



CERTIFICATION TEST REPORT

Report Number. : 12049380-E3V3

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

Model : S16

FCC ID : SBVRM015

IC : 5373A-RM015

EUT Description : 4X4 802.11a/b/g/n HT20 CLIENT & MASTER DEVICE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E
ISED RSS-247 ISSUE 2
ISED RSS-GEN ISSUE 5

Date Of Issue:
October 26, 2018

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REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions | Revised By |
|------|------------|---|------------|
| V1 | 10/5/2018 | Initial Issue | |
| V2 | 10/16/2018 | Updated Section 5.3 & 8.5 (Directinal Anntena gain table) | K.Kedida |
| V3 | 10/26/2018 | Updated Section 5.5, 9.3 & 11 | K.Kedida |

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: 4X4 802.11a/b/g/n HT20 CLIENT & MASTER DEVICE

MODEL: S16

SERIAL NUMBER: 1807-34-7E-5C-00-10-20-4 (Radiated Sample)
1807-34-7E-5C-00-0F-D5-E (Conducted Sample)

DATE TESTED: August 16 – October 3, 2018

| APPLICABLE STANDARDS | |
|--------------------------|--------------|
| STANDARD | TEST RESULTS |
| CFR 47 Part 15 Subpart E | Complies |
| ISED RSS-247 Issue 2 | Complies |
| ISED RSS-GEN Issue 5 | Complies |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC KDB 662911 D01 Multiple Transmitter Output v02r01, FCC KDB 789033 D02 v02r01, ANSI C63.10-2013, RSS-GEN Issue 5, and RSS-247 Issue 2.

3. 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 checked="" type="checkbox"/> Chamber A (ISED:2324B-1) | <input type="checkbox"/> Chamber D (ISED:22541-1) | <input type="checkbox"/> Chamber K (ISED: 2324A-1) |
| <input checked="" type="checkbox"/> Chamber B (ISED:2324B-2) | <input type="checkbox"/> Chamber E (ISED:22541-2) | <input type="checkbox"/> Chamber L (ISED: 2324A-3) |
| <input checked="" type="checkbox"/> Chamber C (ISED:2324B-3) | <input type="checkbox"/> Chamber F (ISED:22541-3) | |
| | <input type="checkbox"/> Chamber G (ISED:22541-4) | |
| | <input type="checkbox"/> Chamber H (ISED:22541-5) | |

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

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.

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a 4X4 802.11a/b/g/n HT20 CLIENT & MASTER DEVICE.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|--------------------------|--------------|--------------------|-------------------|
| Radio 0 | | | |
| 5.2 GHz band, 4TX | | | |
| 5180-5240 | 802.11a | 19.49 | 88.92 |
| 5180-5240 | 802.11n HT20 | 19.63 | 91.83 |
| 5.3 GHz band, 4TX | | | |
| 5260-5320 | 802.11a | 20.24 | 105.68 |
| 5260-5320 | 802.11n HT20 | 20.73 | 118.30 |
| 5.6 GHz band, 4TX | | | |
| 5500-5700 | 802.11a | 19.31 | 85.31 |
| 5500-5700 | 802.11n HT20 | 20.40 | 109.65 |
| 5.8 GHz band, TX | | | |
| 5725-5850 | 802.11a | 24.66 | 292.42 |
| 5725-5850 | 802.11n HT20 | 23.86 | 243.22 |
| Radio 1 | | | |
| 5.2 GHz band, 4TX | | | |
| 5180-5240 | 802.11n HT20 | 19.53 | 89.74 |
| 5.3 GHz band, 4TX | | | |
| 5260-5320 | 802.11n HT20 | 19.33 | 85.70 |
| 5.6 GHz band, 4TX | | | |
| 5500-5700 | 802.11n HT20 | 19.23 | 83.75 |
| 5.8 GHz band, TX | | | |
| 5725-5850 | 802.11n HT20 | 24.30 | 269.15 |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

RADIO 0

| Frequency (MHz) | 5GHz Max Antenna Gain dBi | | | |
|-----------------|--------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| | Chain 0 (Horizontal Polarization) | Chain 1 (Horizontal Polarization) | Chain 2 (Vertical Polarization) | Chain 3 (Vertical Polarization) |
| 5180 - 5850 | 4.62 | 4.19 | 3.85 | 3.70 |

RADIO 1

| Frequency (MHz) | 5GHz Max Antenna Gain dBi | | | |
|-----------------|------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|
| | Chain 0 (Vertical Polarization) | Chain 1 (Vertical Polarization) | Chain 2 (Horizontal Polarization) | Chain 3 (Horizontal Polarization) |
| 5180 - 5850 | 3.70 | 3.85 | 4.19 | 4.62 |

5.4. SOFTWARE AND FIRMWARE

The EUT software were installed during testing was 44.2-53220-RF-Complianc_20180523.

The test utility software used during testing was Sonos Compliance GUI V2.2.

5.5. WORST -CASE CONFIGURATION AND MODE

All configuration was investigated and the worst-case configuration for below 1GHz radiated emissions were performed with the EUT and exercised with all supported external accessories. The worst-case configuration for radiated emissions above 1GHz, and power line conducted emissions were performed with the EUT only.

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.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation for below 1GHz and Z orientation was worst-case orientation for above 1GHz.

Simultaneous transmission for BLE, DTS and 5GHz WLAN radio was investigated, no additional noticeable emissions were found.

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

802.11a mode: 6 Mbps

802.11n HT20mode: MCS3

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Support Equipment List | | | | |
|------------------------|--------------|-------------|------------------------|--------|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| Laptop | Lenovo | X1 Carbon | R9-01VD86 | N/A |
| AC Adapter | Lenovo | ADLX65NLT2A | 11S36200291ZZ200315AJU | N/A |
| Charging Base | Lenovo | X200 | 1S43R8781R934HPB | N/A |

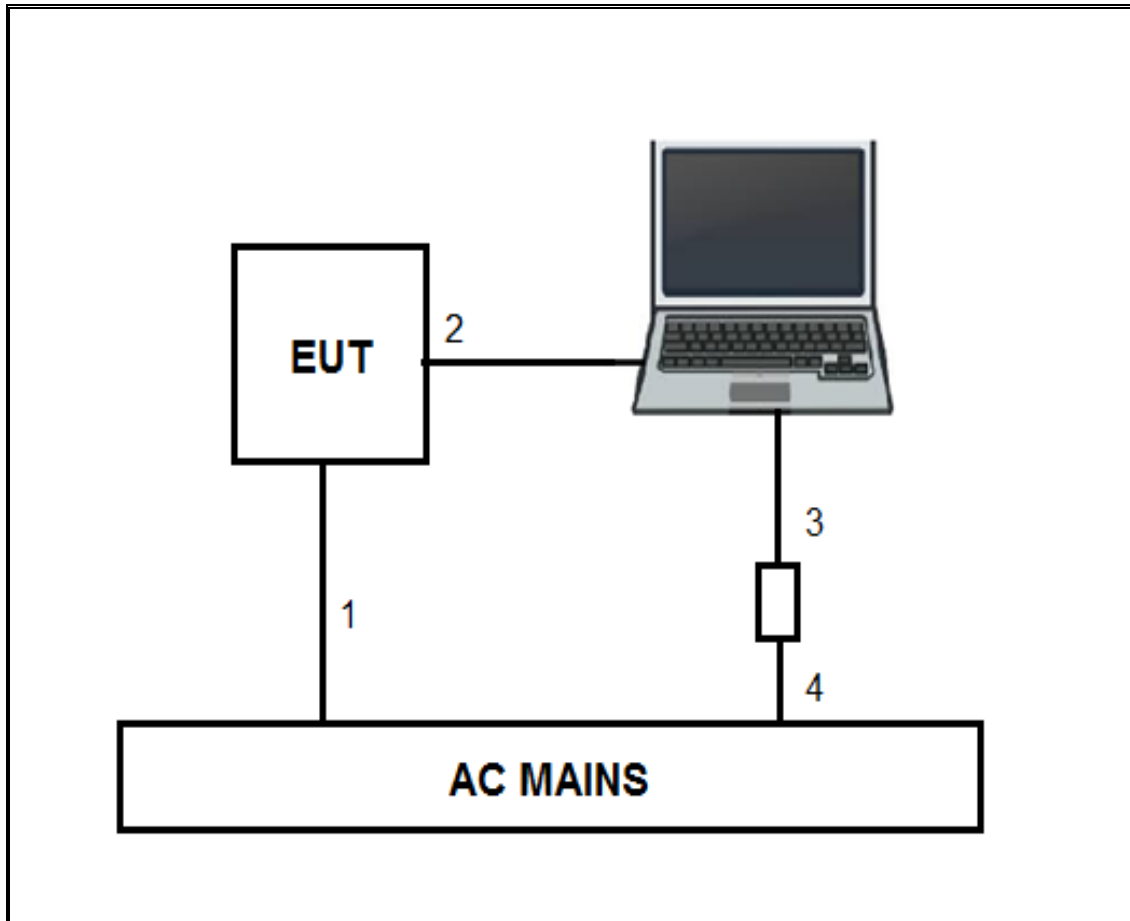
I/O CABLES

| I/O Cable List | | | | | | |
|----------------|----------|----------------------|----------------|------------|------------------|---------------------------|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | AC Power | 1 | AC | Unshielded | 2 | AC Mains to EUT |
| 2 | Ethernet | 1 | RJ45 | Unshielded | 10 | EUT to Laptop |
| 3 | DC Power | 1 | DC | Shielded | 1.2 | AC/DC Adapter to Laptop |
| 4 | AC Power | 1 | AC | Unshielded | 1 | AC Mains to AC/DC Adapter |

TEST SETUP

The EUT is a stand-alone unit, and the radio is exercised by Sonos Compliance GUI V2.2 test utility software via Ethernet.

SETUP DIAGRAM



6. MEASUREMENT METHOD

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

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

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

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

Conducted Output Power: KDB 789033 D02 v02r01, Section E.3.b (Method PM-G) and KDB 789033 D02 v02r01, Section E.2.b (Method SA-1)

Power Spectral Density: KDB 789033 D02 v02r01, Section F

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

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

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

7. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST | | | | |
|--|---------------------------------|------------------------|--------|------------|
| Description | Manufacturer | Model | ID Num | Cal Due |
| Amplifier, 10KHz to 1GHz, 32dB | Agilent (Keysight) Technologies | 8447D | T10 | 08/14/2019 |
| Amplifier, 10KHz to 1GHz, 32dB | Agilent (Keysight) Technologies | 8447D | T15 | 08/05/2019 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences Corp. | JB1 | T407 | 05/10/2019 |
| Antenna, Horn 1-18GHz | ETS-Lindgren | 3117 | T862 | 05/24/2019 |
| Antenna, Horn 1-18GHz | ETS-Lindgren | 3117 | T863 | 06/21/2019 |
| Amplifier, 1 to 8GHz, 35dB | Miteq Inc. | AMF-4D-01000800-30-29P | T1156 | 04/03/2019 |
| Amplifier, 1 to 8GHz, 35dB | Miteq Inc. | AMF-4D-01000800-30-29P | T1573 | 6/12/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T1454 | 01/08/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T1113 | 12/21/2018 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T1466 | 04/16/2019 |
| Power Meter, P-series single channel | Agilent (Keysight) Technologies | N1911A | T1271 | 07/17/2019 |
| Power Sensor, P-series, 50MHz to 18GHz, Wideband | Agilent (Keysight) Technologies | N1921A | T1225 | 04/10/2019 |
| Antenna, Active Loop 9kHz-30MHz | Com-Power Corp. | AL-130R | T1866 | 10/10/2018 |
| 18 - 26.5 GHz Horn Antenna | Seavey Division | MWH-1826/B | T89 | 01/18/2019 |
| Pre-Amp 1-26.5 GHz | Agilent | 8449B | T404 | 03/09/2019 |
| EMI Reciever | Rohde & Schwarz | ESR | T1436 | 02/21/2019 |
| 26.5 – 40 GHz Horn Antenna | Seavey Division | MWH 2640/B | T446 | 08/09/2019 |
| Pre-Amp 26-40GHz | MITEQ | NSTTA2640-35-HG | T1864 | 03/09/2019 |
| L.I.S.N. | FCC INC. | FCC LISN 50/250 | T1310 | 06/15/2019 |

| Test Software List | | | |
|-----------------------|--------------|--------|-------------------------|
| Description | Manufacturer | Model | Version |
| Radiated Software | UL | UL EMC | Ver 9.5, June 24, 2015 |
| Conducted Software | UL | UL EMC | Ver 9.5, May 26, 2015 |
| Antenna Port Software | UL | UL RF | Ver 3.9.1, Dec 28, 2015 |

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

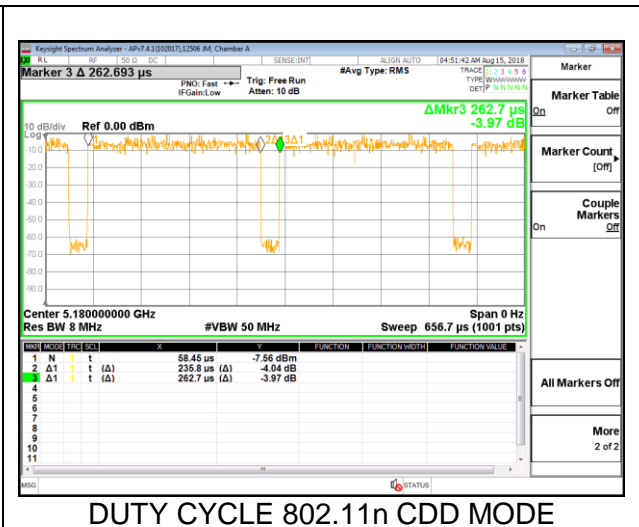
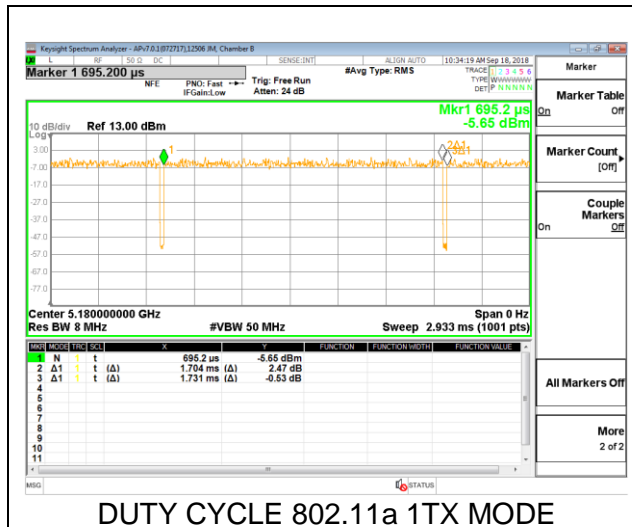
PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

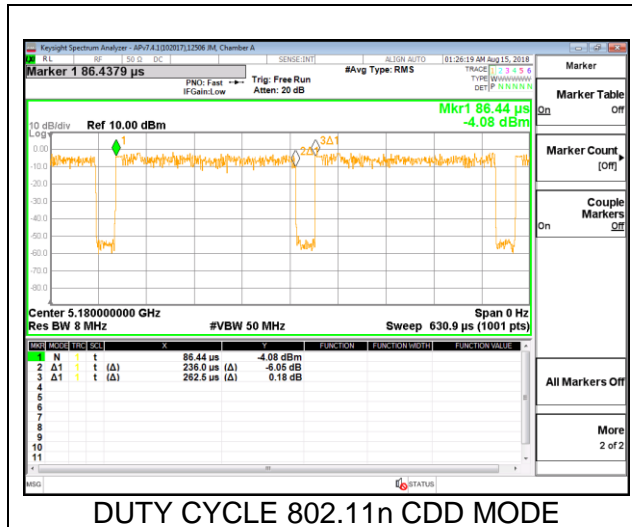
8.1.1 RADIO 0

| 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 | 1.704 | 1.731 | 0.984 | 98.44% | 0.00 | 0.010 |
| 802.11n HT20 | 0.235 | 0.262 | 0.898 | 89.85% | 0.46 | 4.248 |



