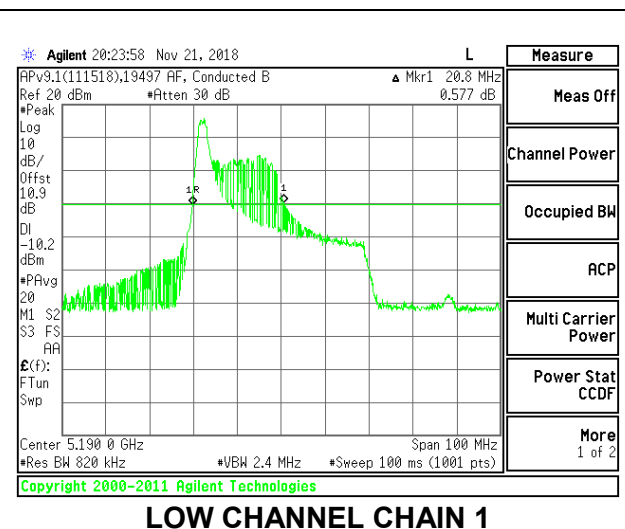
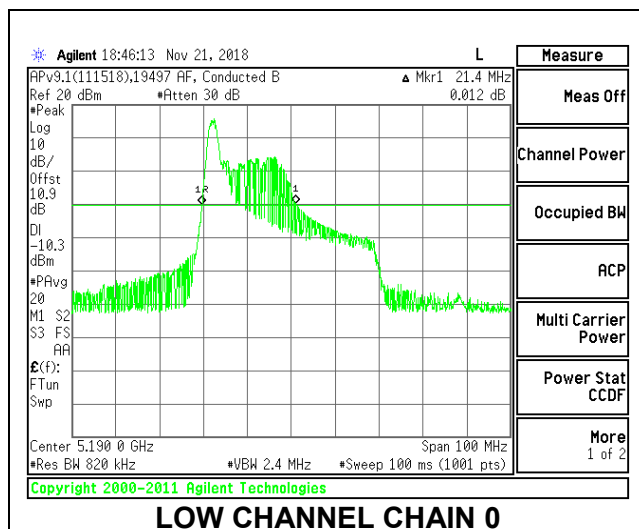
HIGH CHANNEL



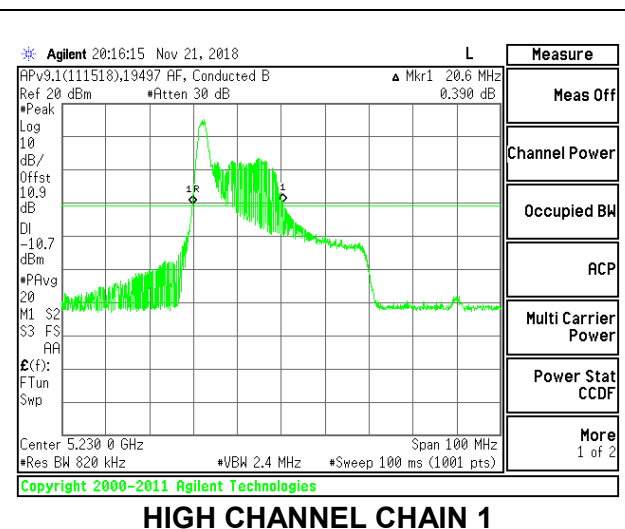
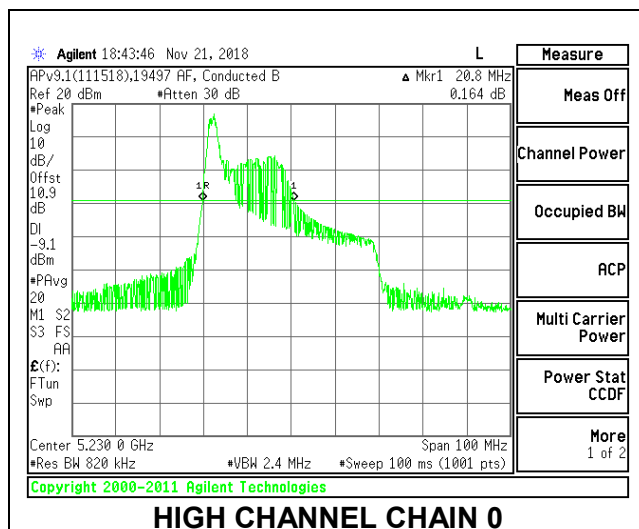
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	21.40	20.80
High	5230	20.80	20.40

LOW CHANNEL



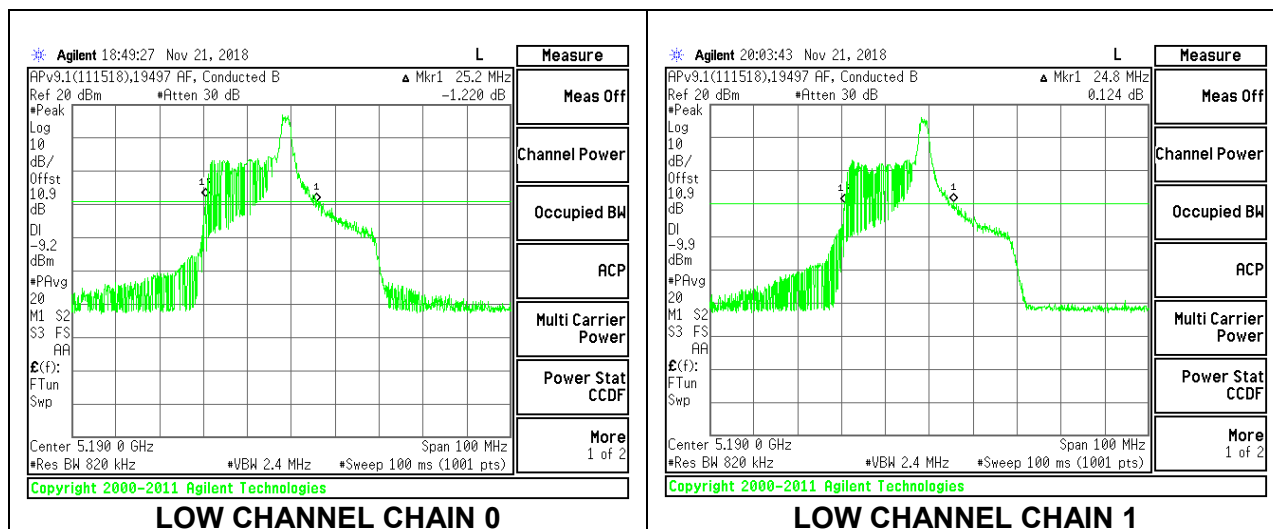
HIGH CHANNEL



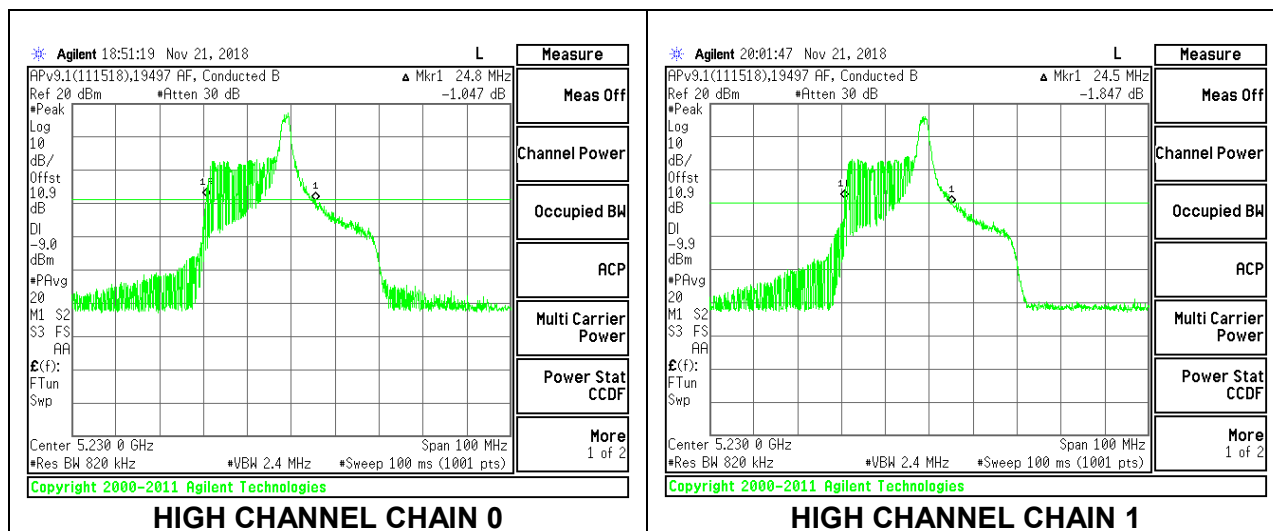
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	25.20	24.80
High	5230	24.80	24.50

LOW CHANNEL



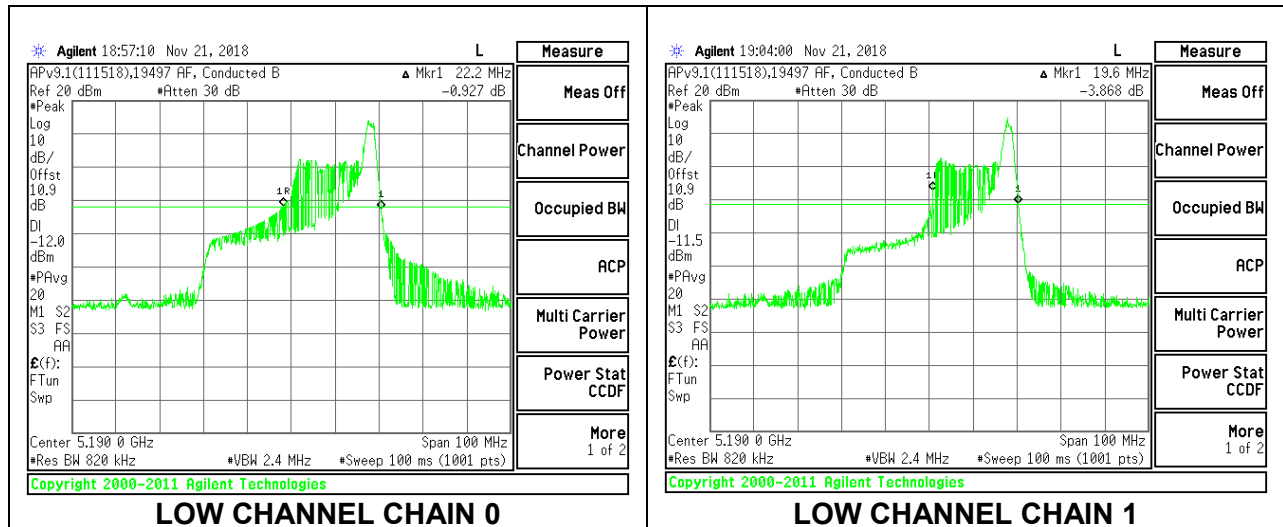
HIGH CHANNEL



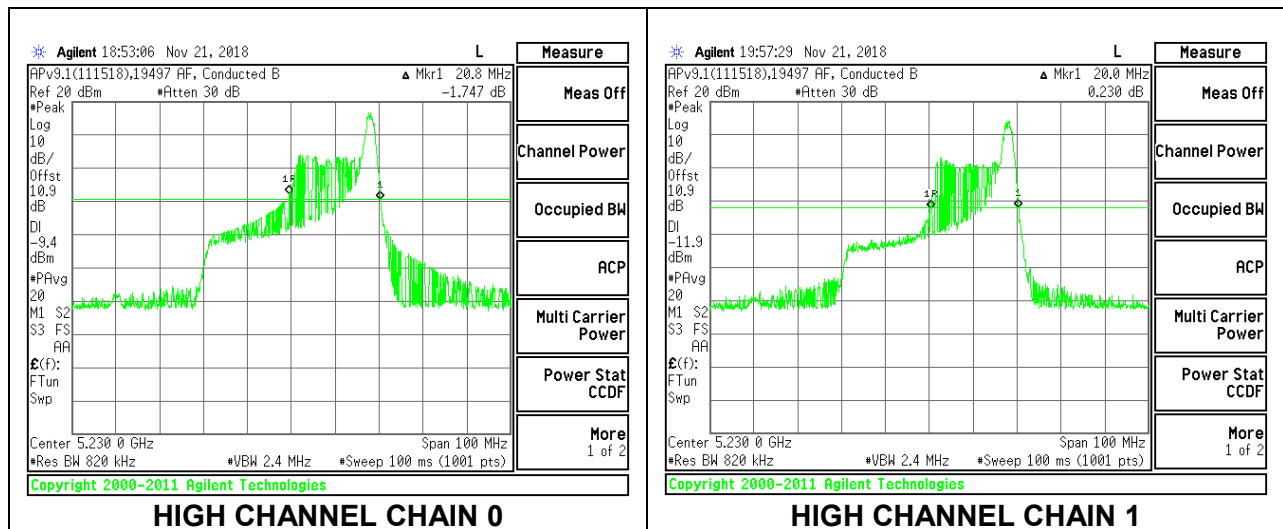
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 17

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	22.20	19.60
High	5230	20.80	20.00

LOW CHANNEL



HIGH CHANNEL

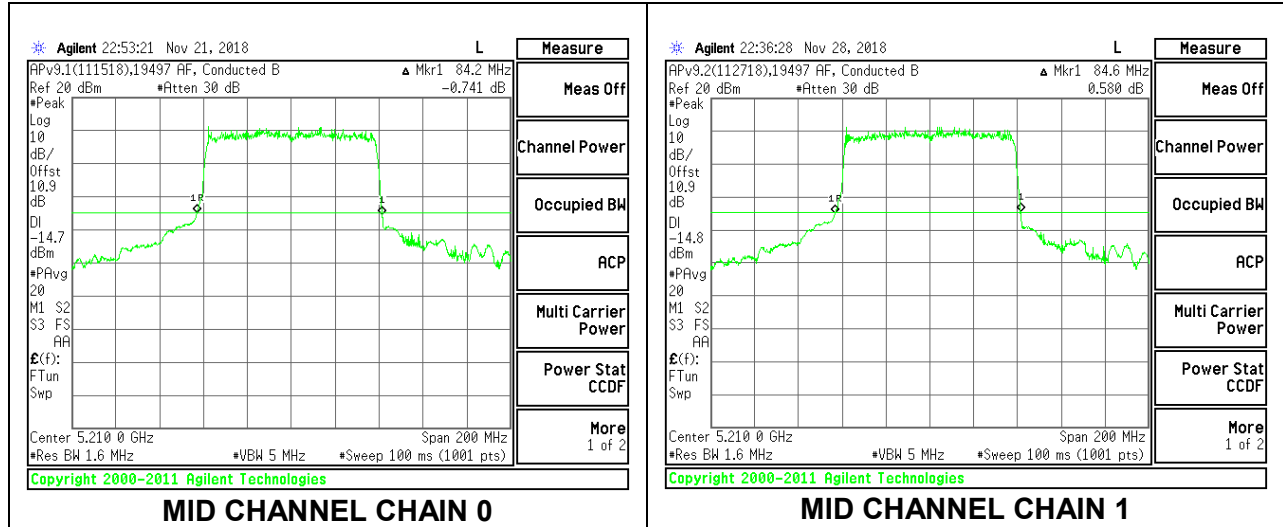


9.2.7. 802.11ax HE80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 OFDMA MODE – 996-Tones, RU Index 67

Channel	Frequency (MHz)	26 dB Bandwidth	26 dB Bandwidth
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	84.20	84.60

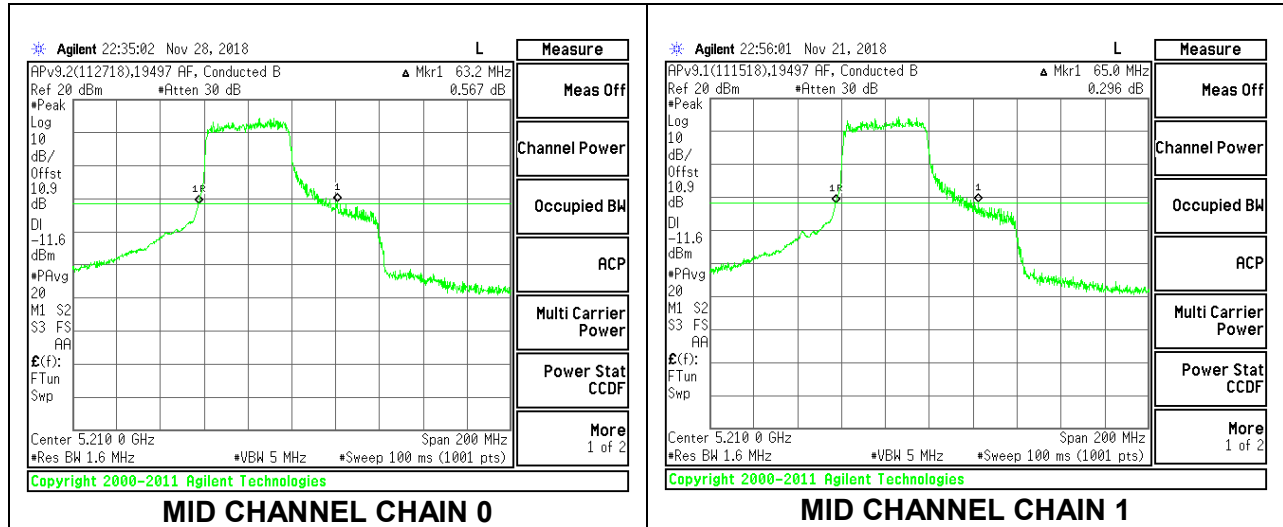
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	63.20	65.00

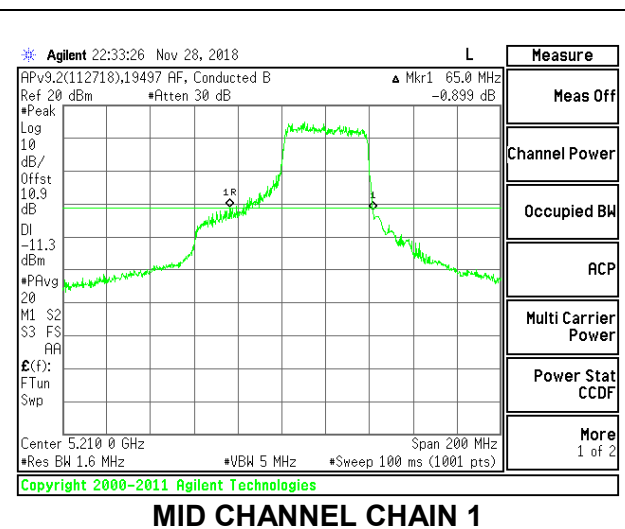
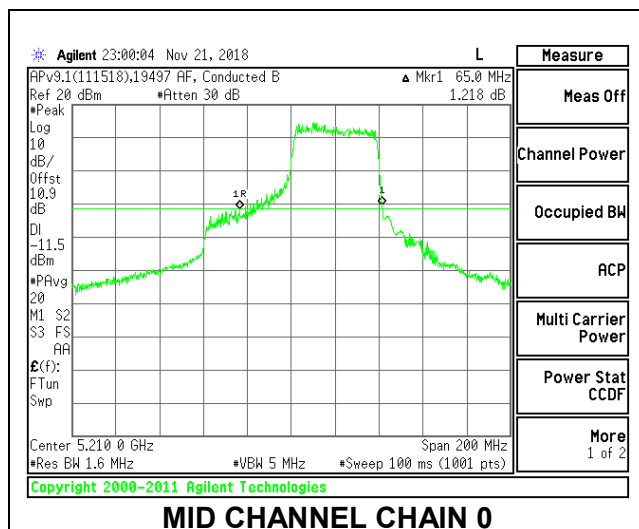
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 484-Tones, RU Index 66