8.1.2 RADIO 1

| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (kHz) |
|--------------|------------------------|------------------|-----------------------------|----------------------|---|-----------------------------|
| 802.11n HT20 | 0.236 | 0.262 | 0.900 | 90.00% | 0.46 | 4.241 |



8.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

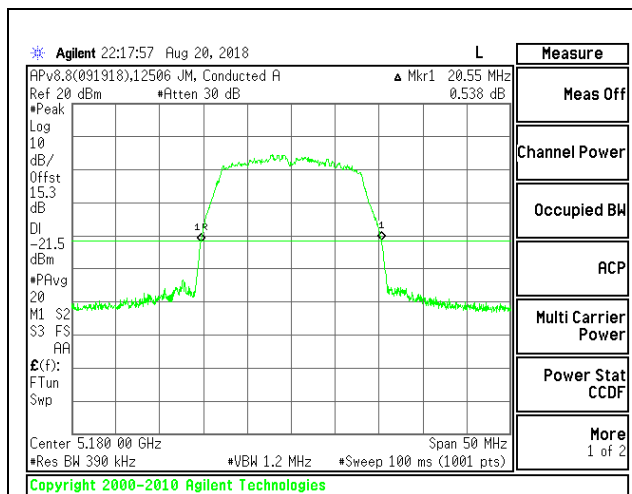
RESULTS

8.2.1 RADIO 0

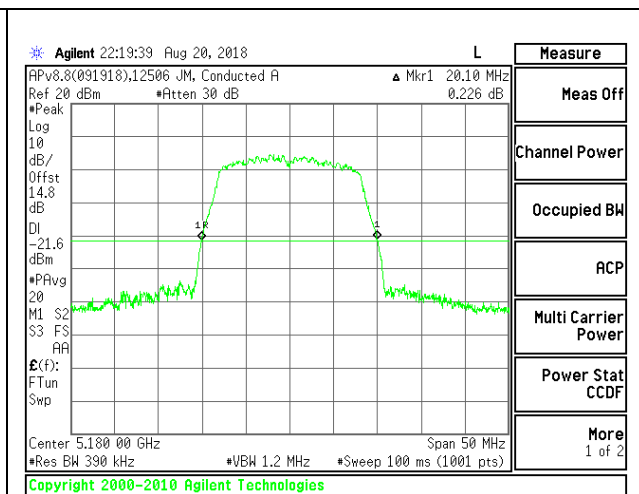
8.2.1.1. 802.11a MODE IN THE 5.2 GHZ BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5180 | 20.55 | 20.10 | 20.05 | 19.90 |
| Mid | 5200 | 20.55 | 20.05 | 19.90 | 19.95 |
| High | 5240 | 20.55 | 20.15 | 20.05 | 19.75 |

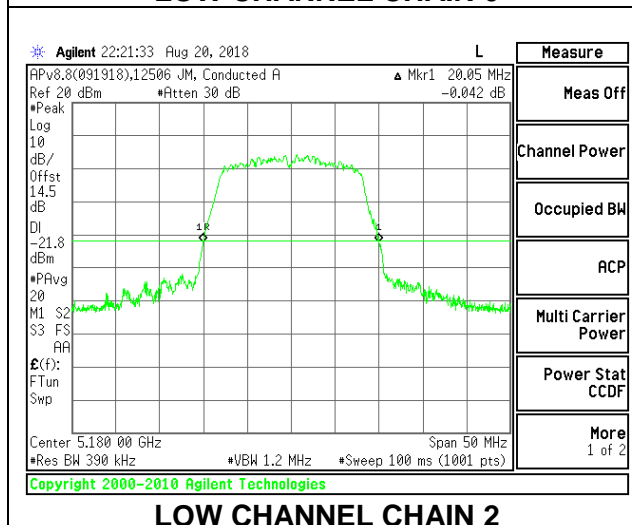
LOW CHANNEL



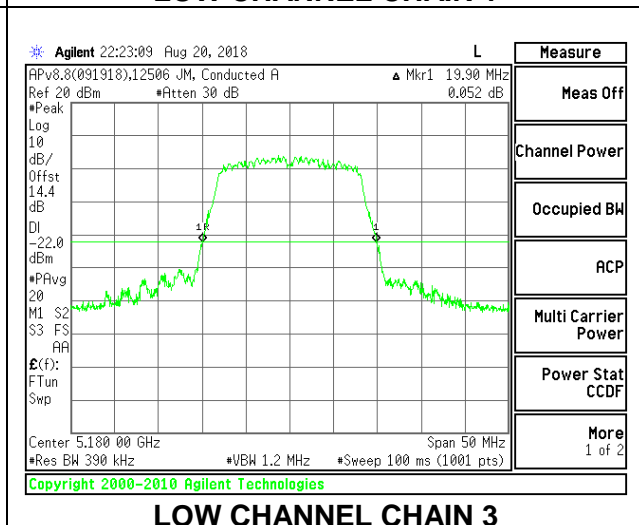
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

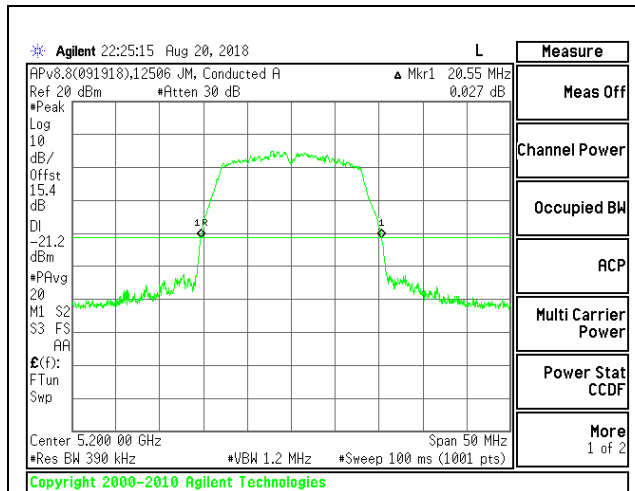


LOW CHANNEL CHAIN 2

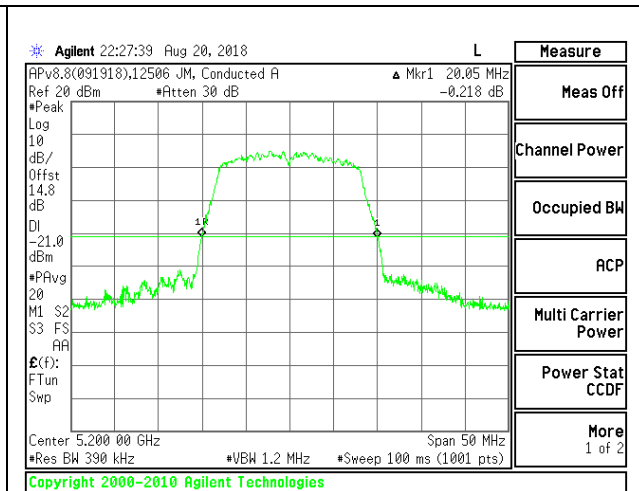


LOW CHANNEL CHAIN 3

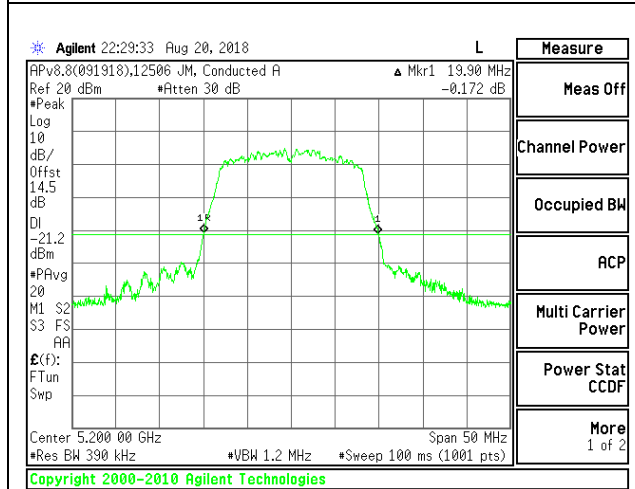
MID CHANNEL



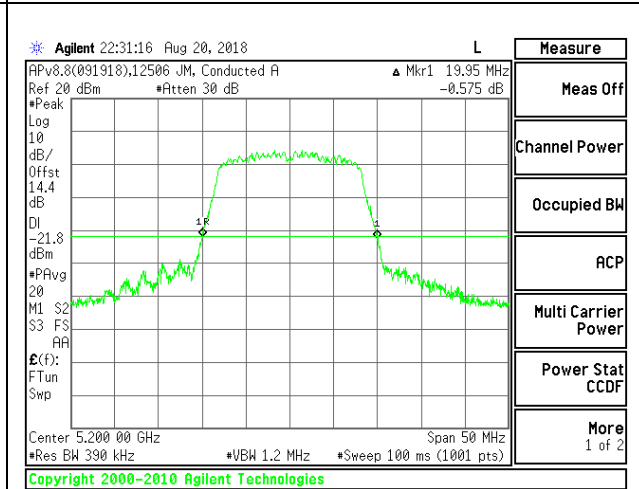
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

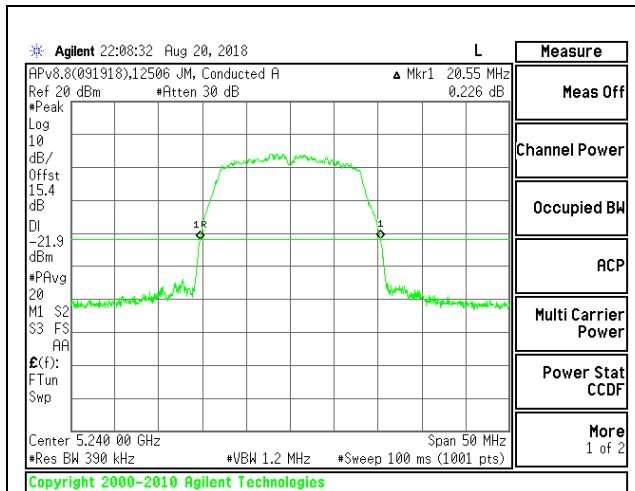


MID CHANNEL CHAIN 2

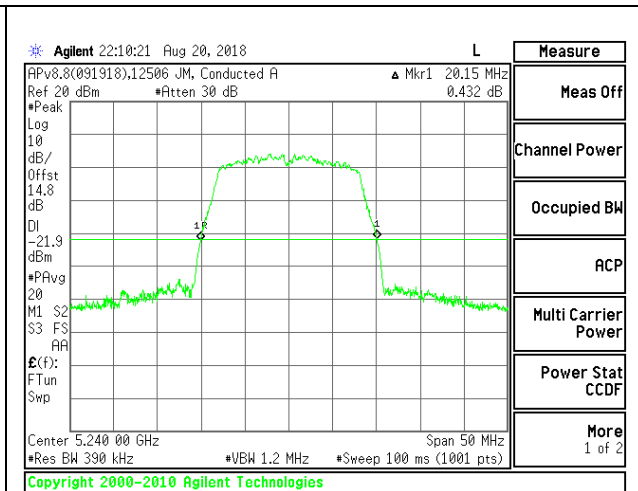


MID CHANNEL CHAIN 3

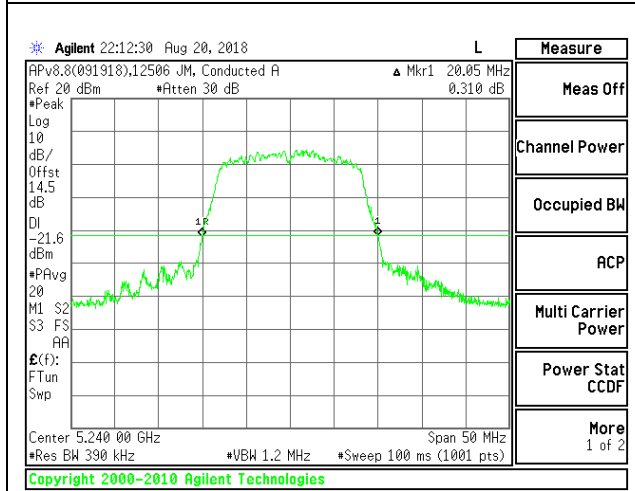
HIGH CHANNEL



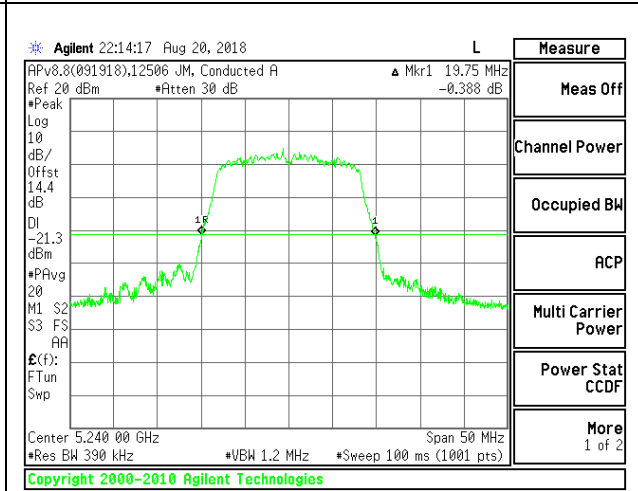
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

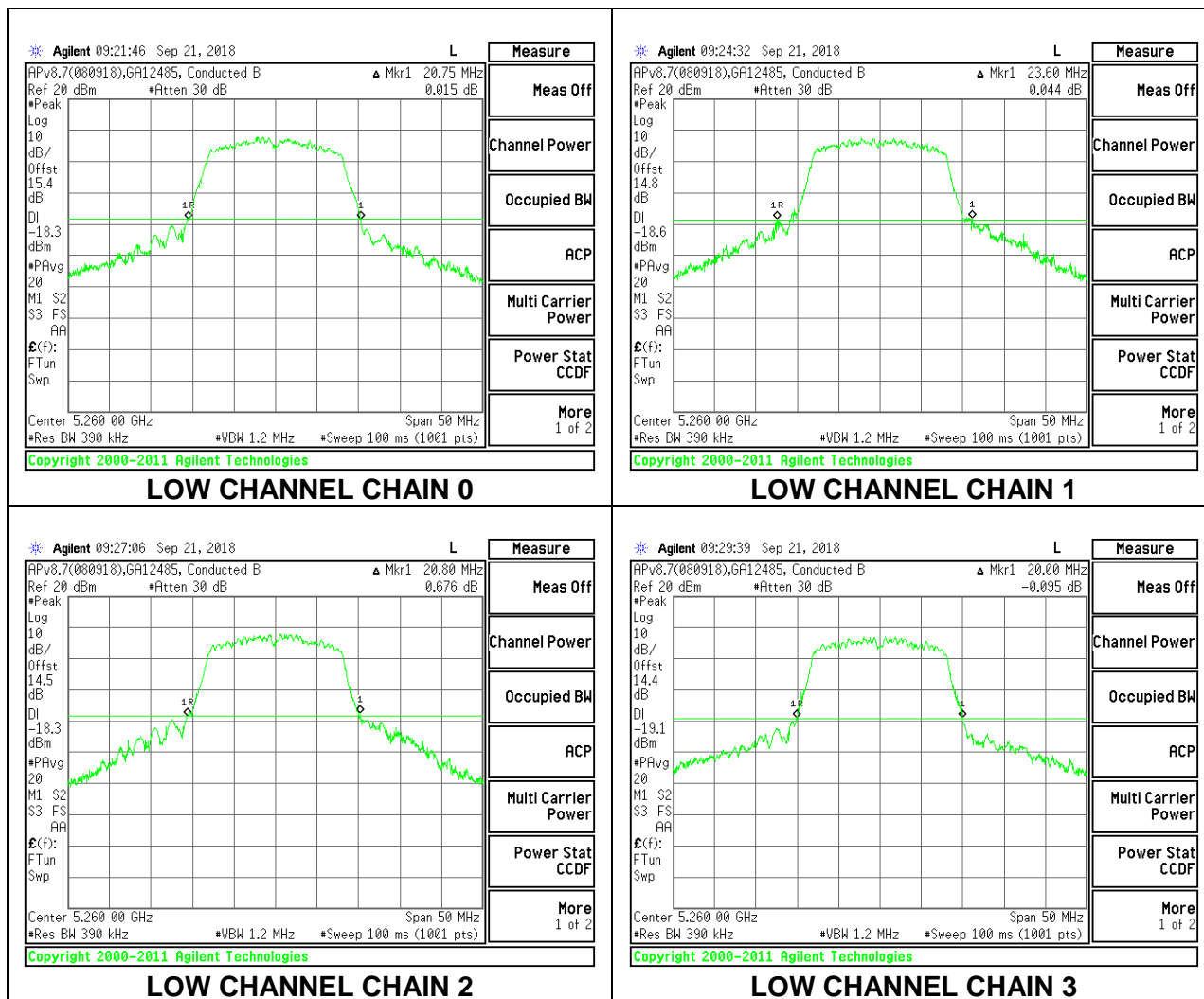


HIGH CHANNEL CHAIN 3

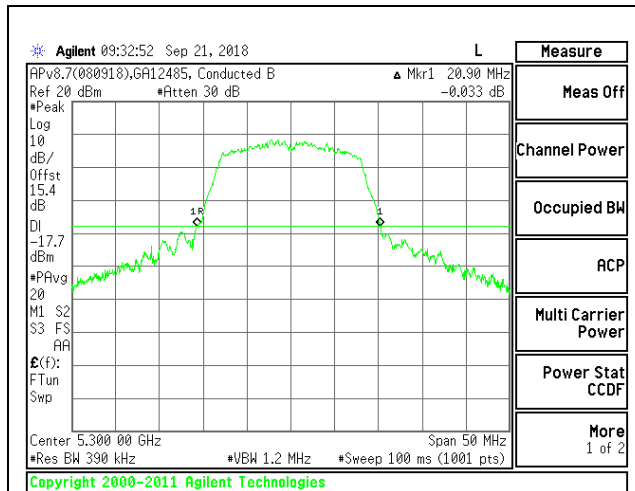
8.2.1.2. 802.11a MODE IN THE 5.3 GHZ BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5260 | 20.75 | 23.60 | 20.80 | 20.00 |
| Mid | 5300 | 20.90 | 21.85 | 20.80 | 20.50 |
| High | 5320 | 21.10 | 23.45 | 23.35 | 20.70 |

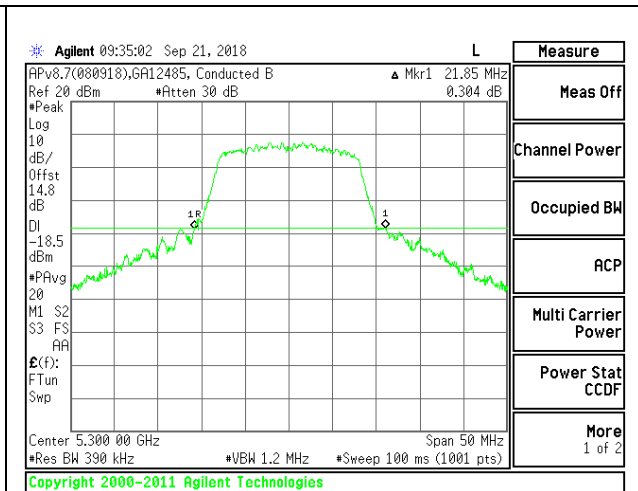
LOW CHANNEL



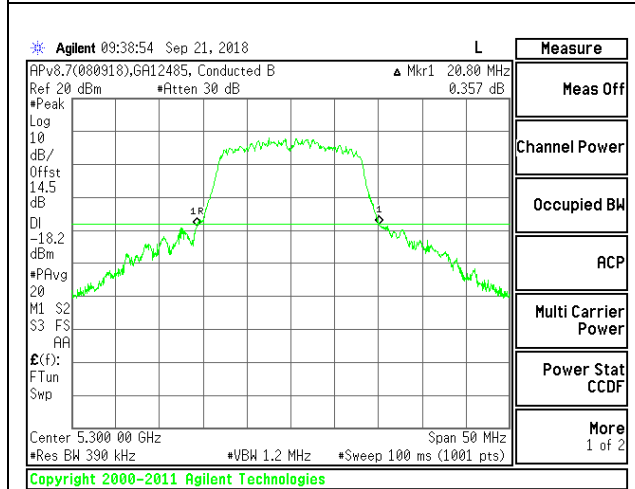
MID CHANNEL



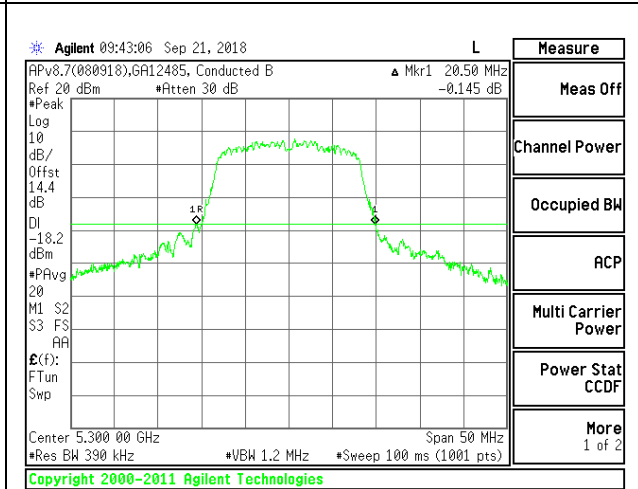
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

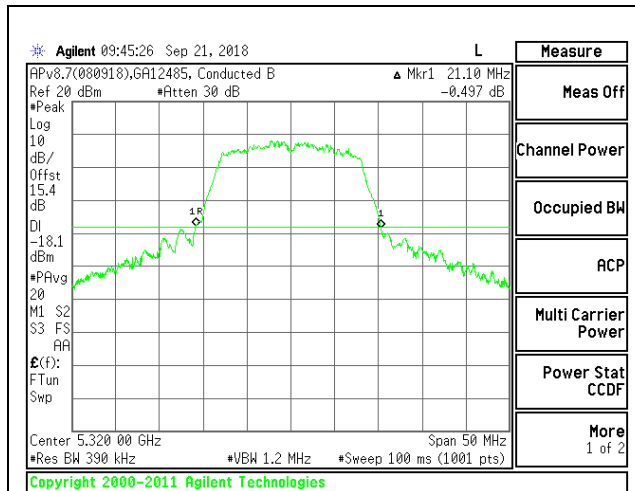


MID CHANNEL CHAIN 2

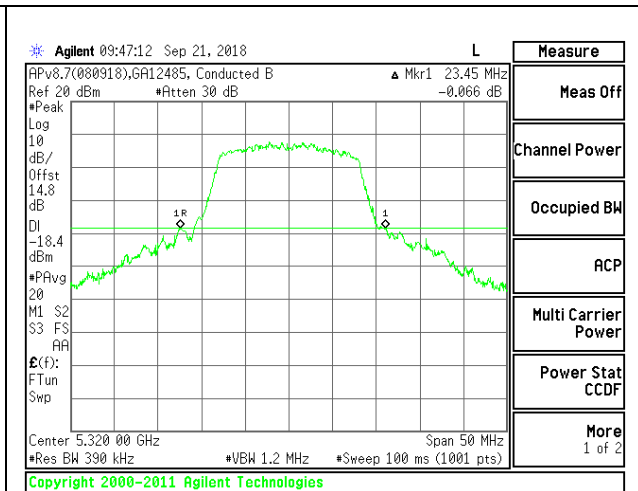


MID CHANNEL CHAIN 3

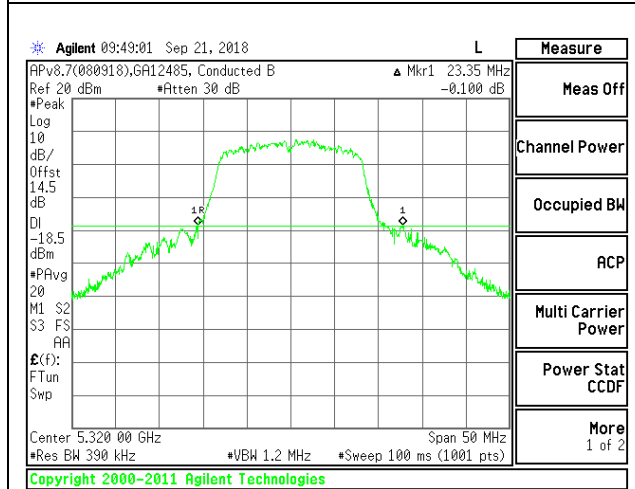
HIGH CHANNEL



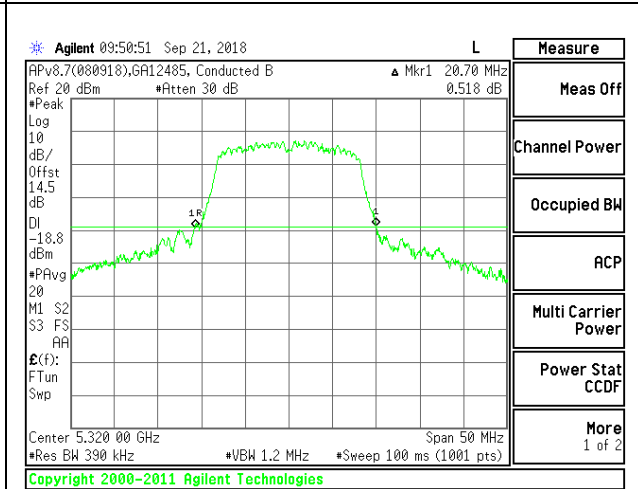
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

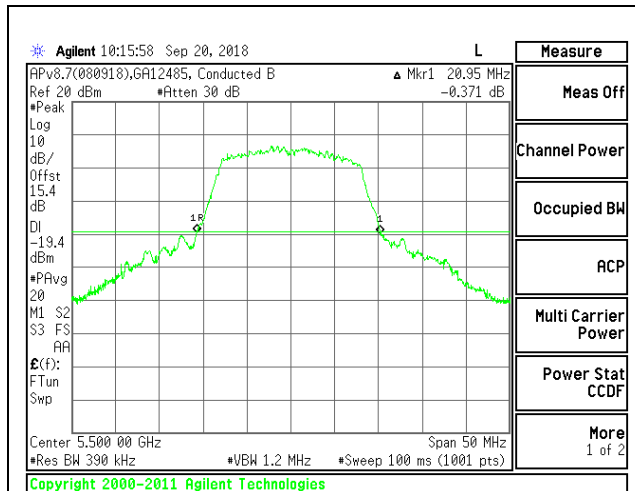


HIGH CHANNEL CHAIN 3

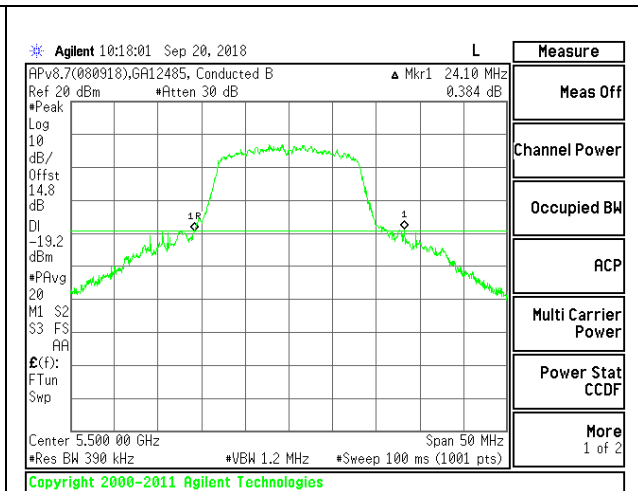
8.2.1.3. 802.11a MODE IN THE 5.6 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5500 | 20.95 | 24.10 | 20.70 | 20.10 |
| Mid | 5580 | 20.50 | 20.50 | 20.05 | 20.05 |
| High | 5700 | 20.50 | 20.10 | 20.15 | 19.85 |

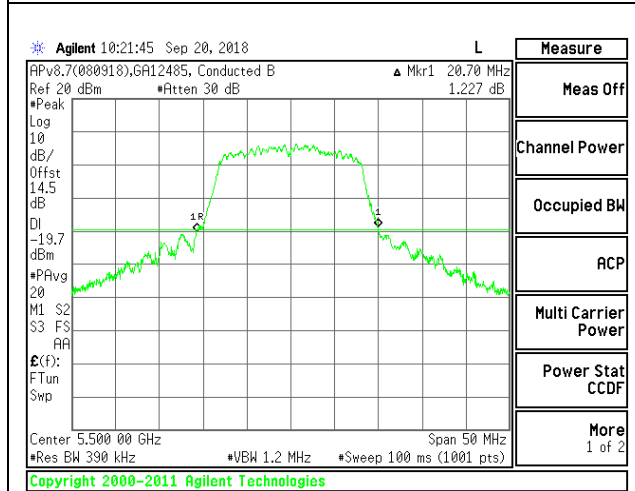
LOW CHANNEL



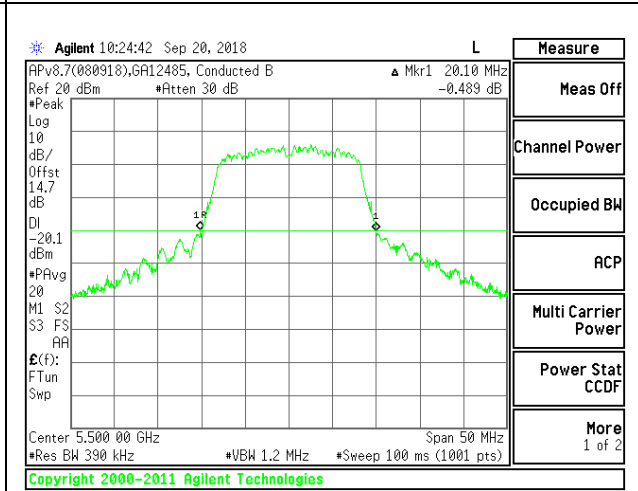
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