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	65.00	65.00

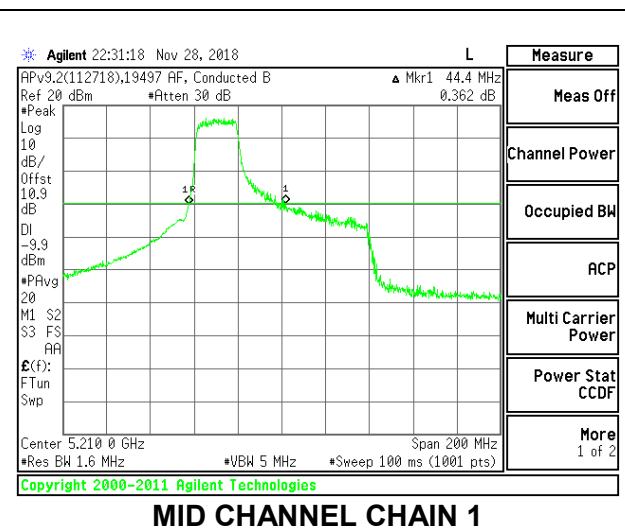
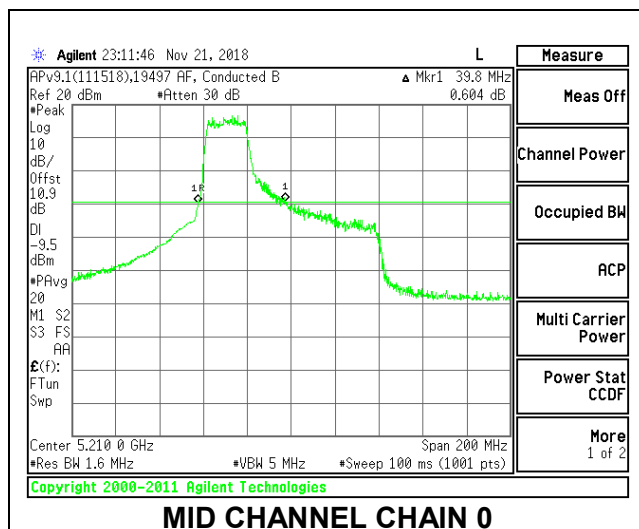
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	39.80	44.40

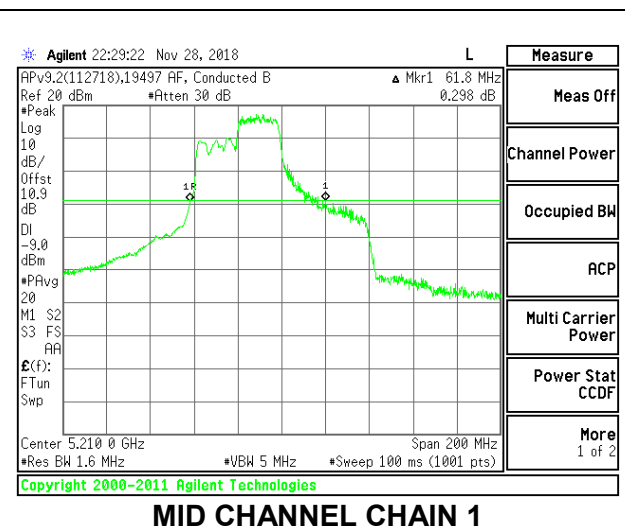
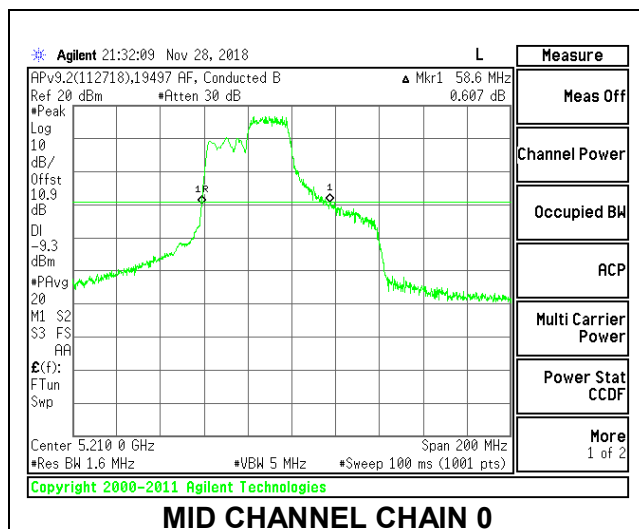
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 62

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	58.60	61.80

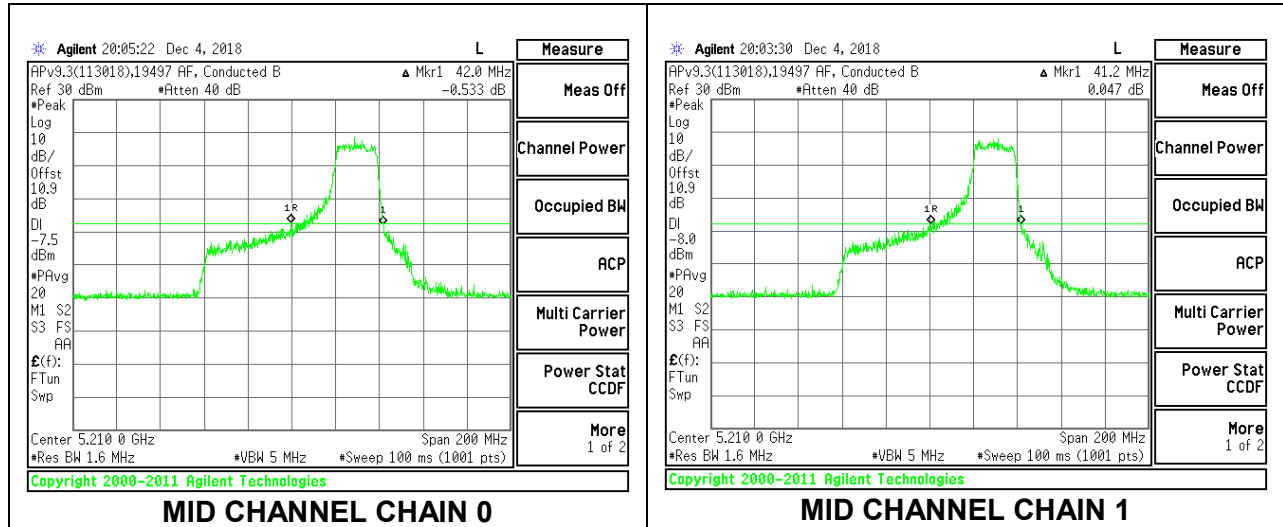
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 64

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Mid	5210	42.00	41.20

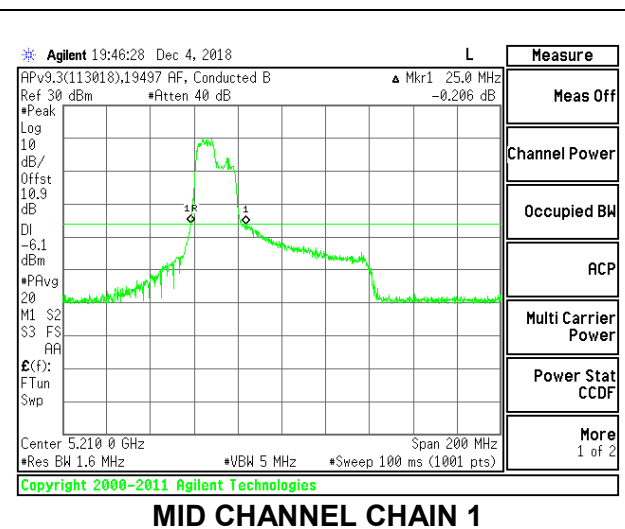
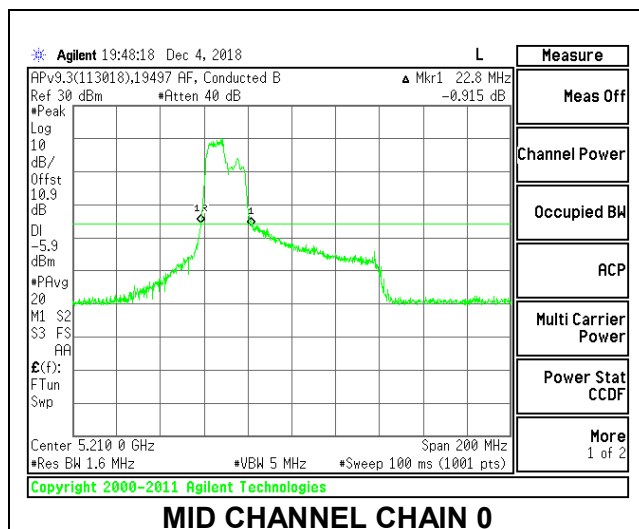
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	22.80	25.00

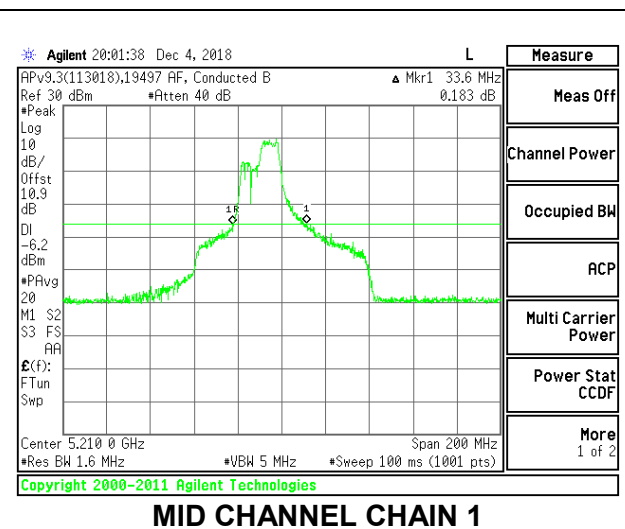
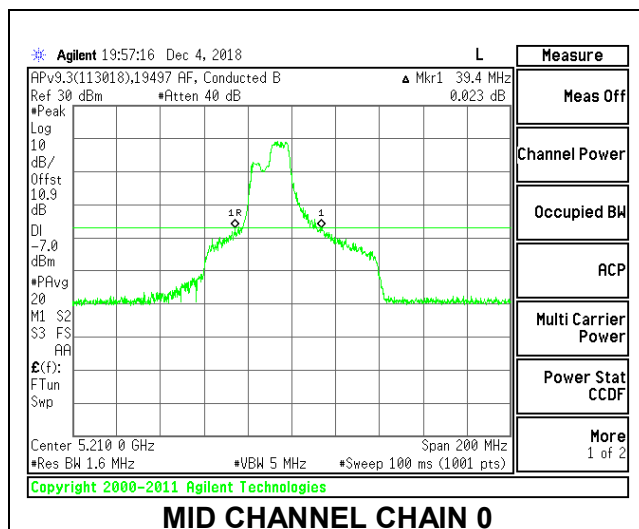
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	39.40	33.60

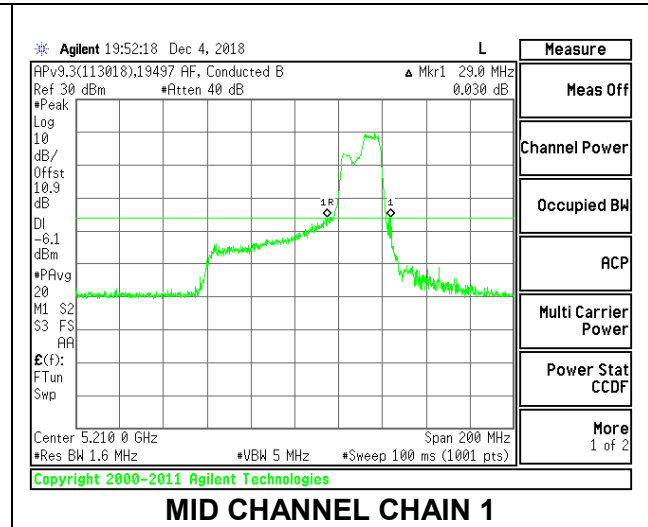
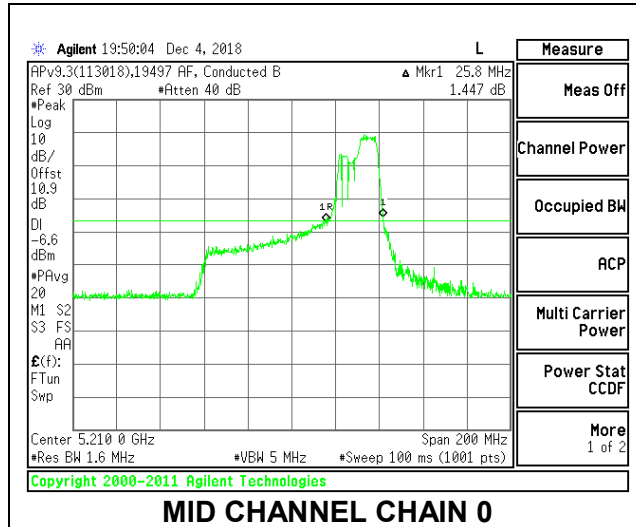
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 60

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	25.80	29.00

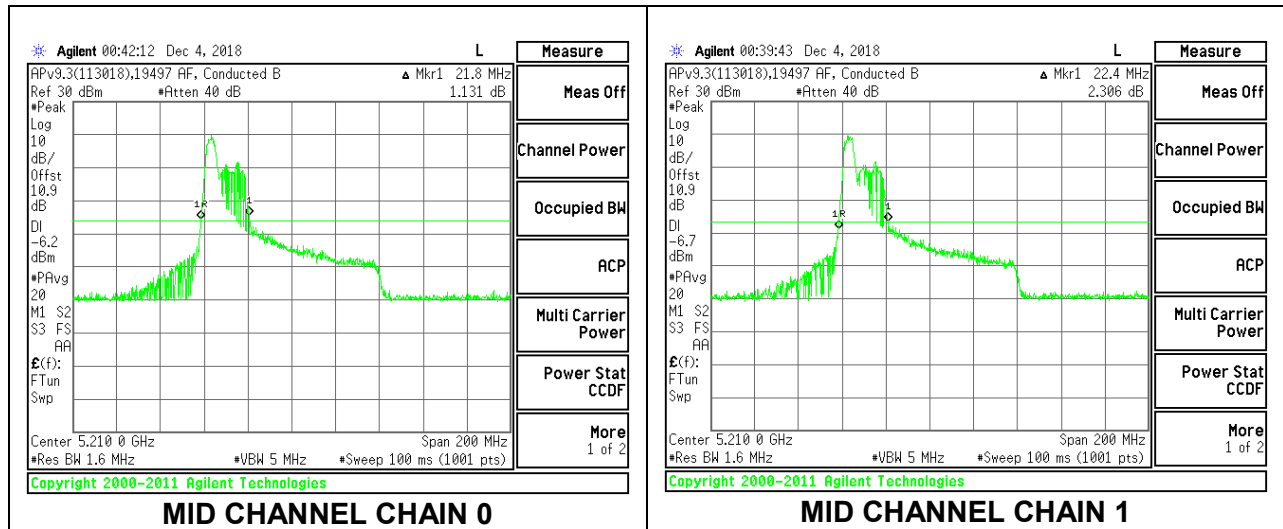
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 37

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	21.80	22.40

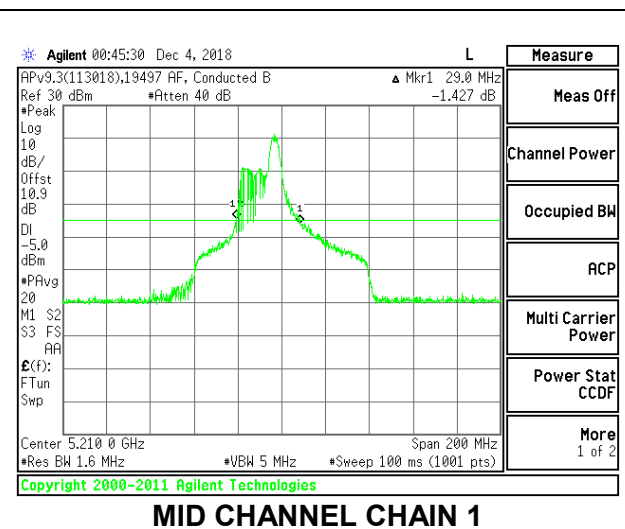
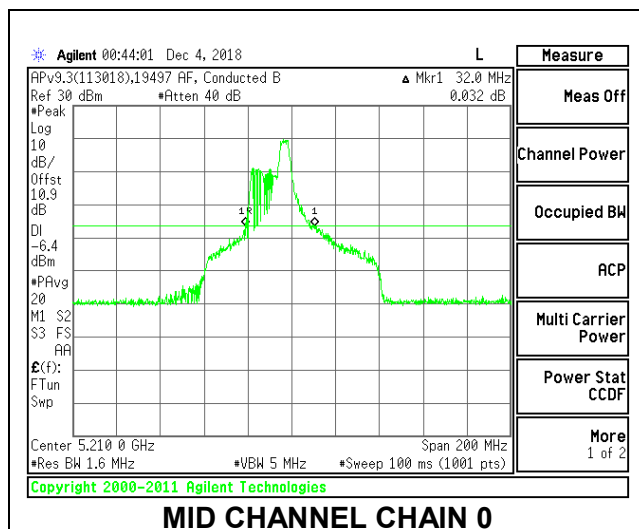
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 44

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	32.00	29.00

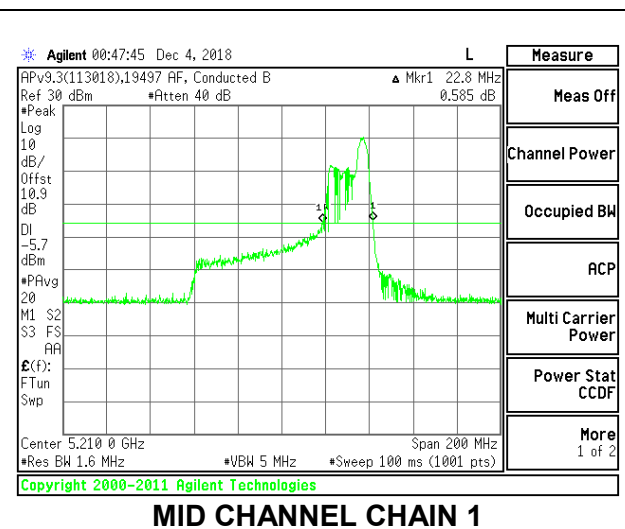
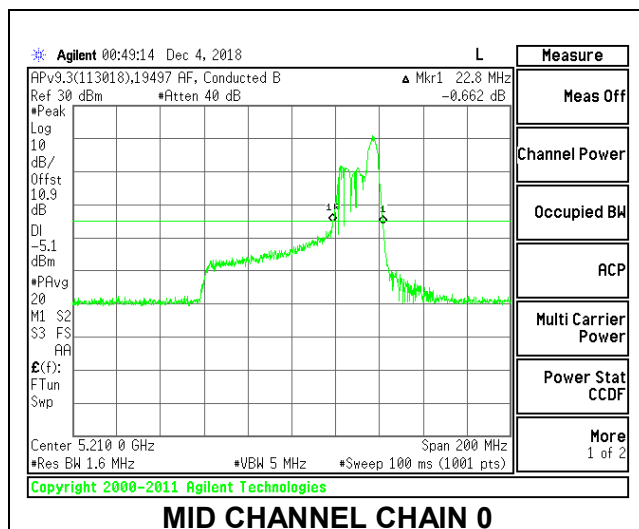
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 52