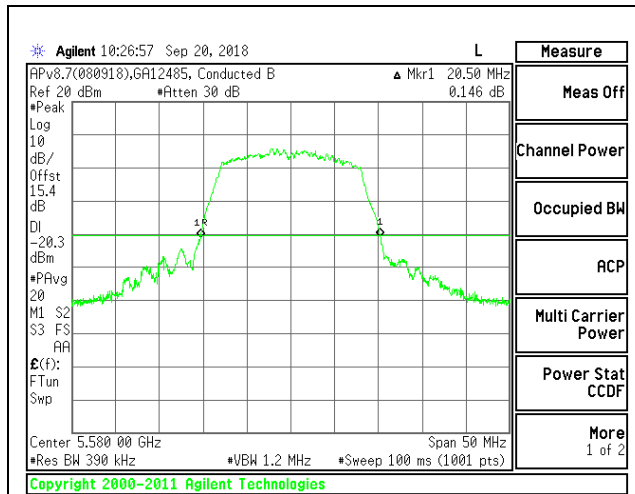


LOW CHANNEL CHAIN 2

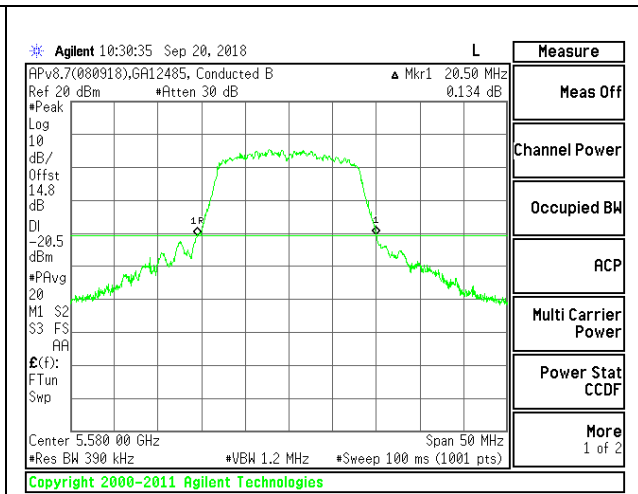


LOW CHANNEL CHAIN 3

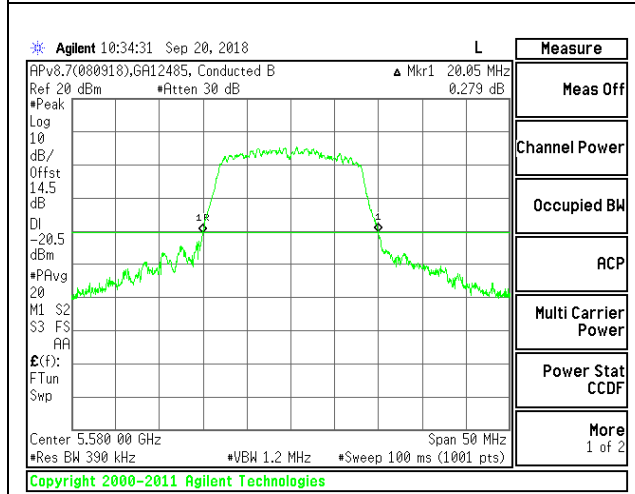
MID CHANNEL



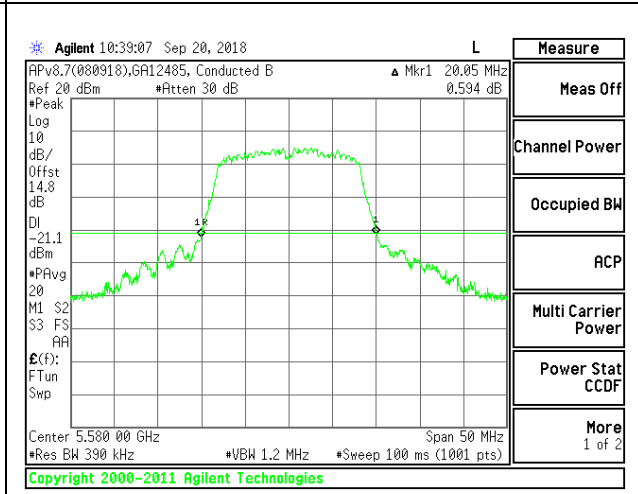
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

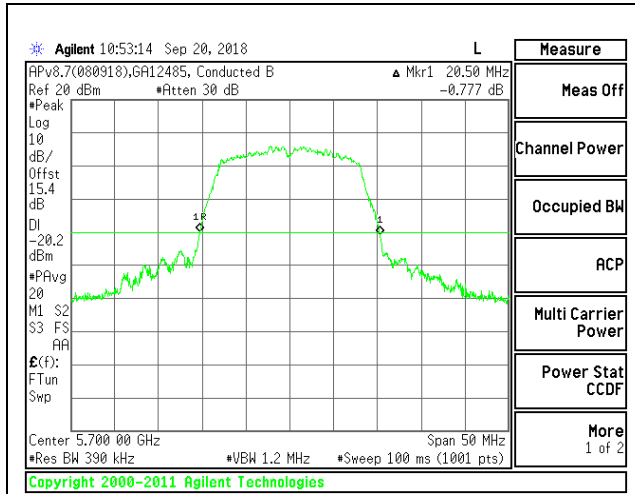


MID CHANNEL CHAIN 2

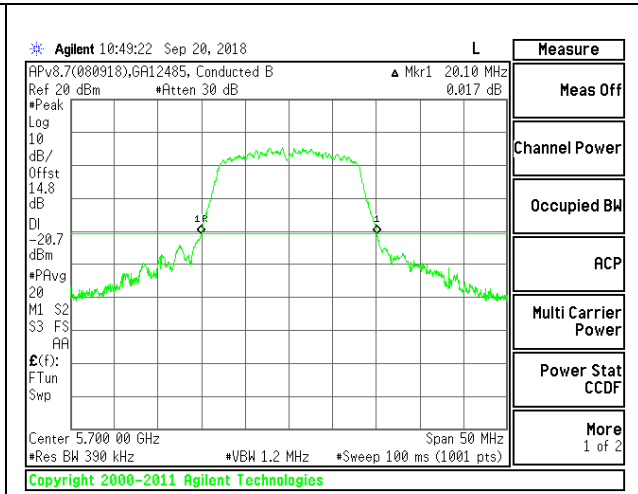


MID CHANNEL CHAIN 3

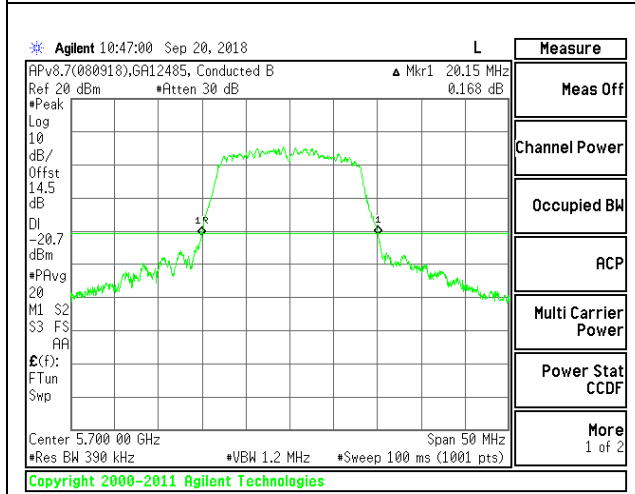
HIGH CHANNEL



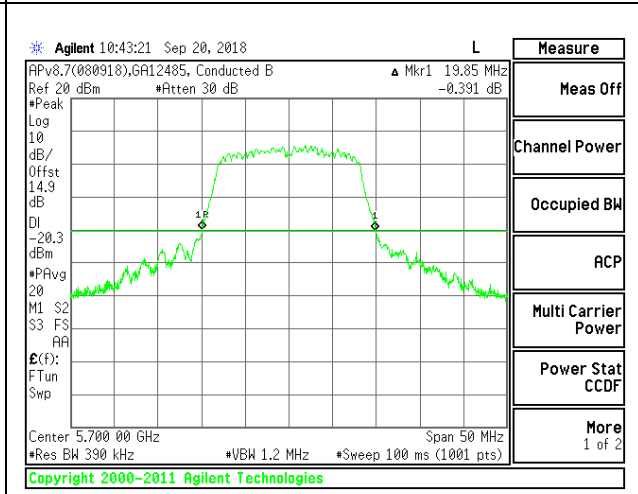
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

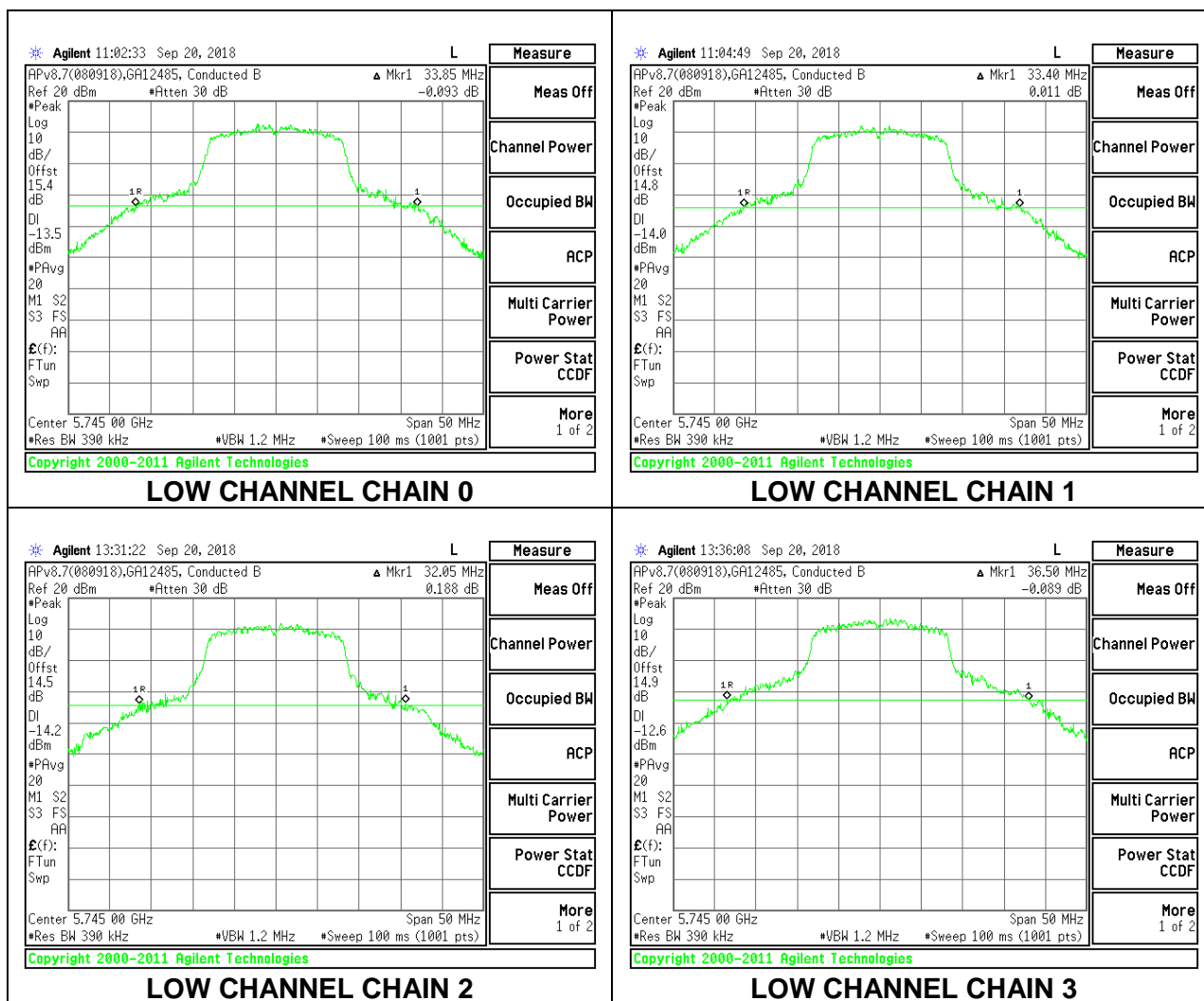


HIGH CHANNEL CHAIN 3

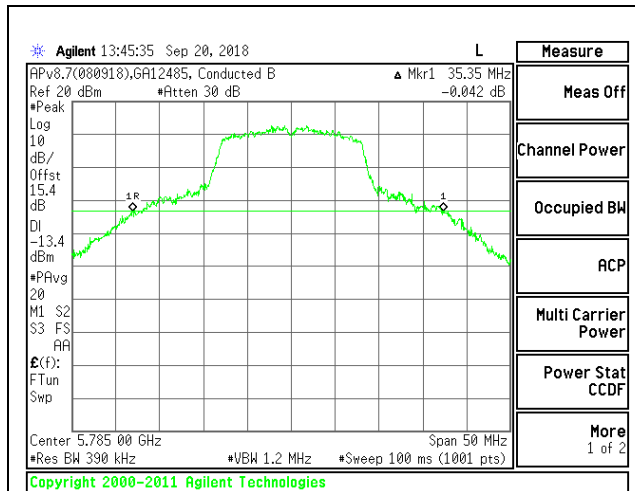
8.2.1.4. 802.11a MODE IN THE 5.8 GHZ BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5745 | 33.85 | 33.40 | 32.05 | 36.50 |
| Mid | 5785 | 35.35 | 34.60 | 33.25 | 37.50 |
| High | 5825 | 36.10 | 34.20 | 33.05 | 36.05 |

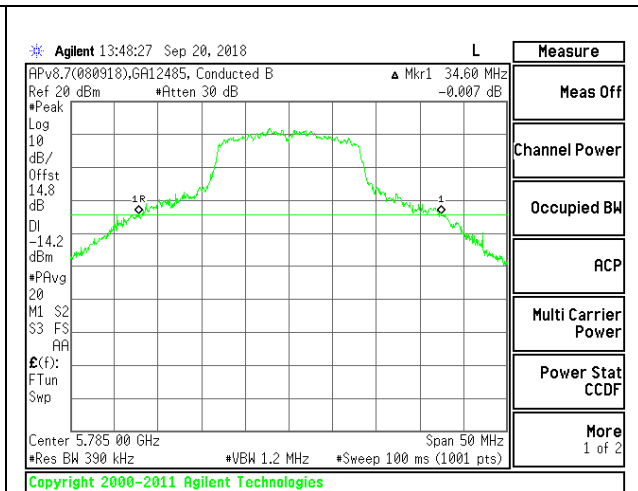
LOW CHANNEL



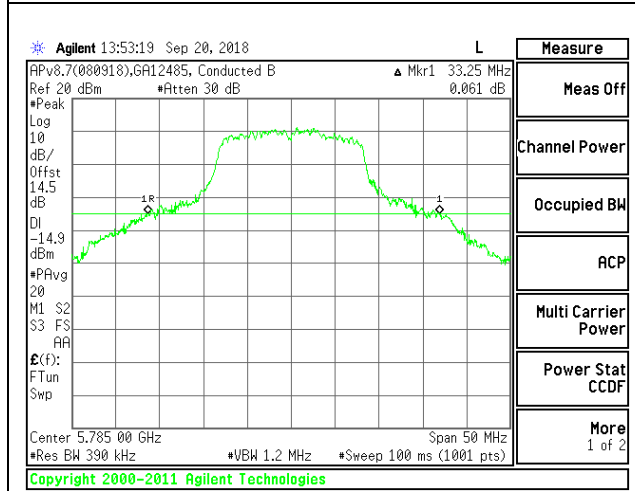
MID CHANNEL



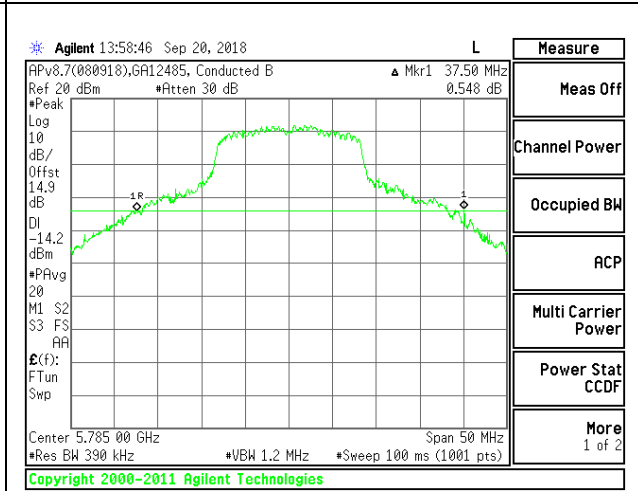
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

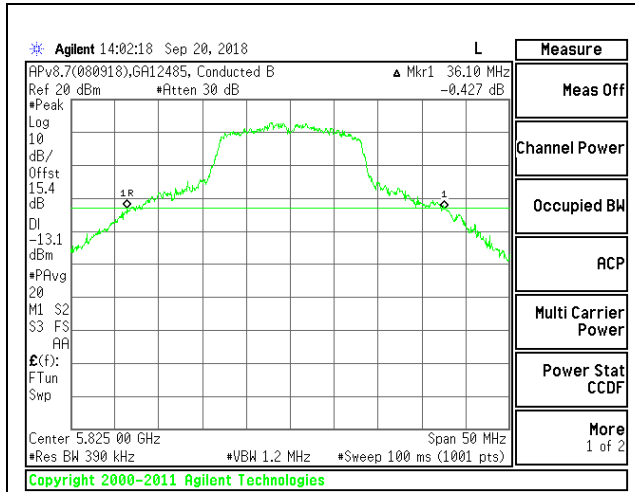


MID CHANNEL CHAIN 2

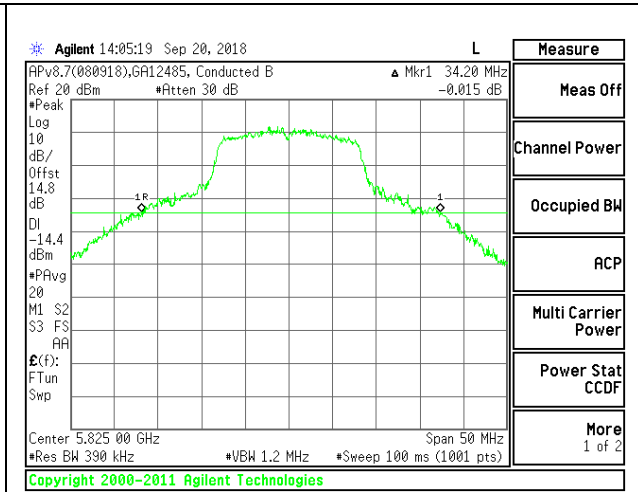


MID CHANNEL CHAIN 3

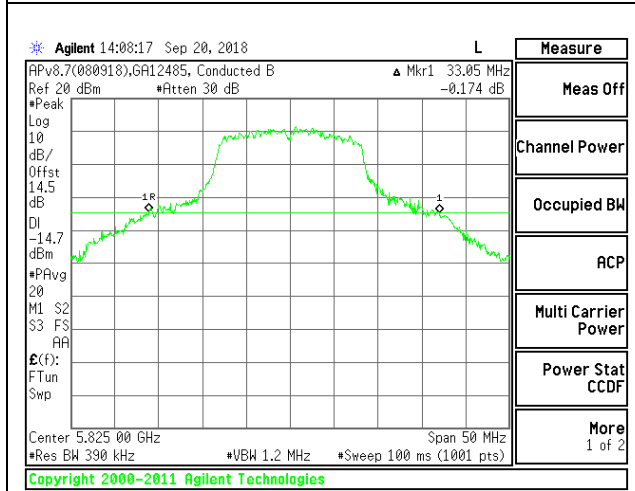
HIGH CHANNEL



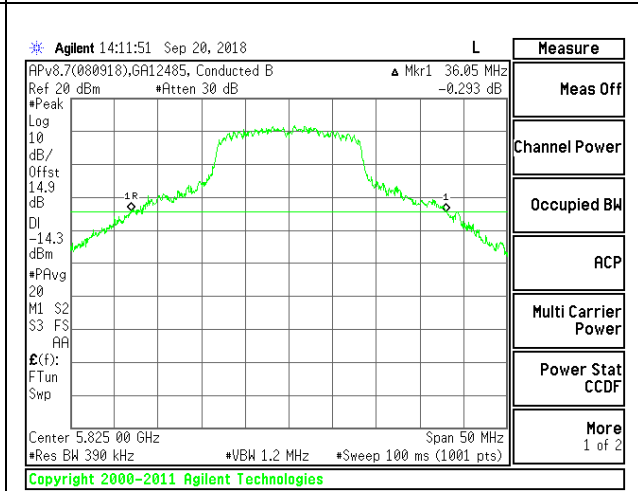
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

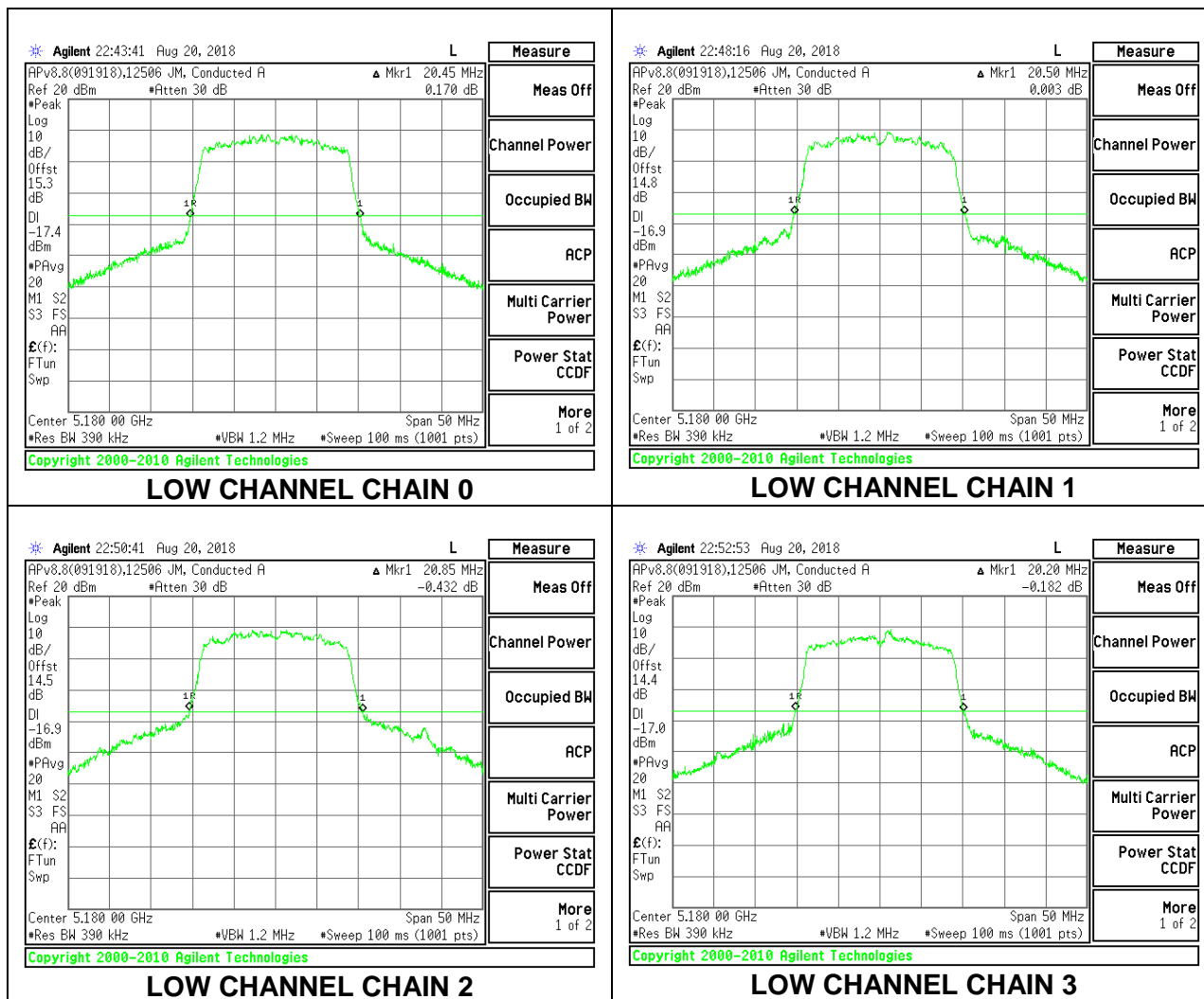


HIGH CHANNEL CHAIN 3

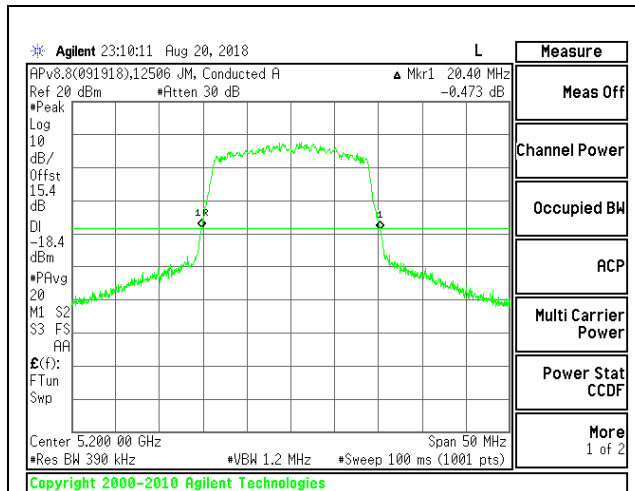
8.2.1.5. 802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5180 | 20.45 | 20.50 | 20.85 | 20.20 |
| Mid | 5200 | 20.40 | 20.35 | 20.45 | 20.15 |
| High | 5240 | 20.40 | 20.40 | 20.75 | 20.20 |

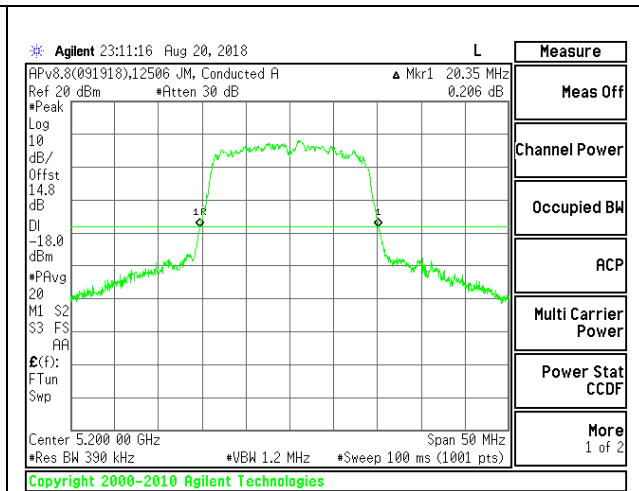
LOW CHANNEL



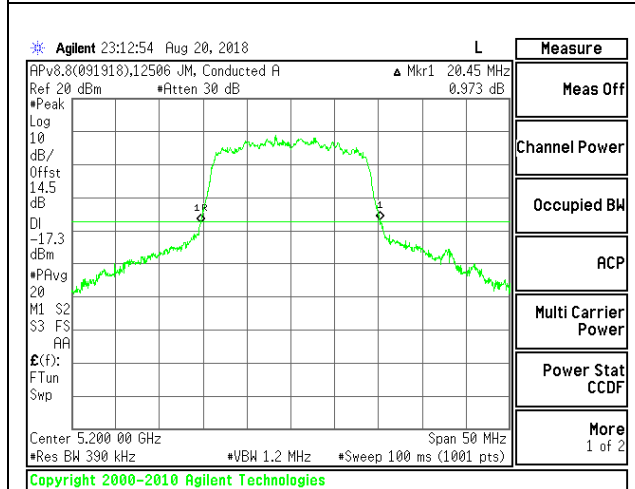
MID CHANNEL



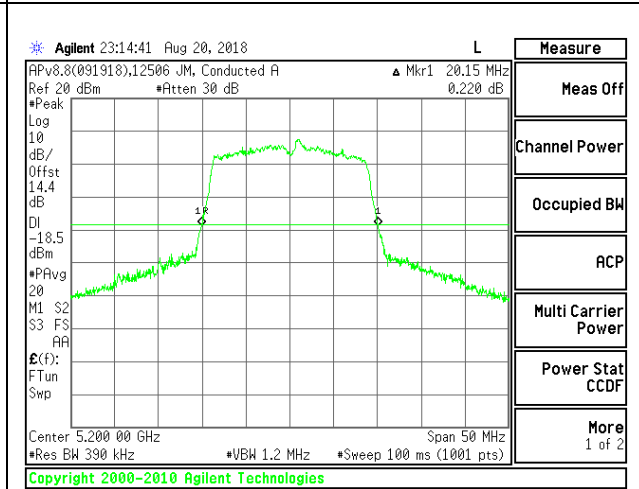
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

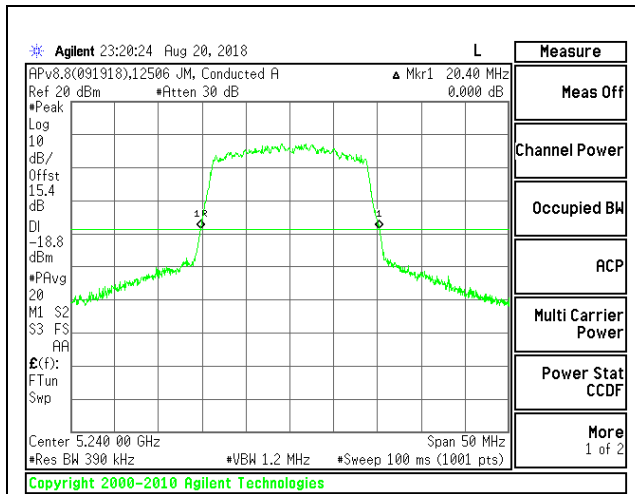


MID CHANNEL CHAIN 2

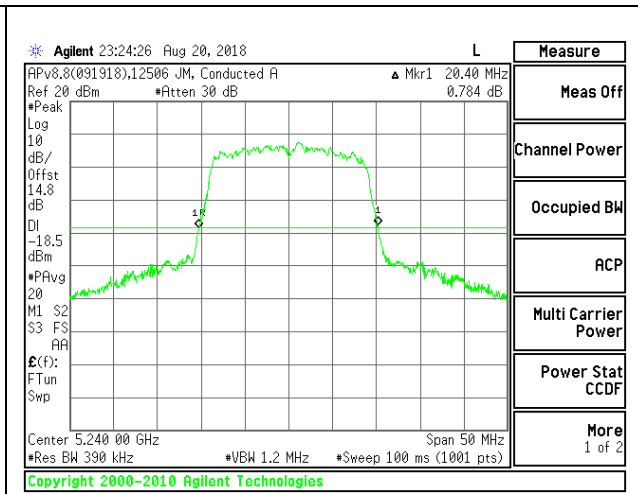


MID CHANNEL CHAIN 3

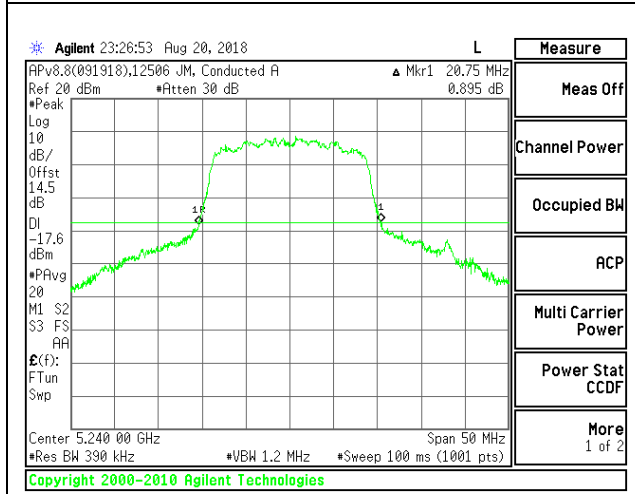
HIGH CHANNEL



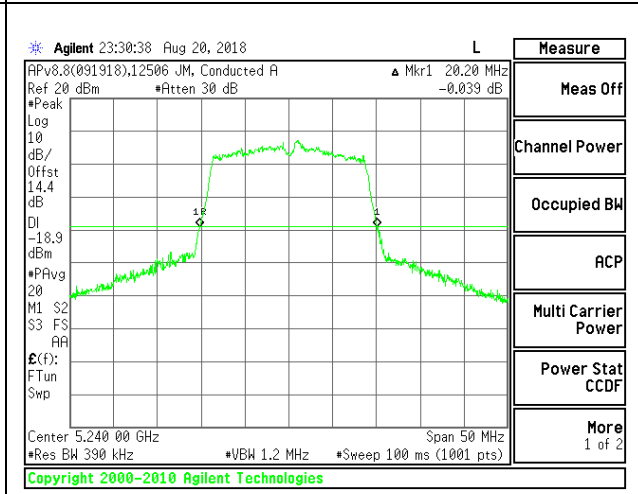
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