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	22.80	22.80

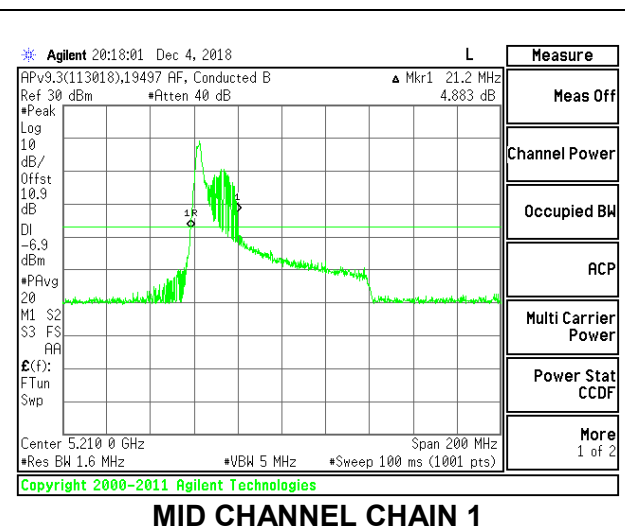
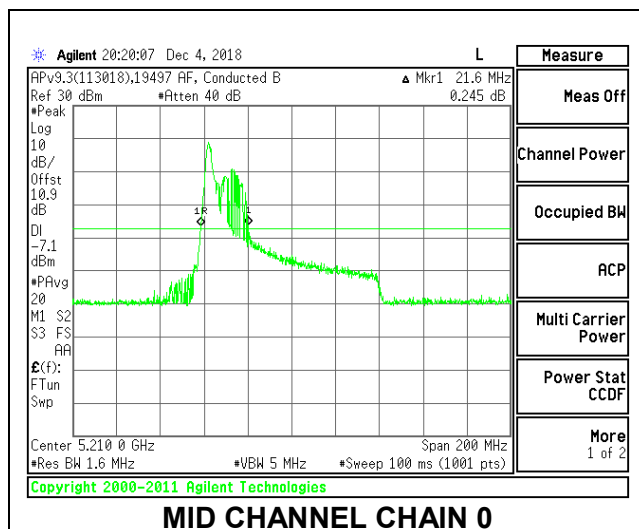
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	21.60	21.20

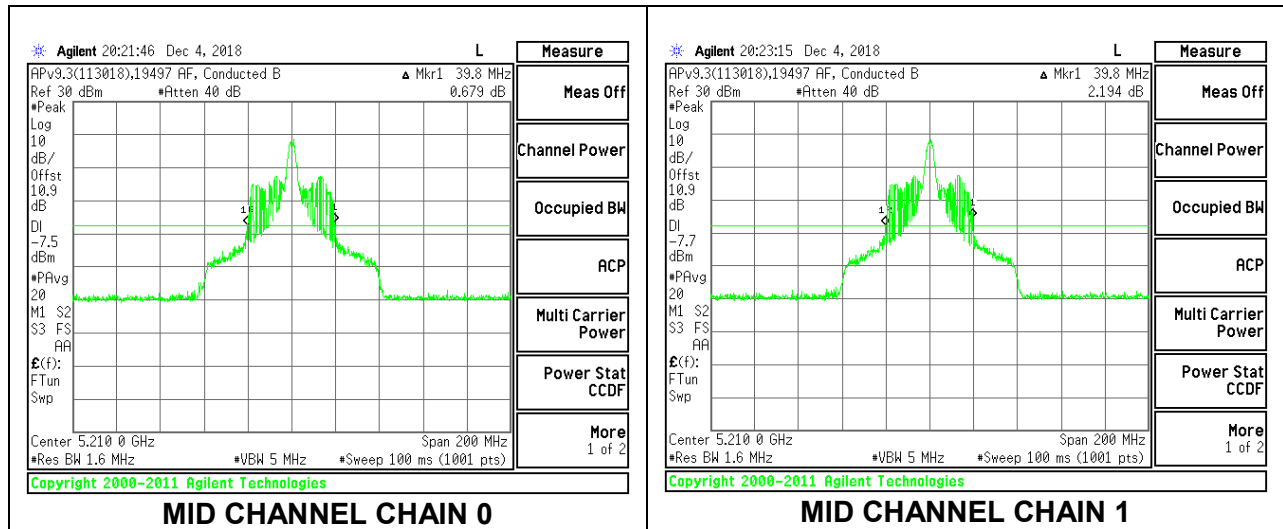
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 18

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	39.80	39.80

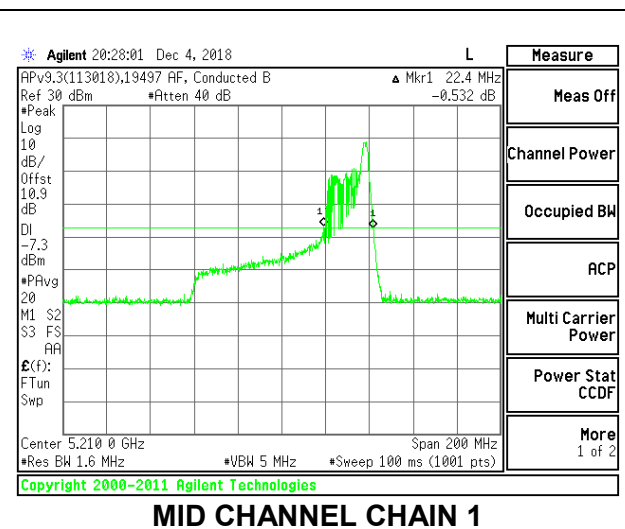
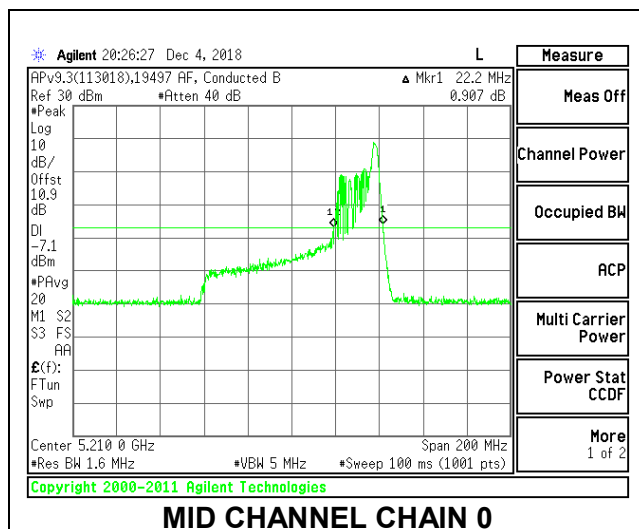
MID CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 36

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	22.20	22.40

MID CHANNEL

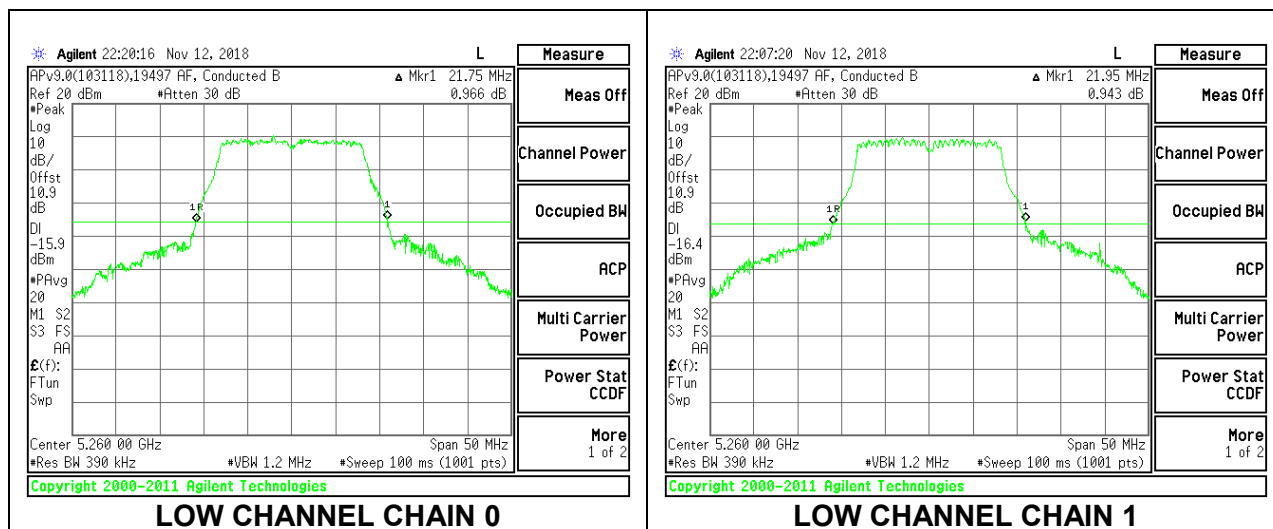


9.2.8. 802.11a MODE IN THE 5.3 GHz BAND

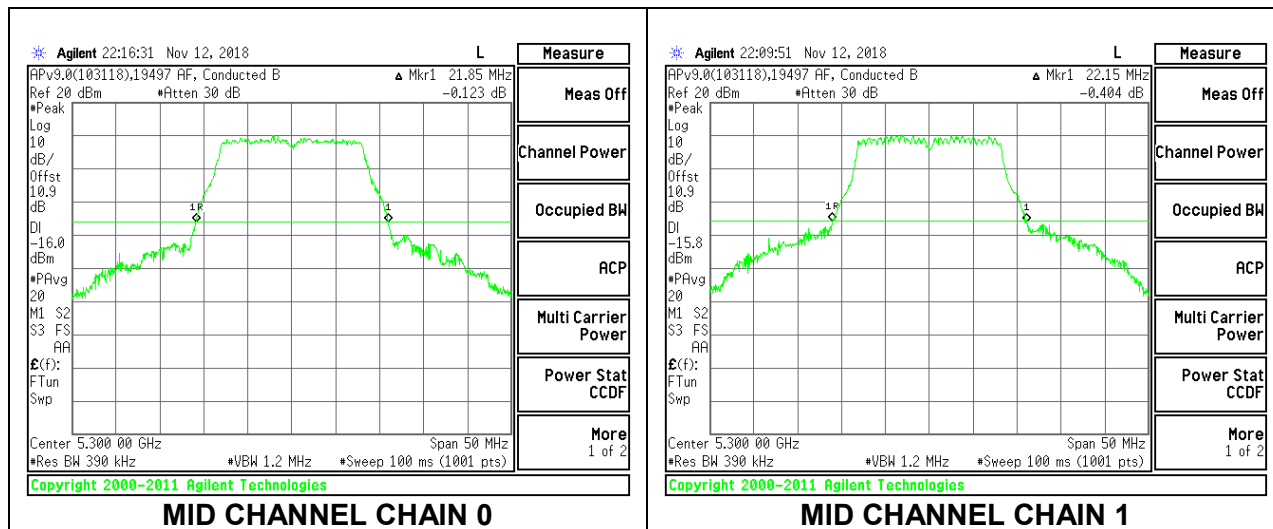
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.75	21.95
Mid	5300	21.85	22.15
High	5320	21.85	22.50

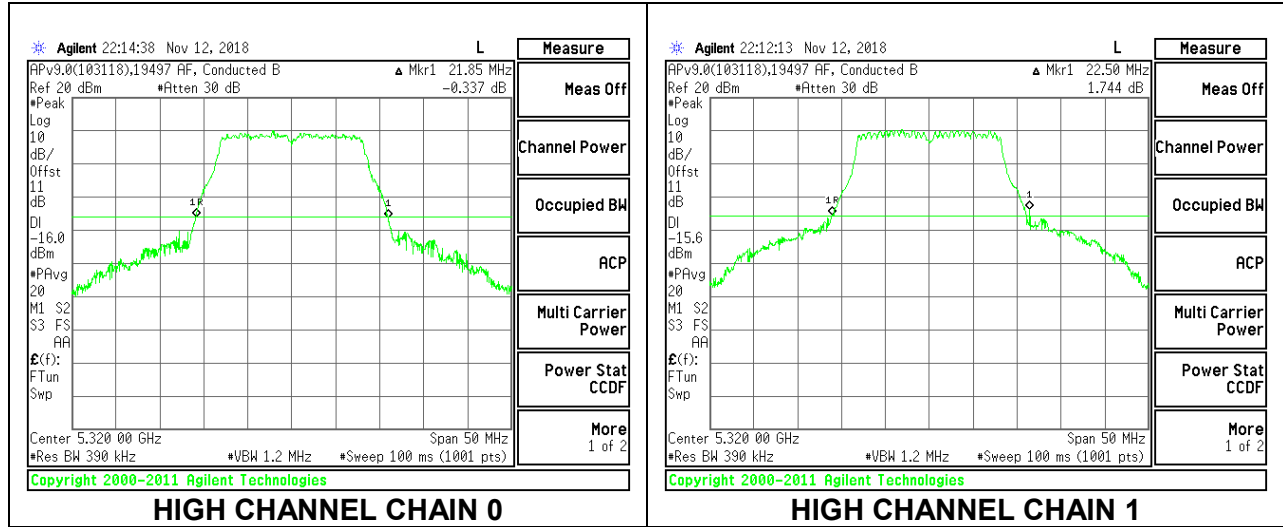
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

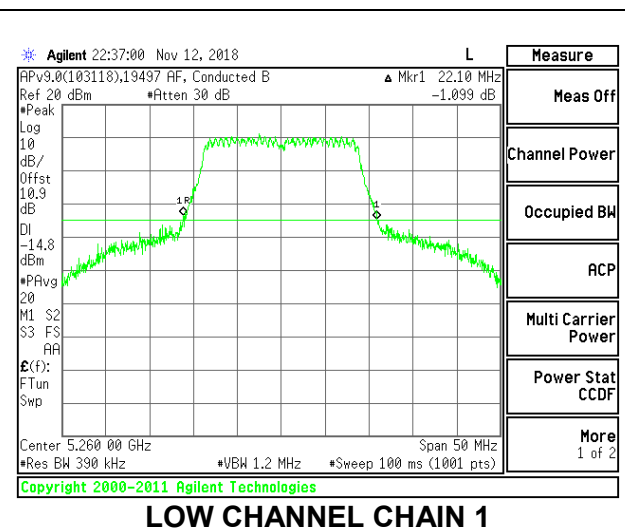
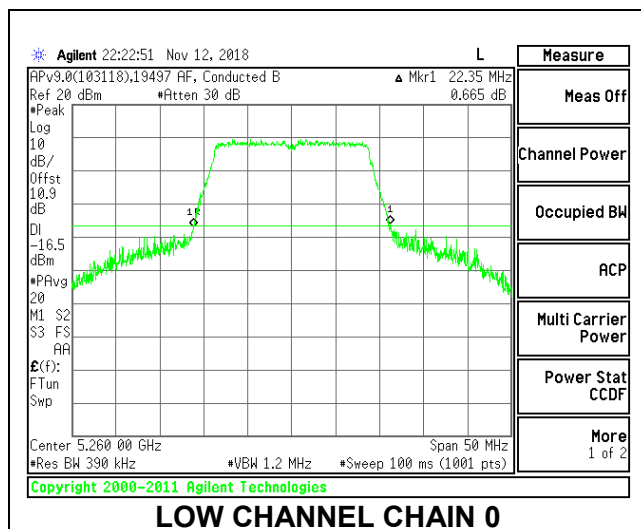


9.2.9. 802.11n HT20 MODE IN THE 5.3 GHz BAND

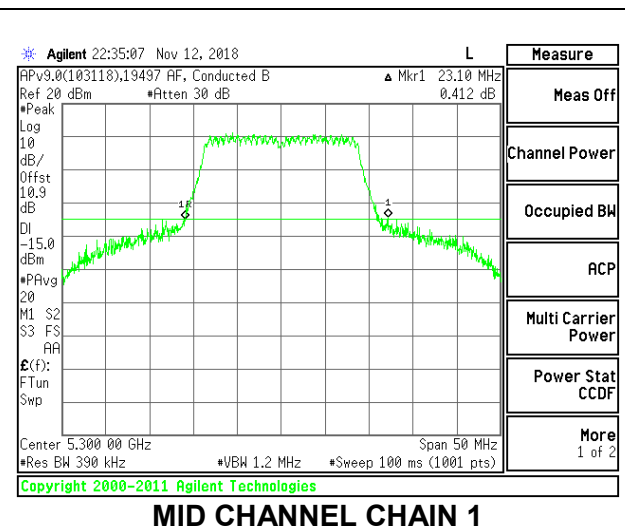
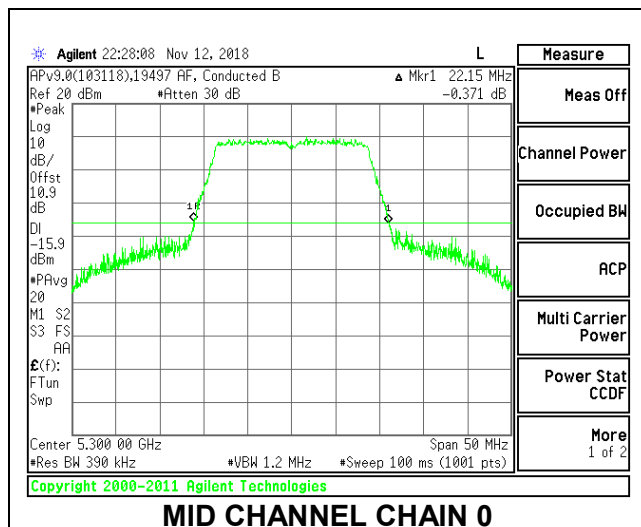
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	22.35	22.10
Mid	5300	22.15	23.10
High	5320	22.25	22.35

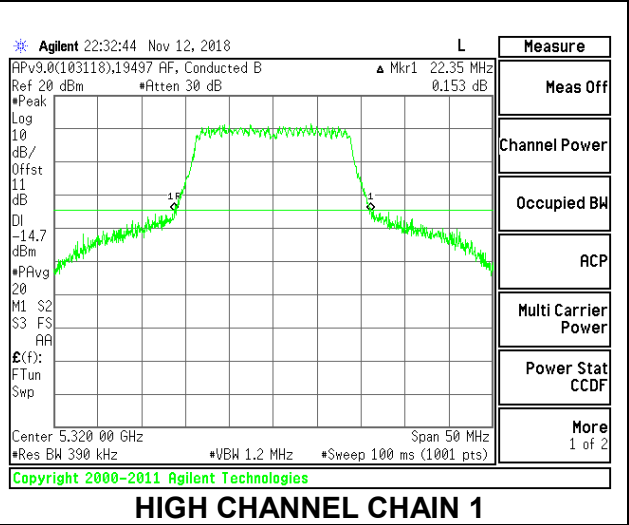
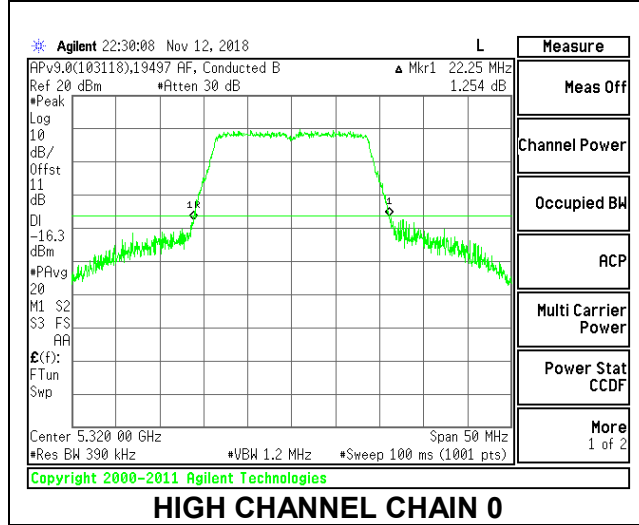
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

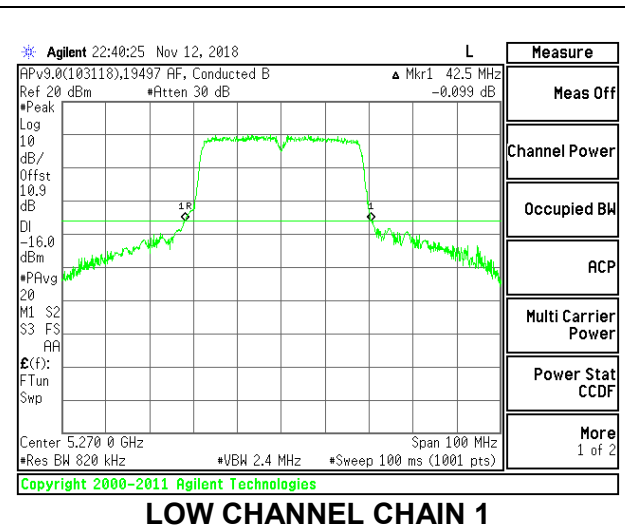
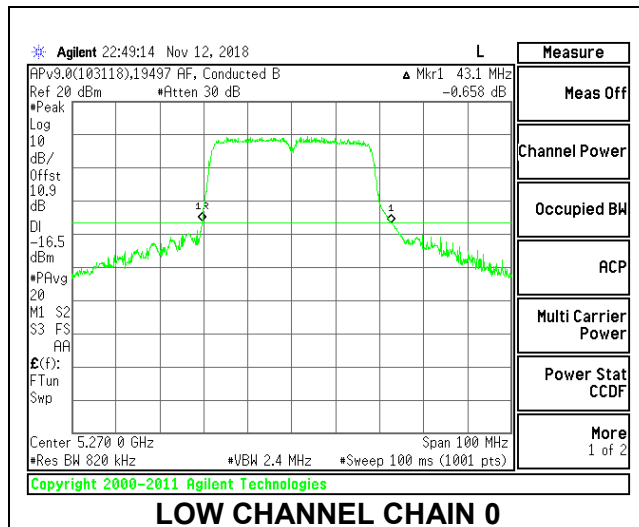


9.2.10. 802.11n HT40 MODE IN THE 5.3 GHz BAND

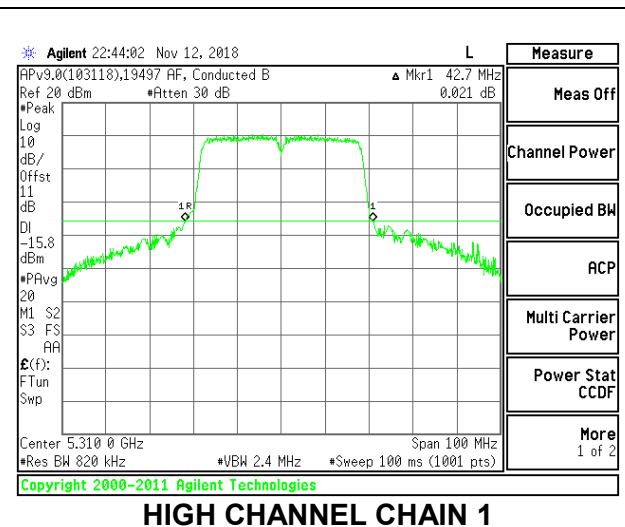
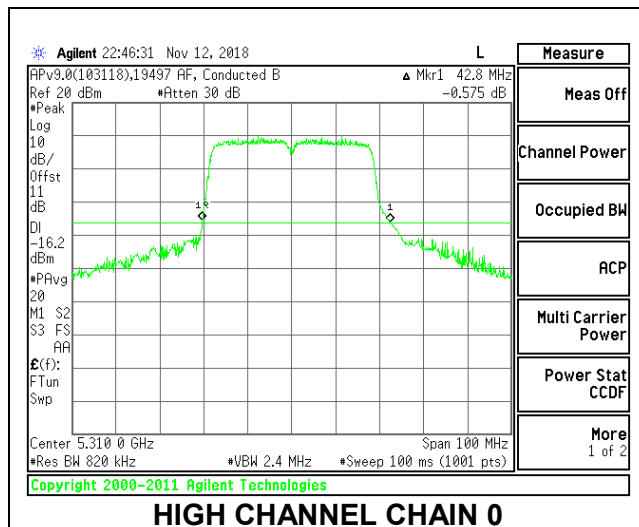
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	43.10	42.50
High	5310	42.80	42.70

LOW CHANNEL



HIGH CHANNEL

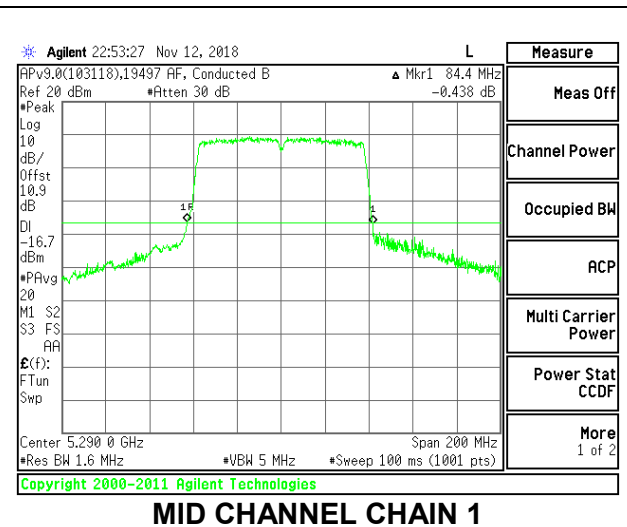
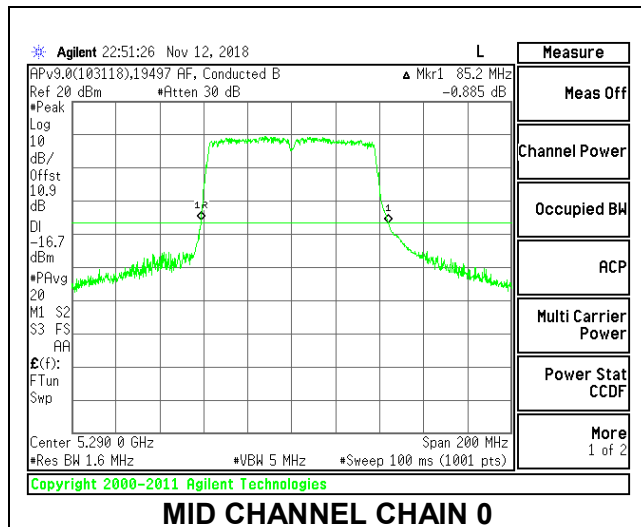


9.2.11. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5290	85.20	84.40

MID CHANNEL

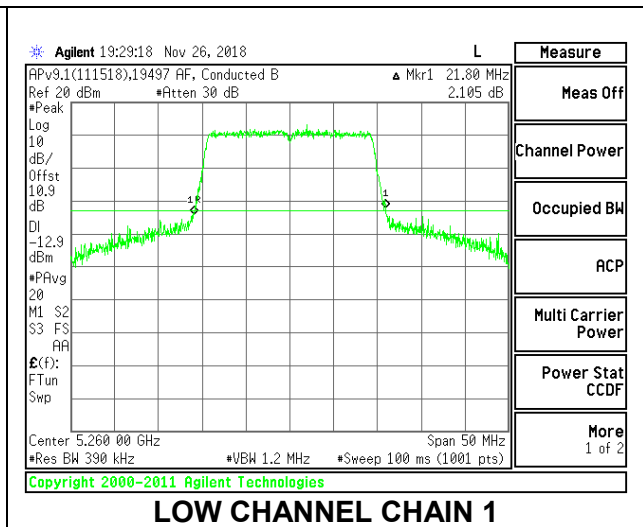
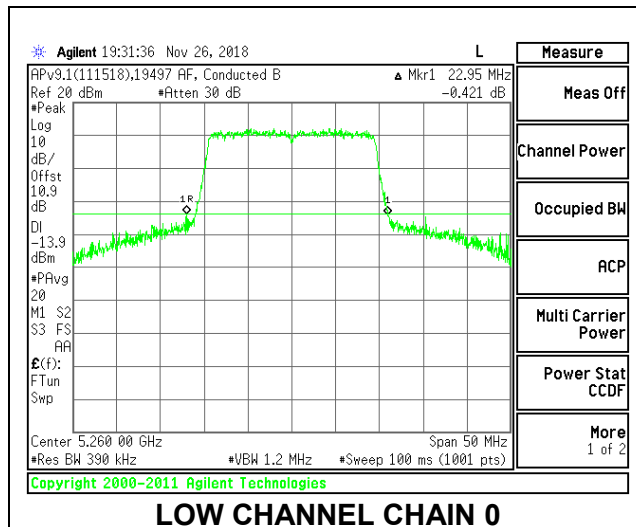


9.2.12. 802.11ax HE20 MODE IN THE 5.3 GHz BAND

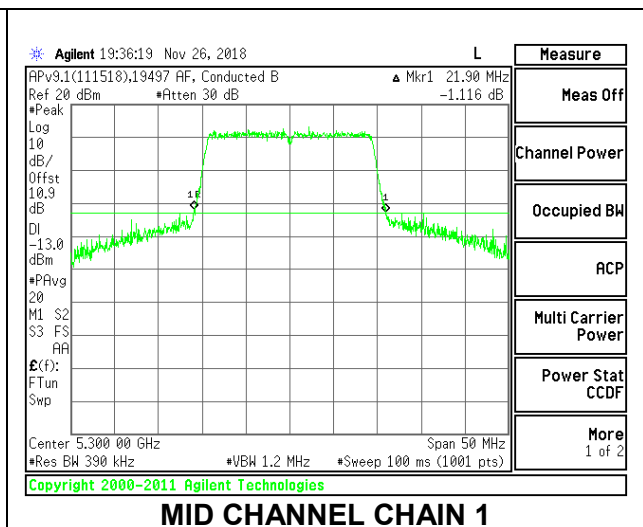
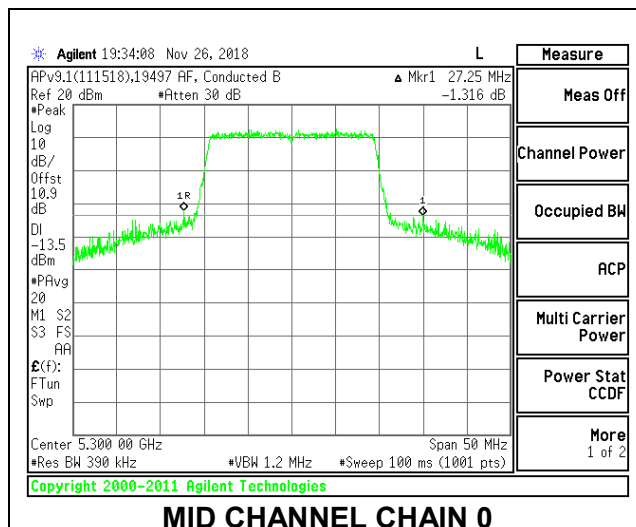
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth	26 dB Bandwidth
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5260	22.95	21.80
Mid	5300	27.25	21.90
High	5320	27.30	21.85

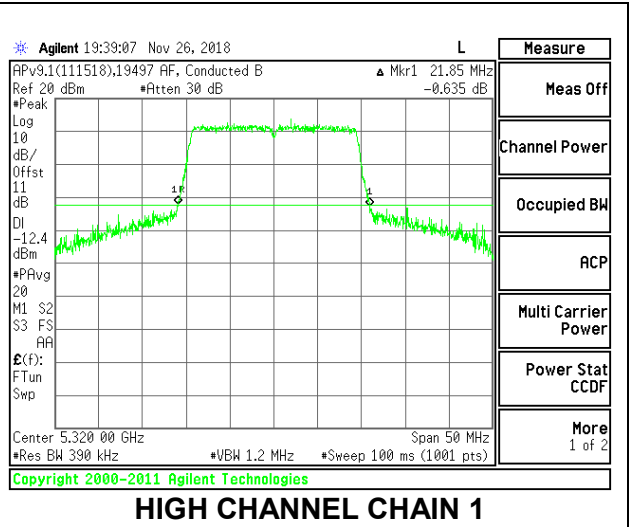
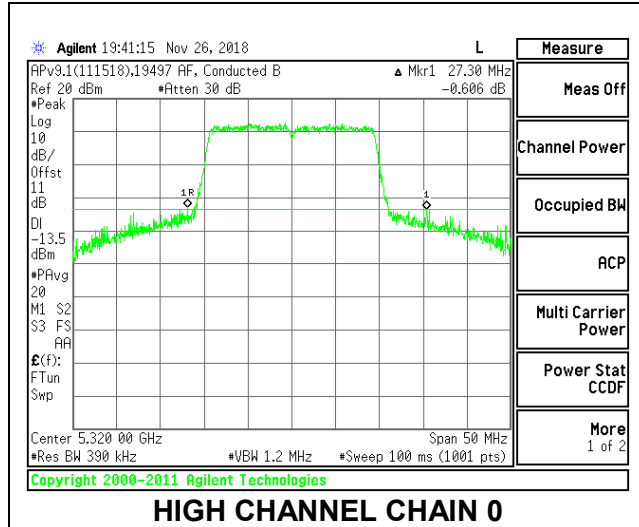
LOW CHANNEL



MID CHANNEL



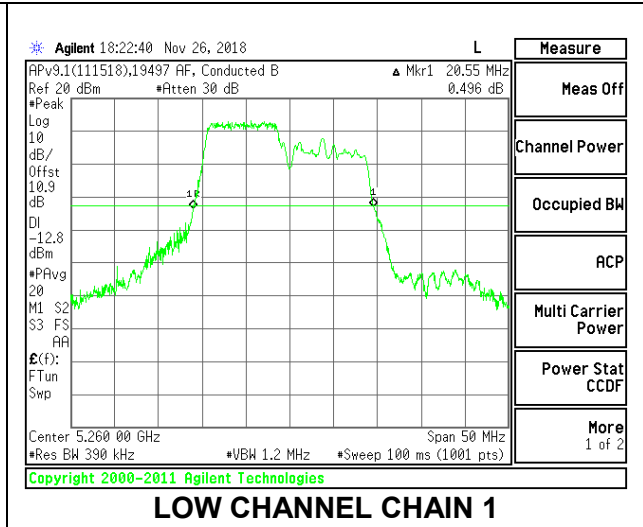
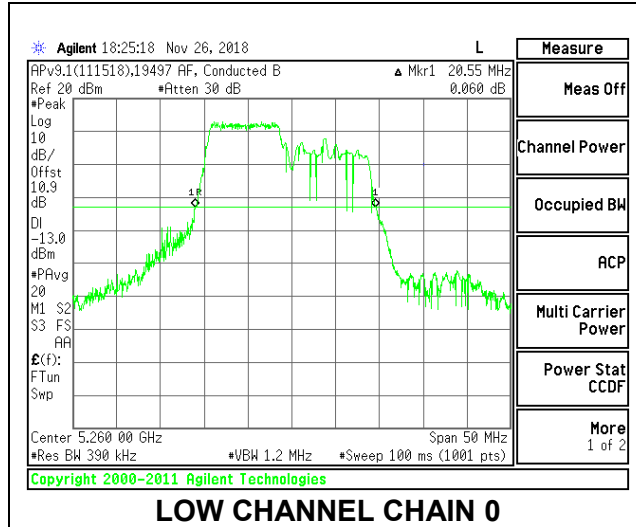
HIGH CHANNEL



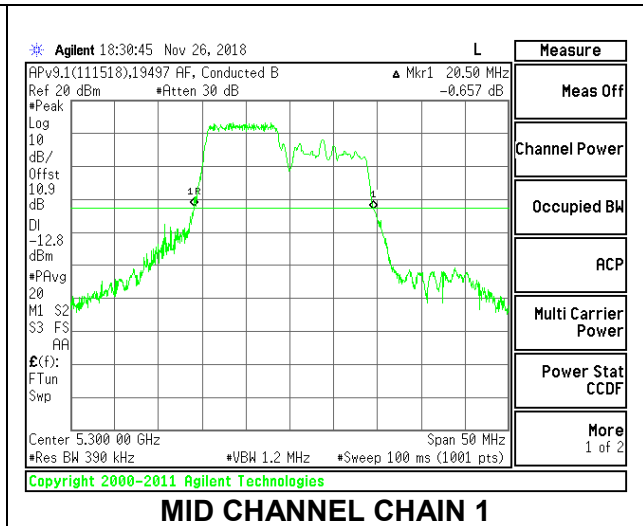
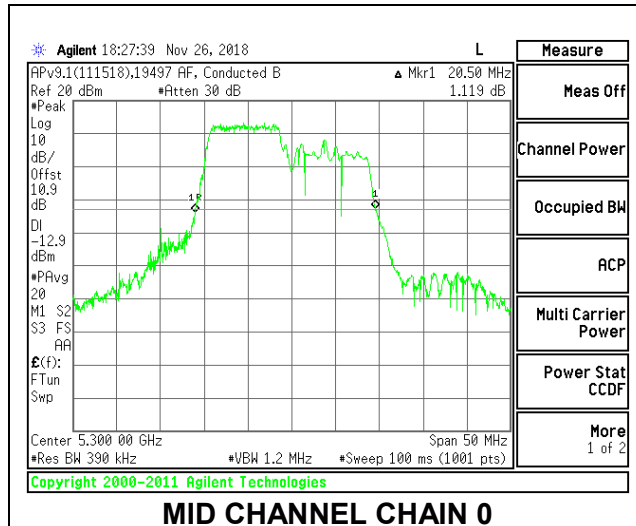
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	20.55	20.55
Mid	5300	20.50	20.50
High	5320	20.50	20.40

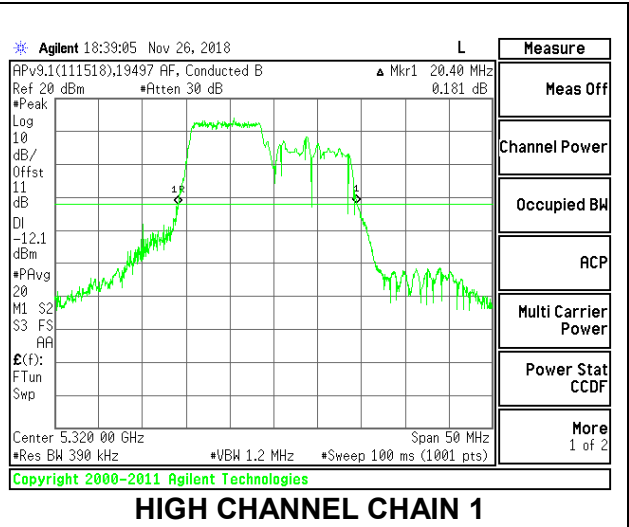
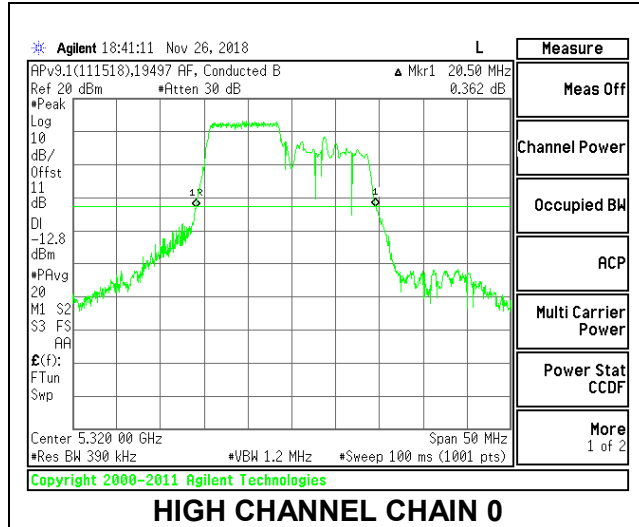
LOW CHANNEL