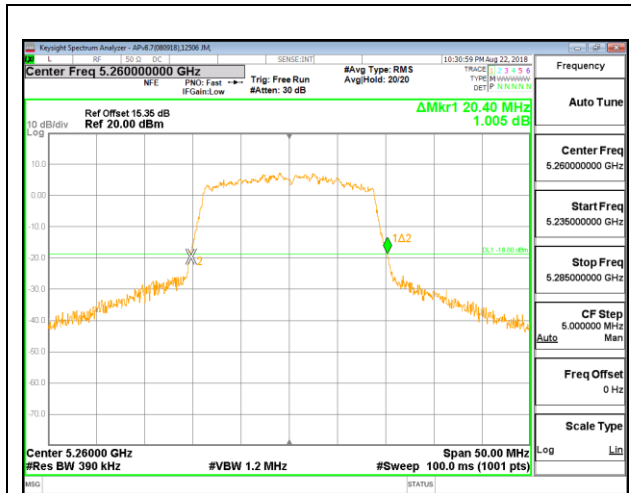


HIGH CHANNEL CHAIN 3

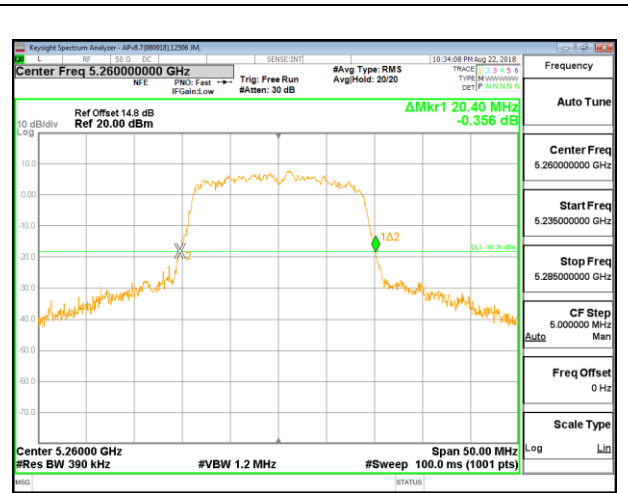
8.2.1.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5260 | 20.40 | 20.40 | 20.90 | 20.55 |
| Mid | 5300 | 20.35 | 20.35 | 21.05 | 20.15 |
| High | 5320 | 20.55 | 20.50 | 22.95 | 20.25 |

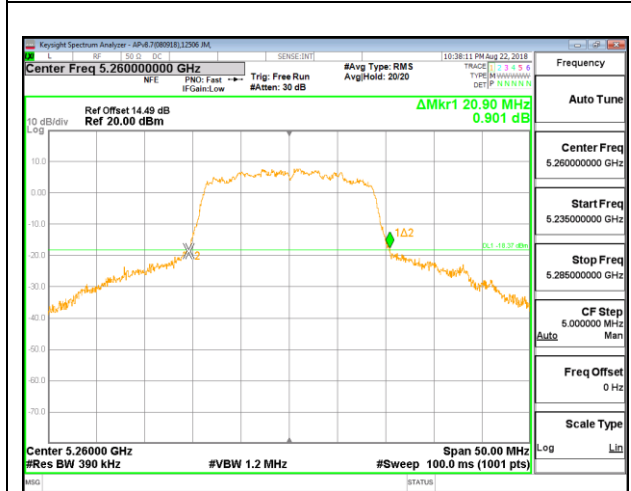
LOW CHANNEL



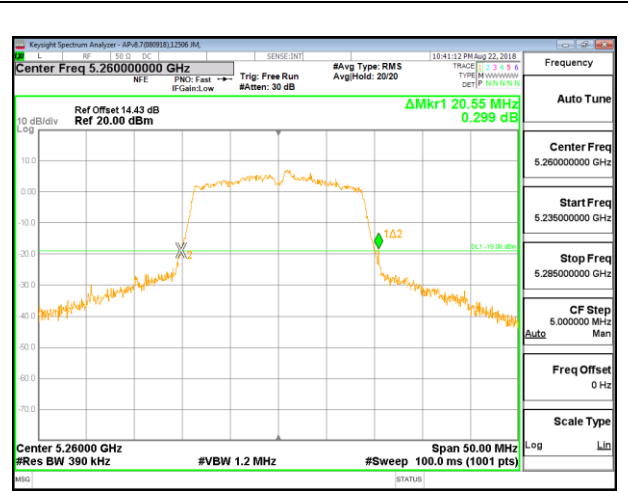
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

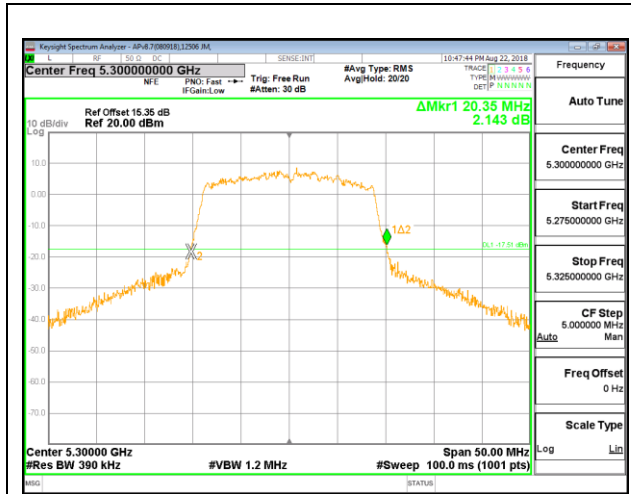


LOW CHANNEL CHAIN 2

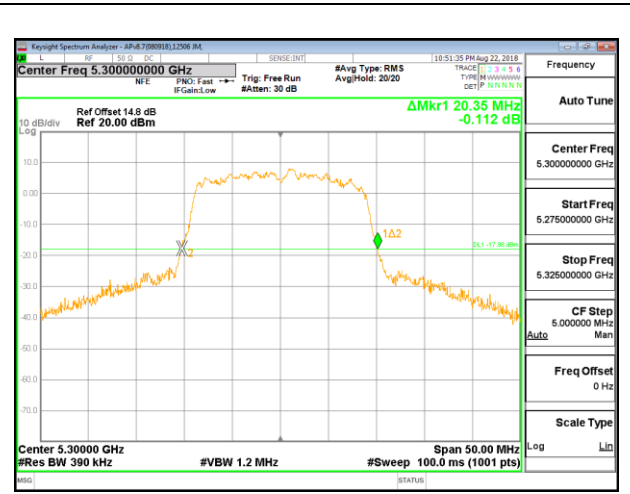


LOW CHANNEL CHAIN 3

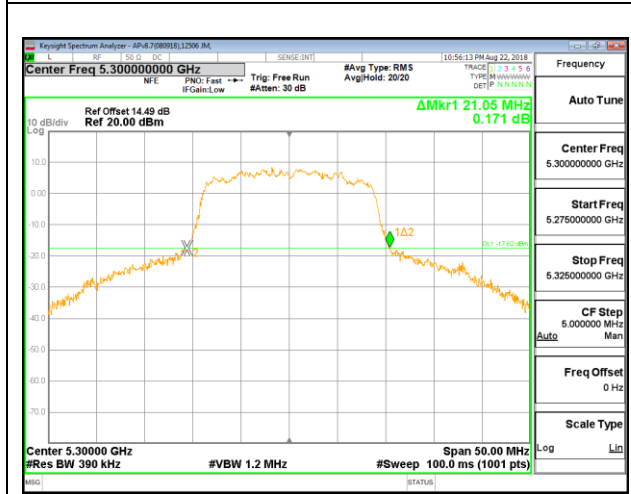
MID CHANNEL



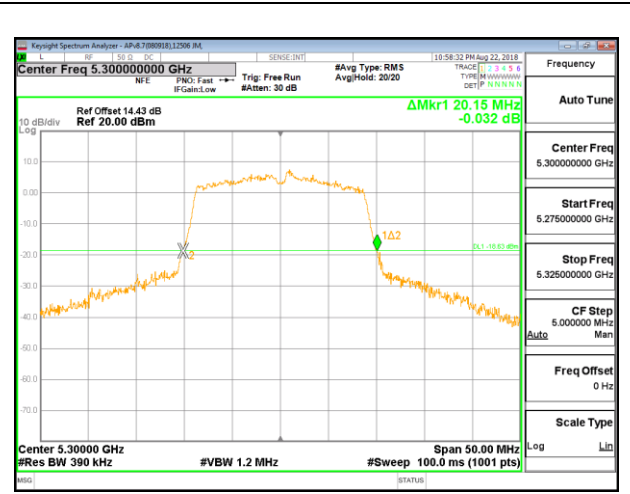
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

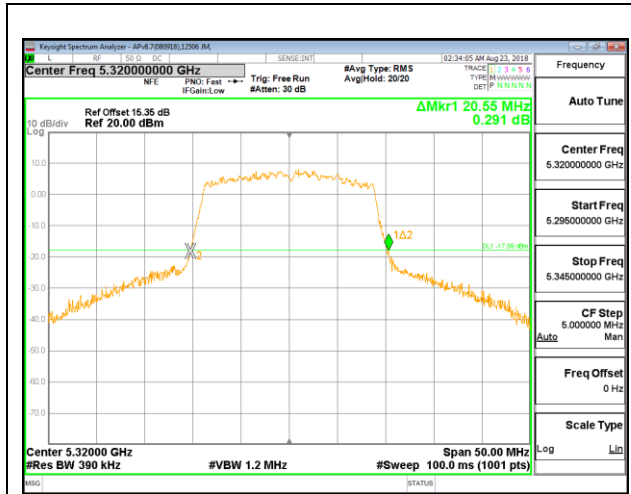


MID CHANNEL CHAIN 2

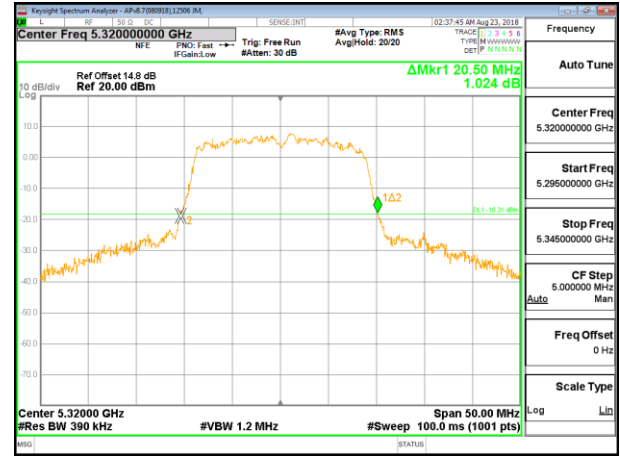


MID CHANNEL CHAIN 3

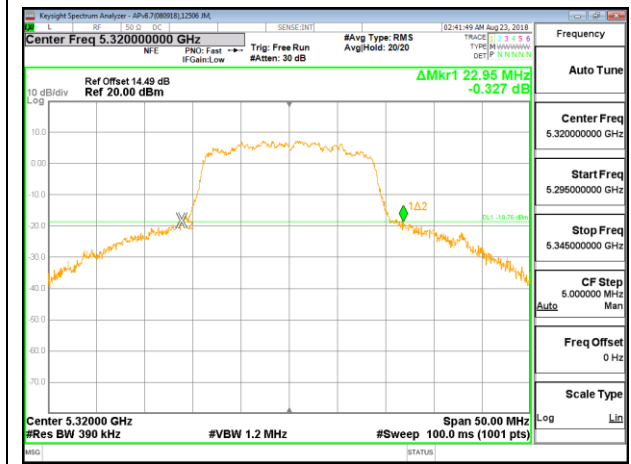
HIGH CHANNEL



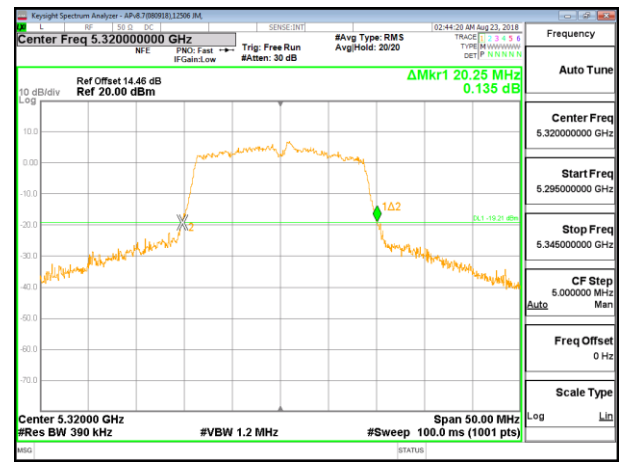
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

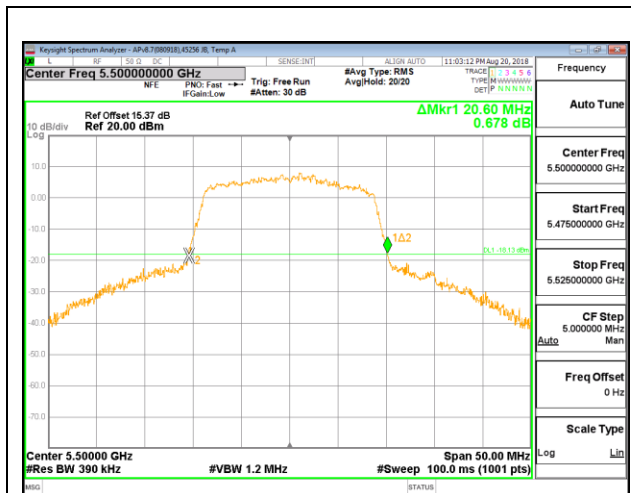


HIGH CHANNEL CHAIN 3

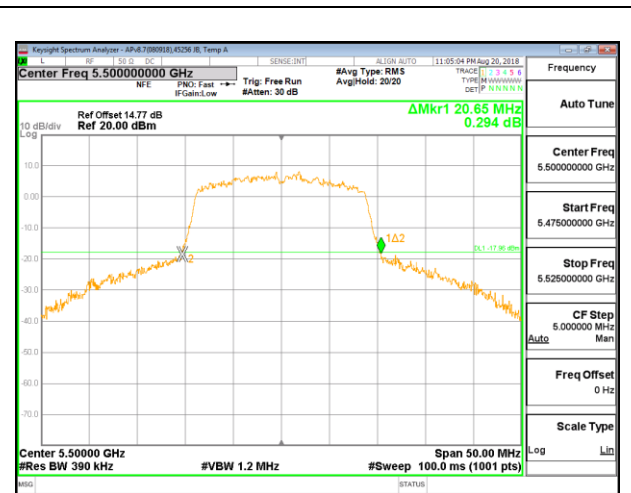
8.2.1.7. 802.11n HT20 MODE IN THE 5.6 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5500 | 20.60 | 20.65 | 20.65 | 20.30 |
| Mid | 5580 | 20.60 | 20.50 | 20.50 | 20.45 |
| High | 5700 | 20.65 | 20.30 | 20.50 | 20.35 |