MID CHANNEL



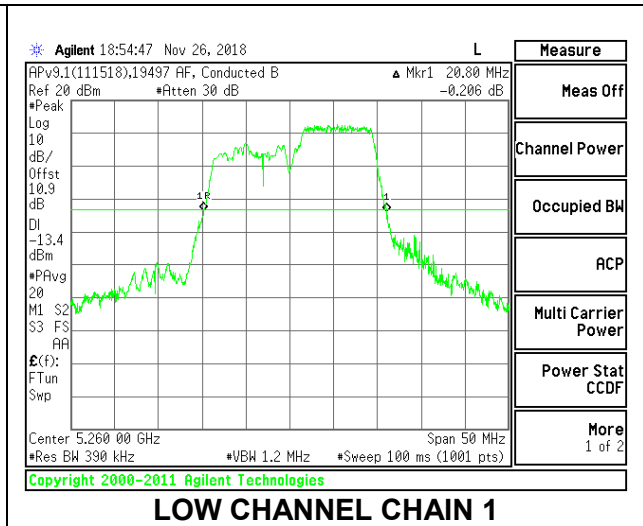
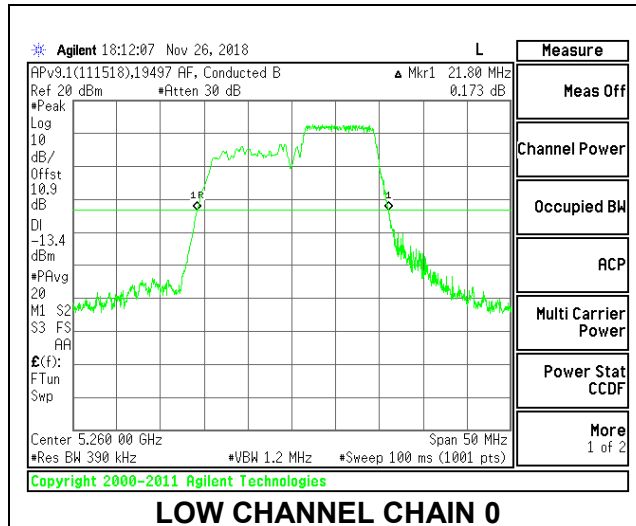
HIGH CHANNEL



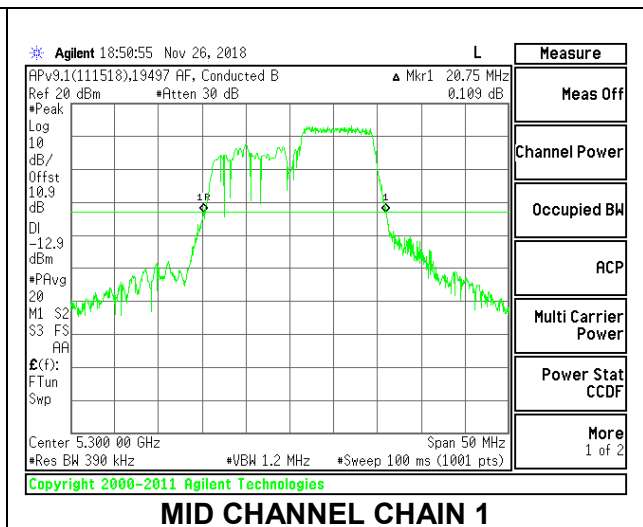
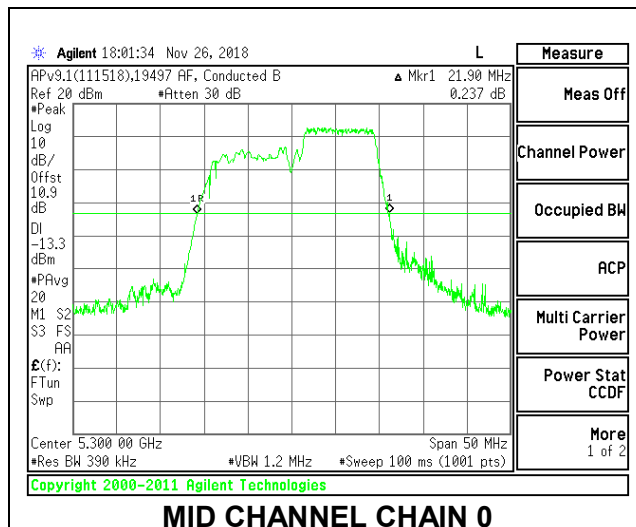
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.80	20.80
Mid	5300	21.90	20.75
High	5320	21.80	20.70

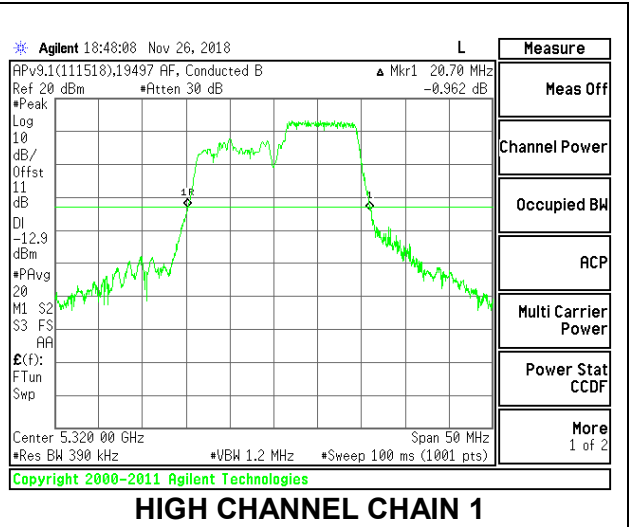
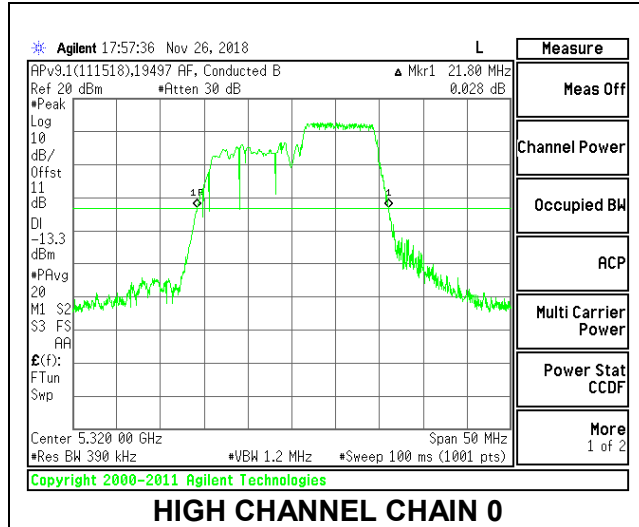
LOW CHANNEL



MID CHANNEL



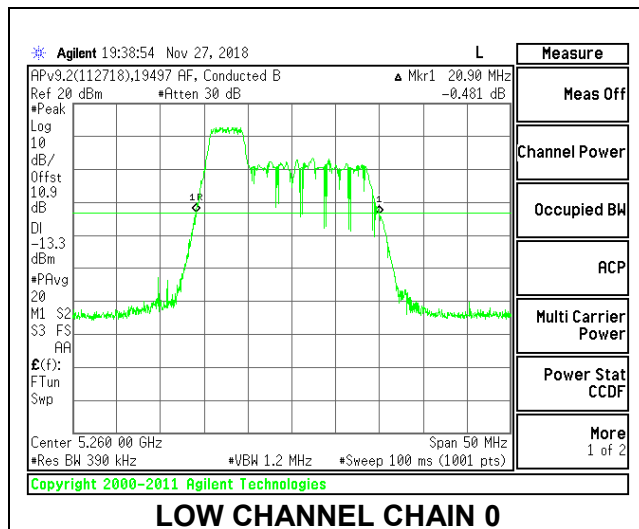
HIGH CHANNEL



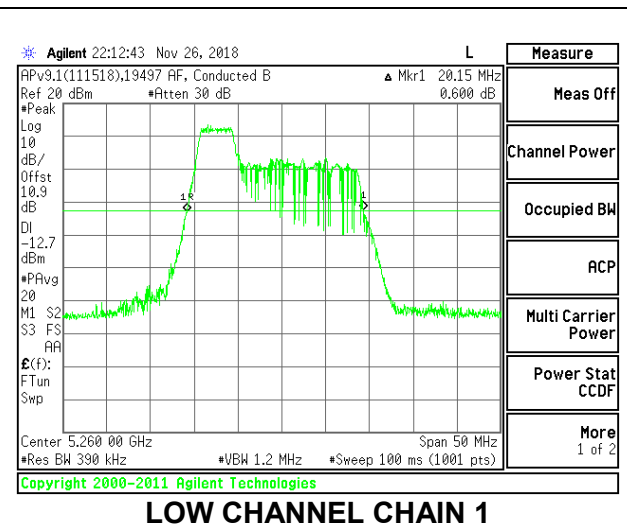
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 37

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	20.90	20.15
Mid	5300	21.00	20.25
High	5320	21.05	20.35

LOW CHANNEL

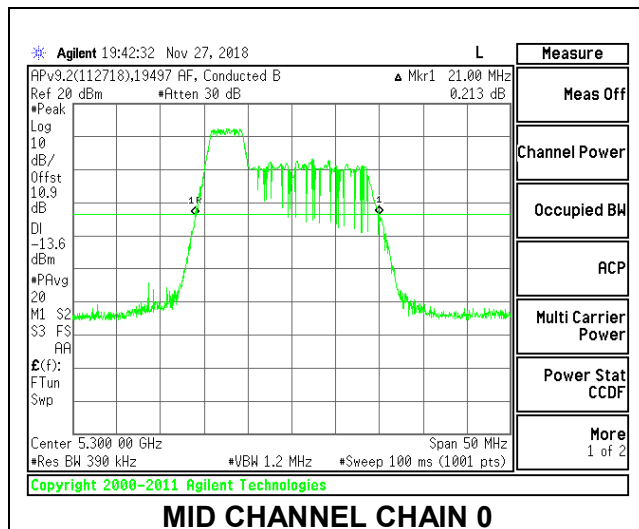


LOW CHANNEL CHAIN 0

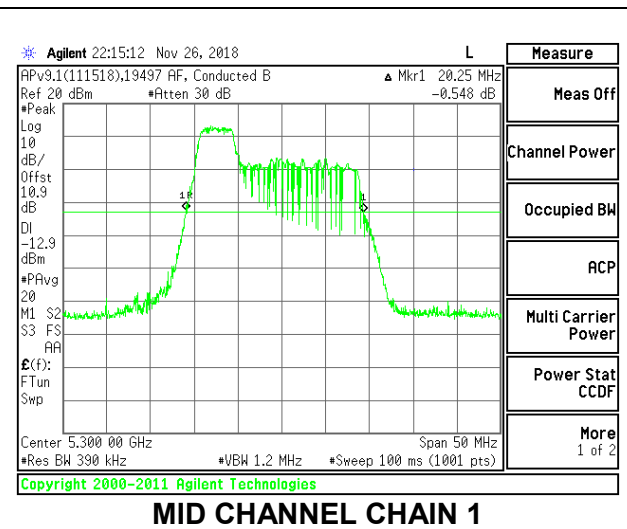


LOW CHANNEL CHAIN 1

MID CHANNEL

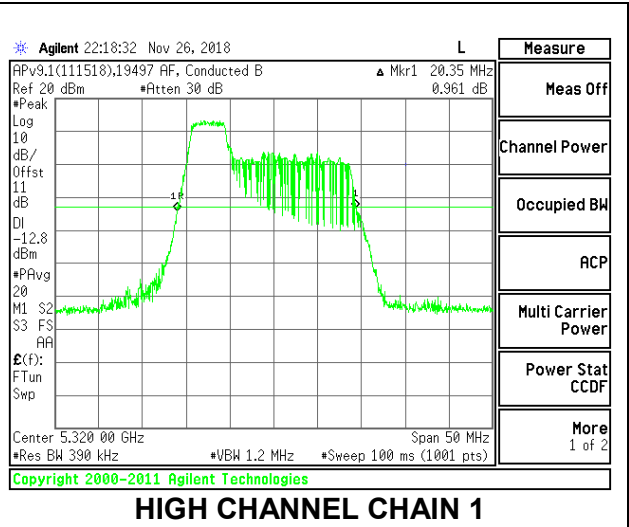
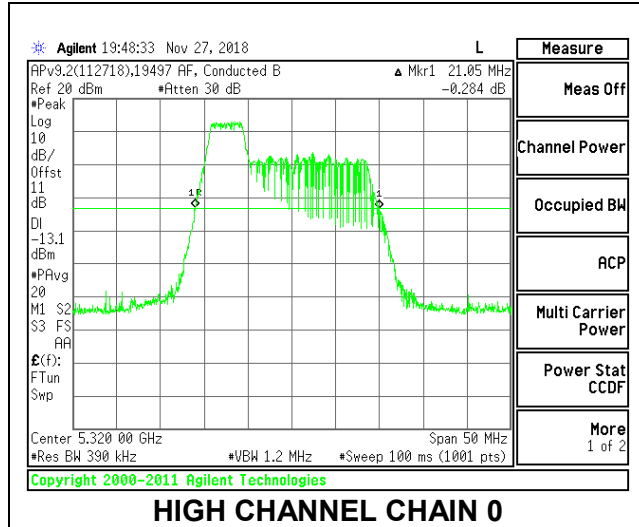


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

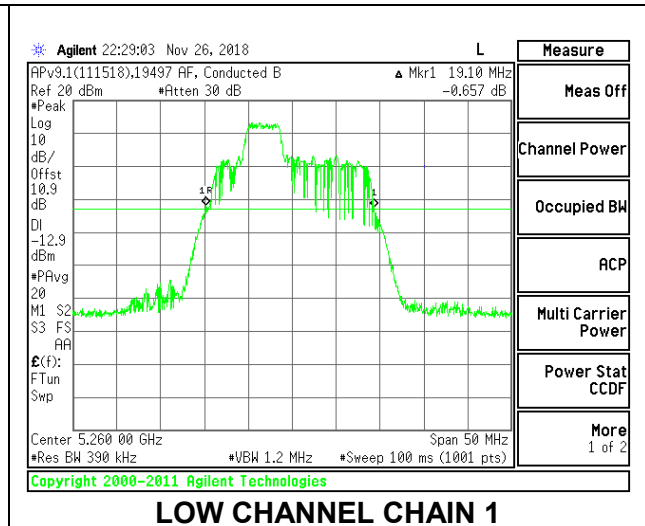
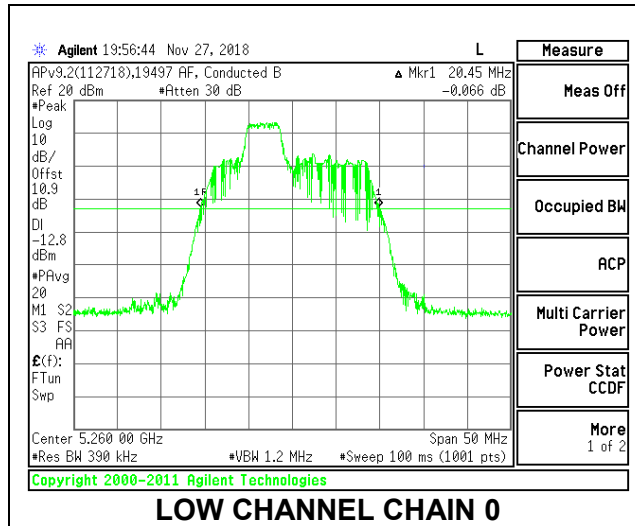
HIGH CHANNEL



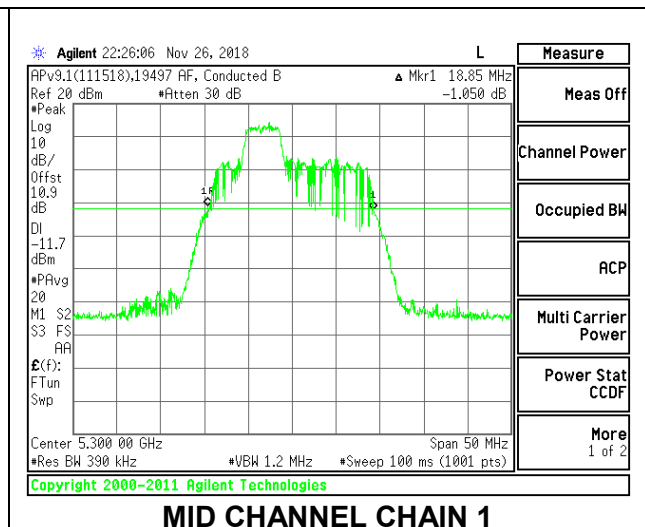
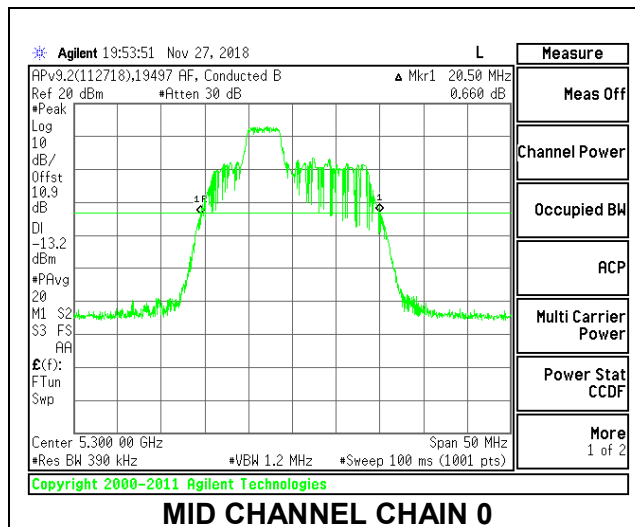
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 38

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	20.45	19.10
Mid	5300	20.50	18.85
High	5320	20.45	18.90

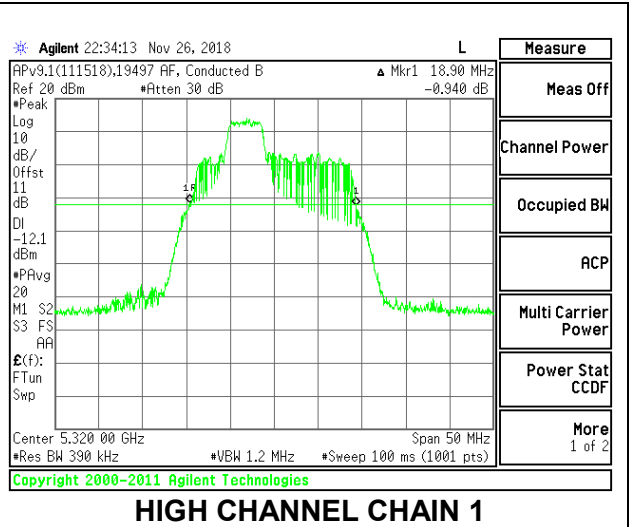
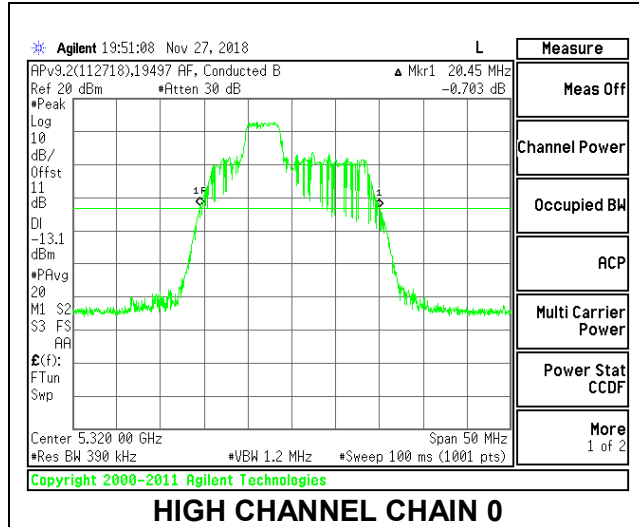
LOW CHANNEL