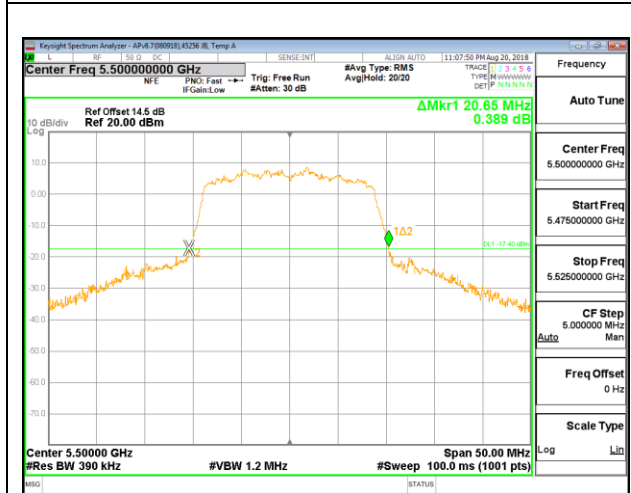
LOW CHANNEL



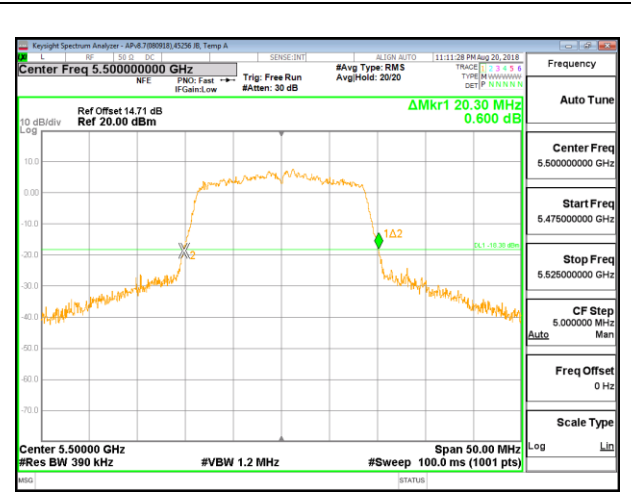
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

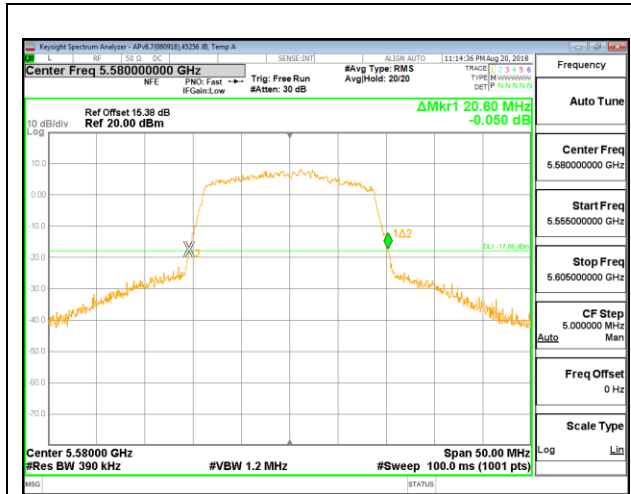


LOW CHANNEL CHAIN 2

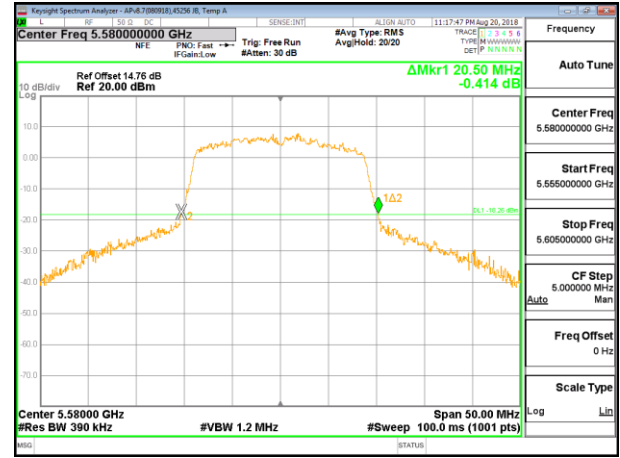


LOW CHANNEL CHAIN 3

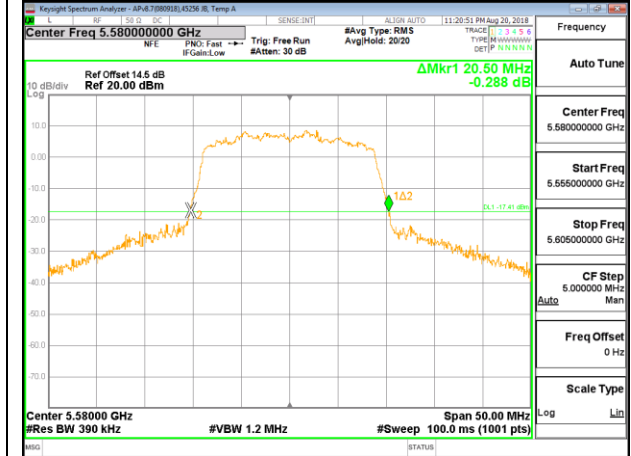
MID CHANNEL



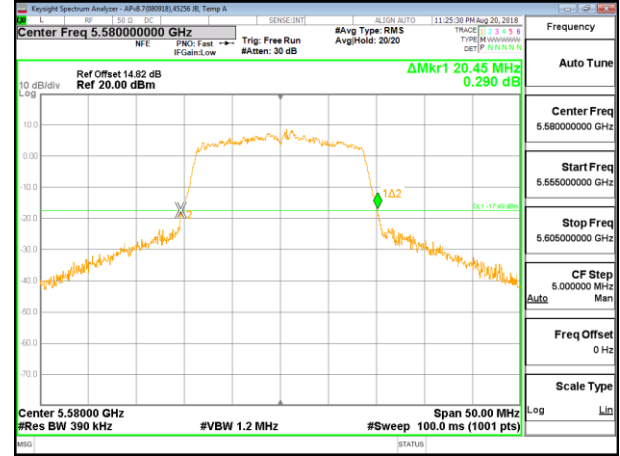
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

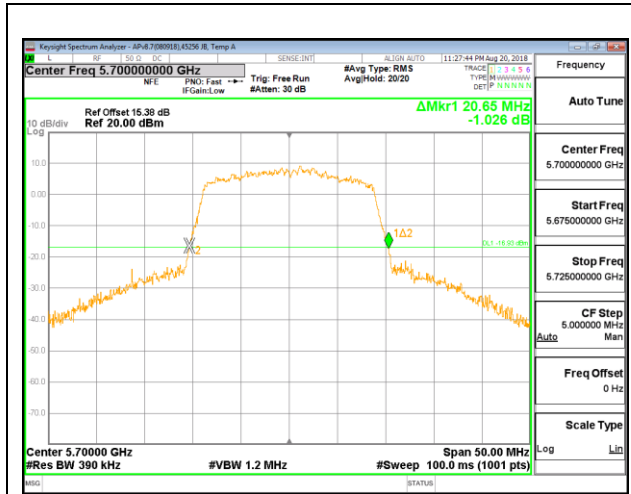


MID CHANNEL CHAIN 2

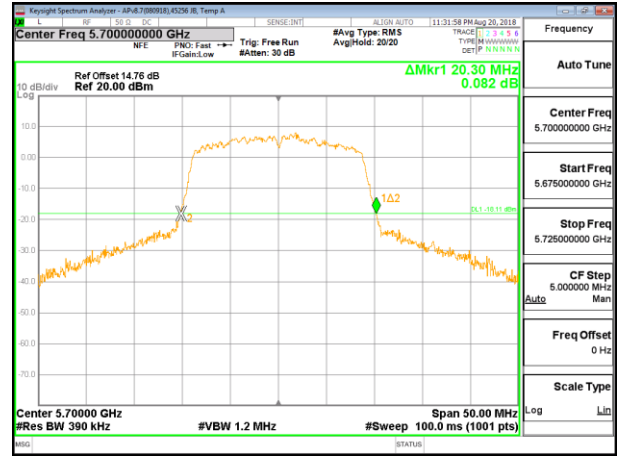


MID CHANNEL CHAIN 3

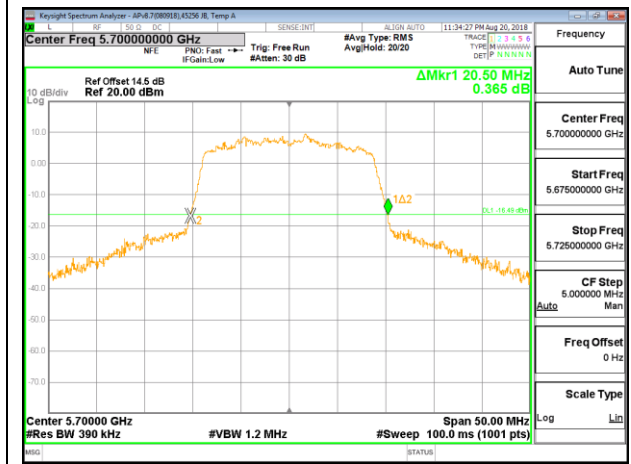
HIGH CHANNEL



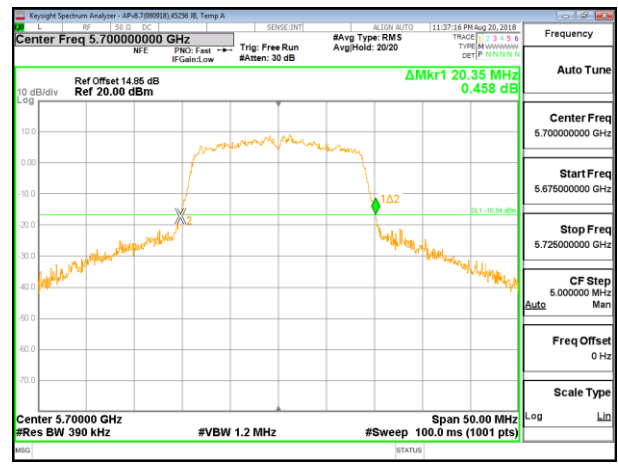
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2

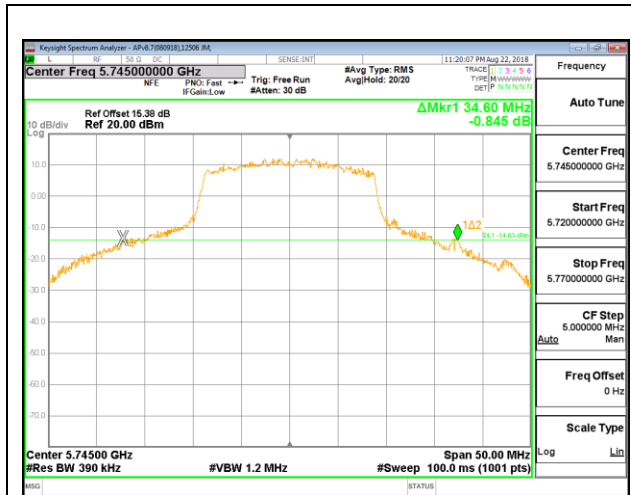


HIGH CHANNEL CHAIN 3

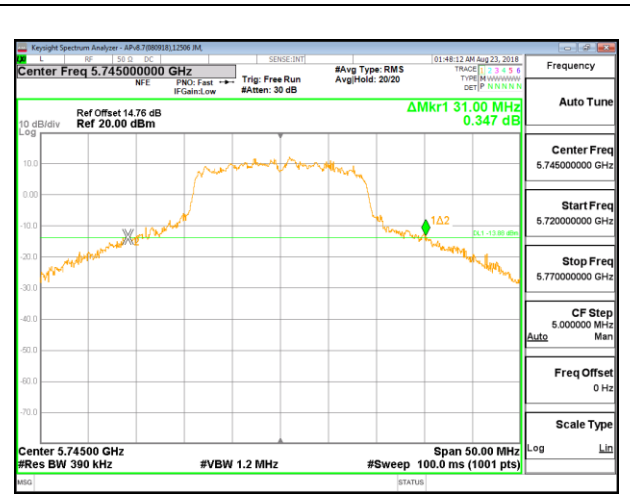
8.2.1.8. 802.11n HT20 MODE IN THE 5.8 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5745 | 34.60 | 31.00 | 34,95 | 35.20 |
| Mid | 5785 | 33.80 | 33.15 | 35.90 | 35.30 |
| High | 5825 | 34.80 | 32.95 | 32.50 | 36.25 |

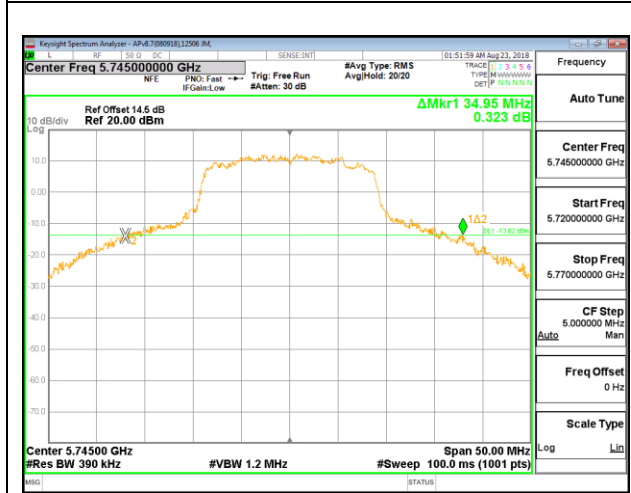
LOW CHANNEL



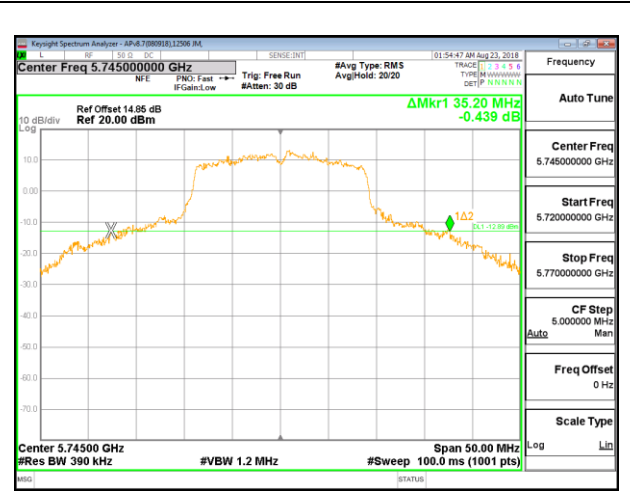
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