MID CHANNEL



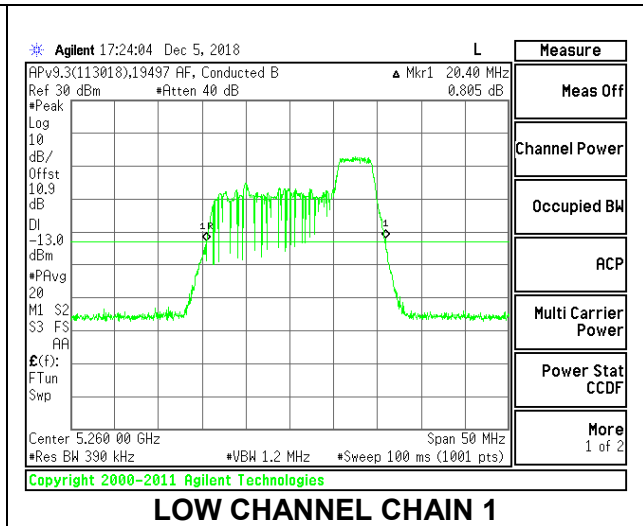
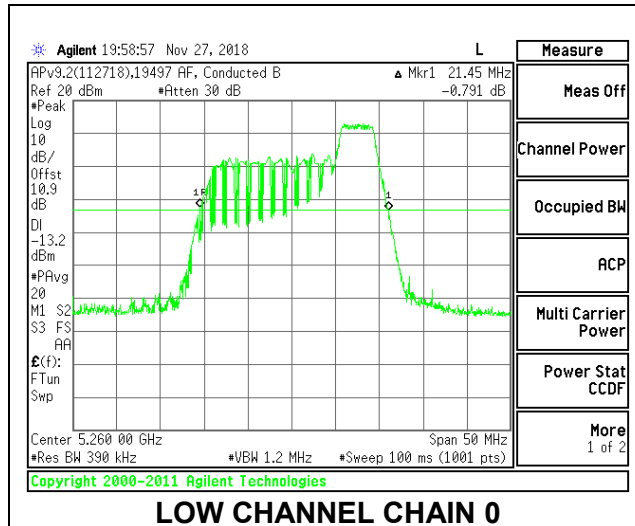
HIGH CHANNEL



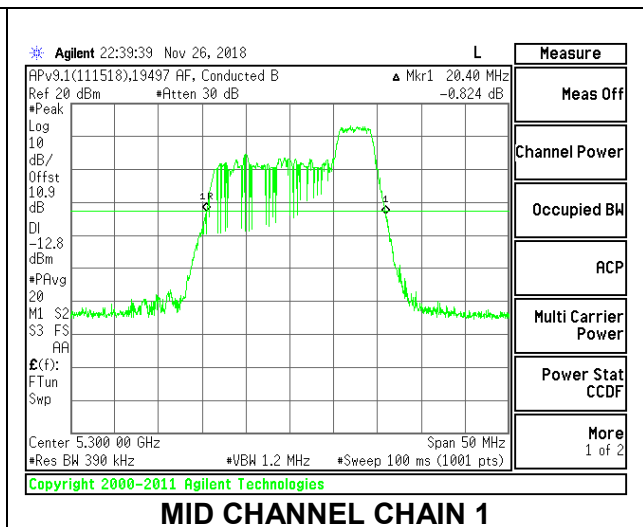
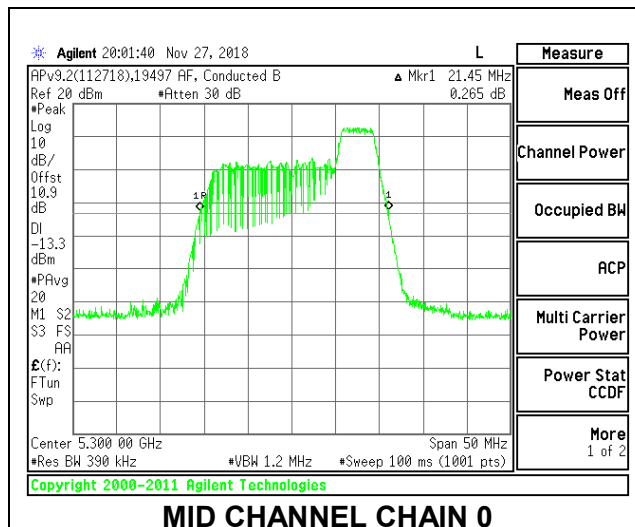
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 40

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.45	20.40
Mid	5300	21.45	20.40
High	5320	21.50	20.45

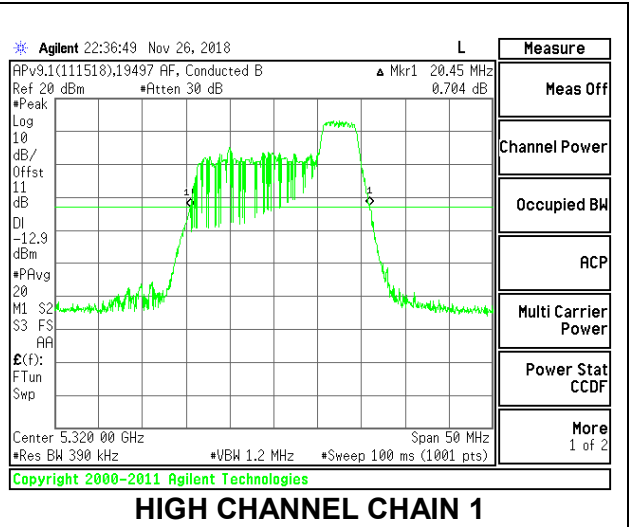
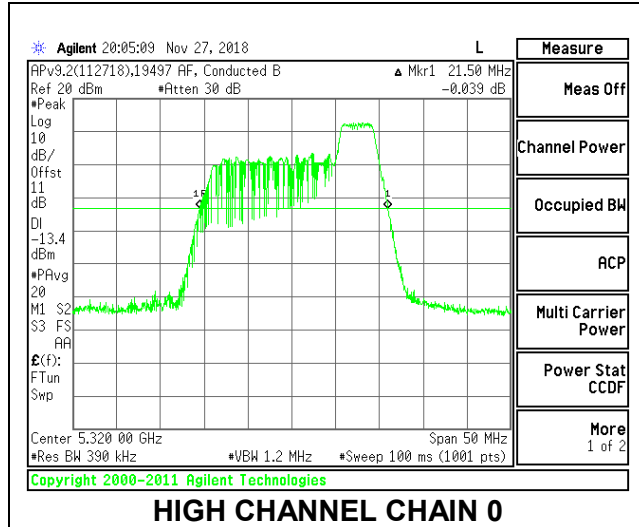
LOW CHANNEL



MID CHANNEL



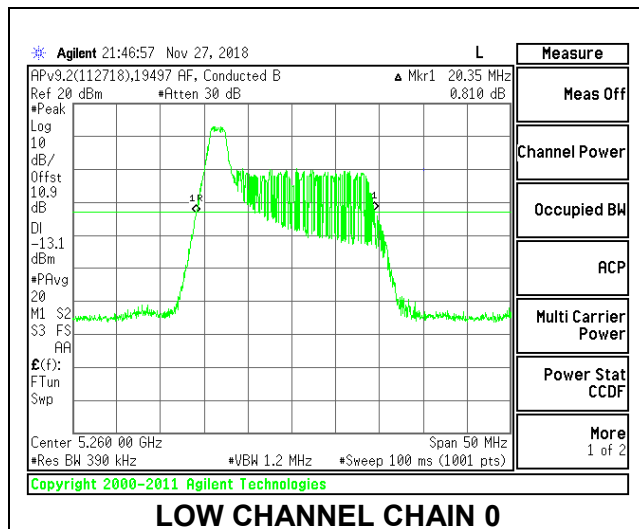
HIGH CHANNEL



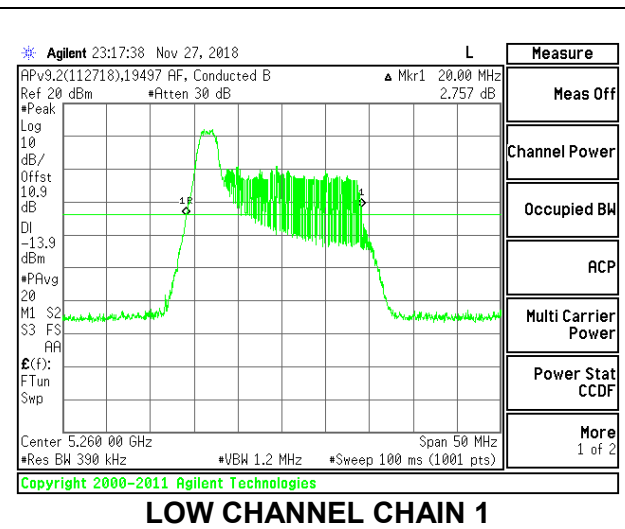
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 0

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	20.35	20.00
Mid	5300	20.55	20.10
High	5320	20.50	20.00

LOW CHANNEL

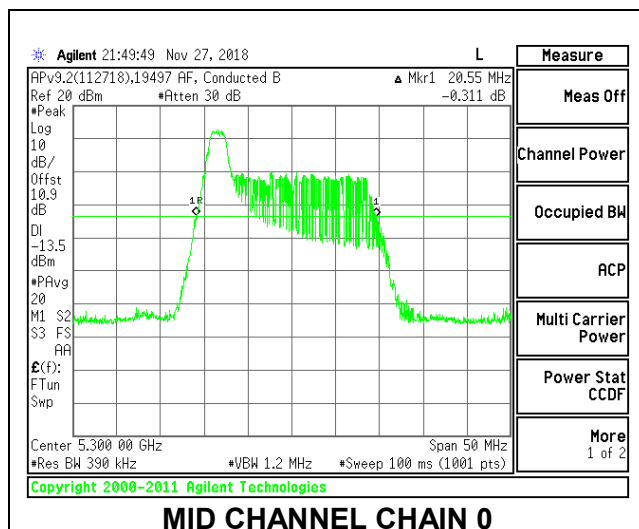


LOW CHANNEL CHAIN 0

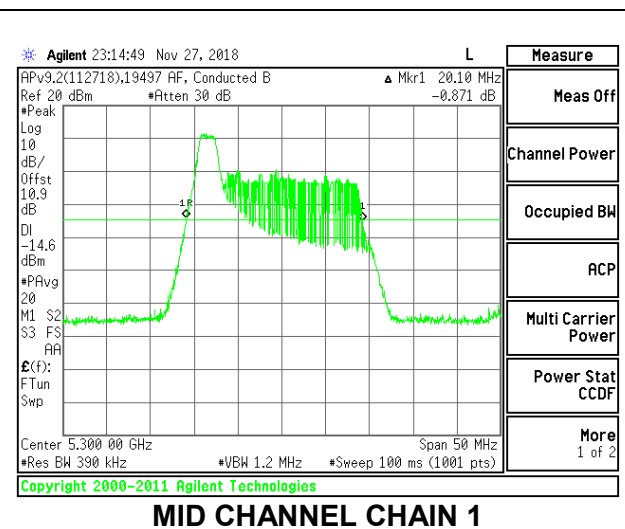


LOW CHANNEL CHAIN 1

MID CHANNEL

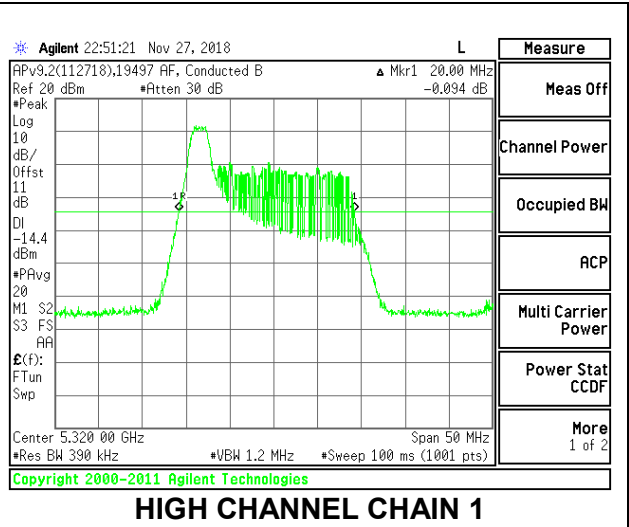
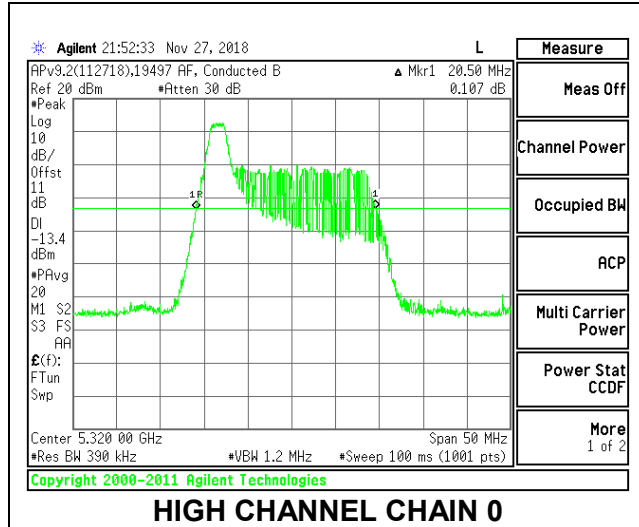


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

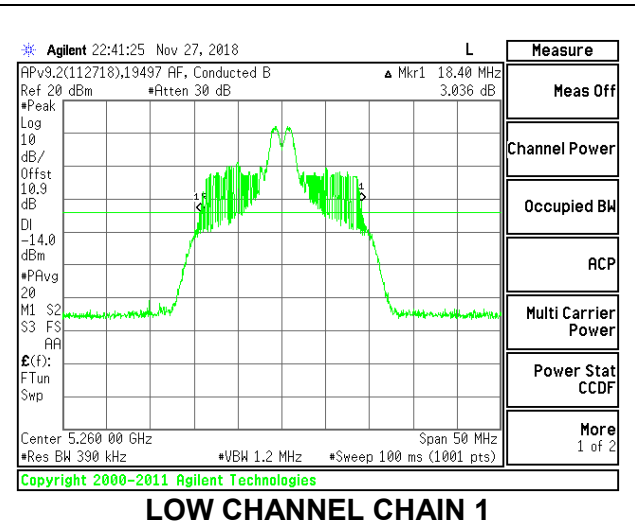
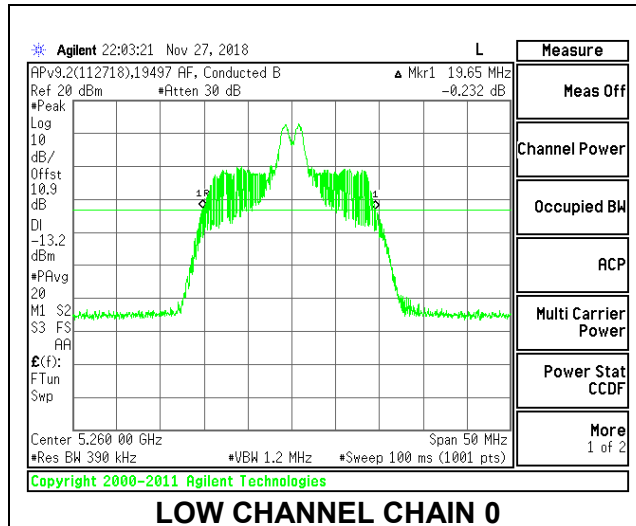
HIGH CHANNEL



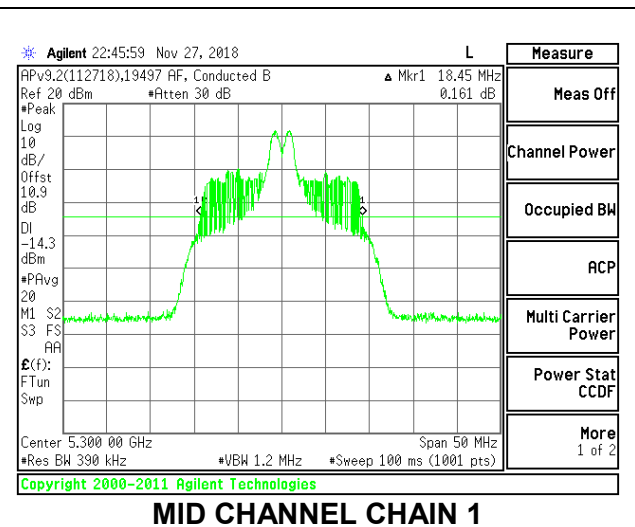
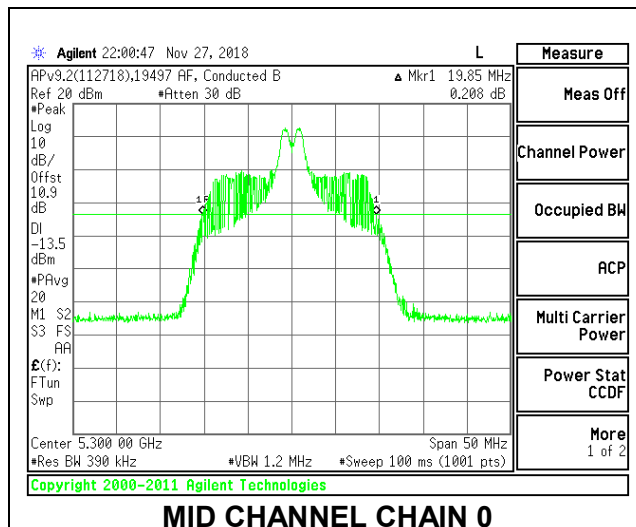
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 4

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	19.65	18.40
Mid	5300	19.85	18.45
High	5320	19.75	18.45

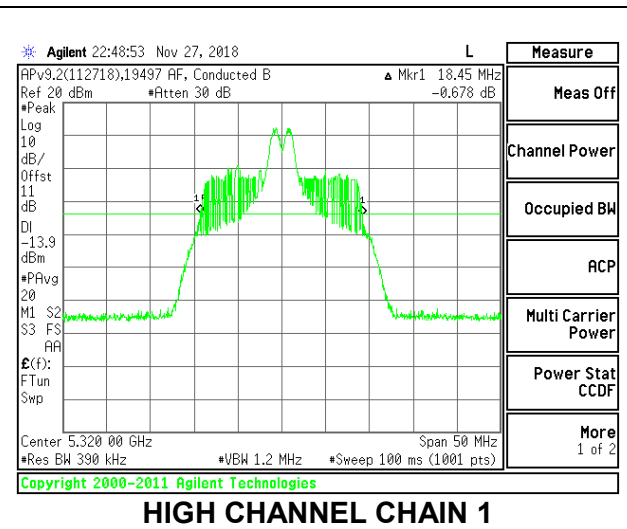
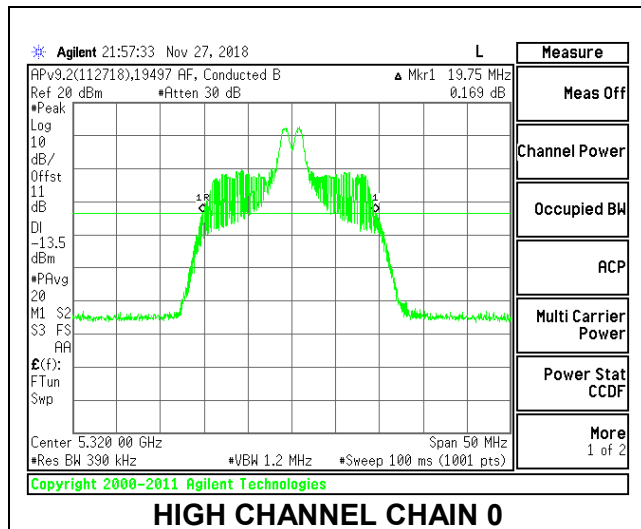
LOW CHANNEL