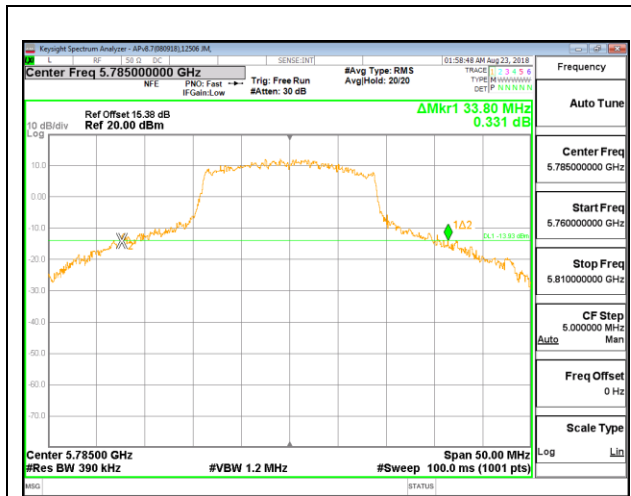


LOW CHANNEL CHAIN 2

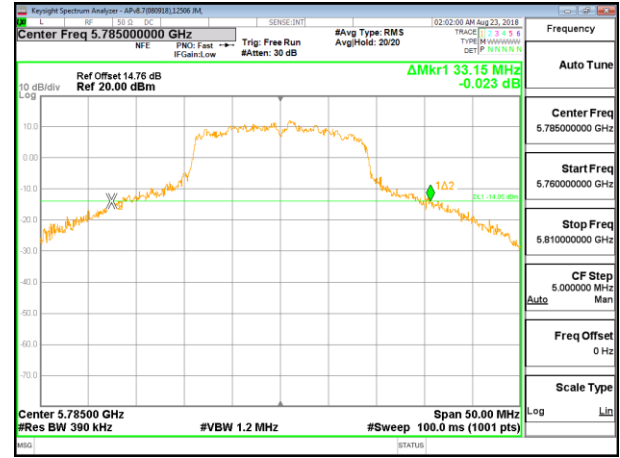


LOW CHANNEL CHAIN 3

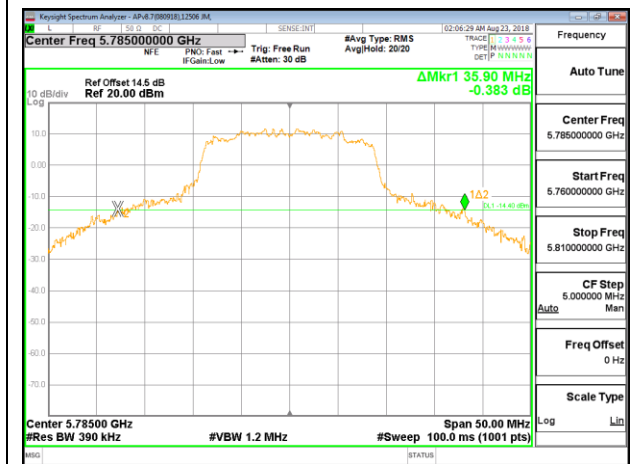
MID CHANNEL



MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

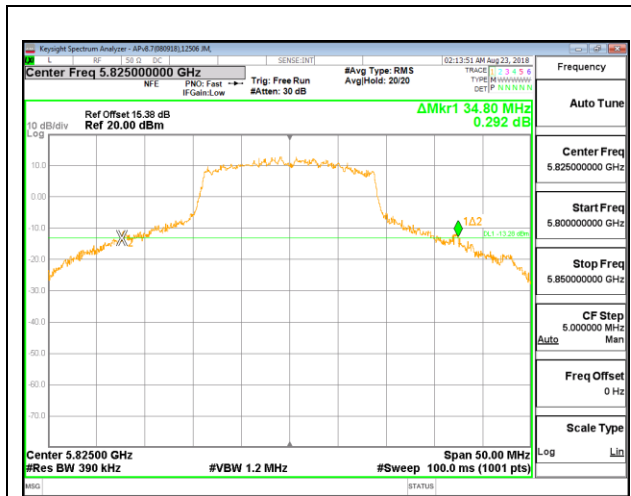


MID CHANNEL CHAIN 2

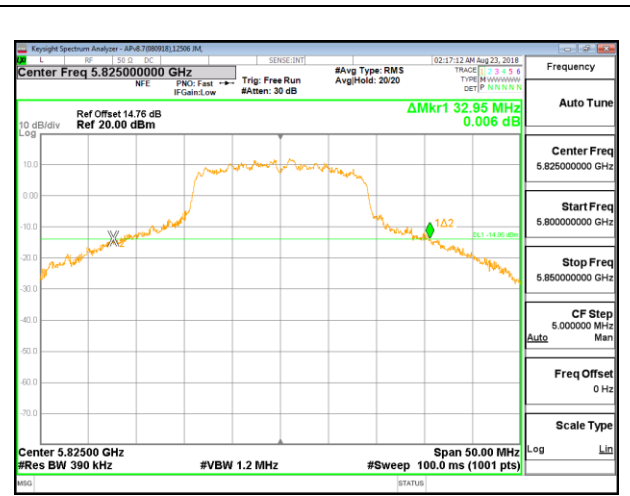


MID CHANNEL CHAIN 3

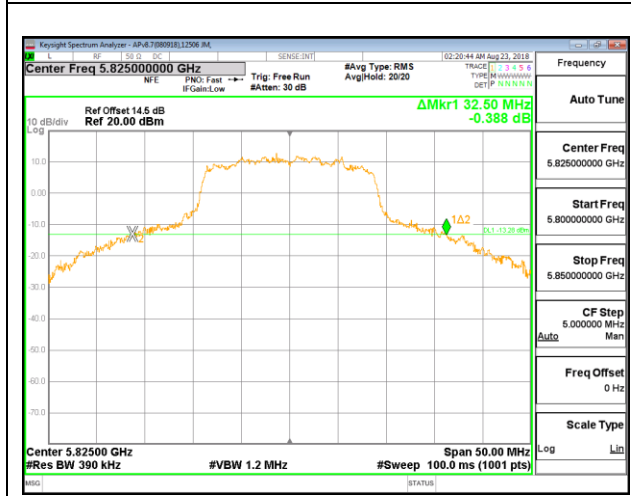
HIGH CHANNEL



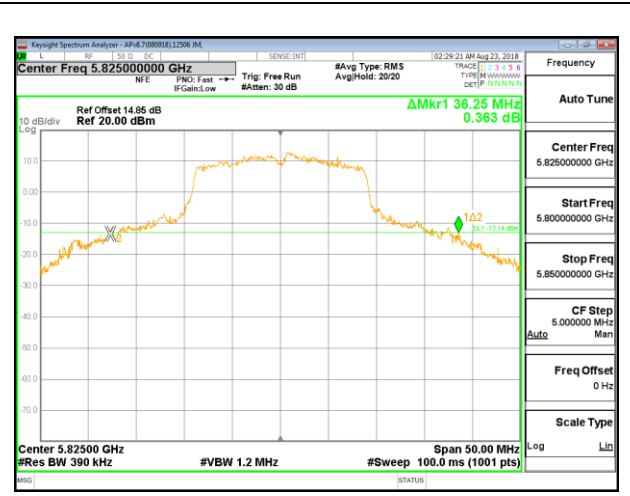
HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1



HIGH CHANNEL CHAIN 2



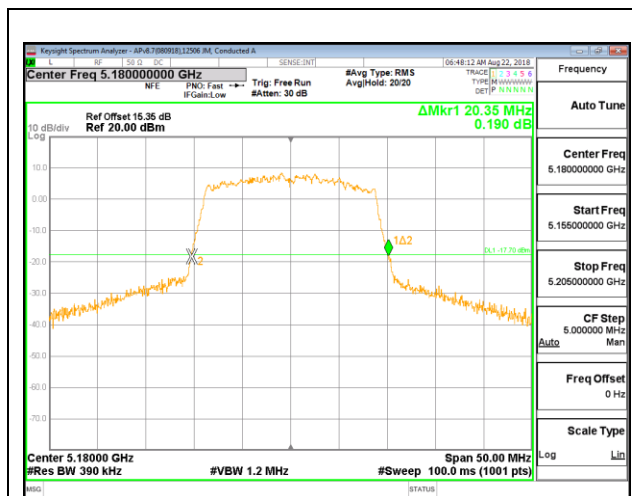
HIGH CHANNEL CHAIN 3

8.2.2 RADIO 1

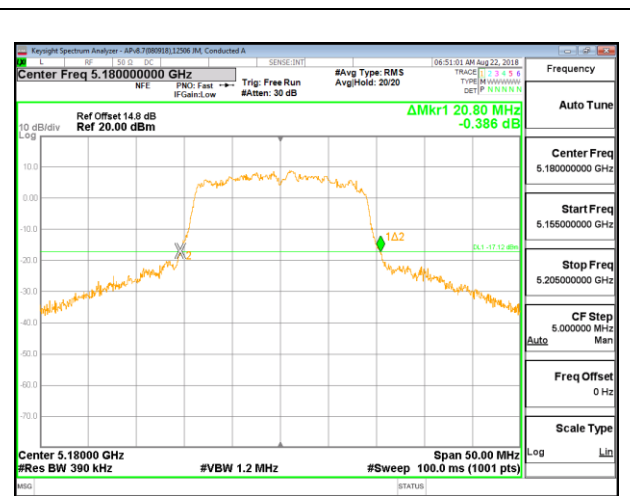
8.2.2.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency (MHz) | 26 dB Bandwidth Chain 0 (MHz) | 26 dB Bandwidth Chain 1 (MHz) | 26 dB Bandwidth Chain 2 (MHz) | 26 dB Bandwidth Chain 3 (MHz) |
|---------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Low | 5180 | 20.35 | 20.80 | 20.75 | 20.10 |
| Mid | 5200 | 20.45 | 20.75 | 20.70 | 20.10 |
| High | 5240 | 20.30 | 20.85 | 20.65 | 20.15 |

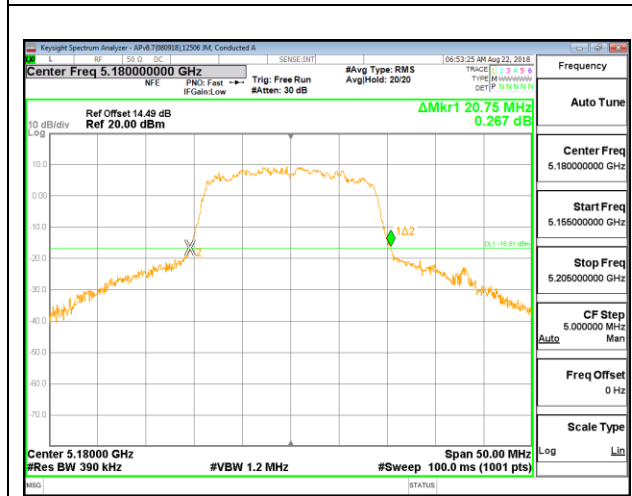
LOW CHANNEL



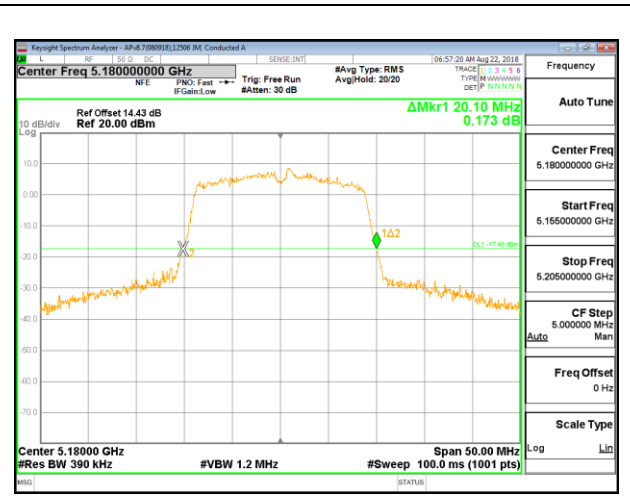
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

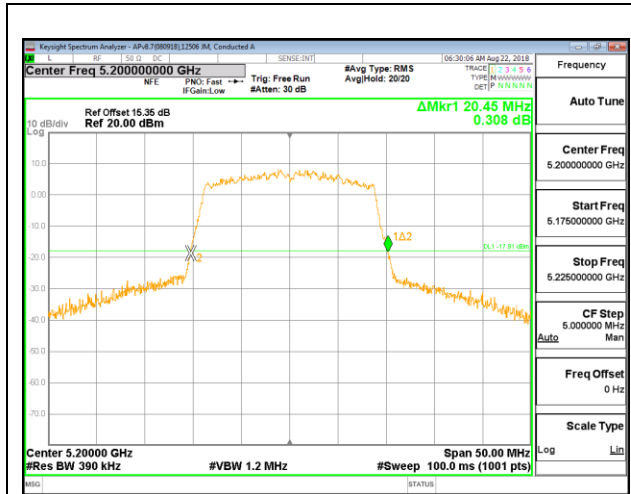


LOW CHANNEL CHAIN 2

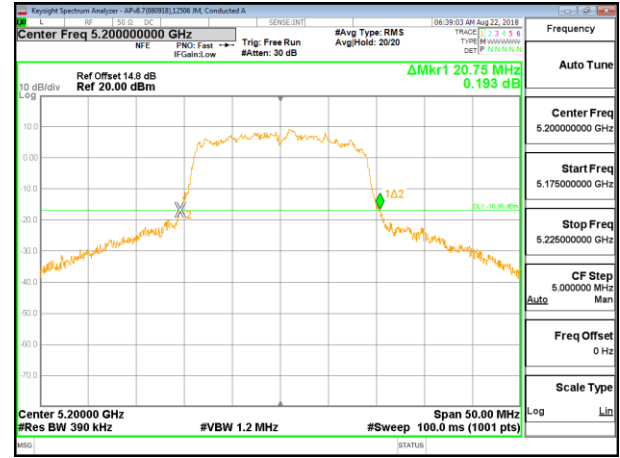


LOW CHANNEL CHAIN 3

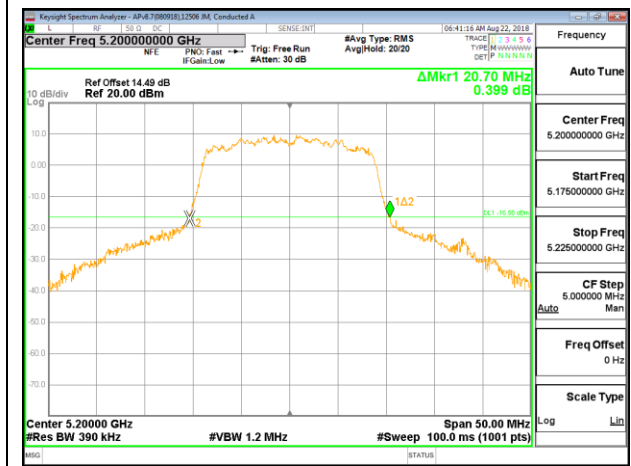
MID CHANNEL



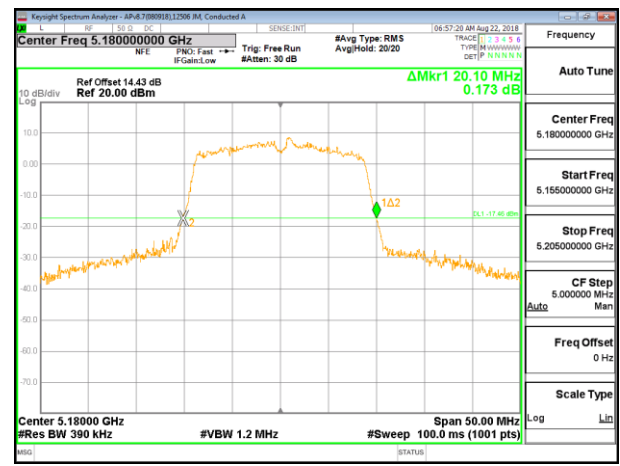
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1



MID CHANNEL CHAIN 2



MID CHANNEL CHAIN 3