MID CHANNEL



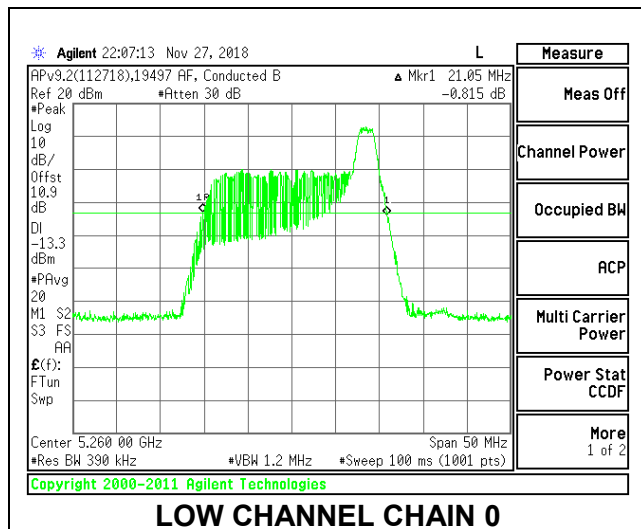
HIGH CHANNEL



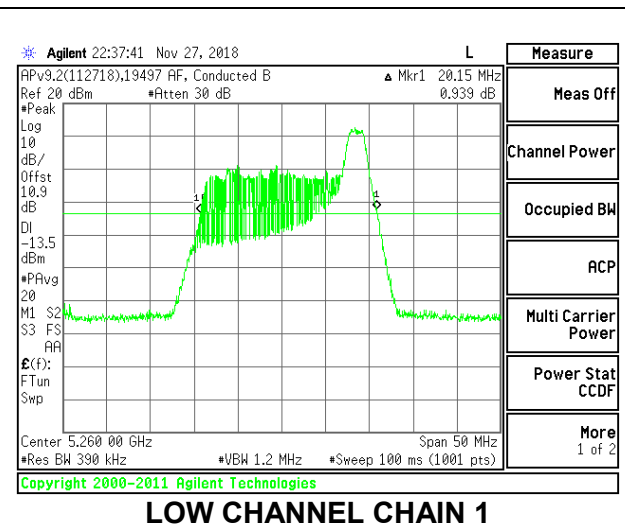
2TX Antenna 1 + Antenna 2 OFDMA MODE – 26-Tones, RU Index 8

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.05	20.15
Mid	5300	20.95	20.10
High	5320	21.10	19.95

LOW CHANNEL

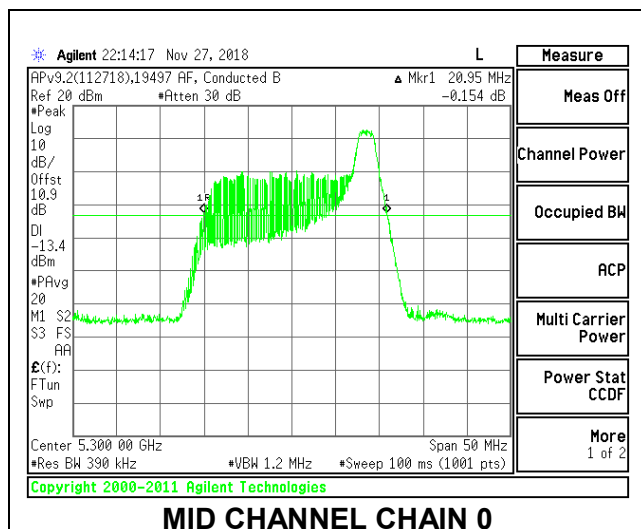


LOW CHANNEL CHAIN 0

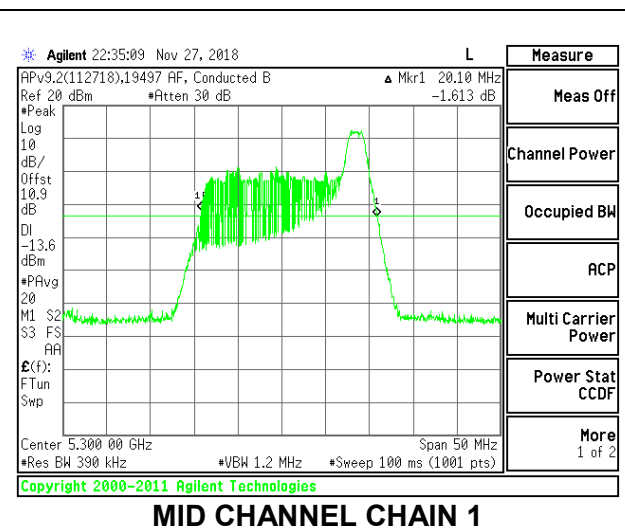


LOW CHANNEL CHAIN 1

MID CHANNEL

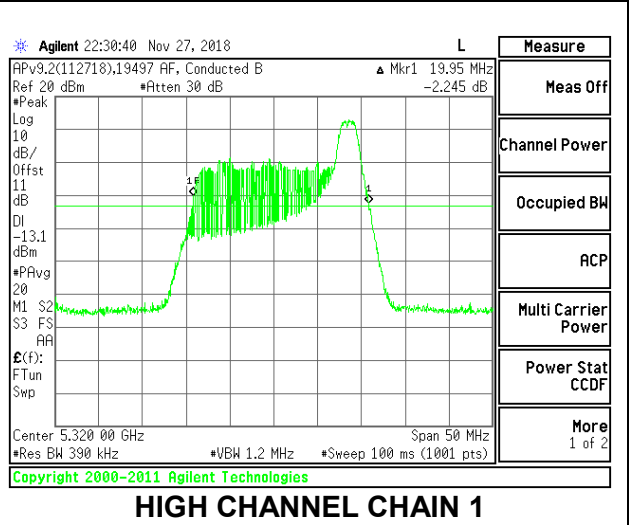
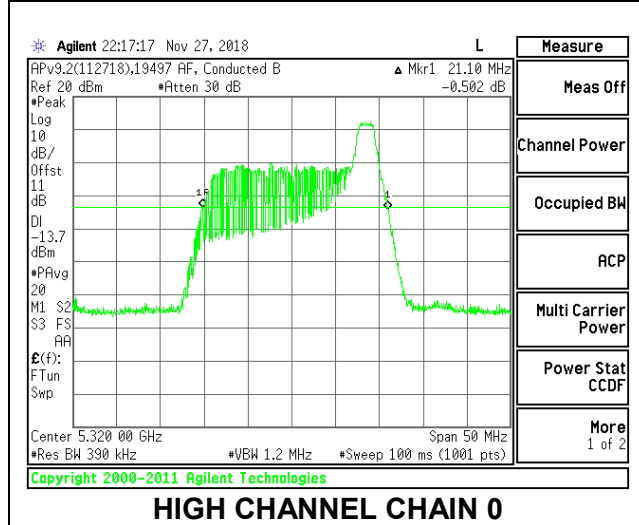


MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

HIGH CHANNEL

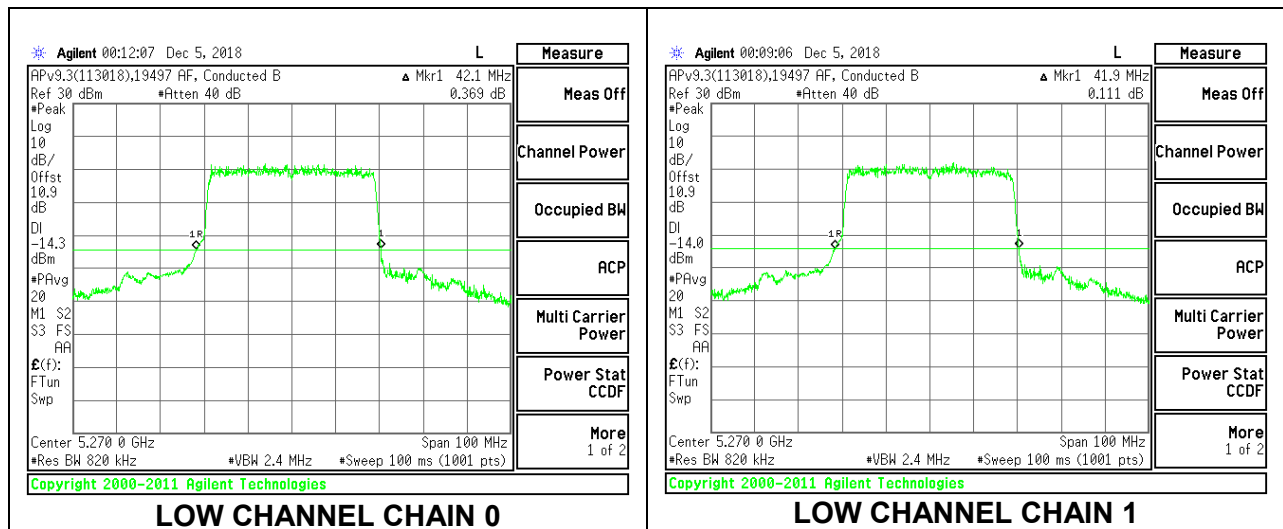


9.2.13. 802.11ax HE40 MODE IN THE 5.3 GHz BAND

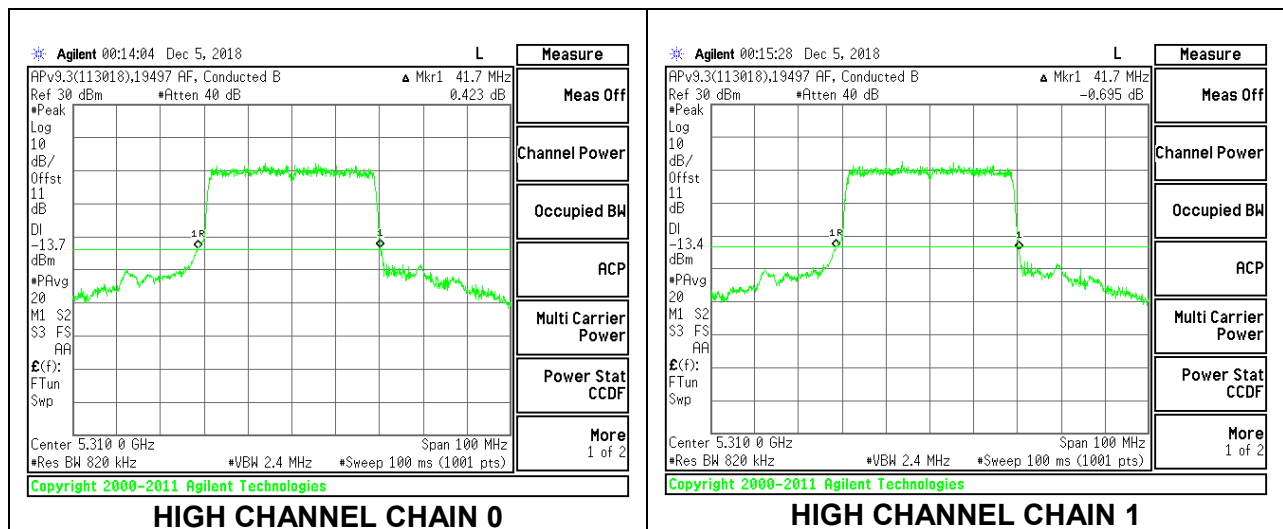
2TX Antenna 1 + Antenna 2 OFDMA MODE – 484-Tones, RU Index 65

Channel	Frequency (MHz)	26 dB Bandwidth (MHz) Chain 0	26 dB Bandwidth (MHz) Chain 1
Low	5270	42.10	41.90
High	5310	41.70	41.70

LOW CHANNEL



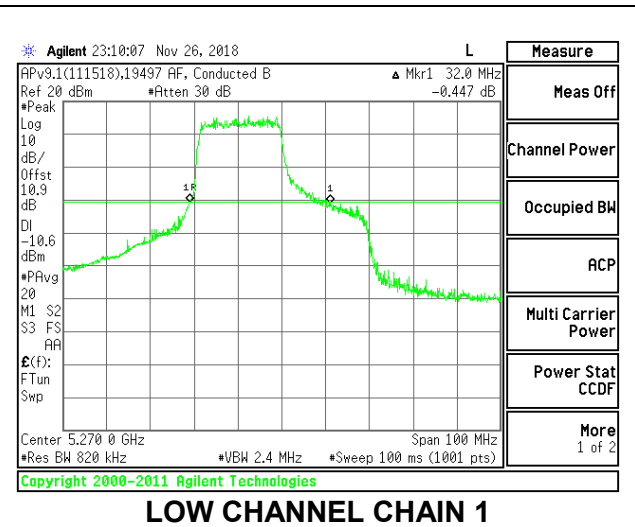
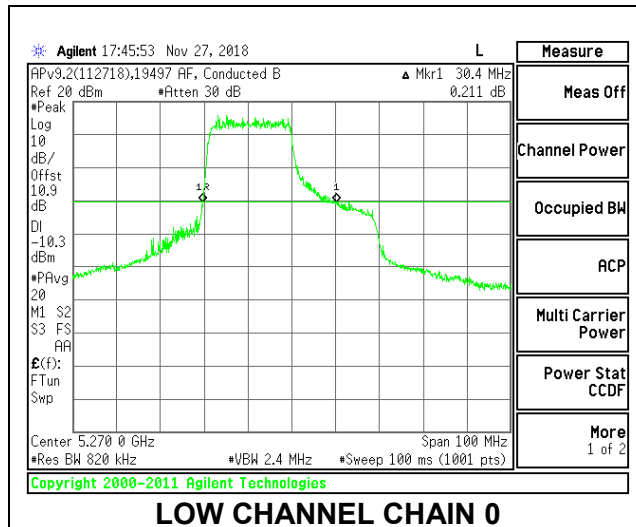
HIGH CHANNEL



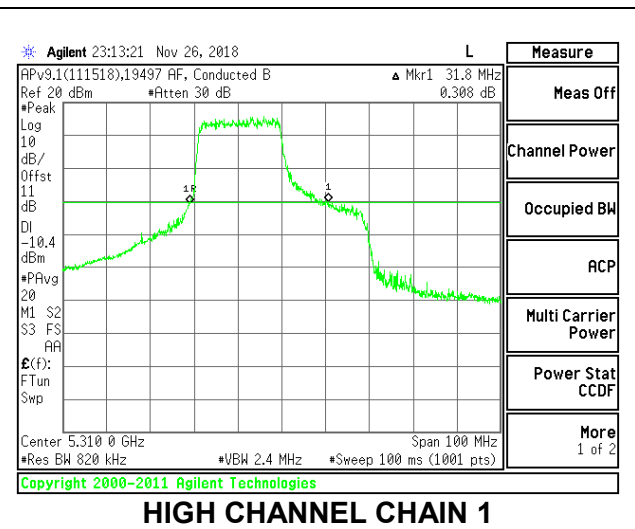
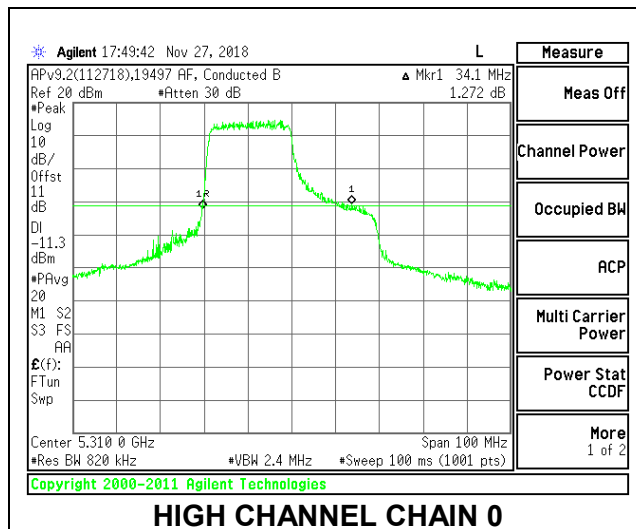
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 61

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	30.40	32.00
High	5310	34.10	31.80

LOW CHANNEL



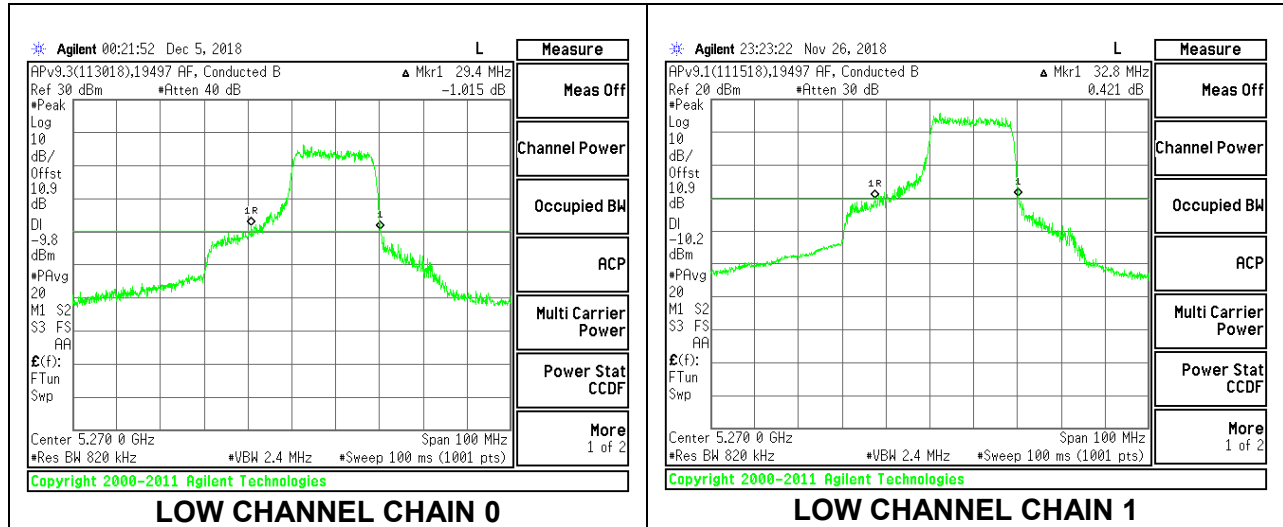
HIGH CHANNEL



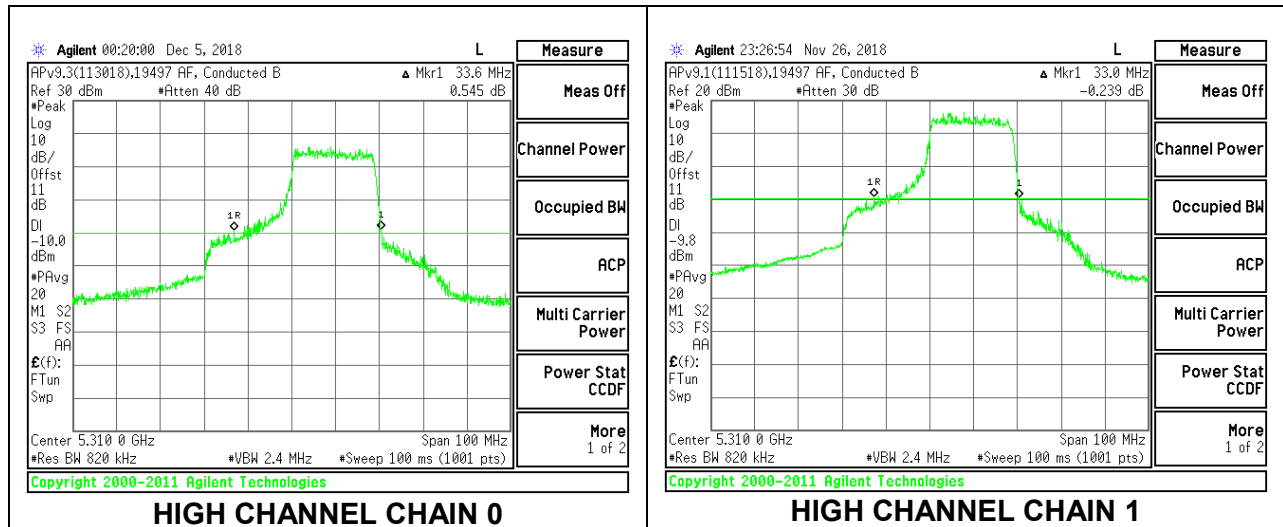
2TX Antenna 1 + Antenna 2 OFDMA MODE – 242-Tones, RU Index 62

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	29.40	32.80
High	5310	33.60	33.00

LOW CHANNEL



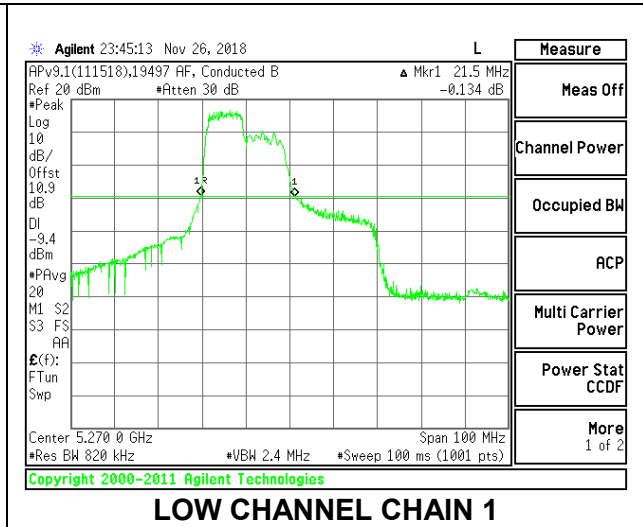
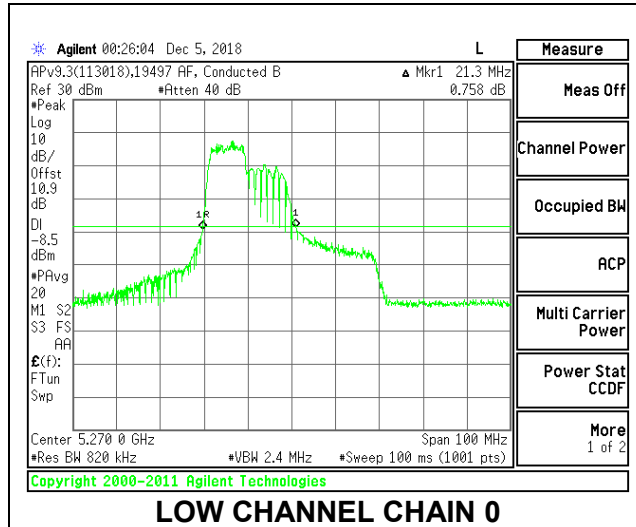
HIGH CHANNEL



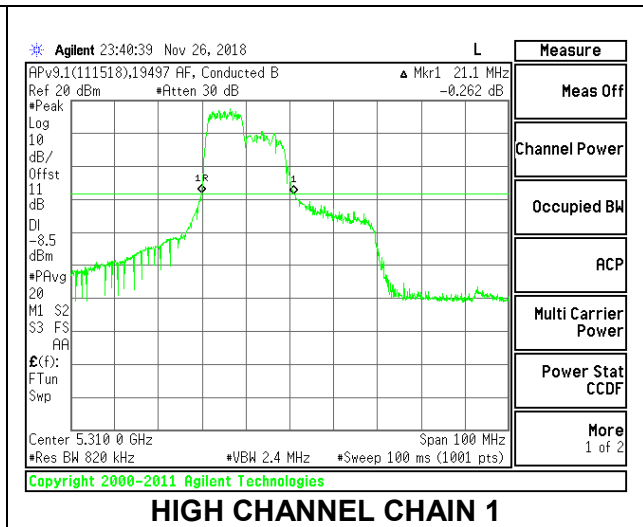
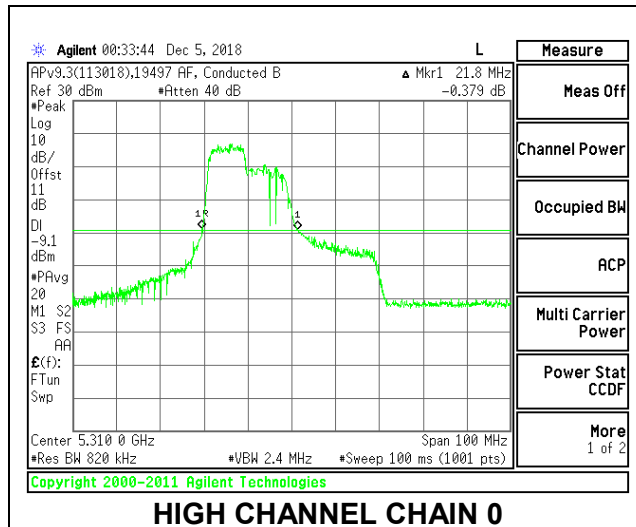
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 53

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5270	21.30	21.50
High	5310	21.80	21.10

LOW CHANNEL



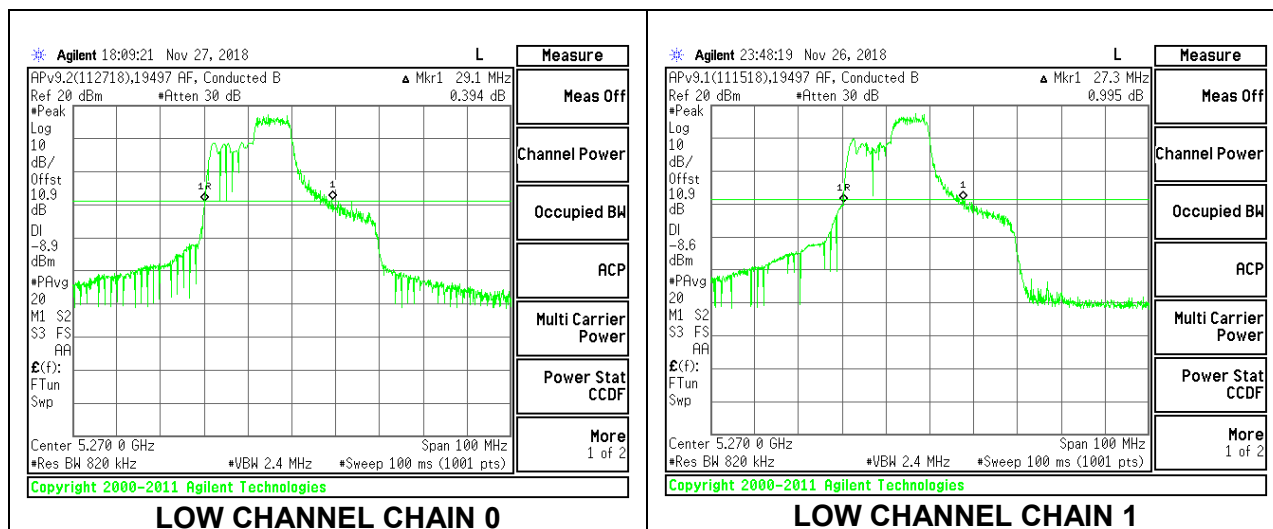
HIGH CHANNEL



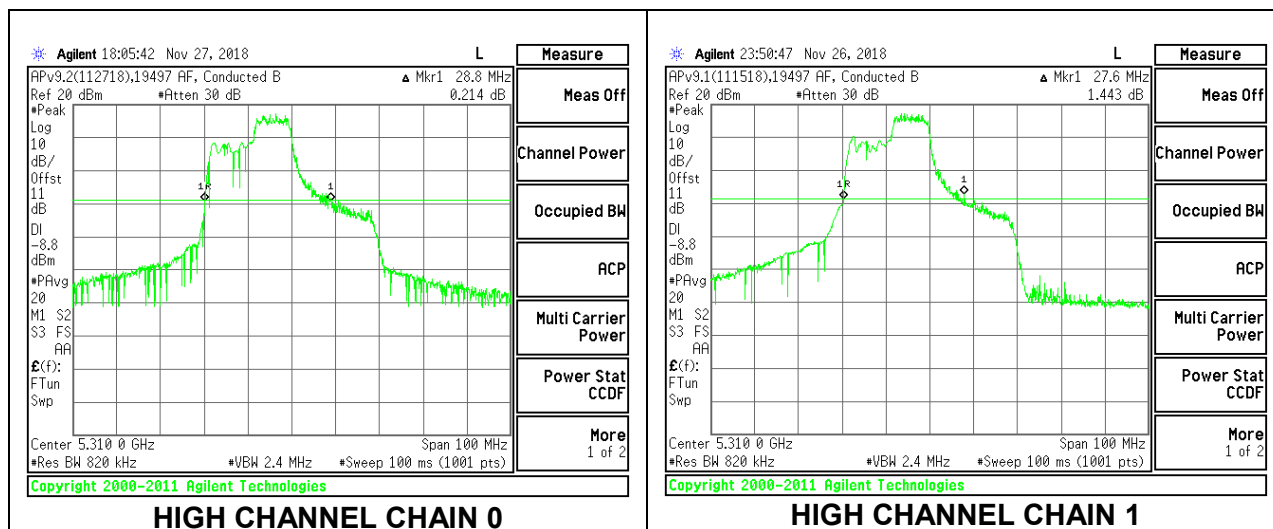
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 54

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5270	29.10	27.30
High	5310	28.80	27.60

LOW CHANNEL



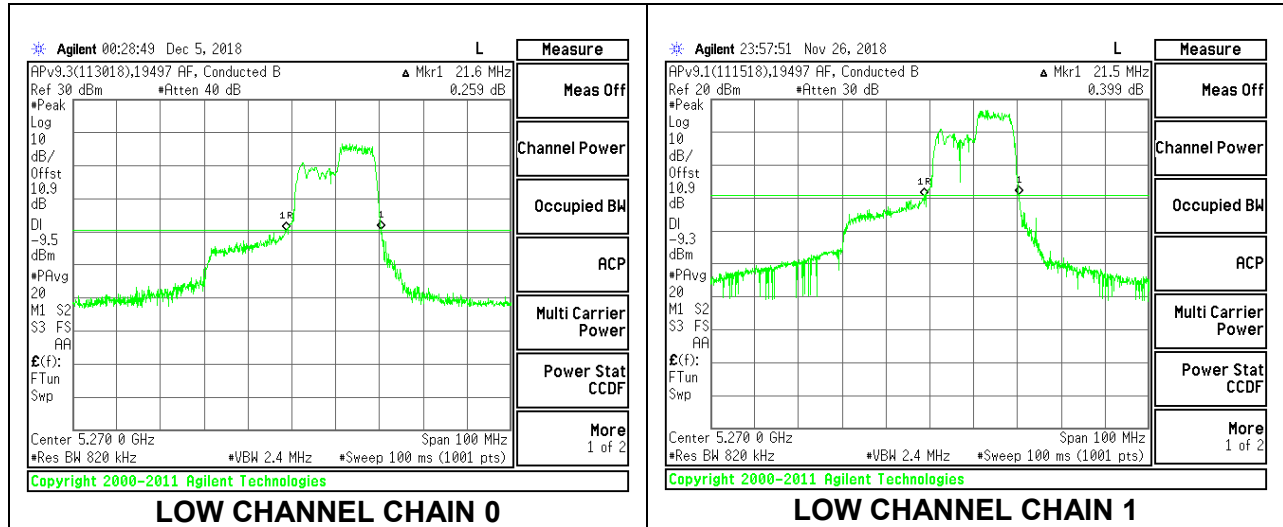
HIGH CHANNEL



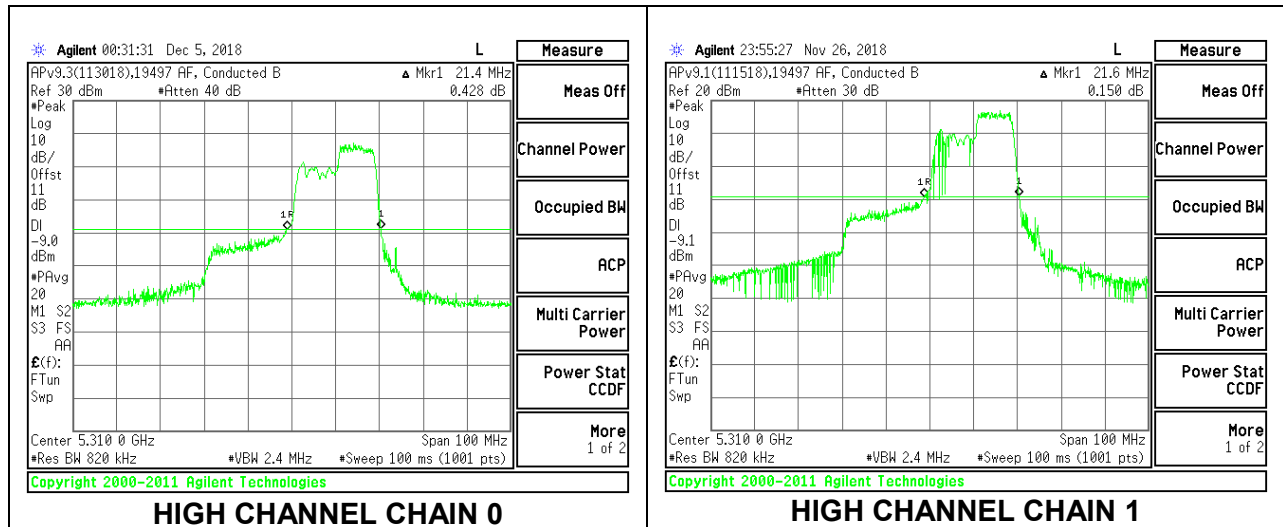
2TX Antenna 1 + Antenna 2 OFDMA MODE – 106-Tones, RU Index 56

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	21.60	21.50
High	5310	21.40	21.60

LOW CHANNEL



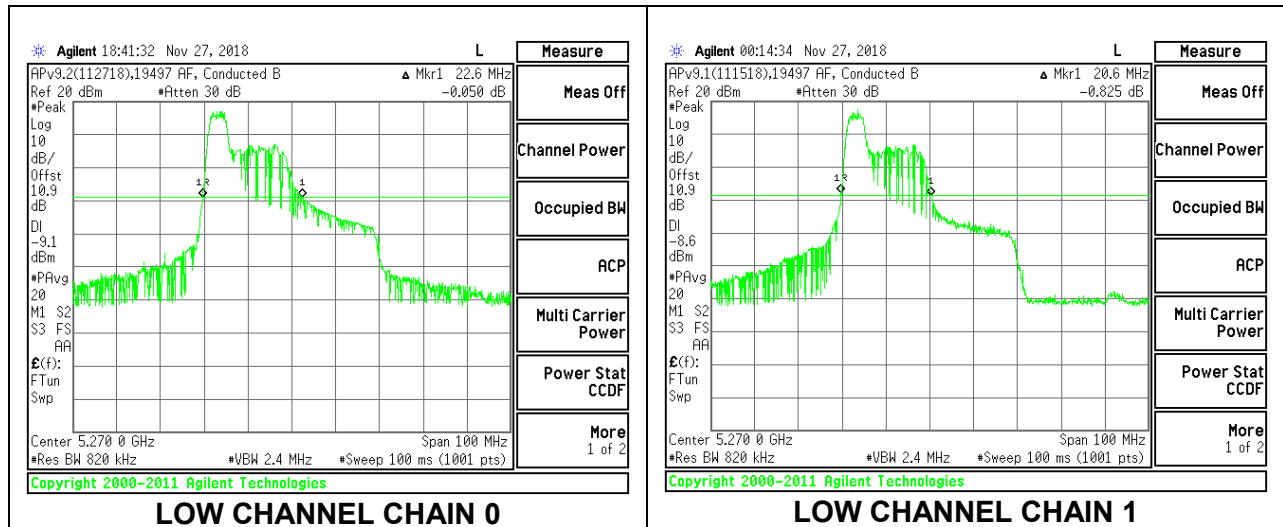
HIGH CHANNEL



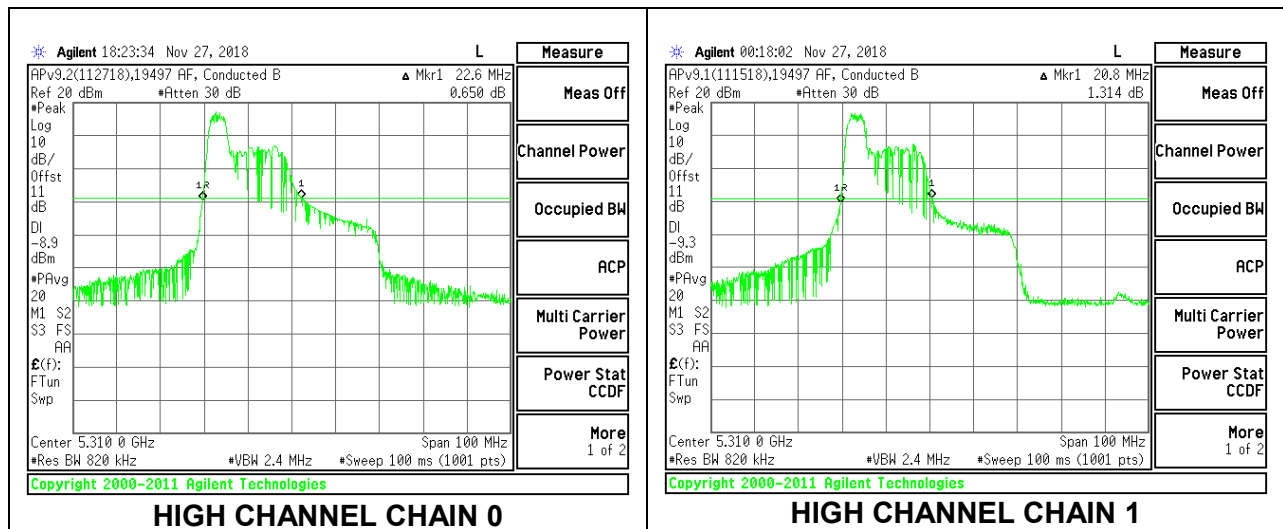
2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 37

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5270	22.60	20.60
High	5310	22.60	20.80

LOW CHANNEL



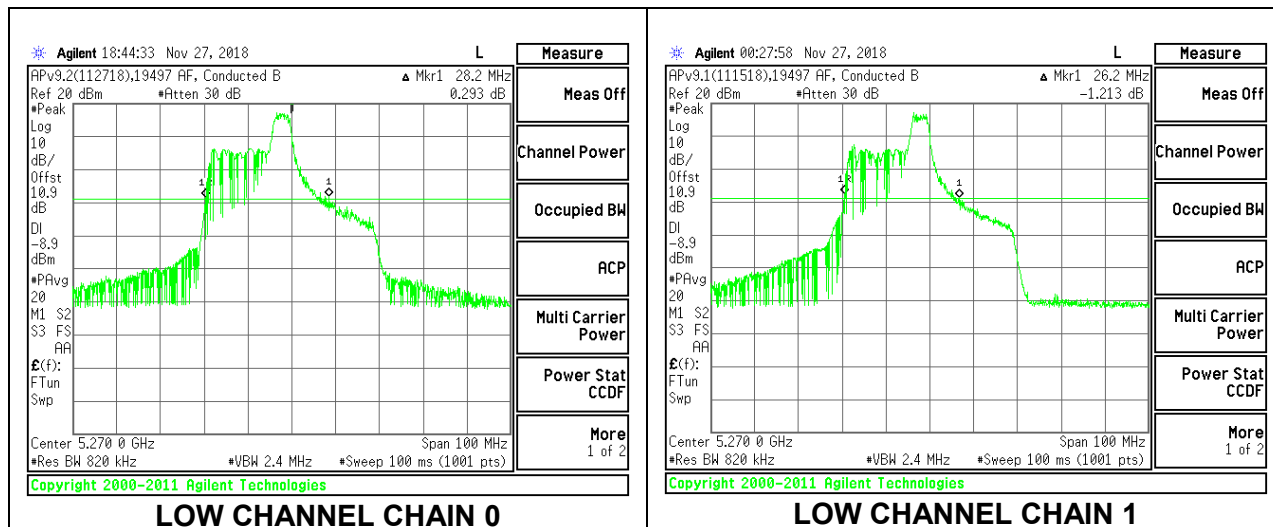
HIGH CHANNEL



2TX Antenna 1 + Antenna 2 OFDMA MODE – 52-Tones, RU Index 40

Channel	Frequency (MHz)	26 dB Bandwidth	
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5270	28.20	26.20
High	5310	27.40	25.40

LOW CHANNEL



HIGH CHANNEL

